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STUDIES ON FRESHWATER ENTOMOSTRACA IN GREENLAND II.

LOCALITIES, ECOLOGY, AND GEOGRAPHICAL DISTRIBUTION OF THE SPECIES

BY

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WITH 84 FIGURES IN THE TEXT, 6 TABLES AND 9 PLATES

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h. a. dec.

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Abstract.

A survey has been made of the freshwaters of Greenland, based on 207 localities—64 lakes, 107 ponds, and 36 temporary waters. Tables are given with information about conductivity, hydrogen ion concentration, alkalinity, acidity, consumption of potassium permanganate, colour, and contents of Ca^{++}, Mg^{++}, Cl^{-}, Fe^{++}, and total iron in most of the localities. An attempt is made to divide lakes, ponds and temporary waters into types.

Freshwater entomostraca have been collected from the 207 localities, and further investigations have been made on collections from 118 localities which the author himself has not examined.

52 species of freshwater entomostraca have been examined, eight of which are new to Greenland. Four previously recorded species have not been found again.

The distribution of the species is viewed in relation to a number of physico-chemical conditions found in the localities investigated.

The distribution of various species in Greenland is shown on a number of maps. On the basis of these maps and the percentage occurrence of the species within 11 areas of distribution into which Greenland is divided, a division of the species into four faunal elements has been made, viz. an element found in the whole of Greenland, a northwestern element, a southern element, and a brackish water element.

I. PREFACE

The present work is based on investigations which I had an opportunity to make in Greenland during the years 1954–1960.

Even though the Greenland fauna of freshwater entomostraca was already, as regards species, considerably better known than most other arctic faunas, there were wide gaps in our knowledge. Thus we had an extremely poor knowledge of the fauna north of Svartenhuk as well as the inland faunas, both on the west coast and the east coast.

Furthermore, there was the peculiar fact that even though some fresh waters, especially ponds and minor lakes, were fairly well examined, it was extremely rare to find accounts of the ecological conditions in connexion with the freshwater fauna. Actually reports on this relation only existed from the area about Disko Bugt and from Ella Ø in East Greenland (Bachmann 1921, Søgaard Andersen 1946), and neither of these works contain analyses of the water.

When during the years 1954–1957 I held an appointment as scientific leader of the Arctic Station of the University of Copenhagen at Godhavn on Disko, it was therefore a natural task to start collections of freshwater entomostraca from many varied localities while at the same time the localities were investigated as thoroughly as possible under the given conditions. The stay on Disko also had the advantage that a number of localities could be examined under winter conditions, which had previously been done only once (Søgaard Andersen 1946).

After my return to Copenhagen in 1957 I was made a fellow at the Freshwater Biological Laboratory of the University of Copenhagen, an appointment which gave me a free hand to work up the material collected. However, I soon realized that if the zoogeographical part of the work should be fairly satisfactory, it was necessary for me to travel part of the east coast and the northern areas of the west coast. It was therefore with great pleasure and interest I accepted an offer of taking part in the Scoresbysund Expedition of the Carlsberg Foundation in the summer of 1958, and in the summer of 1959 I got a chance of travelling in Northwest Greenland, the Upernavik and Thule Districts, through a grant from the Carlsberg Foundation and a free passage from the Ministry for Greenland. In April–May 1960 I again visited the

Thule District on a short trip, thus getting an opportunity of seeing the lakes of the northernmost area in a wintry condition.

In addition to the material I in this way have been able to collect, I have had an opportunity to use all collections from Greenland in the Zoological Museum of the University of Copenhagen. Furthermore, I have gone through some unpublished collections at Riksmuseet in Stockholm and at the Freshwater Biological Laboratory of the University of Copenhagen. Some of my friends, who for other purposes have been travelling in Greenland, also have made some collections, which have been left me. All these collections not made by myself have been very valuable to me, as they have to a great extent covered stretches which I have not travelled myself.

Without help and support from very many quarters it would not have been possible for me to carry through this work. The valuable assistance of the Carlsberg Foundation and the Ministry for Greenland was mentioned above. Besides, I want in the first place to offer my cordial thanks to the Directors of the Arctic Station of the University of Copenhagen, Professors T.W. BÖCHER, Ph.D., K. JESSEN, Ph.D. et Sc.D., R. SPÄRCK, Ph.D., and M. WESTERGAARD, Ph.D., for their never failing interest in my work, both when I was attached to the Station and later. Furthermore the Director of the Freshwater Biological Laboratory of the University of Copenhagen, Professor KAJ BERG, Ph.D., for extraordinarily good working conditions, encouraging advice, and friendly, positive criticism.

Among the large number of persons who have helped me on my travels in Greenland and in various ways have lightened the work for me, I especially want to offer my cordial thanks to LAUGE KOCH, Ph.D., Mr. K. HOLMEN, M.Sc., Mr. S. LÆGAARD, M.Sc., Mr. INGMAR EGEDE, Mr. HANNIBAL FENCKER, Miss TERNA DAHL, ERIK SMIDT, Ph.D., Mr. BENT JENSEN, and the Greenland sealers LORENTZ MØLGAARD, EMIL BROBERG, and QARQUTSIAQ ETAH.

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To Professor KARL LANG, Ph.D., Riksmuseet, Stockholm, I owe a great debt of gratitude for his verification of my determinations of the Harpacticides *Bryocamptus* (*Arcticocamptus*) *arcticus*, *Moraria mrazeki*, *Maraenobiotus brucei*, *M. insignipes*, *Heterolaophonte strömi*, and assistance with the description of *Heterolaophonte* sp., and for having placed the unpublished collections of the Riksmuseet at my disposal, and to Mr. T. WOLFF, M.Sc., of the Zoological Museum of the University of Copenhagen, I am grateful for the active interest with which he has procured the material found in the Museum for me.

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II. HISTORICAL INTRODUCTION

The Greenland freshwaters and their fauna of entomostraca have been treated in a large number of works.

The first communication about Greenland species of freshwater entomostraca is found in OTTO FABRICIUS's "Fauna Groenlandica" (1780) and includes two species, viz. *Cancer stagnalis* (= *Branchinecta paludosa*) and *Daphne pulex* (= *Daphnia pulex*). In 1838 KRØYER in his work "Grønlands Amphipoder" adds *Lynceus lamellatus* (= *Eurycercus glacialis*), and in "Karcinologiske Bidrag" (continuation) (1847) he describes *Apus glacialis* (= *Lepidurus arcticus*).

In 1857 two lists of Greenland animals were published, amongst others containing freshwater entomostraca, as Appendices 2 and 3 to N. RINK, "Grønland, geografisk og statistisk beskrevet", written by J. REINHARDT and J.C. SCHIØDTE, respectively. Only REINHARDT's list contains a species new to Greenland, viz. *Cyclops brevicornis*? (= *Cyclops* (*Acanthocyclops*) *vernalis*?). In 1889 GUERNE and RICHARD published the work "Sur la faune des eaux douces du Groenland", which gives the first complete treatment of a fairly large material from different localities, and besides it is the first working up of an arctic material of freshwater entomostraca. Besides the forms already known (of which, however, *Daphnia pulex* is only recorded as *Daphnia* sp.), they describe the following species: *Holopedium gibberum*, *Daphnia longispina*, *Scapholeberis mucronata*, *Bosmina arctica* (= *B. coregoni obtusirostris*), *Acroperus leucocephalus* (= *A. harpae*), *Alona affinis*, *Pleuroxus nanus* (= *Alonella nana*), *Pleuroxus excisus* (= *Alonella excisa*), *Chydorus sphaericus*, *Polyphemus pediculus*, and *Diaptomus minutus*.

BERGENDAL in 1891 published the work "Kurzer Bericht über eine im Sommer 1890 unternommene zoologische Reise nach Nord-Grönland". In this work he mentions some of the freshwater entomostraca previously found, and some of his material (not all of it as stated by HABERBOSCH (1920, p. 140)) was later worked up by WESENBERG-LUND.

A very valuable contribution to the investigations into the Greenland freshwater entomostraca was made by WESENBERG-LUND in two works, 1894 and 1895. WESENBERG-LUND had at his disposal material

which was very large for its time, from the west coast as well as the east coast, of which, however, unfortunately only the Euphyllopoda and the Cladocera were worked up. The first work (1894) included all forms found, whereas the other (1895) especially deals with the forms of the east coast. The majority of the forms of the two groups already known are mentioned and furthermore the following forms are new to Greenland: *Artemia gracilis* (= *Artemiopsis stefanssoni* v. *groenlandica*), *Latona glacialis* (= *L. setifera*), *Daphnia crassispina* (= *D. atkinsoni* v. *bolivari*), *Simocephalus vetulus*, *Ceriodaphnia quadrangula*, and *Macrothrix arctica* (= *M. hirsuticornis*).

Besides the lists of species the works contain many biological observations and an attempt at a zoogeographical evaluation.

At nearly the same time VANHÖFFEN (1893 a and b) published two minor communications about the subject, and later (1897) his large "Fauna und Flora Grönlands" was published, in which 16 pages are a description of the freshwater fauna in the Umanak Fjord. As species new to Greenland he recorded *Cypris virens* (= *Eucypris virens*) and *Cyclops* (= *Cyclops* (*Cyclops*) *scutifer*) as well as *Canthocamptus* sp. (it is impossible to decide what species he had before him). Furthermore there is in his work some important ecological information.

The "Danmark" Expedition in 1906–08 to the Northeast coast of Greenland brought home from this area a collection of freshwater entomostraca which was worked up systematically by BREHM (1911) and ecologically and biologically by FRITS JOHANSEN (1912). BREHM recorded some of the species previously known from Greenland besides some new species, viz. *Lynceus rectangulus* (= *Alona rectangula*), *Limnocalanus macrurus* (= *L. grimaldi*), *Canthocamptus cuspidatus* (= *Bryocamptus* (*Arcticocamptus*) *tikchikensis*), *C. duthi*? (= *Moraria mrazeki*??), *Epactophanes richardi*, *Maraenobiotus Danmarki* (= *M. brucei*), *Candona groenlandica*, and *Herpetocypris glacialis* (= *Prionocypris glacialis*).

STEPHENSEN (1913 a) published "Grønlands Krebsdyr og Pycnogonider (Conspectus Crustaceorum et Pycnogonidorum Groenlandiae)", in which all collections of freshwater entomostraca made in Greenland up to that time are listed, and in a minor paper (1913 b) he investigated the fauna in Gieseckes Sø. Neither of these works add any new species to the fauna. In 1912 he furthermore investigated the fiords of Southwest Greenland (STEPHENSEN 1916) and from there reported *Diaptomus castor* as new to Greenland.

In the meantime ALM (1914b) had published the work "Beiträge zur Kenntnis der nördlichen und arktischen Ostracodenfauna", based on collections in the Riksmuseet in Stockholm. From Greenland he found the following new species: *Cyprinotus incongruens*, *Candona candida*, and *C. rectangula*.

The greatest and most important work about the Greenland freshwater entomostraca, however, is that of HABERBOSCH (1920), which is a working up of collections made on various expeditions. Already earlier he (HABERBOSCH 1916) had published a list of the Greenlandic and Icelandic species, but in the large work he not only set up a list of species, but also gave an account of the biological conditions of the species, their distribution in Greenland, and the zoogeographical position of the fauna of Greenland. He reported the following species as new to Greenland: *Bosmina longirostris*, *Streblocerus serricaudatus*, *Alona guttata*, *A. intermedia*, *A. quadrangularis*, *Graptoleberis testudinaria*, *Cypris pubera*, *Eucypris affinis hirsuta*, *E. glacialis* v. *albida* (= *Prioncypris glacialis* v. *albida*), *Candona lapponica*, *Cypridopsis vidua*, *Canthocamptus arcticus* (= *Bryocamptus* (*Arcticocamptus*) *arcticus*), *Maraenobiotus insignipes*, and *Nannopus palustris*.

Some of the material used by HABERBOSCH (*loc. cit.*) has also been published by BACHMANN (1921) together with the algal forms found in the localities. As in this work also other ecological conditions of the localities are mentioned, it makes an important contribution to the ecology of the fauna.

Finally POULSEN in two works (1940 a and b) has treated some early and late collections from the east coast, in which there is an evaluation of the special position of the East Greenland fauna of freshwater entomostraca, and POULSEN and LESSE (1951) have treated some collections from Ege in Disko Bugt. None of these works contains species new to Greenland.

Besides these fairly large works there is information about single findings in a number of works which deal with other subjects. These are first of all reports on expeditions; but botanical and zoological works as well sometimes mention various freshwater entomostraca, just as it is possible to find information about the Greenland fauna in some works which deal with the fauna of other areas. The works in question are:

LILLJEBORG (1877, 1900), MIERS (1877), HOLM (1886), WARMING (1886), BRAEM (1893), OHLIN (1895), ORTMANN (1901), EKMAN (1904), DADAY (1910), CHAPPUIS (1929), MARSH (1929), LINDER (1932, 1941), MADSEN (1936), WAGLER (1937), WESENBERG-LUND (1937), SØGAARD ANDERSEN (1946), LANG (1948), VIBE (1949), JOHNSEN (1953), BROOKS (1957), LINDBERG (1957), DUSSART (1958), WILSON (1958), RØEN (1958 a, b, 1959, 1962) and KAISER (1959).

The Greenland fresh waters have also been mentioned by a number of authors. To only a few of them the study of fresh waters was in the front rank, as the information is found in connexion with botanical or zoological investigations.

The earliest information about the Greenland fresh waters are found in RINK (1857). Here and there in his description of Greenland there are remarks about lakes and ponds, their ice-cover and thickness of ice.

BERGGREN (1871, p. 867, 873, and 894) and WARMING (1886, p. 185) in reports on expeditions have a few remarks about lakes and ponds. The latter in his work "Om Grønlands Vegetation" (WARMING 1886–87, p. 127) goes through the fresh waters and fens.

The first thorough description of Greenland lakes and conditions of depth in them has been given by PORSILD (1902, pp. 110–111, 117–118, 201 ff., and 216–217). In this work especially three lakes on Disko are described, thus there are bathymetrical maps of these lakes in the work.

I.A.D. JENSEN (1889) has the first analysis of the water from a Greenland lake, viz. one of the salt lakes at the head of Søndre Strømfjord. It is strange that already at that time it was shown that salt lakes can develop in arctic regions.

From expeditions at the beginning of the 20th century a number of authors give further information about Greenland lakes, thus ENGEL (1910, p. 216), KRUUSE (1911, p. 281), JOHANSEN (1912), NORDMANN (1912), KOCH and WEGENER (1912, p. 22), and TROLLE (1913, pp. 336–390). Most of these works only contain information about depths and ice-cover, but the last-mentioned one also has tables of temperatures and conditions of salinity in the lake Sælsøen, Northeast Greenland.

BACHMANN (1921) investigated a large number of freshwater localities situated from the Umanak Fjord to Godthåb. Unfortunately most of his descriptions are so vague that it may be difficult to find the localities, but there are some valuable pieces of information, especially about conditions of temperature, in his work. Furthermore, he has tried to divide the fresh waters into types of locality, especially on the basis of their conditions of depth. The classification is as follows:

1. Grössere Seen. 2. Teichseen. 3. Tiefere Teiche. 4. Flache Teiche und Tümpel. 5. Wasserpfützen.

To these are added another two groups, viz. Fliessende Gewässer and Warme Quellen. It has not, to any appreciable degree, been tried to distinguish these types by anything but their depths; still there is an attempt at also considering the communities of algae in them.

SØGAARD ANDERSEN (1946) during a wintering in East Greenland, Ella Ø, studied four lakes there. This work partly includes bathymetrical maps of the lakes, partly information about the bottom material, the vegetation, ice-cover and ice-thickness, and finally the fauna. However, there are no measurements of temperature nor any determinations of oxygen content or salinity. As to the oxygen content of the water, it

has been estimated that there was ample oxygen under the ice if the water did not come to smell of H_2S.

In the summary remarks about the four lakes investigated the author concludes that they must, if anything, be described as mesotrophic, but that only the short summer prevents them from developing into eutrophic lakes.

BÖCHER (1949, 1959) has studied the lakes around the head of Søndre Strømfjord and found that within a very limited area there are lakes of a very heterogeneous character there. He groups them in four main types: A. Lakes with acid water poor in salt. B. Lakes with circumneutral water poor in salts. C. Lakes with rather saline, alkaline water, and D. Lakes with saline, highly alkaline water. There are in these works descriptions of lakes of these types and their dependence on the continental climate, and some total analyses of the water of the lakes.

FOGED (1958) has examined a large number of fresh waters in Disko Bugt and the Umanak District, especially with reference to their diatomaceous flora. As regards most localities only a short description is given, but from 36 localities there are also total analyses of samples of water.

HOLMQUIST (1959) in connexion with investigations into the genus *Mysis* gives descriptions of physical-chemical conditions in some large lakes around Disko Bugt and in the Egedesminde District, and finally MADSEN (1959) offers some information from lakes in the Arsuk Fjord area.

III. PHYSIOGRAPHICAL PART

A. Methods Applied for the Determination of Physical and Chemical Conditions.

a. Collection and Transport.

Samples of water for analysis were normally taken direct by transport bottles at some distance under the surface and as far as possible free of the bottom and any vegetation. Where vertical series of samples were taken in lakes a reversing self-closing water bottle with an attached reversing thermometer was used. The water bottles would hold 1.25 litre, so that one sample was sufficient for determination of oxygen as well as other analyses.

For transport bottles one litre pyrex or polyethylene bottles, for winter work exclusively polyethylene bottles were used, as these did not burst if the contents froze. Polyethylene bottles were also used for sending home water samples in 1958–60.

In using these transport bottles no changes in the results of the analyses were found, even after a week's transport, if the bottles were kept in a cool place. The only exception was the actual hydrogen ion concentration, which, as far as possible, was always measured as the samples were taken.

When investigating lakes in winter it was necessary to cut holes in the ice. The diameters of these holes (about 30 cm) were just large enough to enable unimpeded sampling of the plankton. When the lakes were visited by travel boat while they were frozen over, a stand of iron bars was brought along intended to carry a winch, whereas the latter was attached to the end of a sledge when the localities were visited by sledge. Mostly it was necessary to pitch a tent over the hole in the ice and heat the tent with primus stoves, as the low air temperature otherwise in a short time give rise to the formation of rather a thick layer of ice over the hole and the wet winch would freeze into an immovable lump.

In lakes to which it was not possible to carry a boat, a raft was built. In principle this consisted of three oil barrels, on to which a deck was lashed, with a box for the fastening of the winch and a hole in the

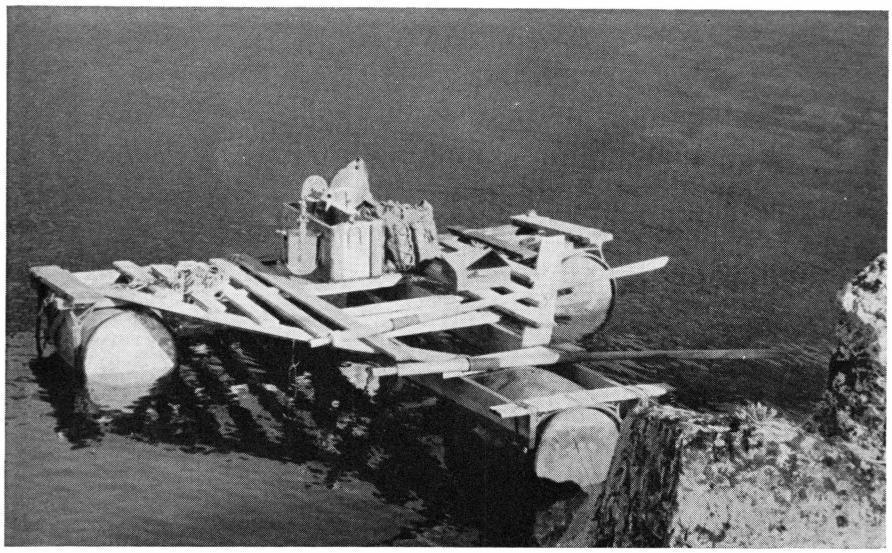


Fig. 1. Raft with winch mounted on it. Loc. 60. Mellemsø. Disko Fjord.

middle for the taking of samples. The fact that such a raft could be used where it was not possible to transport a boat, was due to the raft being easy to dismantle, and each of the various constituents could be carried by two men.

b. Methods of Investigation and Analysis.

I. Temperature. In minor localities and in the cases in which major localities, lakes, were only examined from the beach, the temperature was measured with small field thermometers, with alcohol or mercury and with a graduation of whole or half degrees. At regular intervals they were corrected for their reading as compared with a normal thermometer. For winter journeys alcohol thermometers were always used.

For determination of the temperatures down through the lakes was used a reversing thermometer graduated into $^1/_{10}°$. This, too, was regularly corrected.

II. Colour. The colour of the water was measured in "Ohle" units, i.e. the colour which is produced by dissolving 0.01 mg of methyl orange in 1 litre of distilled water (OHLE 1934; BENNIKE 1943).

III. Hydrogen ion concentration, pH. pH was measured with a portable electrical pH-meter of the make "Radiometer pH-meter 24", or, in 1958–60, of the make "Radiometer pH-meter 21".

From the localities near the station at Godhavn water was brought home in polyethylene or pyrex bottles with determination immediately after the return. In localities to which long journeys were necessary, the pH-meter was brought along, so that determination took place in the locality. In winter and on the journeys in 1958–60 it was impossible to carry the instrument, so in these cases the actual hydrogen ion concentration was determined by means of test paper. In accordance with IVERSEN (1929) both the actual and the theoretically highest and theoretically lowest value were determined at most pH determinations.

IV. Conductivity. This was measured with a "Dionic Water Tester", whose construction, function, and application has been described by WELCH (1948).

V. Alkalinity. From the amount of n/10 HCl needed to change the colour of 100 ml of the sample of water containing methyl orange as indicator from yellow to orange (BENNIKE 1943) according to RUTTNER (1931), is deducted the amount 0.06 ml, as this amount is necessary to change the colour of the indicator in distilled water.

The alkalinity of nearly all the localities investigated here, however, was so small that n/10 HCl was too concentrated for the reading to be accurate. I therefore used n/100 HCl with a reduction of 0.6 ml, and all figures have been indicated in ml of n/100 HCl in order to make direct comparisons, even in cases in which n/10 HCl might have been used.

VI. Acidity. In cases in which a neutral or basic reaction is not obtained by boiling the sample of water, it is of interest to determine the normality of the acid determining the acidity. This determination was made according to the method indicated by BENNIKE (1943).

Because of the low values found in Greenland waters all figures are indicated as ml of n/100 NaOH, with a reduction of 0.25 ml, as this figure indicates the acidity for distilled water.

VII. Calcium, Ca^{++}. Measured by titration with standard sodium versenate (Complexion III); ammonium purpurate is used as indicator. See further HERON and MACKERETH (1955).

VIII. Magnesium, Mg^{++}. The total hardness is measured by titration with standard sodium versenate against eriochrome black T as indicator. The amount of magnesium in mg/l is found by deducting the amount of calcium from the total hardness and multiplying by 0.61.

IX. Iron. Fe^{++} and Fe^{+++}. The determination of iron was made according to the method indicated in RØEN (1957).

X. Oxygen. The oxygen determinations were made according to WINCKLER'S method as described by BENNIKE (1943). Sodium thiosulphate with the normality 0.003572 according to KROGH was used at the titration.

For taking samples from the ice in winter it was necessary to carry weighed chemicals in a dry state, and then dissolve them in distilled water immediately before taking samples in the tent. The bottles for the samples were transported in plastic bags with water between shirt and sweater, as this was the only place where they could be kept free from frost. Freezing of the bottles would make them burst.

XI. Potassium-permanganate consumption. The method described by BENNIKE (1943) was used.

B. List of Localities Examined.

In this list the localities examined are arranged according to their geographical situation. The West Greenland localities are the first listed, then follow the East Greenland ones. For each stretch of coast the numbering is made from north to south and from west to east. As far as possible the geographical coordinates are given with the exactitude of a minute of an arc, as it has not been possible to make more accurate measurements on the Greenland maps. In cases of large localities (the large lakes) longitude and latitude indicate the place where samples normally were taken. From the localities situated within the urban areas of Godhavn and Godthåb there are no indications of coordinates, as no coordinates are shown on the maps of the towns, and it has not been possible for me to have these established. Furthermore it is stated on which map, Greenland 1:250,000, the localities are found, if such maps have been published.

1. Great Lake, MacCormick Fjord.
2. Pond A., MacCormick Fjord.
3. Pond B., MacCormick Fjord.
4. Pond C., MacCormick Fjord.
5. Pond D., MacCormick Fjord.
6. Pond E., MacCormick Fjord.
7. Lake North of Settlement Qeqertat. Lat. 77°30′ N., long. 66°40′ W.
8. Pond at Settlement Qeqertat. Lat. 77°29′ N., long. 66°41′ W.
9. Lake Immediately East of Settlement Qeqertat, Imertalik. Lat. 77°29′ N., long. 66°40′ W.

10. Temporary Pond on Herberts Ø. Lat. 77°22′ N., long. 70°08′ W.
11. Minor Lake near Kangerdlugssuaq. Lat. 77°18′ N., long. 67°08′ W.
12. Larger Lake near Kangerdlugssuaq. Lat. 77°16′ N., long. 67°18′ W.
13. Pond at the Settlement Igánaq. Lat. 76°52′ N., long. 70°55′ W.
14. Pond supplying Igánaq with Drinking Water. Lat. 76°52′ N., long 70°54′ W.
15. Pond Southeast of Igánaq. Lat. 76°51′ N., long. 70°52′ W.
16. Lake near Dundas. Lat. 76°33′ N., long. 68°40′ W.
17. Western Pond near Dundas. Lat. 76°33′ N., long. 68°40′ W.
18. Eastern Pond near Dundas. Lat. 76°33′ N., long. 68°36′ W.
19. Lake Tuto. Lat. 76°23′ N., long. 68°15′ W.
20. Lake at Savigsivik.
21. Pond at Savigsivik.
22. The Water Lake, Kraulshavn.
23. The Water Lake, Tasiussaq.
24. Pond between the Water Lake and the Trading Station Tasiussaq.
25. Pond in the Northern Part of the Trading Station Tasiussaq.
26. Smallest Pond in the Southern Part of the Trading Station Tasiussaq.
27. Largest Pond in the Southern Part of the Trading Station Tasiussaq.
28. Puddle near Ivnarssuit.
29. Pond at Ivnarssuit.
30. Pond at Tuvssâq.
31. Small Lake near Tuvssâq.
32. Pond near Tuvssâq.
33. Pond at Augpilagtoq. Lat. 72°63′ N., long. 55°39′ W. 72 V. 1. Upernavik.
34. Lake near Augpilagtoq. Lat. 72°53′ N., long. 55°37′ W. 72 V. 1. Upernavik.
35. Largest Pond on the Northern Part of Upernavik Ø. Lat. 72°48′ N., long. 56°07′ W. 72 V. 1. Upernavik.
36. Smallest Pond on the Northern Part of Upernavik Ø. Lat. 72°48′ N., long. 56°07′ W. 72 V. 1. Upernavik.
37. Middle Pond on the Northern Part of Upernavik Ø. Lat. 72°48′ N., long. 56°07′ W. 72 V. 1. Upernavik.
38. Pond in the Ravine of Severance, Upernavik. Lat. 72°48′ N., long. 56°07′ W. 72 V. 1. Upernavik.
39. Lake in the Ravine of Severance, Upernavik. Lat. 72°48′ N., long. 56°07′ W. 72 V. 1. Upernavik.
40. Pond immediately Southwest of the Ravine of Severance, Upernavik. Lat. 72°48′ N., long. 56°08′ W. 72 V. 1. Upernavik.
41. Pond North of the Cairn, Upernavik. Lat. 72°47′ N., long. 56°08′ W. 72 V. 1. Upernavik.
42. Pond immediately North of the Cairn, Upernavik. Lat. 72°47′ N., long. 56°08′ W. 72 V. 1. Upernavik.
43. Pond near the Beacon Station, Upernavik. Lat. 72°47′ N., long. 56°10′ W. 72 V. 1. Upernavik.
44. Tyfussøen, Upernavik. Lat. 72°46′ N., long. 56°09′ W. 72 V. 1. Upernavik.
45. Pond between "Livets top" and the Highest Point, Upernavik. Lat. 72°46′ N., long. 56°09′ W. 72 V. 1. Upernavik.
46. Pond near the Radio Station of Upernavik. Lat. 72°46′ N., long. 56°09′ W. 72 V. 1. Upernavik.
47. Pond on the slope above Old Upernavik. Lat. 72°46′ N., long. 56°09′ W. 72 V. 1. Upernavik.
48. Lake at Kingigtoq. Lat. 72°40′ N., long. 55°58′ W. 72 V. 1. Upernavik.

49. Pond in Prøven. Lat. 72°23′ N., long. 55°33′ W. 72 V. 1. Upernavik.
50. Lake at Niaqornat. Lat. 70°47′ N., long. 53°45′ W. 70 V. 1. Nûgssuaq.
51. The Water Lake, Umanak. Lat. 70°41′ N., long. 56°08′ W., 70 V. 2. Umanak.
52. Lillesø, Umanak. 70°41′ N., long. 52°08′ W. 70 V. 2. Umanak.
53. Pond Northwest of the School, Umanak. Lat. 70°41′ N., long. 52°08′ W. 70 V. 2. Umanak.
54. Kakissalik, Ikerasak. Lat. 70°31′ N., long. 51°21′ W. 70 V. 2. Umanak.
55. Lake in Ikerasak rich in plants. Lat. 70°30′ N., long. 51°19′ W. 70 V. 2. Umanak.
56. Tarajornitsoq, Ikerasak. Lat. 70°30′ N., long. 51°20′ W. 70 V. 2. Umanak.
57. Pond at Nordfjord. Lat. 69°57′ N., long. 54°34′ W. 69 V. 1. Godhavn.
58. Taserssuaq, Atâ. Lat. 69°47′ N., long. 50°57′ W. 69 V. 2. Jakobshavn.
59. Navdluarssuk. Lat. 69°45′ N., long. 50°09′ W. 69 V. 2.
60. Mellemsø, Disko Fjord. Lat. 69°31′ N., long. 53°44′ W. 69 V. 1. Godhavn.
61. Lillesø, Disko Fjord. Lat. 69°31′ N., long. 53°45′ W. 69 V. 1. Godhavn.
62. Lake at Evqitsoq, Disko Fjord. Lat. 69°30′ N., long. 53°53′ W. 69 V. 1. Godhavn.
63. Puddle at the Trading Station of Disko Fjord. Lat. 69°29′ N., long. 53°56′ W. 69 V. 1. Godhavn.
64. Lake at Qivítut, Disko Fjord. Lat. 69°27′ N., long. 53°40′ W. 69 V. 1. Godhavn.
65. Pond in Rodebay. Lat. 69°21′ N., long. 51°01′ W. 69 V. 2. Jakobshavn.
66. Pond on Kangârssuk, Fortunebay. Lat. 69°16′ N., long. 53°50′ W. 69 V. 1. Godhavn.
67. Lake on Kangârssuk, Fortunebay. Lat. 69°16′ N., long. 53°50′ W. 69 V. 1. Godhavn.
68. Littoral Pond on Kangârssuk, Fortunebay. Lat. 69°16′ N., long. 53°50′ W. 69 V. 1. Godhavn.
69. Morænesø, Blæsedalen. Lat. 69°16′ N., long. 59°29′ W. 69 V. 1. Godhavn.
70. Puddle in Østerdalen, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
71. Pond North of the Flagpole of Arctic Station, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
72. Pond North of the Scientific Leader's Residence, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
73. Hippurissø, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
74. Holostomadam, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
75. Circular Puddle North of Tranbrænderisø, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
76. Pond in Langekær, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
77. Pond on the South Border of Gravryggen, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
78. Puddle West of the Gravel-Pit, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
79. Tranbrænderisø, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
80. Western Mountain Puddle on Gravryggen, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
81. Eastern Mountain Puddle on Gravryggen, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
82. Pond East of Tranbrænderisø, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
83. Branchipusdam, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
84. Pond at Magnetic Station, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
85. Taserssuaq (Thygesens sø), Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.

86. Spectacle-shaped Pond West of "Thygesens sø", Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
87. Pond immediately South of Loc. 86, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
88. Shallow Pond Southeast of Loc. 86, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
89. Pond at the highest point between Kirkegårdsbugten and "Thygesens Sø", Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
90. Pond near Kirkegårdsbugten, Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
91. Pond South of "Thygesens Sø", Godhavn. Town map of Godhavn. 69 V. 1. Godhavn.
92. Puddle in the valley South of the Children's Sanatorium, Jakobshavn. Lat. 69°14′ N., long. 51°06′ W. 69 V. 2. Jakobshavn.
93. Puddle on slope of valley East of the Children's Sanatorium, Jakobshavn. Lat. 69°14′ N., long. 51°06′ W. 69 V. 2. Jakobshavn.
94. Pond in valley, Jakobshavn. Lat. 69°14′ N., long. 51°06′ W. 69 V. 2. Jakobshavn.
95. Lowest Pond East of the Bridge at the Cemetery, Jakobshavn. Lat. 69°13′ N. long. 51°07′ W. 69 V. 2. Jakobshavn.
96. Uppermost Pond East of the Bridge at the Cemetery, Jakobshavn. Lat. 69° 13′ N., long. 51°07′ W. 69 V. 2. Jakobshavn.
97. Pond Immediately North of the Pitorqeq Cairn, Jakobshavn. Lat. 69°13′ N., long. 51°07′ W. 69 V. 2. Jakobshavn
98. Pond South the Pitorqeq Cairn, Jakobshavn. Lat. 69°13′ N., long. 51°07′ W. 69 V. 2. Jakobshavn.
99. Lake at Claushavn. Lat. 69°05′ N., long. 51°07′ W. 69 V. 2. Jakobshavn.
100. Pond in bog on Hunde Eiland. Lat. 68°51′ N., long. 53°07′ W. 68 V. 1. Egedesminde.
101. Puddle on Hunde Eiland. Lat. 68°51′ N., long. 53°07′ W. 68 V. 1. Egedesminde.
102. Pond on Grønne Eiland. Lat. 68°50′ N., long. 51°51′ W. 68 V. 2. Christianshåb.
103. The Water Lake, Christianshåb. Lat. 68°49′ N., long. 51°12′ W. 68 V. 2. Christianshåb.
104. Puddle near Large Lake, Christianshåb. Lat. 68°49′ N., long. 51°10′ W. 68 V. 2. Christianshåb.
105. Lake at Kangersuneq. Lat. 68°46′ N., long. 50°52′ W. 68 V. 2. Christianshåb.
106. Pond in Akúnâq. Lat. 68°45′ N., long. 62°20′ W. 68 V. 2. Christianshåb.
107. The Water Lake, Egedesminde. Lat. 68°42′ N., long. 52°53′ W. 68 V. 1. Egedesminde.
108. Lake at Orpigsôq Qarajaq. Lat. 68°41′ N., long. 50°53′ W. 68 V. 2. Christianshåb.
109. Puddle at Orpigsôq Qarajaq. Lat. 68°41′ N., long. 50°53′ W. 68 V. 2. Christians-. håb.
110. Gieseckes Sø. Lat. 67°39′ N., long. 53°33′ W. 67 V. 1. Nordre Strømfjord west.
111. Lake on Arnaq Qavdlunâq. Lat. 67°16′ N., long. 53°22′ W. 67 V. 1. Nordre Strømfjord west.
112. Small alkaline Lake near Strømfjordshavn. Lat. 66°59′ N., long. 50°59′ W.
113. Limnaeasø. Søndre Strømfjord. Lat. 66°58′ N., long 51°05′ W.
114. Brayasø. Søndre Strømfjord. Lat. 66°58′ N., long. 51°03′ W.
115. Lille Saltsø, Søndre Strømfjord. Lat. 66°58′ N., long. 50°42′ W.
116. Store Saltsø, Søndre Strømfjord. Lat. 66°58′ N., long. 50°38′ W.
117. Pond near Store Saltsø, Søndre Strømfjord. Lat. 66°58′ N., long. 50°38′ W.
118. Puddle in Holsteinsborg. Lat. 66°56′ N., long. 53°39′ W. 66 V. 1. Holsteinsborg.

119. The Water Lake, Holsteinsborg. Lat. 66°56′ N., long. 53°38′ W. 66 V. 1. Holsteinsborg.
120. Lake above Vandfaldskløften, Umîvît, Søndre Strømfjord. Lat. 66°53′ N., long. 50°52′ W.
121. Pond in Umánârssuk. Lat. 66°51′ N., long. 53°35′ W. 66 V. 1. Holsteinsborg.
122. Lake on Angujârtorfik, Søndre Strømfjord. Lat. 66°51′ N., long. 51°06′ W.
123. Lake on the South Side of Umîvît, Søndre Strømfjord. Lat. 66°50′ N., long. 50°57′ W.
124. Pond in Itivdleq. Lat. 66°35′ N., long. 53°20′ W. 66 V. 1. Holsteinsborg.
125. Lake near Anders Olsens Sund. Lat. 66°28′ N., long. 53°38′ W. 66 V. 1. Holsteinsborg.
126. Northern Pond near Anders Olsens Sund. Lat. 66°28′ N., long. 53°38′ W. 66 V. 1. Holsteinsborg.
127. Southern Pond near Anders Olsens Sund. Lat. 66°28′ N., long. 53°38′ W. 66 V. 1. Holsteinsborg.
128. Pond in bog at the bottom of Lille Malene Bugt, Godthåb. Lat. 64°11′ N., long 51°44′ W. 64 V. 1. Godthåb.
129. Pond at the bottom of Lille Malene Bugt, Godthåb. Lat. 64°11′ N., long. 51°44′ W. 64 V. 1. Godthåb.
130. The Water Lake, Godthåb. Lat. 64°11′ N., long. 51°45′ W. 64 V. 1. Godthåb.
131. Rock pool NE of the Training College, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
132. Pond immediately East of the Home for the Aged, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
133. Pond South of the Water Lake, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
134. Pond on the Plain, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
135. Puddle near "Østerbro", Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
136. Pond on Quagssúnguaq, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
137. Western Puddle near the Transmitting Station, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
138. Midmost Puddle near the Transmitting Station, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
139. Eastern Puddle near the Transmitting Station, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
140. Pond South of the Transmitting Station, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
141. Puddle at Ny Herrnhut, Godthåb. Town map of Godthåb. 64 V. 1. Godthåb.
142. Lille Sø, Maria Ø. Lat. 72°58′. N., long. 24°53′ W. 72 Ø. 2. Kong Oscars Fjord.
143. Store Sø, Maria Ø. Lat. 72°57′ N., long. 24°55′ W. 72 Ø. 2. Kong Oscars Fjord.
144. Pond A on Kap Oswald, Ella Ø. Lat. 72°53′ N., long. 25°07′ W. 72 Ø. 2. Kong Oscars Fjord.
145. Pond B on Kap Oswald, Ella Ø. Lat. 72°53′ N., long. 25°07′ W. 72 Ø. 2. Kong Oscars Fjord.
146. Puddle on Kap Oswald, Ella Ø. Lat. 72°53′ N., long. 25°07′ W. 72 Ø. 2. Kong Oscars Fjord.
147. Rundsø, Ella Ø. Lat. 72°53′ N., long. 25°08′ W. 72 Ø. 2. Kong Oscars Fjord.
148. Langsø, Ella Ø. Lat. 72°53′ N., long. 25°08′ W. 72 Ø. 2. Kong Oscars Fjord.
149. Puddle on the plateau of Ulvesø, Ella Ø. Lat. 72°52′ N., long. 24°06′ W. 72 Ø. 2. Kong Oscars Fjord.
150. Ulvesø, Ella Ø. Lat. 72°52′ N., long. 25°05′ W. 72 Ø. 2. Kong Oscars Fjord.

151. Puddle in Spring River, Geographical Society Ø. Lat. 72°44′ N., long. 22°30′ W. 72 Ø. 1. Kap Parry.
152. Basaltsø, Geographical Society Ø. Lat. 72°44′ N., long. 22°30′ W. 72 Ø. 1. Kap Parry.
153. Puddle near Basaltsø, Geographical Society Ø. Lat. 72°44′ N., long. 22°28′ W. 72 Ø. 1. Kap Parry.
154. Small Lake, Geographical Society Ø. Lat. 72°44′ N., long. 22°25′ W. 72 Ø. 1. Kap Parry.
155. Pond, Geographical Society Ø. Lat. 72°43′ N., long. 22°35′ W. 72 Ø. 1. Kap Parry.
156. Pond A near Airfield, Mesters Vig. Lat. 72°15′ N., long. 23°55′ W. 72 Ø. 2. Kong Oscars Fjord.
157. Pond B near Airfield, Mesters Vig. Lat. 72°15′ N., long. 23°55′ W. 72 Ø. 1. Kong Oscars Fjord.
158. Pond C near Airfield, Mesters Vig. Lat. 72°14′ N., long. 23°54′ W. 72 Ø. 1. Kong Oscars Fjord.
159. Pond near the Radio Station of the Airfield, Mesters Vig. Lat. 72°13′ N., long. 23°54′ W. 72 Ø. 1. Kong Oscars Fjord.
160. Pond South of Airfield of Mesters Vig. Lat. 72°12′ N., long. 23°56′ W. 72 Ø. 1. Kong Oscars Fjord.
161. Northern Pond near Rungsted Elv, Mesters Vig. Lat. 72°11′ N., long. 24°00′ W. 72 Ø. 2. Kong Oscars Fjord.
162. Southern Pond near Rungsted Elv, Mesters Vig. Lat. 72°11′ N., long. 24°00′ W. 72 Ø. 2. Kong Oscars Fjord.
163. Grønnesø, Charcots Land. Lat. 71°57′ N., long 28°54′ W.
164. Uppermost Fen, Charcots Land. Lat. 71°57′ N., long. 28°54′ W.
165. Puddle near Grønnesø, Charcots Land. Lat. 71°57′ N., long. 28°55′ W.
166. Lowermost Fen, Charcots Land. Lat. 71°56′ N., long. 28°54′ W.
167. Northern Pond on the Moraine, Charcots Land. Lat. 71°55′ N., long. 29°00′ W.
168. Southern Pond on the Moraine, Charcots Land. Lat. 71°55′ N., long. 29°00′ W.
169. Hippuris Pond, Charcots Land. Lat. 71°54′ N., long. 28°59′ W.
170. Ice-dammed Lake, Charcots Land. Lat. 71°53′ N., long. 28°54′ W.
171. Northern Lake on Mountain Plateau, Charcots Land. Lat. 71°52′ N., long. 28°55′ W.
172. Pond on Mountain Plateau, Charcots Land. Lat. 71°52′ N., long. 28°55′ W.
173. Southern Lake on Mountain Plateau, Charcots Land. Lat. 71°51′ N., long. 28°55′ W.
174. Puddle at an altitude of 1350 m., Nathorsts Land. Lat. 71°46′ N., long. 26°55′W.
175. Smallish lake, Nathorsts Land. Lat. 71°43′ N., long. 27°00′ W.
176. T-Sø, Nathorsts Land. Lat. 71°43′ N., 27°00′ W.
177. Holger Danskes Briller, Eastern Part, Scoresby Land. Lat. 71°24′ N., long. 24°55′ W.
178. Puddle 100 m. North of Holger Danskes Briller, Scoresby Land. Lat. 71°24′ N., long 24°55′ W.
179. Puddle 50 m. North of Holger Danskes Briller, Scoresby Land. Lat. 71°24′ N., long. 24°55′ W.
180. Puddle East of Holger Danskes Briller, Scoresby Land. Lat. 71°23′ N., long. 24°54′ W.
181. Western Border Pond, Scoresby Land. Lat. 71°23′ N., long. 24°54′ W.
182. Middle Border Pond, Scoresby Land. Lat. 71°23′ N., long. 24° 54′W.
183. Eastern Border Pond. Scoresby Land. Lat. 71°23′ N., long. 24°53′ W.

184. Puddle on Elvsletten, Scoresby Land. Lat. 71°23′ N., long. 24°53′ W.
185. The Expansion of the River, Scoresby Land. Lat. 71°23′ N., long. 24°63′ W.
186. Pond immediately South of the River, West, Scoresby Land. Lat. 71°22′ N., long. 24°51′ W.
187. Pond immediately South of the River, East, Scoresby Land. Lat. 71°22′ N., long. 24°51′ W.
188. Pond System South of the River, Western, Scoresby Land. Lat. 71°21′ N., long. 24°50′ W.
189. Pond System South of the River, Middle, Scoresby Land. Lat. 71°21′ N., long. 24°50′ W.
190. Pond System South of the River, Eastern, Scoresby Land. Lat. 71°21′ N., long. 24°50′ W.
191. Pond on Rypenæs. Lat. 71°00′ N., long. 27°43′ W.
192. Potamogetonsø, Rypefjord. Lat. 70°59′ N., long. 27°44′ W.
193. Pond A, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
194. Pond B, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
195. Pond C, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
196. Pond D, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
197. Pond E, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
198. Pond F, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
199. Pond G, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
200. Pond H, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
201. Pond I, Rypefjord. Lat. 70°59′ N., long. 27°43′ W.
202. Pond in bog near Rypefjord. Lat. 70°58′ N., long. 27°40′ W.
203. Blaasø, Gåseland. Lat. 70°58′ N., long. 28°56′ W.
204. Pond between Blaasø and Faxa Sø, Gåseland. Lat. 70°14′ N., long. 28°54′ W.
205. Faxa Sø, Gåseland. Lat. 70°13′ N., long. 28°52′ W.
206. Northern Pond near Faxa Sø, Gåseland. Lat. 70°13′ N., long. 28°52′ W.
207. Southern Pond near Faxa Sø, Gåseland. Lat. 70°12′ N., long. 28°52′ W.

C. Descriptions of Localities Examined.

In the following section I shall go through all the localities examined, which have been divided into three groups:

1. Lakes.
2. Ponds.
3. Temporary Waters

Each of these groups will be introduced by a description of the localities, which will be followed by a table of the values measured in the localities, and finally there will be a total survey of the Greenland localities falling within the group in question.

It is necessary here to define the concepts of 'lake', 'pond', and 'puddle' as used in this work, as the definitions of these concepts generally used do not completely apply to the arctic localities, as the vegetationless, deeper zone in the fresh waters, the presence or absence of which is considered the distinguishing mark between a lake and a pond, is often found in even very shallow localities. Therefore I have chosen to define an arctic lake as a stagnant permanent freshwater locality which never

freezes solid, an arctic pond as a stagnant permanent freshwater locality which may freeze solid, and a puddle, with the usual definition, as a stagnant freshwater locality which for a short or long period of the year is dried up.

In cases in which I have been in doubt as to the type of locality, I have placed this in the group of ponds if a permanent locality freezes solid one year but not another year, as the decisive factor must be whether the locality can freeze solid at all, and in the same way localities have been referred to the group of puddles if they have only once been observed in a dried-up state.

Localities which were only visited once, or which were not visited in winter, owing to travelling difficulties, were placed in a group according to my own estimate together with any information obtained from people acquainted with the locality

1. Lakes.

Descriptions.

1. Great Lake, MacCormick Fjord.

Situated about 2 km inland from the head of MacCormick Fjord. The lake must, if anything, be considered a large expansion of the river that drains off the valley north of Red Cliff Peninsula. It is about 3 km long and about 1 km broad in the broad place. It was not possible to establish the depth, but this is hardly considerable, as the bottom near the banks slopes little towards the middle. Close to the shore the bottom is stony with coarse gravel among the stones, farther out it consists of fine-grained sand. The water is coloured reddish brown from suspended material, the transparency being only about 10 cm. It was not possible to establish the presence of vegetation in the lake. At the eastern end the lake receives a great inflow from two other lakes farther east in the valley, and some other inflow comes through glacial streams from glaciers north and south of the river. Outlet through a large river, the only one in the Thule district with a large population of char (*Salvelinus alpinus*). It falls into MacCormick Fjord.

	Temperature	
	Air	Water
28.8.1959	4.5°	3.0°

2. Lake North of Settlement Qeqertat.

Large lake situated about 2 km north of the settlement Qeqertat on the Harward Islands. It was impossible to establish the size of the lake as it was very foggy during the visit. The bottom near the edge of the lake consisted of large boulders, with huge growths of mosses. The bottom sloped steeply outwards. The lake receives some small tributaries from the surrounding heights during the spring thaw, but according to the statements of the population and my own observations, it has no outlet.

	Temperature	
	Air	Water
20.8.1959	0.5°	3.5°

9. Lake Immediately East of Settlement Qeqertat, Imertalik.

Lake about 4 km long and 1 km broad, longitudinal direction E—W, situated about 100 m east of the settlement Qeqertat. At the eastern end the banks consist of a very dense pavement of smallish stones as far as it is possible to see. The bottom slopes evenly and gently downwards, while the northern and southern banks slope steeply into the water. The greatest depth, which was established from the ice, 200 m from the eastern end, was 12 m, but probably there are considerably greater depths in the lake. At a depth of 12 m there were growths of moss, but no other vegetation was observed. There is inflow of glacial streams from the surrounding heights, and towards the east there is a very small outlet, which, however, only functions during the spring thaw after winters with great precipitation.

	Temperatures			Remarks
	Air	Water		
20.8.1959	0.2°		5.4°	
4.5.1960	−11.0°	1.7 m	0.4°	The lake with 1.6 m ice,
		5 –	2.5°	on which 10 cm firm snow
		12 –	3.7°	

11. Minor Lake near Kangerdlugssuaq.

Situated about 2 km south of the settlement Kangerdlugssuaq, about 100 m above sea level. Surrounded in all directions by steep sides, about 50 m in height, which mainly consist of sandstone screes. The lake is oval, about 100 m in length, from north to south, and about 50 m across. It can be estimated to be about 10 m deep in the deepest place. The bottom consists exclusively of large boulders, irregularly distributed. On stones near the shore there is sparse vegetation of moss. Water is incessantly oozing down into the lake from the surrounding terrain, but no outlet was observed. The water was completely clear.

	Temperatures		Remarks
	Air	Water	
20.8.1959	5.5°	3.5°	The water was ice-covered at the southern end of the lake

12. Larger Lake near Kangerdlugssuaq.

Situated about 4 km south of the settlement Kangerdlugssuaq, about 200 m above sea level. The lake is situated on a gravelly plain, towards the east demarcated by a range of hills. It is crescent-shaped, its greatest length being 300 m from north to south, its greatest breadth is about 200 m. It seems to be rather shallow, the depths hardly exceeding 4 m. Near the shore the bottom is stony, but there are sparse growths of moss. Farther out it is sandy and clayey without any vegetation. No permanent outlet or inlet was observed.

	Temperatures	
	Air	Water
20.8.1959	2.5°	8.5°

16. Lake near Dundas.

Situated about 4 km east of the Radio Station Dundas (earlier Thule) in a very broad pass in the range of hills which separates the Dundas peninsula from the

Pitugfik plain. The altitude above sea level is about 200 m. The lake is somewhat irregular in shape, about 300 m long and 200 m broad. The water is very clear. The bottom and the banks are stony with large growths of mosses. The greatest depth is about 6 m. There were some small rills of outflow and inflow, but they probably only function during the spring thaw.

	Temperatures		Remarks
	Air	Water	
8.9.1959	1.0°	3.5°	The greater part of the lake frozen over, only near the eastern bank some open water

19. Lake Tuto.

Ice-dammed lake situated southeast of the Pitugfik plain at the southern end of Store Landgletscher. Its eastern boundary is constituted by the glacier, and a small glacier tongue calves into it. On the other three sides the lake is demarcated by stony moraine. It is about 1 km long and half as broad. Longitudinal direction N—S. Near the beach the bottom consists of sand, farther out of fine clayey ooze. The lake is quite vegetationless. It is stated to be about 70 m deep, but I found no depths greater than 20 m. Through an outlet at the southern end the lake is drained over the Pitugfik plain. The water is rather milky.

	Temperatures			Remarks
	Air	Water		
6.9.1959	−8.5°	1 m	1.0°	Very clear ice cover 15 cm in thickness over the whole lake
		10 –	4.0°	
		20 –	4.0°	

20. Lake at Savigsivik.

Lake shaped somewhat irregularly, about 800 m in each direction. Situated nearly 1.5 km west of the Trading Station Savigsivik on Meteorit Ø. The lake is situated on a headland and towards the east and north is demarcated by systems of beach ridges about 200 m broad. It is surrounded by a fringe of mosses about 10 m broad, and in this place the bottom is very soft, but farther out there is a firm sandy bottom. The lake is rather shallow, the greatest depths hardly exceeding 5 m. There are several small inlets to the lake and draining takes place through an outlet towards the east.

	Temperatures	
	Air	Water
13.8.1959	5.3°	3.5°

22. The Water Lake, Kraulshavn.

This lake is situated in the immediate vicinity of the Trading Station Kraulshavn, and supplies the population with water. It is a somewhat irregularly shaped lake, about 1×0.8 km, towards the north demarcated by a steep mountain wall, in the other directions surrounded by lower, broken, gneissic ground. The water is clear and the lake is very deep; I could not decide how deep. Near the edges of the lake the bottom is everywhere stony with a sparse growth of mosses, and farther out large boulders could be seen on the bottom. I was informed by the population

that the lake is ice-free from about 15 July to about 1 September. There is a short outlet carrying much water towards the sea in the west.

	Temperatures	
	Air	Water
28.7.1959	6.5°	5.3°

23. The Water Lake, Tasiussaq.

Situated about 1 km from the Trading Station Tasiussaq, about 100 m above sea level. The lake is rather large, but its size could not be determined because of fog. The shores, which everywhere consist of vegetationless rock, go steeply into the water to a depth of about a metre and a half. Near the edge of the lake the bottom consists of large stones, farther out, as far as could be seen, it is sandy, here and there with a sparse vegetation.

	Temperatures	
	Air	Water
18.7.1959	3.5°	3.0°

31. Small Lake near Tuvssâq.

Situated at about 150 m above sea level on the western part of the fairly large island found immediately east of the island on which the depot Tuvssâq is situated. The lake is very irregular, if anything shaped like a dumb-bell. Longitudinal direction N—S, about 300 m long, 50 broad in the narrowest place, about 100 m in the broadest place. Here and there along the shores there is a little cotton-grass, otherwise the shores consist of bare rock descending vertically into the lake to a depth of 2.5 m. The greatest depth is about 4 m. The bottom is very soft, without vegetation. The lake receives a small inflow from Loc. 32 and has an outlet to the sea.

	Temperatures		
	Air	Surface	Bottom
17.7.1959	8.5°	8.0°	6.0°

34. Lake near Augpilagtoq.

Situated about 2 km east of the Trading Station Augpilagtoq. The lake is very large, but the size is difficult to establish as its shape is very irregular with many headlands and large and small indentations. As far as could be seen the shores consisted of bare rocks descending almost vertically into the water. The depth near the edge of the lake is about 3 m, farther out probably much greater. No vegetation was seen in the lake.

	Temperatures		
	Air	Surface	Bottom
15.7.1959	11.5°	9.0°	5.7°

39. Lake in the Ravine of Severance, Upernavik.

Situated in the southern part of the ravine which separates the island on which the town of Upernavik is situated, from the smaller, eastern part. The longitudinal direction of the lake is NW—SE. It is about 400 m in length and 50 m in the broadest

place. Towards the northeast the lake is demarcated by a steep gneissic wall, which continues almost vertically into the water to a depth of 8 m. On the other sides the demarcation is the greatly broken bottom of the valley, which passes evenly into the lake. In the shallow places the bottom consists of stone, in deeper water the bottom is soft. There was no vegetation in the lake. There is no actual inflow, but there is a short outlet towards the southeast to the sea.

	Temperatures	
	Air	Water
21.7.1959	9.0°	6.3°

44. Tyfussøen, Upernavik.

In all probability this lake is the same as the one included as No. 17. in the list of collections not made by the author as "The lake above the ship's harbour, Upernavik." The reason why I have included the locality twice is that during the 28 years that have elapsed between the two collections, the character of the lake has changed greatly, if we judge from the fauna. This change is first of all due to the fact that many houses have been built round the lake. The map of Upernavik of 1919 (AMDRUP et al. 1921, p. 472) shows no buildings at all near the lake. Now it is the centre of the most densely built-up residential quarter of the town, and a large amount of waste water from houses runs direct into it. Besides, the lake receives what the melt water washes into it during the spring thaw. The lake is irregularly roundish, about 75 m in diameter and up to 3.5 m in depth. The vegetation round it is very vigorous, but in the lake itself there is no vegetation at all. The bottom consists of black mud stinking of sulphuretted hydrogen. The water is green from plankton algae, the transparency is only about 10 cm. There is a small outlet to the seashore.

	Temperatures	
	Air	Water
14.7.1959	6.5°	10.0°

48. Lake at Kingigtoq.

This is a fairly large lake, situated about 500 m NW of the now abolished settlement Kingigtoq, very irregular in shape, about 1 km in diameter. It is no doubt very deep. The shores are partly rock, partly vegetation-covered slopes with ice-ramparts No vegetation was observed in the lake. The water is very clear. Situated about 25 m above the sea, to which there is an outlet abounding in water.

	Temperatures		
	Air	Surface	Depth of 2 m
25.7.1959	10.3°	8.2°	6.3°

50. Lake at Niaqornat.

Situated immediately east of the Trading Station Niaqornat. In the east and west it is demarcated from the sea by beach ridges about 25 m broad, the highest edge of which is 6 m above sea level. Towards the north and south the demarcation consists of basalt, which descends vertically into the lake. The shape of the lake is roughly equilaterally triangular, with a length of the sides of about 400 m. The bottom near the edges of the lake consists of dark mud with a distinct smell of sulphuretted hydrogen. In the greater part of the lake the depth is $2^1/_2$—3 m, and

the fluctuations in water level are very small. The lake gets its supply of water partly from melt water and direct precipitation, partly – although to a small extent – as spray from the sea. It has no outlet. There is no higher vegetation in the lake.

	Temperatures		
	Air	Surface	Bottom
5.8.1956	12.4°	11.0°	8.3°
7.7.1957	10.1°	8.4°	6.5°

51. The Water Lake, Umanak.

Large lake situated about 200 m west of the Radio Station of Umanak. The shape of the lake is very irregular; its greatest extent is about 500 m.

The substratum consists of gneiss, and almost everywhere the rock descends steeply into the water. Only in a few small creeks there is shallow water at the edge of the lake, and there a little vegetation may be found. The greatest depth of the lake is 14 m. The bottom material consists of light brown mud, and the bottom is here and there overgrown with poorly developed mosses. The lake has a number of small inlets and has an outlet towards the northwest, which debouches into Spraglede bugt. However, it only functions in the period of the spring thaw.

	Temperatures			Remarks
	Air	Surface	Bottom	
28.8.1955	3.2°	3.5°	4.8°	
6.8.1956	18.7°	10.4°	4.9°	
12.3.1957		0.45°	3.8°	210 cm thick ice over the whole lake. The ice is quite clear, sometimes transparent. No snow-cover.
3.7.1957	13.6°	6.2°	4.2°	It was stated that the last ice disappeared about 10.6.

54. Kakissalik, Ikerasak.

The Greenland name of the lake probably means that it contains sticklebacks. The lake is situated nearly 1.5 km northwest of the Trading Station Ikerasak. It is oblong, the longitudinal direction being N—S, and is about 200 m long and 100 m broad. The shape is somewhat irregular, as several minor headlands jut into the lake. The shores consist partly of steep mountain sides, partly of reaches of flat meadow-land with luxuriant vegetation. The depth is small, the greatest being 4 m. The bottom consists of stones, among which there is a well-developed vegetation, mainly consisting of mosses. The water is brownish. There is no inflow proper, but there is a small outlet towards the south, which, however, only seems to function immediately after the spring thaw.

	Temperatures		
	Air	Surface	Bottom
2.7.1957	18.3°	10.2°	6.8°

55. Lake in Ikerasak Rich in Plants.

This locality is no doubt the same as that which VANHÖFFEN (1897) examined under the designation "Pflanzenreicher Teich von Ikerasak".

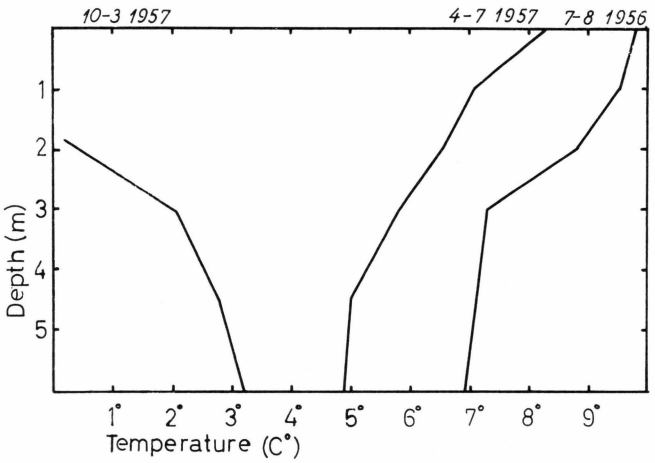


Fig. 2. Temperatures in Loc. 55, Lake rich in plants in Ikerasak.

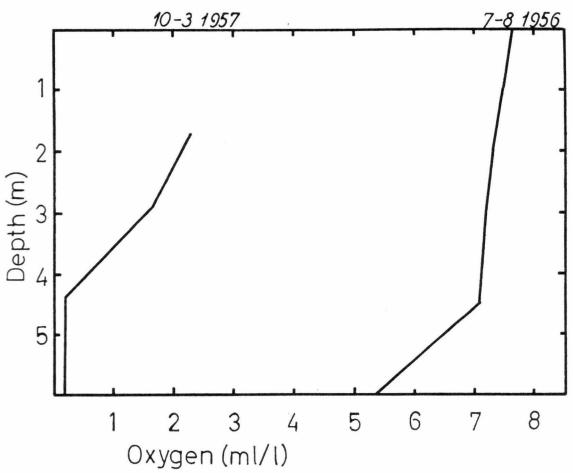


Fig. 3. Contents of oxygen in Loc. 55, Lake rich in plants in Ikerasak.

It is situated in the northernmost part of the trading station in a small valley on a substratum of clay. The lake is well over 100 m in diameter, is almost regularly circular, and is surrounded by an enormous fringe of vegetation consisting especially of *Myriophyllum* and *Batrachium*. Immediately outside this bog the bottom slopes steeply down to a depth of about 6 m. The whole bottom is covered with vegetation, especially mosses, but also a little *Myriophyllum*. There are also large amounts of filamentous algae in the lake, both sessile on other plants and free-floating in large lumps. There is an outlet, which, however, rarely functions.

Conditions of Ice in the Lake

10.3.1957	180 cm thick ice on the lake
11.5.1957	The ice 210 cm thick
9.6.1957	Large floe in the middle of the lake
4.7.1957	Ice-free

56. Tarajornitsoq, Ikerasak.

The Greenland name of the lake means "The one which tastes of salt". The lake is situated about 1 km southwest of the Trading Station Ikerasak, at an altitude of 150 m. The vegetation round the lake is very poor. The lake is oblong, about 200×100 m. The greatest depth is 7 m. The banks are flat and stony, farther out the bottom is sandy. There was no vegetation to be seen in the lake. The water tastes rather salt. There are a few small inlets, which function during the spring thaw, but there was no outlet.

		Temperatures	
	Air	Surface	4 m
4.7.1957	18.7°	7.2°	5.8°

58. Taserssuaq, Atâ.

Very large lake situated north of the Trading Station Atâ on the east coast of Arveprinsens Eiland. The lake is about 9 km in length and 2.4 km in breadth in the broadest place. Longitudinal direction N—S. The greatest depth measured, 137 m,

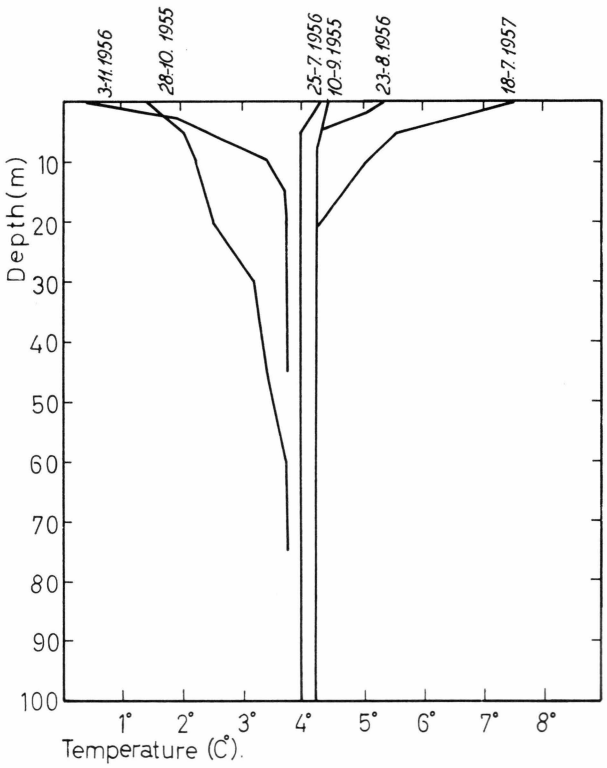


Fig. 4. Temperatures in Loc. 58, Taserssuaq, Atâ.

is approximately in the middle of the lake, where the lake is broadest. From the northern end of the lake a large creek curves towards the northeast. The depths in this creek are about 50 m. The creek is separated from the rest of the lake by a treshold with a depth of 20 m.

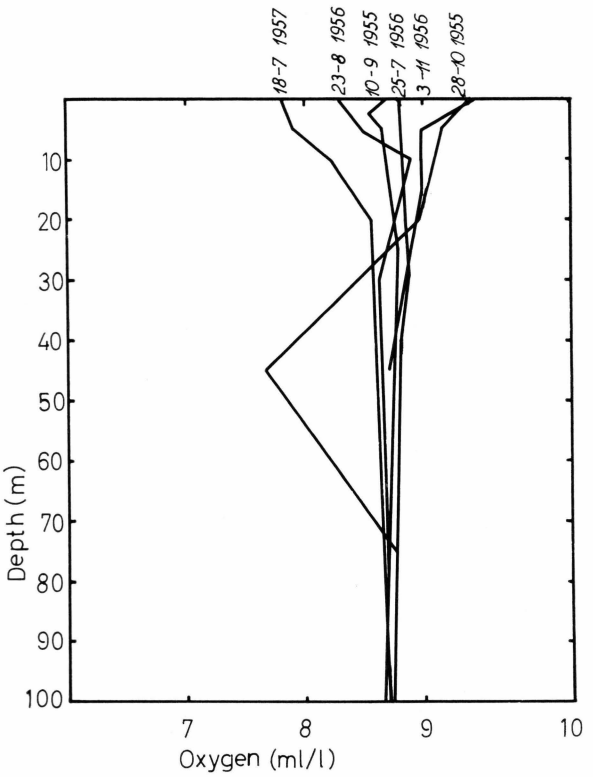


Fig. 5. Oxygen content in Loc. 58, Taserssuaq, Atâ.

There have been some previous investigations of the lake. Its depth was measured by ENGEL (1910), who found a depth of 100 m, and some physiographical investigations have been carried out by HOLMQUIST (1959).

The lake is a cut-off branch of a fiord. Its surface is few metres above sea level, and it is separated from the sea by a 300 m broad isthmus, which consists of clay containing shells of marine mussels. While taking bottom samples at the southern end of the lake a number of shells from marine species were found, among them *Portlandia arctica*, *Mytilus edulis*, and *Balanus* sp., at depths of 7–9 m.

The east shore is the steepest of the shores of the lake, as the gneiss there in most places descends almost vertically to a depth of about 50 m. The west shore is not quite so steep and there is a narrow beach there.

In the large creek towards the northeast the shore is quite flat and passes into large marshy stretches. Close to the shore the bottom in most places is stony or consists of bare rock, but farther out it consists of light grey, very soft mud. On the steep shores there is no vegetation other than sessile filamentous algae, in the northeastern creek there are large growths of *Hippuris* along the edges of the lake, and at the south end, close to the outlet, there are some growths of *Batrachium* and mosses.

The lake receives some inflow, especially mountainous rivulets from the west side. At the southern end it has a short outlet, abounding in water, to the sea.

Conditions of Ice in the Lake

30. 5.1954	Thick ice on the whole of the lake. The ice could not bear, however, as it fell to pieces in long crystals when it was touched. Along the shores there were small zones of thawing.
18.10.1954	Ice-free.
20. 7.1955	A floe in the northern part of the lake, otherwise the lake was ice-free.
27.10.1955	At the southern end of the lake 15 cm thick ice. The northern part of the lake was ice-free.
25. 7.1956	Ice-free.
3.11.1956	40 cm ice all over the lake.
17. 6.1957	Only open water at the outlet and along the south-eastern shore. Otherwise the lake was covered by thick, impassable ice.
18. 7.1957	Ice-free.

59. Navdluarssuk.

Lake about 2 km in length and 500 m in breadth, situated at an altitude of 400 m. The shores everywhere consist of gneiss, which descends more or less steeply into the water. Where the slope of the shores is slight, large stones are scattered fairly far out into the water. Between the stones on land there is a little vegetation. Apparently there is no vegetation in the lake. In a steep place a depth of 14 m was measured, but this is hardly the greatest depth of the lake. The water is very milky from suspended clayey ooze, the transparency being about 1 m. At the southern end the lake receives a great inflow, which partly comes from a couple of small lakes near the inland ice, and partly is a direct flow-off of melt water from the ice-cap. At the northern end the lake has a large outlet, which by way of some large waterfalls runs to the sea.

	Temperatures			
	Air	Surface	5 m	14 m
17.7.1957	7.2°	3.4°	3.1°	3.1°
20.8.1957	6.3°	3.8°	3.2°	3.2°

60. Mellemsø, Disko Fjord.

This lake has previously been investigated by PORSILD (1902), BACHMANN (1921), and HOLMQUIST (1959).

Of these investigations only those made by PORSILD (*loc. cit.* p. 201) give satisfactory information, as a bathymetrical map of the lake was drawn which seems to be fairly correct, apart from the fact that all indicated depths in my opinion are 20–25 per cent. too great.

The lake is situated on the isthmus Eqalúnguit itivnerat, which separates the two southern branches of Disko Fjord and at the same time is used as a crossing between them. The isthmus itself, which is about 1 km in breadth, consists of gneiss, but on both sides of it there are basalt mountains. From the head of the middle branch of Disko Fjord, Kangerdluarssuk, the distance is about 3 km to the lake. The lake is situated at an altitude of 35 m across the isthmus. It is 1 km long, the longitudinal direction N—S, so that the north and south ends run into the basalt, and the breadth is 300 m. The shores are steep, except at the ends, where there are low stretches with a luxuriant vegetation, thus *Angelica*, through which streams flow to the lake. As mentioned above, the lines of depths on PORSILD's

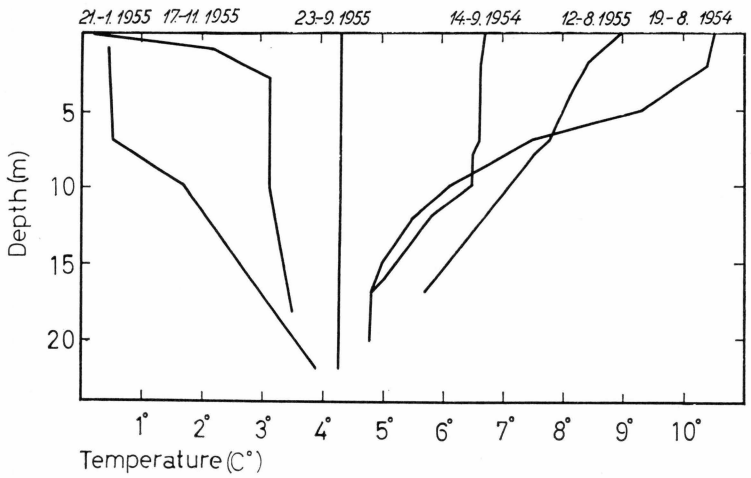


Fig. 6. Temperatures in Loc. 60, Mellemsø, Disko Fjord, 1954 and 1955.

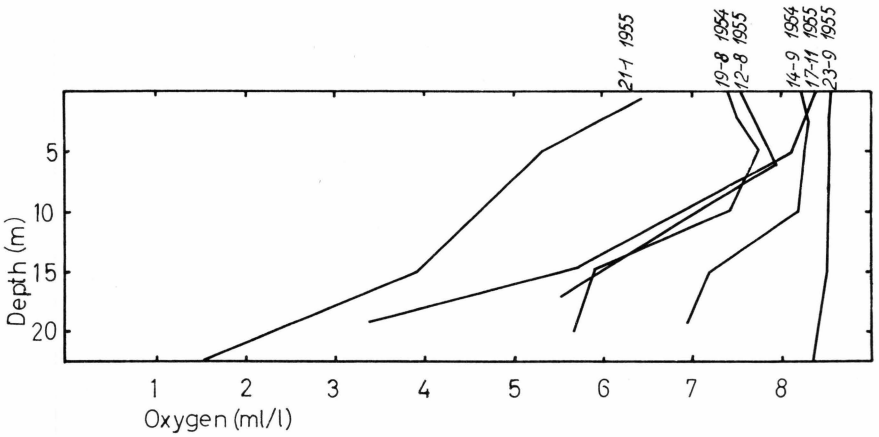


Fig. 7. Oxygen content in Loc. 60, Mellemsø, Disko Fjord, 1954 and 1955.

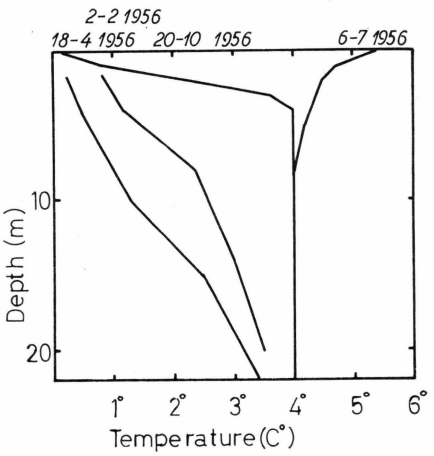


Fig. 8. Temperatures in Loc. 60, Mellemsø, Disko Fjord, 1956.

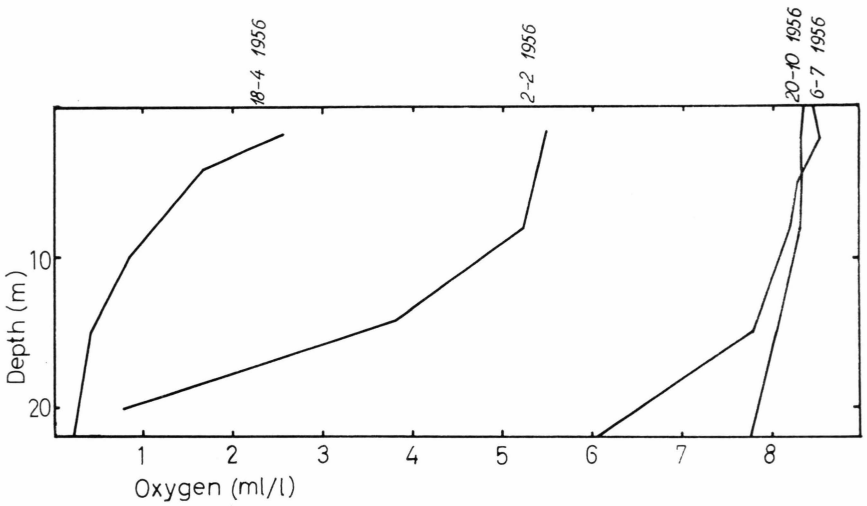


Fig. 9. Oxygen content in Loc. 60, Mellemsø, Disko Fjord, 1956.

map are not quite correct, as the greatest depth it was possible for me to find was 27 m. Near the shores the bottom is stony, here and there around the mouths of the inlets with a little vegetation, farther out it consisted of brownish mud. Transparency in the lake varied greatly. In the spring and the autumn it was 6–8 m, but in midsummer it was only 1.5–2 m, and the water in the upper layers was rather greenish from plankton algae. In the middle of the western side there is a broad outlet.

Conditions of Ice in the Lake

21. 1.1955	Ice 0.8 m thick, covered by 1 m snow.
10. 7.1955	Ice-free.
23. 9.1955	Between stones close to the shore very little ice.
17.11.1955	30 cm ice covered by 10 cm snow.
2. 2.1956	1.5 m ice covered by 20 cm snow.
18. 4.1956	1.8 m ice, 15 cm snow.
6. 7.1956	An ice-sheet of about 150×100 m in the middle of the lake.
20.10.1956	10 cm ice, 10 cm snow.
4. 1.1957	75 cm ice, 50 cm snow.
2. 3.1957	1.2 m ice, 40 cm snow.
9. 4.1957	1.3 m ice, 40 cm snow.
7. 6.1957	The ice melted along the edges of the lake and otherwise very brittle.
30. 7.1957	Ice-free.

61. Lillesø, Disko Fjord.

Like Mellemsø this lake was investigated by PORSILD (1902), BACHMANN (1921), and HOLMQUIST (1959a). PORSILD (*loc. cit.* p. 201) has a map of the lake on which the depths, however, as was the case of Mellemsø, are to be somewhat reduced.

The lake is situated at 24 m above sea level, nearly 2 km SW of Mellemsø. It is almost circular, about 300 m in diameter. The northern and western banks consist of steep, vegetationless gneissic rocks, while the other banks pass evenly into moist fens. The greatest depth found by me is 12.5 m, the same depth as that

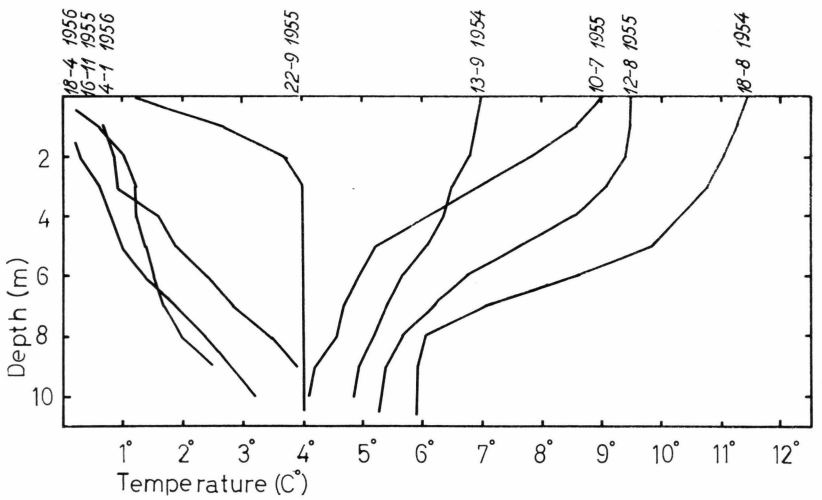


Fig. 10. Temperatures in Loc. 61, Lillesø, Disko Fjord.

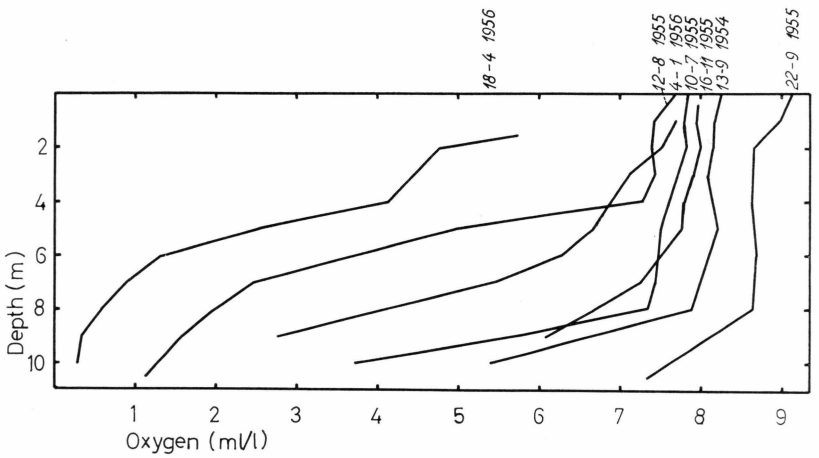


Fig. 11. Oxygen content in Loc. 61, Lillesø, Disko Fjord.

found by Holmquist (1959, p. 133). The bottom of the lake everywhere consists of brown mud, with a large content of more or less decomposed vegetable matter. Along the southern and eastern edge of the lake there is rather a vigorous vegetation mainly consisting of *Hippuris*. There are also distinct ice-ramparts. There are three minor, periodic inflows, and an outlet which runs through a valley westwards to Kangerdluarssuk.

Conditions of Ice in the Lake

21. 1.1955	Ice 0.7 m covered by 1 m snow.
10. 7.1955	Ice-free.
22. 9.1955	Thin fringe of new ice in the southernmost part of the lake.
16.11.1955	40 cm almost transparent ice.
2. 2.1956	1.6 m ice, 10 cm snow.

(To be continued)

18. 4.1956	1.7 m ice. Very little snow.
6. 7.1956	A few quite small floes in the lake.
20.10.1956	20 cm ice, thin cover of snow.
4. 1.1957	65 cm ice, 25 cm snow.
2. 3.1957	1.1 m ice, 20 cm snow.
9. 4.1957	1.3 m ice, 40 cm snow.
7. 6.1957	The shores thawed out, but the ice has by the wind been pressed against the rocks descending into the lake in the north.
30.7.1957	Ice-free.

62. Lake at Evqitsoq, Disko Fjord.

Situated about 1 km east of the abolished Trading Station Evqitsoq on the north side of Kangerdluarssuk. There a low and marshy peninsula juts out and approximately in the middle of this the lake is situated. PORSILD (1902, p. 216) mentions this place, writing that there are several small lakes, the largest one of which measured 7 m in the deepest place. There is only one lake, but sometimes there may be a little water on smaller parts of the marshy stretches. There, too, great depths also seem to have been indicated, as it has not been possible for me to find any depth greater than 5.5 m, which is in agreement with HOLMQUIST (1959a, p. 133). The lake is somewhat irregular in shape, 400 m long, longitudinal direction N—S, and 300 m broad. The shores are very sharply cut off by the ice and here and there have ice-ramparts. The bottom, which here and there close to the shore had a sparse growth of *Callitriche* and *Hippuris*, consisted of dark mud with large numbers of chironomids. There is no actual inflow, but an outlet runs south to the sea.

Conditions of Ice in the Lake

21. 1.1955	Ice 0.8 m, snow 0.7 m.
9. 7.1955	Ice-free.
22. 9.1955	Thin new ice over the southern half of the lake.
16.11.1955	40 cm transparent ice.
4. 2.1956	1.5 m ice, very thin layer of snow.

(To be continued)

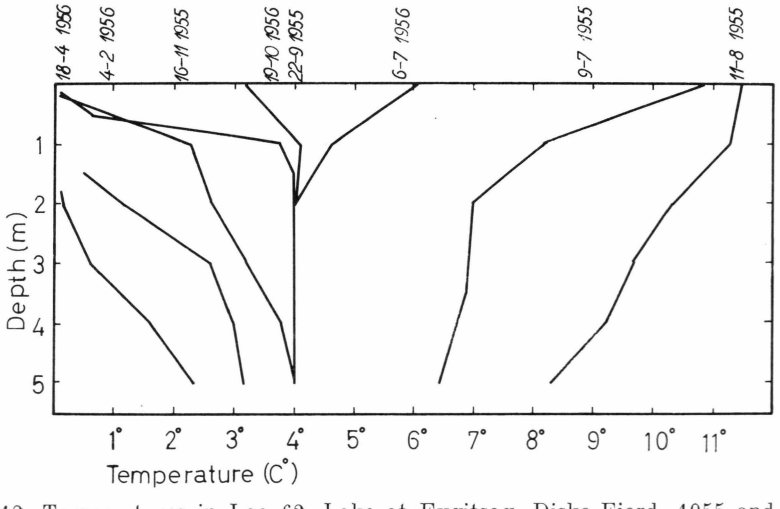


Fig. 12. Temperatures in Loc. 62, Lake at Evqitsoq, Disko Fjord, 1955 and 1956.

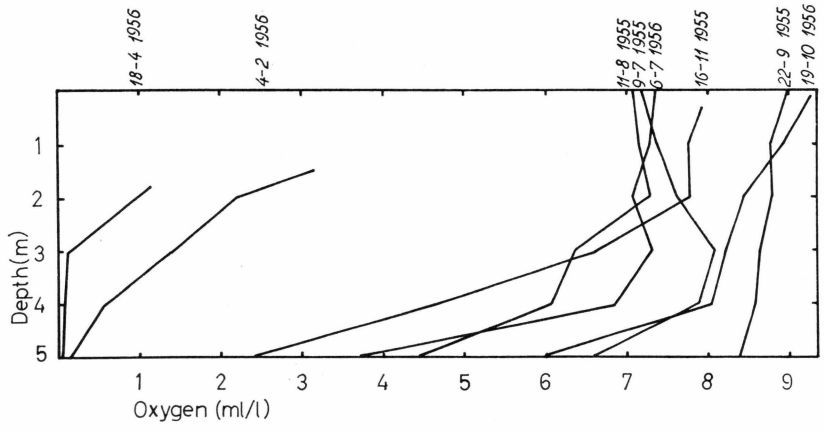


Fig. 13. Oxygen content in Loc. 62, Lake at Evqitsoq, Disko Fjord, 1955 and 1956.

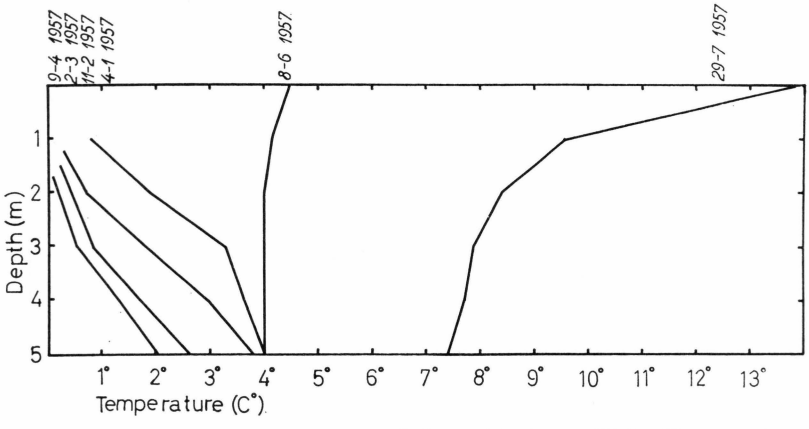


Fig. 14. Temperatures in Loc. 62, Lake at Evqitsoq, Disko Fjord, 1957.

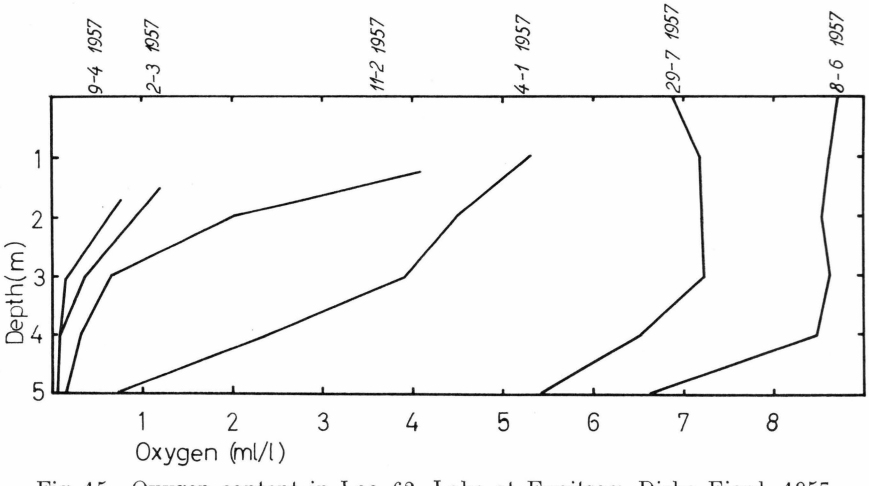


Fig. 15. Oxygen content in Loc. 62, Lake at Evqitsoq, Disko Fjord, 1957.

18. 4.1956	1.8 m ice, 20 cm snow.
6. 7.1956	Ice-free.
19.10.1956	20 cm ice, a very thin layer of snow.
4. 1.1957	1.05 m ice, 30 cm snow.
11. 2.1957	1.2 m ice, 20 cm snow.
2. 3.1957	1.5 m ice, 10 cm snow.
9. 4.1957	1.6 m ice, 30 cm snow.
8. 6.1957	Open along the west shore, but in several places the lake was frozen solid. The ice very brittle and crumbly.
29. 7.1957	Ice-free.

64. Lake at Qivitut, Disko Fjord.

Lake situated at the root of the peninsula Qivítut on the south side of Disko Fjord. It is about 400 m long, the longitudinal direction is NW—SE, and the lake is about 200 m broad. It is surrounded by very moist fens with a rich vegetation.

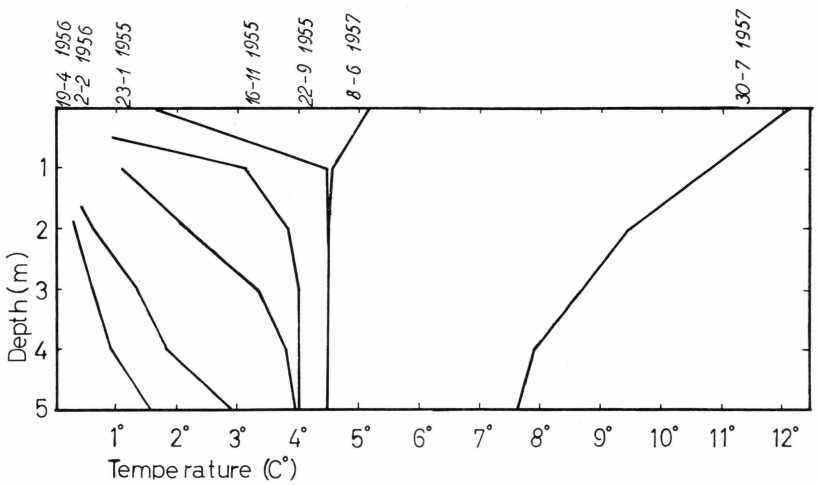


Fig. 16. Temperatures in Loc. 64, Lake at Qivítut, Disko Fjord.

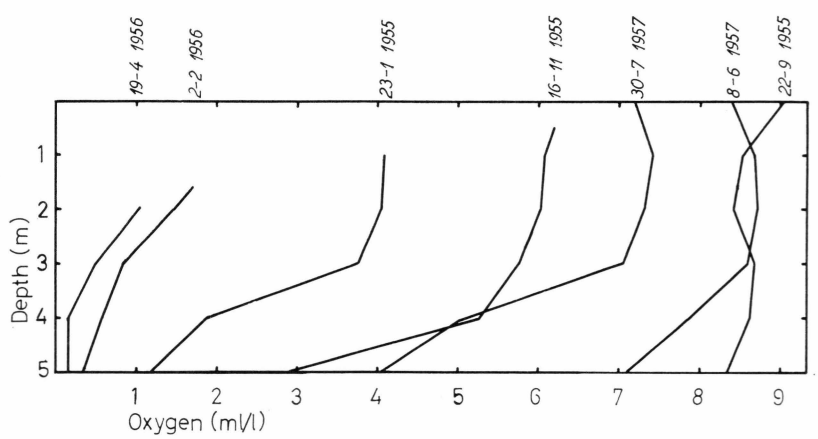


Fig. 17. Oxygen content in Loc. 64, Lake at Qivítut, Disko Fjord.

The banks are cut off sharply in most places and here and there there are distinct ice-ramparts. In shallow water the bottom is clayey or stony, with large growths of mosses, in deeper water the bottom consists of greyish brown mud with some chironomids. The greatest depth found in the lake was 4.5 m. There is no inflow proper, but a small outlet from the northwest end of the lake to the sea.

Conditions of Ice in the lake

23. 1.1955	0.8 m ice, 1 m snow.
11. 7.1955	Ice-free.
22. 9.1955	Very thin new ice along the banks and on the southeastern part of the lake.
16.11.1955	45 cm ice with a very thin cover of snow.
4. 2.1956	1.6 m ice, 10 cm snow.
19. 4.1956	1.9 m ice, 25 cm snow.
7. 7.1956	Ice-free.
21.10.1956	25 cm ice, thin cover of snow.
6. 1.1957	1.1 m ice, 20 cm snow.
12. 2.1957	1.3 m ice, 15 cm snow.
4. 3.1957	1.6 m ice, 10 cm snow.
10. 4.1957	1.7 m ice, 40 cm snow.
8. 6.1957	Thick ice on large parts of the lake, only open in the northwestern part.
30. 7.1957	Ice-free.

67. Lake on Kangârssuk, Fortunebay.

Situated on the eastern part of the westernmost of the peninsulas by which Fortunebay is bounded, immediately west of the now abolished Trading Station. The distance to the sea is about 200 m and the altitude is 10 m. The lake is situated on a substratum of basalt, and surrounded by rather dry moor. The banks are sharply cut off, and in many places there are ice-ramparts. The longitudinal direction is E—W, the length is 800 m, and the breadth 300 m. The greatest depth is 7 m, but the greater part of the bottom is at a depth of 4–4.5 m. The bottom at the banks consists of large stones, but farther out there is light mud. There is no vegetation in the lake. There is inflow into the lake in several places, the greatest coming into the western end from a lake of a similar kind. At the eastern end the lake has an outlet to the sea.

	Temperatures					Remarks
	Air	Surface	2 m	4 m	7 m	
6.9.1956	5.0°	7.0°				
21.2.1957	–22.5°		1.8°	2.5°	3.9°	Covered by 2 m ice
9.8.1957	8.2°	7.5°	4.8°	4.3°	4.2°	

69. Moræneso, Blæsedalen.

This lake is 500 m long and 150 m broad (longitudinal direction E—W), situated immediately north of the moraine at the mouth of Blæsedalen (a valley). Round the lake there are systems of ice-ramparts. At the edge of the lake the bottom is stony, but farther out it consists of dark mud. Along the banks, especially at the western end of the lake, there are large growth of *Hippuris*, *Batrachium*, and mosses. The greatest depth measured was 5 m, but the greater part of the bottom is at a

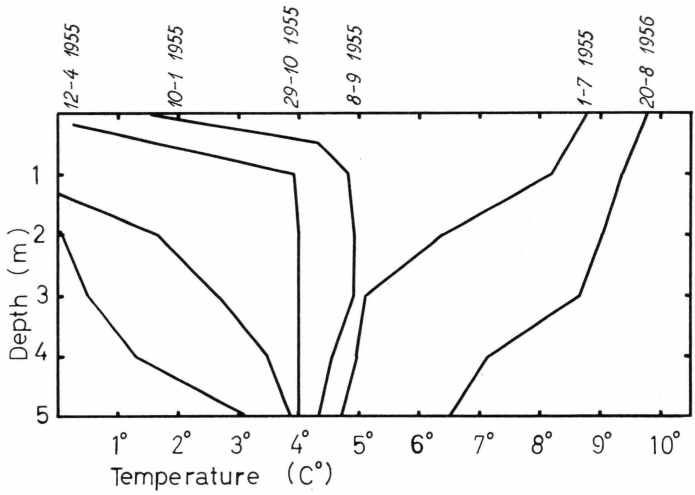


Fig. 18. Temperatures in Loc. 69, Moræneso, Blæsedalen.

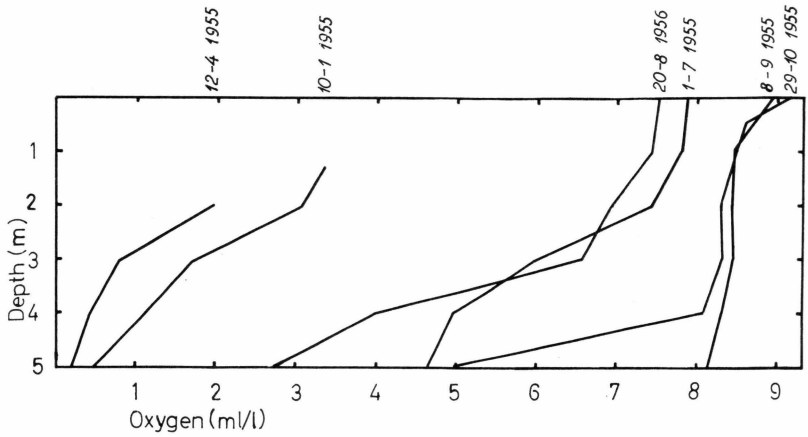


Fig. 19. Oxygen content in Loc. 69, Moræneso, Blæsedalen.

depth of 3 m. There are two tributaries to the lake at the eastern end, and at the western end there is an outlet to the river Rødeelv.

Conditions of Ice in the Lake

24. 9.1954	New ice on the greater part of the lake, only in the middle and at the outlet there is open water.
29.10.1954	20 cm ice all over the lake.
10. 1.1955	1.3 m ice.
12. 4.1955	2.0 m ice.
13. 6.1955	A large floe in the middle of the lake.
1. 7.1955	Ice-free.
8. 9.1955	Very little new ice close to the edge of the lake.
1.10.1955	The whole lake covered by thin new ice.

(To be continued)

6.10.1956	5 cm ice all over the lake.
1. 2.1957	1.1 m ice.
23. 2.1957	1.8 m ice.
1. 4.1957	2 m ice.
13. 6.1957	Ice only in the western part of the lake.

85. Taserssuaq (Thygesens Sø), Godhavn.

This lake has been investigated several times previously. It was mentioned by Rink (1857, Vol. 1, p. 91), Bachmann (1921, p. 115) mentions it as "29. See von Godhavn", and under the same name Haberbosch (1920) has lists of the entomostraca. Finally it has been described by Foged (1958, p. 51) under the name of "Lake Taserssuaq, "Thygesens Sø", near Godhavn".

The lake is situated 150 m south of the buildings of the Trade Department in Godhavn, and the area round the northern end and along the whole of the east side is built up. It is 300 m long (longitudinal direction N—S), and well over 100 m broad. The greatest depth is 3 m, but the greater part of the bottom is at a depth of 2.5 m. The edge of the lake mainly consists of very moist stretches, only on the west side there are stretches where the bare mountain goes right down to the lake. The bottom consists of dark mud. Here and there it is stony, and there is only a little vegetation, consisting of *Potamogeton*, *Hippuris*, and mosses.

Because of the neighbouring built-up areas the lake is much polluted.

From the south there is inflow from Loc. 91, and at the northern end there is an outlet to the sea.

	Temperatures					Remarks
	Air	Surface	1 m	2 m	3 m	
27. 6.1954	10.0°	13.5°	6.5°	6.0°		
10. 7.1954	12.5°	12.8°	11.0°	8.3°	7.1°	
2. 8.1954	11.2°	15.5°				
26. 8.1954	12.6°	10.2°	8.4°	7.8°		
21. 9.1954	2.8°	4.2°	4.3°		4.3°	
26.10.1954	−6.2°		2.1°	2.8°	3.9°	0.8 m ice
4. 7.1955	12.0°	13.0°	12.0°	7.8°		
3. 9.1955	7.3°	6.8°	5.4°	5.2°	4.6°	
7. 9.1955	3.5°	5.4°	5.1°			
28. 2.1956	−20.8°		0.3°	2.8°	3.1°	1.3 m ice
18. 7.1956	19.0°	15.4°	12.1°	9.4°		
20. 8.1956	9.1°	8.3°	6.4°			
9. 9.1956	4.0°	5.9°	5.9°	4.8°		
17.12.1956	−18.3°		0.4°	2.6°		1.05 m ice
21. 3.1957	−22.0°			0.9°	2.1°	1.7 m ice
30. 3.1957	−19.4°			0.8°	2.1°	1.7 m ice
31. 5.1957	6.3°	1.8°	1.3°			More than one third of the lake ice-covered
13. 7.1957	10.8°	9.3°	6.4°			
3. 8.1957	11.2°	15.4°	10.8°	8.2°	7,9°	
24. 9.1957	8.8°	5.0°				

99. Lake at Claushavn.

Entomostraca must have been collected from this locality previously, for it must have been this locality Lundbeck (1891, p. 135) visited.

It is a shallow lake situated immediately east of the Trading Station of Claushavn, on the south side in part encircled by the settlement. The lake is roundish, about

400 m in diameter. The greatest depth is 3 m. Along the edges of the lake there is a dense growth of *Hippuris*, *Batrachium*, and mosses. Farther out the bottom is vegetationless, apart from algal filaments, and consists of a dense pavement of pebbles with a little loose ooze between them. A fairly large tributary comes from the east, while a short outlet, carrying much water especially during the spring thaw, runs through the trading station to the sea.

	Temperatures			Remarks
	Air	Surface	Bottom	
25. 8.1956	6.1°	7.0°	5.2°	
31.10.1956	–8.5°	0.4°	3.6°	25 cm ice all over the lake.
17. 5.1957	8.2°	0.4°	0.9°	Ice on the greater part of the lake. The shallow parts are frozen solid, but at inflow and outlet there are large open areas.
18. 6.1957	5.6°	13.2°	8.1°	Very high water level.
20. 7.1957	15.8°	14.3°	12.8°	The water level considerably lower than 18.6. The outlet functions little.

103. The Water Lake, Christianshåb.

Situated 75 m above sea level, about 250 m NE of the Radio Station of Christianshåb. The shape of the lake is very irregular, the greatest extent being about 200×100 m. The greatest depth measured was 4 m. The surroundings consist of low gneissic hummocks with small, dry, vegetation-covered stretches in between. At the edges of the lake the bottom consists of sand with some stones, and here there is a sparse vegetation of mosses. Farther out the bottom is dark mud. In the winter of 1956–57, in connexion with the building of a pumping station, a boring was made through the bottom. This proved to consist of 1.5 m mud, including 1 m mud mixed with sand, under that 1.5 m pure quartz sand and under that the firm rock. The lake has some small tributaries which are more or less constant, and there is an outlet southwards to the sea. The outlet, however, has in recent years only functioned during the spring thaw, as the pumping of water to the town has balanced the inflow.

	Temperatures					Remarks
	Air	Surface	1 m	2 m	4 m	
25. 8.1956	4.1°	6.5°			5.1°	
30.10.1956	–8.0°	0.25°	0.9°	1.6°	3.8°	20 cm ice all over the lake.
17. 5.1957	5.3°	0.2°	0.6°	0.8°	2.9°	Ice all over the lake, 1.2 m thick. At the edges of the lake there is a layer of ice over the bottom, and between this and the surface ice there is water. It looks as if the frost creeps out along the bottom.
18. 6.1957	6.5°	11.3°			8.5°	
20. 7.1957	7.9°	12.2°			8.8°	
22. 8.1957	9.5°	9.5°	8.9°	8.3°	8.4°	

105. Lake at Kangersuneq.

Situated on the south side of the fiord Kangersuneq south of Christianshåb, 60 m above sea level. The lake is regularly oval, 600 m long and 300 m broad, longitudinal direction NW—SE. Depths up to 12 m. The banks consist of embankments of gravel and in shallow water the bottom is sand with some stones, farther out there is light mud. There is no vegetation in the lake. At the eastern end there is a tributary to the lake, and at the northwestern end there is an outlet through a ravine to the sea.

	Temperatures			
	Air	Surface	2 m	8 m
20.6.1957	9.8°	8.0°	12.3°	5.8°
21.7.1957	6.8°	9.3°		5.6°
22.8.1957	4.2°	9.5°	9.2°	5.4°

107. The Water Lake, Egedesminde.

Situated south of Egedesminde. Rather large lake, nearly two km long (longitudinal direction E—W) at the eastern end about 800 m, at the western end 400 m broad. The abrupt constriction is in the middle of the lake. The surroundings are low, rounded, almost vegetationless, gneissic rocks and the banks are rather stony. Only on the southern side of the lake, at the constriction there is an area with very

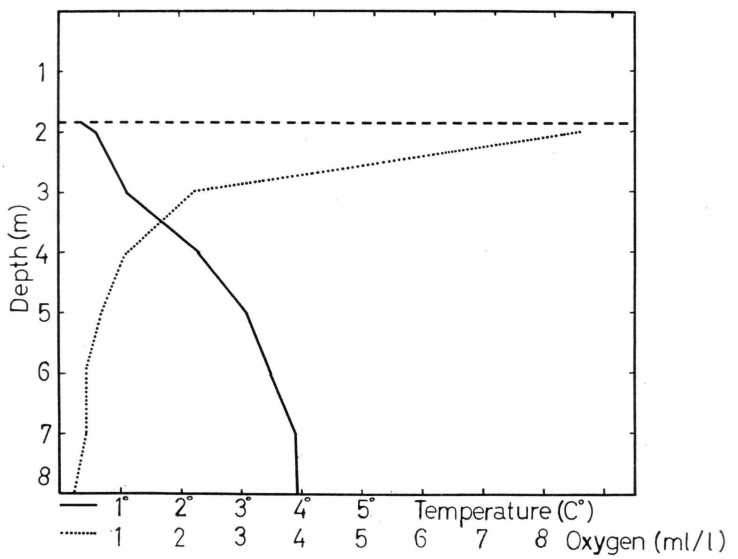


Fig. 20. Temperatures and oxygen content in Loc. 107, the Water Lake, Egedesminde. 15.5.1957.

soft bottom material right to the bank. There is also a vigorous bottom vegetation there, mainly consisting of *Hippuris*, and there are distinct lines from glaciation. Otherwise the vegetation almost exclusively consists of mosses. The greatest depth found was 8 m. The bottom material is dark grey mud.

There are a couple of minor tributaries from the south, and furthermore the lake during the spring thaw receives melt water from the surrounding heights. An

outlet from the westernmost end runs to Smallesund. Besides there is an artificial culvert, which supplies water to the town of Egedesminde.

During the coming years the lake will completely change character, because a dam, to regulate the supply of water to the town, will be built across it at the constriction, so that the water level at the eastern end will be higher.

	Temperatures			Remarks
	Air	Surface	2 m	
15.5.1957	12.2°	See the curve		1.8 m ice all over the lake. There is some water on the ice and here and there deep holes have been melted into it.
27.6.1957	12.0°	11.3°	6.2°	
22.7.1957	8.2°	12.4°	8.9°	
24.8.1957	9.3°	9.1°	7.6°	
25.9.1957	6.3°	7.1°	6.8°	
9.7.1959	11.2°	12.8°	6.3°	

108. Lake at Orpigsôq Qarajaq.

Situated 800 m from the western bank of the northern side branch of Orpigsôq fjord, Orpigsôq Qajaraq, 75 m above sea level.

The lake is nearly 1 km long (longitudinal direction N—S) and 500 m broad. The western edge of the lake consists of a 200 m high, almost vertical granite wall, while the edges of the other sides of the lake are low granite rocks between which there are marshy areas. A depth of 15 m was measured under the steep wall, but there are probably deeper places in the lake.

Close to the edges of the lake the bottom consists of stones, farther out there is light mud. The only vegetation in the lake is a few mosses.

In the middle of the eastern side the lake has an outlet to the sea.

	Temperatures			
	Air	Surface	5 m	15 m
19.6.1957	11.2°	6.8°	4.1°	4.0°
21.7.1957	9.5°	14.2°	5.4°	4.3°
23.8.1957	10.0°	10.1°	6.0°	5.6°

110. Gieseckes Sø.

The lake has previously been examined by NORDMANN (1912) and HOLMQUIST (1959a). Furthermore, STEPHENSEN (1913b) has worked up collections of entomostraca from the lake.

Gieseckes Sø is one of the largest lakes of Greenland. It is 30 km in length (longitudinal direction NE—SW), but is only 6 km broad in the broadest place. According to LAURSEN (1944, pp. 36–39, and 1950, pp. 55–78) it must be considered a cut-off branch of a fiord, as it is possible to find marine deposits in and near it. The greatest depth found in the lake is 85 m, but there are probably still greater depths. Investigations have only been made in the southernmost part of the lake, where the greatest depth is 39 m. In this area the bottom material consists of fine sand. The water is very clear, the transparency extends down to 21 m. The lake

receives many small tributaries, and there is a short, abundant outflow from the south-westernmost end to the sea.

	Temperatures				Remark
	Air	Surface	15 m	35 m	
15.6.1956					Ice all over the lake.
29.9.1956	1.8°	2.8°			
30.8.1957		8.5°	8.5°	5.0°	

111. Lake on Arnaq Qavdlunâq.

Arnaq Qavdlunâq is a peninsula on the north side of Nordre Isortoq, rather close to the mouth of the fiord. On a plateau that forms the continuation of a creek, which from the west goes north of the peninsula, there are some small lakes. Loc. 111 is the westernmost of these. The longitudinal direction of the lake is N—S, it is about 150 m in length, but the northernmost part is only a narrow indentation of 35 × 10 m. The rest of the lake is rounded, the breadth is 75 m. The indentation is only about 2 m deep, but the rest of the lake is about 25 m deep, with steep banks. The bottom is clayey all over the lake. Along the banks there is a vigorous vegetation in the lake, especially consisting of *Hippuris*. There is an outlet to the sea.

	Temperatures		
	Air	Surface	Bottom
13.9.1956	6.3°	4.5°	5.1°

112. Small Alkaline Lake near Strømfjordshavn.

Under the designation above, Böcher (1949, p. 49) has previously described this lake.

The lake is roundish, a little longer in the E—W direction than in the N—S direction, thus about 600 × 500 m. Depths down to about 4 m. The banks are very moist and densely overgrown. In shallow water the bottom is completely covered by a dense carpet of *Drepanocladus aduncus*. A couple of small periodically water-bearing rills lead to the lake, and the bed of a brook, which seemed to be an outlet, was quite dry.

	Temperatures			Remark
	Air	Surface	Bottom, 1 m	
21.9.1956	−0.8°	1.8°	0.9°	Very thin ice on large parts of the lake.

113. Limnaeasø, Søndre Strømfjord.

Previously treated by Böcher (1959, pp. 50–52) and presumably by I.A.D. Jensen (1889, p. 59) as well. On the map in Böcher (1959, p. 49) denoted by c.

Situated as the westernmost fairly large lake in the area Tarajornitsut north of the innermost part of Søndre Strømfjord. The shape of the lake is very irregular. Its greatest extent, about 2 km, is in the direction NE—SW. The surroundings consist of terraces of peat, from *Drepanocladus aduncus*, greatly mixed with sand and clay. The banks consist of the same material and are sharply cut-off. The bottom

of the lake quite close to the bank consists of sand, but farther out it is greatly mixed with finer materials. There is no vegetation in the lake.

There is neither inflow nor outlet to the lake.

	Temperatures		
	Air	Surface	Bottom
21.9.1956	–1.5°	0.9°	1.4°

114. Brayasø, Søndre Strømfjord.

Situated about 800 m east of Loc. 113. Mentioned by BÖCHER (1959, pp. 48–50; on the map p. 49 denoted by b).

The lake is nearly 2 km long and 400 m broad. The bottom, which mainly consists of fine sand, slopes towards the greatest depth, which is about 6 m. Along the banks there are growths of *Potamogeton filiformis* and a great many filamentous algae.

There are two tributaries, both coming from the south, one at the western end and one at the eastern end, but there is no outlet. In protected creeks along the bank, there was very thin new ice.

	Temperatures		
	Air	Surface	Bottom
21.9.1956	–1.1°	0.8°	0.9°

115. Lille Saltsø, Søndre Strømfjord.

Situated 100 m above sea level nearly 1 km from the head of the northern branch of Søndre Strømfjord. The lake is oblong, longitudinal direction E—W, about 400 m long and 250 m broad. The banks are clayey, with some stones and a vegetation mainly consisting of *Juncus*. The bottom slopes evenly down towards the deepest place, which is about 4 m deep. The lake is without any permanent outlet.

Previously examined by BÖCHER (1949, pp. 49–52).

116. Store Saltsø, Søndre Strømfjord.

Previously examined by BÖCHER (1949, pp. 53–56, and 1959, pp. 54–59). Fairly large lake, situated nearly 4 km east of the head of the northern branch of Søndre Strømfjord. The lake is shaped like a curved trough, 1 km long and 400 m broad, longitudinal direction NW—SE. It was not possible to establish the depths of the lake, but as the surroundings are rather steep, I estimate it to be rather deep. Round the lake there are terraces of peat, mainly consisting of *Drepanocladus aduncus*. The banks consist of the same material and are very sharply cut-off. The bottom of the lake, at any rate close to the banks, consists of this material, too, though somewhat mixed with fine sand and clay. The bottom is quite vegetationless. The lake has neither inflow nor outflow.

	Temperatures		
	Air	Surface	Bottom
20.9.1956	2.6°	3.8°	0.2°

119. The Water Lake, Holsteinsborg.

This is a large lake situated nearly 2 km east of Holsteinsborg. Its shape is somewhat irregular, the size being 1 km by 1.5 km. The depth is stated to be about

20 m. The surroundings consist of gneiss, though in many places marshy areas reach down to the water. At the edge of the lake the bottom is stony, farther out it consists of fine sand. There is no vegetation in the lake. The water is very clear.

	Temperatures			Remark
	Air	Surface	Bottom	
12.6.1956				The lake completely ice-covered.
14.9.1956	5.9°	7.2°	4.1°	
26.9.1956	0.5°	2.5°	3.2°	

120. Lake above Vandfaldskløften, Umîvît, Søndre Strømfjord.

This lake is situated about 400 m above sea level on the north side of Umîvît, Søndre Strømfjord. It is triangular, with rounded corners, the sides being nearly 1 km. The banks everywhere consist of rock, with sparse vegetation in crevices. The bottom, which everywhere is vegetationless, consists of large flat stones near the banks, while farther out in deeper water the bottom is soft. Greatest depth about 5 m. The water is brownish. The lake receives a few minor tributaries and has an outlet through Vandfaldskløften.

	Temperatures		
	Air	Surface	Bottom
19.9.1956	–2.4°	2.3°	2.7°

122. Lake on Angujârtorfik, Søndre Strømfjord.

Situated 200 m above sea level, nearly 2 km north of Angujârtorfik, which is a branch on the south side of Søndre Strømfjord. The longitudinal direction of the lake is SE—NW, its length is nearly 1 km, and it is about 400 m broad. In the middle of the lake there is a small island. It seems rather shallow, the depths being between 2 and 3 m. Along the banks there are everywhere large ice-ramparts. The shallow parts of the lake have vigorous growths of *Hippuris* and various mosses. At the time of the visit to the lake there was new ice in several places along the banks. There is no inflow proper, and an outlet from the southernmost end to the sea was dry and probably functions only during the spring thaw.

	Temperatures		
	Air	Surface	Bottom
18.9.1956	1.9°	3.5°	2.8°

123. Lake on the South Side of Umîvît, Søndre Strømfjord.

Situated about 1 km inland on the south side of Umîvît immediately opposite to the Vandfaldskløften, about 50 m above sea level. The lake is about 600 m long and 400 m broad. The banks are covered with vegetation, and in a few places slope down towards the water. In shallow water, along the banks, the bottom is densely overgrown with *Myriophyllum* and *Menyanthes*. Farther out the bottom is only overgrown with mosses or it is completely vegetationless. Depths down to 4 m. There are some small tributaries and a very slowly flowing outlet.

	Temperatures		
	Air	Surface	Bottom
19.19.1956	4.3°	1.9°	2.8°

125. Lake near Anders Olsens Sund.

Lake 200 m long and 50 m broad situated immediately east of Anders Olsens Sund. The longitudinal direction is north—south. The lake is situated in a small valley, opening towards the sound and only separated from this by a bank mainly consisting of clay. On the long sides the lake is mainly bounded by vegetationless rock walls, but here and there there are small marshy coastal areas. The depth of the lake in the deepest place is about 3 m. The bottom is very soft, consisting of light clayish ooze. Along the banks there is a vigorous vegetation of *Hippuris*.

From the north there is inflow from a couple of similar lakes, and at the southern end there is an outlet to the sea.

	Temperatures		
	Air	Surface	Bottom
16.9.1956	2.4°	1.3°	2.8°

130. The Water Lake, Godthåb.

This is an artificial lake situated immediately north of Godthåb. The lake is about 600 m long (longitudinal direction N—S), and at the northern end 200, at the southern end 150 m broad. The lake is dammed in a valley by three dams, one main dam in the south and two other dams in the north and west. These dams were finished in 1954 (BØGEKJÆR 1954). Originally there was in the valley a small lake or large pond. The lake is apparently quite vegetationless and besides by the dams is surrounded by almost bare rock walls. It receives a culverted inflow from the lake Ravnesø in the north, and the outlet, which is also culverted, is the water supply to the town of Godthåb.

	Temperature		Remarks
	Air	Water	
31.5.1956	6.0°	0.9°	Ice on the greater part of the lake, only at the eastern bank a large hole through the ice.
27.9.1957	6.4°	8.1°	
30.6.1959	14.5°	11.0°	Ice-free.

143. Store Sø, Maria Ø.

This lake is situated on the south-westernmost part of Maria Ø, and is separated from the sea in the west and south by large beach ridge systems, mainly consisting of very coarse gravel. The lake is 1 km long and 500 m broad tapering somewhat towards the ends. The bottom consists of pale grey mud; close to the banks there are some stones with a little moss, *Drepanocladus*. The water is very clear. The bottom can be seen everywhere in the lake. At the northern end of the lake there are large growths of *Potamogeton filiformis* and *Scorpidium*. Round the lake there are systems of ice-ramparts. There are some small tributaries coming from the surrounding heights and towards the south the lake has an outlet to the sea. This outlet only functions during the spring thaw.

	Temperatures			Remark
	Air	Surface	Bottom	
20.7.1958	9.9°	16.0°	8.6°	
22.8.1958	7.0°	9.0°	7.3°	On a small creek towards the NW there was new ice.

147. Rundsø, Ella Ø.

This lake has previously been examined by Søgaard Andersen (1946, pp. 20–29, maps on Plates 1 and 2), and especially its entomostracal fauna has been worked up by Poulsen (1940a). The lake is nearly circular, with the diameters 340 and 270 m. Greatest depth 11 m. There is inflow in the east, but an outlet towards the west only functions during the spring thaw.

		Temperatures		
	Air	Water close to the bank	The surface in the middle	9 m
16.7.1958	18.0°	14.0°	11.0°	5.1°
21.8.1958	9.2°	11.0°	8.1°	4.9°

148. Langsø, Ella Ø.

The lake has previously been examined by Søgaard Andersen (1946, pp. 11–20; maps: Plates 1 and 2) and the entomostracal fauna has been worked out by Poulsen (1940a and b). The lake is 650 m long (longitudinal direction NE—SW) and about 140 m broad and is somewhat irregular in shape. The greatest depth is 2.5 m (stated by Søgaard Andersen to be 2 m, but then the water level must have been very low when he made his measurements). There are some minor tributaries and the outlet only functions during the spring thaw. In addition, an artificial outlet is established in summer through a plastic hose, through which the Ella Ø Station is supplied with water.

The bottom consists of pale grey mud covered by a layer of algal filaments. The only other vegetation is some *Potamogeton filiformis* along the banks.

	Temperatures		
	Air	Surface	Bottom
16.7.1958	17.5°	14.0°	13.2°
21.8.1958	10.5°	11.5°	11.0°

150. Ulvesø, Ella Ø.

Examined previously by Søgaard Andersen (1946, pp. 29–31. Map: Plates 1 and 2). The entomostracal fauna has been worked up by Poulsen (1940a and b). This lake is oval, 550 m long and 200 m broad. The greatest depth is 5 m. There is no vegetation at all in the lake. There are some minor tributaries from the surrounding hills and an outlet from the northeastern end. The tributaries and the outlet only function during the spring thaw. The water is clear, from the heights round the lake the bottom could be seen everywhere.

	Temperatures		
	Air	Surface	Bottom
18.7.1958	19.5°	12.7°	4.9°
23.8.1958	7.5°	6.5°	4.8°

152. Basaltsø, Geographical Society Ø.

Situated near the south coast of Geographical Society Ø on a plateau about 100 m above sea level. It is somewhat irregularly shaped, about 2 km in length (longitudinal direction E—W), about 500 m wide in the east and tapering towards the west. The substratum consists of basalt, and in several places there is solifluction

down to the edge of the lake. The bottom, which is without any vegetation at all, slopes steeply down from the bank and mainly consists of fine basalt sand. The greatest depth measured is 15 m, but no doubt there are greater depths in the lake. The water is very clear, transparency 12 m. There are several tributaries to the lake, especially from the north and east, most of them functioning throughout the summer. There is an outlet to the sea from the west end.

	Temperatures		
	Air	Surface	15 m
25.8.1958	3.0°	5.0°	4.6°

154. Small Lake, Geographical Society Ø.

Situated about 2 km east of Loc. 152 on a somewhat higher plateau. The lake is oval, about by 0.5 km. The banks are stony; the bottom slopes evenly towards the middle. The greatest depth is about 3.5 m. Close to the bank the bottom is stony, farther out it consists of basalt sand. Among the stones near the edge of the lake a little *Scorpidium* grows, otherwise the lake is vegetationless. There is no real inflow, but the lake receives water from the surrounding heights. There is an outlet from the west end running to Loc. 152.

	Temperatures		
	Air	Surface	Bottom
25.8.1958	4.0°	4.5°	4.6°

163. Grønnesø, Charcots Land.

Situated about 1100 m above sea level on a mountain plateau, the northeastern boundary is a steep slope down towards the Nordvestfjord. The lake is very irregular in shape, nearly divided into two almost equally large parts, the northwestern one of which is very shallow and has the character of a pond, but the southeastern one has depths down to 10 m. Only the latter part of the lake has been examined. The greatest extent of this part is about 200 m. In shallow water the bottom has a vigorous vegetation of mosses and filamentous algae, but in deeper water the bottom is mainly vegetationless. The water is very clear. From the surrounding heights it is possible to see the bottom everywhere in the lake. There is no real inflow, but during the spring thaw the lake must receive some water from the surrounding heights, which, amongst other things, consists of limestone, and from the southern end there is a small outlet, which, however, only functions periodically.

	Temperatures		
	Air	Surface	5 m
4.8.1958	8.5°	11.5°	5.7°

170. Ice-dammed Lake, Charcots Land.

This lake is situated in a valley in the southern part of Charcots Land. From Daugaard-Jensens Gletscher a small side glacier juts into the valley, and this side glacier forms the southern boundary of the lake. The glacier front towards the lake is nearly 1 km broad, and the lake, which is situated in continuation of the side glacier, is nearly 3 km in length and 1.5 km in breadth in the broadest place. The water level of the lake is not constant. In 9 days, from the 1st to the 10th of August 1958 the water level rose by about 1.5 m. The nearest surroundings of the lake

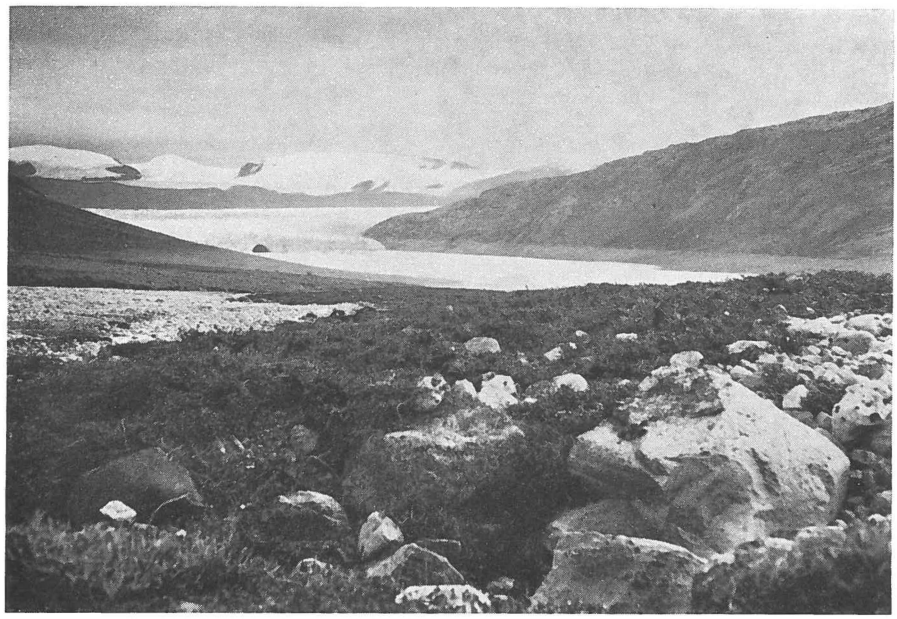


Fig. 21. Loc. 170. Ice-dammed lake in Charcots Land. The lake as seen from the north. Along the western shore the light, vegetationless zone round the lake and the sharply defined boundary towards the vegetation are seen.

are quite vegetationless steep gravel and clay slopes, but 30 m above the level of the lake there is a very sharply defined limit, above which there is a vigorous vegetation. This might suggest that the water level of the lake is subject to regular fluctuations so that it is completely or partly emptied when the water level reaches or approaches the limit of vegetation. Probably the lake in such cases has so high a water level that the side glacier at the end of it is raised somewhat and the water flows out under it into the Nordvestfjord. The greatest depth of the lake could not be established, but in a place only 100 m from the edge of the lake 18 m was measured. The bottom consists of fine sand and ooze of clay, and the water is milky from suspended clay. The transparency is only 25 cm. No vegetation in the lake.

There are three large tributaries to the lake, two rivers coming from the north and west, and an outlet through an ice cave. Besides, the lake receives a great many small streams and brooks.

Furthermore the glacier calves a great many blocks of ice into the lake.

	Temperatures		
	Air	Surface	Bottom (18 m)
1.8.1958	6.5°	4.2°	4.1°

171. Northern Lake on Mountain Plateau, Charcots Land.

Situated on the northern part of a mountain plateau southwest of the ice-dammed lake (Loc. 170) about 800 m above sea level. The extent of the lake is about 200 × 300 m, but its shape is somewhat irregular, with many headlands and small creeks. The water is quite clear so that the bottom is visible almost everywhere. The depth hardly exceeds 5 m. The banks are stony with some vegetation, mainly

consisting of mosses. Farther out the bottom is free of vegetation, only here and there there are rather large growths of algae on stones.

There are some small tributaries to the lake, and a rather large outlet in the south to Daugaard-Jensens Gletscher.

	Temperatures		
	Air	Surface	Bottom (3 m)
7.8.1958	12.5°	11.2°	5.8°

173. Southern Lake on Mountain Plateau, Charcots Land.

This small lake is situated on the southern part of the mountain plateau on which the lake Loc. 171 is also situated.

The lake is oval, its longitudinal direction N—S, about 75 m long and 50 m broad. Greatest depth about 5 m. It is situated in a cleft. The edges of the lake are naked, steep rock walls, and the bottom consists of large boulders, on which the only vegetation is a sparse growth of algae. Here and there along the edges of the lake, however, there is a little *Drepanocladus*. No inflow proper was seen, but there is an outlet to Daugaard-Jensens Gletscher.

	Temperatures		
	Air	Surface	Bottom (3 m)
7.8.1958	10.8°	10.8°	5.7°

175. Smallish Lake, Nathorst Land.

Situated nearly 1 km north of T-sø (Loc. 176), a little less than 800 m above sea level, the lake is 500 m long and 200 m broad (longitudinal direction E—W). The southern boundary of the lake is a steep rock wall, while the other edges of the lake are marshy fens, through which some small brooks run to the lake. On large parts of the bottom there are vigorous growths of *Hippuris* and *Drepanocladus*. Only in the middle, where the depth is between 3 and 4 m, there is apparently no vegetation. The lake has a small outlet to T-sø.

	Temperatures		
	Air	Surface	Bottom (2 m)
11.8.1958	11.0°	9.5°	7.5°

176. T-sø, Nathorst Land.

This large lake is situated at an altitude of 600 m above sea level. The lake is T-shaped. The longitudinal direction is E—W, and the long branch of the lake is about 10 km in length and nearly 1.5 km broad. The transverse part of the lake is situated in the west and is more irregular, nearly 2.5 km broad and well over 4 km long. The lake is very deep, especially in the long and narrow part, but unfortunately it was impossible to make measurements of depths. Estimates could only be made from an airplane. The southern edge of the lake consists of mountain, descending almost vertically into the lake, but the other banks are more gently sloping. Along the banks there are many stones, which in some cases have been pressed by the ice so as to form stone ridges. In shallow water there are large growths of *Drepanocladus* and filamentous algae, farther out the bottom is without any vegetation. The water is very clear and transparent. The lake receives a great many larger and smaller

tributaries, and from the southwestern branch there is a large outlet to the Nordvestfjord.

	Temperatures		
	Air	Surface	10 m
10.8.1958	10.0°	5.0°	5.0°

177. Holger Danskes Briller, Eastern Part, Scoresby Land.

Holger Danske Briller ('Holger the Dane's Spectacles') is the name of two lakes situated in a valley stretching from the Nordostbugt in a westerly direction to the Nordvestfjord. The two lakes are of approximately the same shape and size, but whereas the western one is quite shallow and the water in it is very muddy, the eastern one, which is the one examined here, is deep and has clear water. The lake is nearly 4 km by 1.5 km. In the north and south it is surrounded by high mountains. The lake is separated from the western lake by a large moraine of gravel, and in the east there is a somewhat lower moraine, beyond which there is a very large, completely naked clayey plain. The banks of the lake are stony everywhere, farther out it is sandy. The lake is deep, but it was not possible to make any real measurement of the depths. There is no vegetation at all in the lake. From the heights in the north and south there are a great many small tributaries, and from the eastern end there is an outlet to the sea through a ravine in the moraine, and through the large, clayey plain, which is no doubt, completely flooded during the spring thaw.

		Temperatures	
	Air	Surface (at the bank)	Bottom (at a depth of 10 m)
14.8.1958	8.0°	8.0°	4.3°

185. The Expansion of the River, Scoresby Land.

Immediately east of the large clayey plain the river which forms the outlet from Loc. 177, has a lake-like expansion. It is nearly 1 km long and 400 m broad. The boundary towards the north and west is the clayey plain, whereas in the south and east it has sharply cut-off banks against an expanse with tundra vegetation. The expansion is rather deep, 5 m being the greatest depth that could be measured. The bottom consists of fine, greyish clay. There is no vegetation in the lake.

	Temperatures		
	Air	Surface	Bottom
16.8.1958	9.0°	9.5°	5.8°

192. Potamogetonsø, Rypefjord.

This smallish lake is situated at an altitude of 100 m on the peninsula west of Rypefjord, nearly 1 km from the sea. It has previously been described by LÆGAARD (1960). It is triangular, about 600 m long (longitudinal direction N—S) and at the southern end about 300 m broad. Its greatest depth is about 3 m. The lake is situated on a substratum of gneiss. The surroundings mainly consist of marshy areas. In shallow water the bottom consists of soft, dark mud, which has a rich vegetation of different mosses and *Batrachium*, while farther out there is sand with a sparse vegetation. The water is brownish, with a low transparency.

There are several small tributaries and there is an outlet at the northern end of the lake.

Analytical Tables.

Locality	Date	Conductivity	Hydrogen Ion tration	
			Actual	Highest
1. Great Lake, MacCormick Fjord	28.– 8. 1959	45	7.1	7.1
9. Lake Immediately East of Settlem. Qeqertat	4.– 5. 1960	220	7.3	7.5
12. Larger Lake near Kangerdlugssuaq	20.– 8. 1959	65	6.6	6.9
19. Lake Tuto	6.– 9. 1959	15	6.8	6.9
20. Lake at Savigsivik	13.– 8. 1959	24	5.7	5.9
22. The Water Lake, Kraulshavn	28.– 7. 1959	42	5.7	5.8
31. Small Lake near Tuvssâq	17.– 7. 1959	30	5.6	5.6
39. Lake in the Ravine of Severance, Upernavik	21.– 7. 1959	42	6.2	6.7
48. Lake at Kingigtoq	25.– 7. 1959	25	6.0	6.2
50. Lake at Niaqornat	5.– 8. 1956	710	9.4	9.5
	7.– 7. 1957	580	7.9	8.0
51. The Water Lake, Umanak	29.– 8. 1955	475	7.3	7.4
	6.– 8. 1956	450	7.4	7.5
	12.– 3. 1957	465	7.1	7.5
	3.– 7. 1957	460	7.4	7.5
54. Kakissalik, Ikerasak	4.– 7. 1957	171	7.1	7.3
55. Lake in Ikerasak	7.– 8. 1956	650		
	10.– 3. 1957	910	7.5	7.6
	4.– 7. 1957	710	7.2	7.3
56. Tarajornitsoq, Ikerasak	4.– 7. 1957	1300	8.9	9.0
58. Taserssuaq, Atâ	18.–10. 1954	52		
(Surface)	20.– 7. 1955	50	6.9	7.6
(90 m)	20.– 7. 1955	50	7.2	7.6
	10.– 9. 1955	48	6.9	7.2
	28.–10. 1955	26	6.7	6.9
(0 m)	26.– 7. 1956	50	6.8	7.9
(55 m)	26.– 7. 1956	62	6.8	7.8
	23.– 8. 1956	68	7.3	7.3
	3.–11. 1956	26	6.3	7.3
	11.– 6. 1957	53	7.1	7.4
59. Navdluarssuk	17.– 7. 1957	17	6.7	7.1
60. Mellemsø, Disko Fjord (0 m)	14.– 9. 1954	39		
(17 m)	14.– 9. 1954	41		
	10.– 7. 1955	42	7.2	8.0
(0 m)	12.– 8. 1955	37	7.4	7.5
(10 m)	12.– 8. 1955	36	6.9	7.5
(17 m)	12.– 8. 1955	36	6.8	7.5
(1 m)	23.– 9. 1955	35	7.3	7.6
(14 m)	23.– 9. 1955	34	7.3	7.6
	17.–11. 1955	34	7.2	7.5
(Just below ice)	2.– 2. 1956	102	7.1	7.2
(20 m)	2.– 2. 1956	56	6.1	6.8
	6.– 7. 1956	27	6.7	7.9

Lakes.

Concen- (pH) Lowest	Alkali- nity	Aci- dity	Calcium	Mag- nesium	Chloride	Fe++	Total Fe	Consump- tion of potassium perman- ganate	Colour (Ohle)
5.9	2.9	–	2.2	0.4	7.0	–	–	8	–
6.1		–	12.7	7.2	42.5	–	–	28	6
5.6	3.1	–	3.8	2.3	10.5	–	–	6	2
6.5	0.9	–	–	0.6	–	–	–	10	1
5.4	1.5	–	–	1.3	2.6	–	–	16	5
4.8	1.8	–	1.2	1.3	8.5	–	–	7	1
5.1	1.9	–	1.9	0.2	5.3	–	–	14	4
5.2	1.6	–	1.2	0.7	6.8	–	–	12	4
5.2	4.9	–	0.8	1.2	3.5	–	–	4	–
6.6	19.7	–	21.1	7.5	–	0.04	0.25	33	4
6.8	16.2	–	16.4	7.0	136.8			31	4
6.0	6.7	–	15.6	10.3	–	–	–	65	–
6.1	8.0	-	12.5	7.0	–	0.08	0.38	28	–
6.1	10.8	–	13.1	14.9	–	–	0.02	24	7
6.0	7.7	–	12.1	12.6	127.6			30	5
6.0	7.8	–	7.3	2.9	42.5			31	14
6.2	31.1	–	60.2	31.4		0.02	0.21	43	44
6.1	15.8	–	32.9	16.2	170.0			43	28
7.0	22.3	–	41.8	20.9	373.5			35	4
	1.7	–	4.2	0.5		0.06	0.06	12	–
5.8	1.7	–	4.3	0.3				12	–
5.8	2.0	–	4.1	0.7				12	–
5.8	1.1	0.2	3.4	0.3		0.06	0.06	8	–
5.7	1.9	–	5.3	1.5				12	–
5.8	1.7	–	4.7	1.6				12	–
5.8	2.0	–	4.0	0.7				27	–
5.8	2.5	–	2.6	0.6				17	1
5.4	3.3	–	4.4	0.7	12.0			15	2
5.8									
5.6	1.9	–	2.0	0.3	5.5			7	–
6.0	2.8	–	3.1	0.8	–	0.06	0.10	38	–
5.9	2.0	–	3.3	0.2				32	–
5.9	2.0	–	3.5	0.3				28	–
5.9	2.2	–	3.7	0.5				28	–
5.7	3.0	–	2.6	0.8				20	5
5.7	2.7	–	2.2	1.0				15	5
5.7	2.7	–	4.0	0.2	–	–	–	28	2
5.8	2.8	–	3.8	1.4		0.02	0.03	36	10
5.6	2.3	1.8	3.6	0.1		–	0.06	22	10
5.6	2.2	-	2.7	1.2		–	0.06	24	3

(To be continued)

Analytical Tables.

Locality	Date	Conductivity	Hydrogen Ion tration	
			Actual	Highest
	20.–10. 1956	62	7.5	7.6
	4.– 1. 1957	86	7.5	7.6
	9.– 4. 1957	148		
61. Lillesø, Disko Fjord	13.– 9. 1954	49		
	10.– 7. 1955	38	7.5	7.8
	12.– 8. 1955	41	7.4	8.0
	22.– 9. 1955	44	7.2	7.4
	16.–11. 1955	58	6.9	7.3
	18.– 4. 1956	285	8.6	9.0
	6.– 7. 1956	38	7.2	8.0
	20.–10. 1956	54	6.9	7.2
	4.– 1. 1957	120	7.6	7.6
	9.– 4. 1957	230	7.5	7.8
62. Lake at Evqitsoq, Disko Fjord	15.– 9. 1954	65		
	9.– 7. 1955	66	7.0	7.8
	11.– 8. 1955	62		
	22.– 9. 1955	65	7.3	7.5
	16.–11. 1955	84	7.0	7.4
	4.– 2. 1956	144	6.6	7.3
	18.– 4. 1956	155	7.1	8.3
	6.– 7. 1956	56	6.8	7.6
	19.–10. 1956	109	7.0	7.3
	4.– 1. 1957	115	7.4	7.5
	11.– 2. 1957	135	7.3	7.4
	2.– 3. 1957	158	7.0	7.2
	9.– 4. 1957	164	6.3	7.2
	8.– 6. 1957	55	6.2	7.3
64. Lake at Qivítut	8.– 6. 1957	74	7.3	7.4
67. Lake on Kangârssuk, Fortunebay	6.– 9. 1956	62	6.8	7.2
	21.– 2. 1957	115	7.0	7.2
69. Moræneso, Blæsedalen	20.– 2. 1956	180	6.6	7.4
	4.– 5. 1956	240	6.6	7.8
	1.– 2. 1957	130	7.1	7.3
	23.– 2. 1957	162	6.7	7.1
	1.– 4. 1957	196	7.1	7.3
	2.– 5. 1957	240	6.6	7.3
	13.– 6. 1957	58	7.1	7.1
85. Taserssuaq ("Thygesens sø"), Godhavn	4.– 7. 1955	50	6.8	7.1
	3.– 9. 1955	62	7.8	8.5
	28.– 2. 1956	141	6.7	7.1
	17.–12. 1956	170	6.7	7.7
	20.– 3. 1957	475	7.3	7.5
	30.– 3. 1957	520	7.3	7.6

Lakes. (cont.).

Concen- (pH) Lowest	Alkali- nity	Aci- dity	Calcium	Mag- nesium	Chloride	Fe^{++}	Total Fe	Consump- tion of potassium perman- ganate	Colour (Ohle)
5.4	4.5	–	2.7	1.9		–	–	24	5
6.6	4.9	–	2.1	4.5		–	–	42	1
	5.0	–	3.2	1.3				177	3
5.9	3.1	–	4.5	0.5		0.04	0.06	35	5
5.6	2.5	–	3.4	1.3				35	3
5.8	2.9	–	3.4	1.8				29	9
5.9	3.0	–	4.9	2.0				31	8
7.4	74.0	–	16.9	7.0				32	9
5.9	3.1	–	3.6	1.8		0.04	0.12	25	6
5.9	5.1	–	3.5	2.3				20	6
6.9	5.8	–	4.2	1.2				27	6
6.3	8.9	–	3.5	2.6				21	4
6.9	5.4	–	5.2	1.0		0.06	0.14	44	6
6.3	5.1	–	4.6	1.1				30	18
6.3	6.0	–	6.2	2.0		0.04	0.11	33	11
6.3	7.4	–	7.2	1.8		0.02	0.02	22	1
6.9	10.4	–	8.5	4.1		0.06	0.15	41	11
5.9	5.1	–	3.8	2.6		–	0.30	28	8
5.8	7.7	–	4.0	2.8				30	8
6.5	8.2	–	5.6	2.2				32	11
6.5	9.7	–	7.5	2.2				29	12
6.2	12.8	–	5.2	3.6		0.03	0.07	26	8
5.8	50.6	–	5.9	3.8				29	7
5.2	4.3	–	3.3	1.5				20	16
6.1	3.8	–	3.5	1.8				25	19
5.8	4.8	–	3.3	0.4				36	12
5.8	9.9	–	2.9	4.9				36	13
6.4	15.6	–	21.2	4.8		0.22	0.94	37	35
6.5	25.2	–	27.0	6.7		0.04	4.76	32	118
6.5	13.8	–	10.5	3.1				36	38
6.2	18.1	–	16.7	19.8				34	48
6.4	20.8	–	20.2	3.4				33	70
6.5	26.1	–	21.6	6.4				28	15
5.7	4.6	–	3.9	2.4				28	1
5.5	2.9	–	4.5	0.4		0.05	0.16	34	2
6.3	3.1	–	6.3	2.1		–	–	34	7
5.9	4.6	–	9.6	4.5		–	–	32	3
6.4	8.6	–	11.8	5.0				31	5
6.8	31.7	–	42.2	34.3		0.13	2.10	36	76
6.8	51.1	–	44.4	35.9		0.51	4.62	41	124

(To be continued)

Analytical Tables.

Locality	Date	Conductivity	Hydrogen Ion tration	
			Actual	Highest
	31.– 5. 1957	77	7.1	7.3
99. Lake at Claushavn	25.– 8. 1956	54	7.4	7.4
	17.– 5. 1957	64	6.4	7.0
103. The Water Lake, Christianshåb	25.– 8. 1956	59	6.2	7.1
	30.–10. 1956	47	6.7	7.0
	17.– 5. 1957	54	7.2	7.3
105. Lake at Kangersuneq	20.– 6. 1957	42	7.3	7.3
107. The Water Lake, Egedesminde	15.– 5. 1957	80	6.3	7.1
108. Lake at Orpigsôq, Qarajaq	19.– 6. 1957	47	7.3	7.5
110. Gieseckes Sø	29.– 9. 1956	55	6.8	8.3
(Surface)	30.– 8. 1957	52		
(15 m)	30.– 8. 1957	52		
(35 m)	30.– 8. 1957	52		
111. Lake on Arnaq Qavdlunâq	13.– 9. 1956	61	6.8	6.9
112. Small Alkaline Lake near Strømfjordshavn (Böcher 1949)	3.– 8. 1946		8	
113. Limnaeasø (Böcher 1949)				
	21.– 9. 1956	4400	9.4	9.4
114. Brayasø (Böcher 1959)	21.– 9. 1956	3000	8.5	8.7
	21.– 9. 1956		9.0	
116. Store Saltsø (Böcher 1949)	1946		9.5	
	20.– 9. 1956	3100	8.8	8.9
(Böcher 1959)	20.– 9. 1956		9.0	
119. The Water Lake, Holsteinsborg	14.– 9. 1956	80	6.6	7.1
122. Lake on Angujârtorfik	18.– 9. 1956	270	8.0	8.3
123. Lake on the South Side of Umîvît	19.– 9. 1956	91	7.5	8.1
125. Lake near Anders Olsens Sund	16.– 9. 1956	100	7.8	7.9
130. The Water Lake, Godthåb	13.– 5. 1956	71	6.8	7.3
143. Store Sø, Maria Ø	20.– 7. 1958	225	7.5	6.3
147. Rundsø, Ella Ø	15.– 7. 1958	260	7.5	6.7
148. Langsø, Ella Ø	15.– 7. 1958	200	7.5	6.6
150. Ulvesø, Ella Ø	18.– 7. 1958	225	7.2	8.1
152. Basaltsø, Geogr. Soc. Ø	25.– 8. 1958	49	6.6	6.7
154. Small Lake, Geogr. Soc. Ø	25.– 8. 1958	21	6.2	6.2
163. Grønnesø, Charcots Land	4.– 8. 1958	480	7.4	6.1
170. Ice-dammed Lake, Charcots Land	1.– 8. 1958	34	6.6	7.6
171. Northern Lake on Plateau, Charcots Land	7.– 8. 1958		7.2	
173. Southern Lake on Plateau, Charcots Land	7.– 8. 1958	160	7.5	7.6
175. Smallish Lake, Nathorst Land	11.– 8. 1958	102	6.6	7.1
176. T-sø, Nathorst Land	10.– 8. 1958	50	6.2	6.6
177. Holger Danskes Briller	14.– 8. 1958	46	6.2	6.3
185. Expansion of River, Scoresby Land	16.– 8. 1958		6.6	
192. Potamogetonsø, Rypefjord	30.– 7. 1958	42	6.6	7.3
203. Blaasø, Gåseland	25.– 7. 1958	65	6.4	7.4
205. Faxasø, Gåseland	24.– 7. 1958	65	6.5	7.2

Lakes. (cont.).

Concen- (pH) Lowest	Alkali- nity	Aci- dity	Calcium	Mag- nesium	Chloride	Fe++	Total Fe	Consump- tion of potassium perman- ganate	Colour (Ohle)
5.0	3.4	–	4.5	1.6				25	6
5.7	3.0	–	4.6	0.5				37	17
6.2	3.5	–	3.2	1.3				21	18
5.8	2.5	–	3.1	1.5				33	4
5.4	2.7	–	4.0	0.8				29	2
6.3	3.2	–	2.2	1.1				14	3
5.3	1.5	–	2.1	0.9		–	–	20	5
5.3	4.0	–	2.8	2.0				18	6
5.6	2.4	–	3.9	1.8				18	4
5.8	2.0	–	1.4	2.1		0.07	0.08	18	3
2.1	2.1	–	1.8	1.4	12.0			13	
2.2	2.2	–	2.2	1.3	12.0			13	
2.2	2.2	–	1.9	1.4	12.0			14	
5.5	3.6	1.2	2.4	1.2				29	7
			25.0	41.0	154.0				
				308.0	903.0				
9.0	264.0	–	1.4	280.2		0.07	0.10	32	2
8.1	178.0	–	13.0	182.2		–	0.06	37	5
			15.0	180.0	1240.0	0.1			
			32.0	236.0	708.0				
8.6	237	–	32.8	190.6		0.06	0.11	38	6
			30.0	182.0	570.0	0.1			
5.3	2.6	–	3.5	1.7			0.09	24	3
6.6	24.6	–	26.8	9.5		0.05	0.05	36	10
5.9	9.0	–	7.0	3.9		0.56	0.59	38	67
6.2	6.7	–	9.1	1.3				26	8
6.4	2.7	–	6.1	1.0		0.03	0.04	28	3
8.2	18.1	–	24.6	8.6	19.2			22	1
8.3	27.2	–	34.8	10.4	8.5			28	2
8.3	26.2	–	24.1	8.0	6.4			34	6
6.4	22.1	–	28.6	11.2	1.5			16	–
5.5	3.8	2.5	4.9	1.7	0.5			11	–
4.8	1.2	1.1	1.9	0.7	0.3			12	–
7.5	13.5	–	90.6	7.3	0.4			48	15
5.5	3.3	–	4.2	1.6	0.4			14	3
5.4	10.3	–	24.3	3.7	0.2			18	1
6.3	8.7	–	15.4	1.8	0.5			32	6
4.9	4.2	1.8	6.3	1.1	0.5			10	2
5.5	5.4	2.3	6.6	1.1	1.1			14	–
6.1	4.1	–	5.6	1.1	0.4			29	10
6.3	8.0	–	10.9	0.6	0.4			14	3
6.1	7.4	–	10.4	0.9	0.3			15	5

	Temperatures		
	Air	Surface	3 m
30.7.1958	9.5°	11.5°	8.4°

203. Blaasø, Gåseland.

Situated 270 m above sea level, this lake is fairly large, nearly 4 km long (longitudinal direction E—W) and 1.5 km broad in the broadest place. The banks are stony almost everywhere, sometimes firm rock, and only here and there small, vegetation-covered valleys go down to the lake. Near the edge of the lake the bottom is stony in most places, but in a few places clayey. As far as could be seen, there was no vegetation in the lake. The water is bluish, opalescent, the transparency only 1 m. The lake has two large tributaries from the north and the south in the western part. There is an outlet carrying much water from the east end to Loc. 205, Faxa Sø.

	Temperatures		
	Air	Water, surface	Water, 3 m
25.7.1958	13.0°	6.2°	6.0°

205. Faxa Sø, Gåseland.

Situated 240 m above sea level about 3 km southeast of Blaasø, this lake is about 11 km long (longitudinal direction NW—SE) and 3 km broad in the broadest place. The lake is surrounded by 1800 m high mountains, the slopes of which, covered by scree, go down to the edge of the lake. On the south side, where a large river delta debouches, the banks, however, consist of soft clayey ooze. Close to the banks the bottom is stony – sandy, but only a few metres from the edge of the lake it consists of clay. There is no vegetation in the lake. The water is quite grey from suspended clay particles, and the transparency is only 0.3–0.6 m. There are three large tributaries to the lake, at the northwestern end from Blaasø, in the south from an ice-dammed lake, and at the southeastern end. As the discharge of these tributaries fluctuates greatly with the air temperature, the water level of the lake may fluctuate considerably. Thus in a few days, from 23.7. to 26.7., it rose by nearly one metre. There is an outlet to the sea from the southeastern end of the lake.

	Temperatures			
	Air	Surface	1 m	3 m
24.7.1958	7.5°	6.0°	6.0°	6.0°

Summary Remarks on the Lakes.

Conditions of the Ice.

Duration of the ice-cover. It is characteristic of all the Greenland lakes that they are only ice-free during a comparatively short period in summer, but are frozen over during the rest of the year. The lakes which have been examined, are, however, situated on a stretch ranging over 14 degrees of latitude or about 1550 km. In the works of previous authors (RINK 1857, BERGENDAL 1892, HARTZ 1896, JOHANSEN 1912, TROLLE 1913, BACHMANN 1921, HABERBOSCH 1920, and SØGAARD

ANDERSEN 1946) it is possible to find some information about the duration of the ice-cover and the thickness of the ice and if these statements are compared with my own observations a survey is obtained of the length of the period of ice-cover in the various parts of the west coast of Greenland from Godthåb northwards, while the information about conditions in East Greenland is very scarce, apart from what has been stated by SØGAARD ANDERSEN (*loc. cit.*).

Godthåb (about lat. 64°N.). 1.5.1956 the water lake was thawing. At visits on 29.9.1957 and 30.6.1959 it was ice-free. It was stated that normally it was thawed out about 10.6. and was completely covered with ice about 15.10. These dates, which, however, must be taken with all possible reservations, as the lake in its present form has existed for very few years, seem to indicate that the ice-free period of the lake is of about four months.

Holsteinsborg and Søndre Strømfjord (about lat. 67°N.). On 12.6. 1956 the water lake in Holsteinsborg and on 15.6.1956 Gieseckes Sø were still completely frozen up, whereas BACHMANN (*loc. cit.* p. 71) states that a lake near Holsteinsborg on 21.6.1908 was still half covered with ice. There was no sign of ice-cover in the water lake of Holsteinsborg nor in Gieseckes Sø on the visits of respectively 26. and 29.9.1956, but at the examination at the head of Søndre Strømfjord, there was new ice on parts of three of the lakes on 18. and 20.9.1956. Thus it seems that the lakes in this area are completely thawed out at the end of June and that the freezing over takes place about 1. October. Hence, the lakes there have an ice-free period of well over three months.

Disko Bugt (about lat. 69°N.). The great majority of observations originate from this area. It is, however, difficult to fix especially the time of the breaking up of the ice with certainty, as in that season it may be completely impossible to get to some of the localities examined.

In the literature there are some pieces of information about this area as BACHMANN (*loc. cit.* p. 91) found the greater part of the lake near Egedesminde (my Loc. 107) on 24.6. covered with ice and on 13.7. found ice on the northernmost end of Langsø in Disko Fjord. Furthermore, RINK (1857) states that the lake in Godhavn (my Locality 85) was frozen up 4.10., while a lake on Arveprinsens Eiland still on 15.6.1950 had 2 ells (= about 125 cm) thick ice.

My own observations show that the ice-free period for the lakes in Disko Bugt is just under three months, but that the ice-free period of the shallow lakes is shifted about a fortnight ahead of that of the deep lakes. Thus on 20.7.1955 some ice was left in Taserssuaq, Atâ, while the shallower lakes Mellemsø, Lillesø, the lake at Evqitsoq, the lake at Qivítut, and Morænesø in Blæsedalen were completely ice-free already in the beginning of the month. On 17.6.1957 there was ice on

the greater part of Taserssuaq, Atâ, while the Water Lake at Egedesminde ten days later was quite ice-free and, judging from the temperature, had been so for some time. Again the shallow lakes were completely covered with ice 10–20 cm thick in the middle of October 1956, while Taserssuaq, Atâ, at the end of that month was frozen over only in the southernmost part.

The Umanak Fjord (about lat. 71°N.). From there we have little information about the duration of the ice-cover. DRYGALSKI (1897, p. 419) states that "Tasiusak" on "Karajak-Nunatak" was ice-free on 8.7.1893, and according to information received by myself it is a rule that the water lake was ice-free from about 15.7. to 1.10., thus two months and a half. The small shallow lake in Ikerasak rich in plants (Loc. 55), however, was quite ice-free about 20.6.1956, but was completely frozen up already at 5.9.1955.

From the southern part of Upernavik District no information is available, but the Water Lake at Kraulshavn (about lat. 74°N.) is said to be ice-free about a month and a half, viz. from about 15.7. to about 1.9.

Thule (about lat. 77°N.). Loc. 11, Minor Lake near Kangerdlugssuaq was in part covered with new ice already on 20.8.1959 and Loc. 16, Lake near Dundas was almost completely frozen up on 8.9., while Loc. 19, Lake Tuto, was covered with about 15 cm ice everywhere already on 6.9. According to the information I could obtain, the lake in this area is normally ice-free from the end of July to the end of August, thus only about one month, but rather often it may happen in the large lakes that the ice does not succeed in melting before the freeze-up sets in again.

As to the east coast, the duration of the ice-cover is known from Ella Ø (about lat. 73°N.) in the winter of 1933–34 (SØGAARD ANDERSEN 1946). The two lakes Langsø and Rundsø were frozen over for nine months, Langsø from 25.9. to 20.6., and Rundsø from 1.10. to 2.7. It is evident that in the deeper Rundsø the freeze-up as well as the thawing was later than in the very shallow Langsø. From the beginning of the freezing over of Langsø until the end well over a week passed, but there is no information concerning the duration of the thawing.

Furthermore, JOHANSEN (1912) gave some information about the lakes near Danmarkshavn (about lat. 77°N.). The ice-cover on the two large lakes Sælsø and Annekssø as well as some minor lakes has been mentioned. As to Annekssø it is doubtful whether it is ever completely ice-free. Sælsø is normally ice-free in August, but in bad years it does not break up, and the minor lakes become ice-free in June and begin being frozen over in August–September, i.e. that they are ice-free for one and a half to two months.

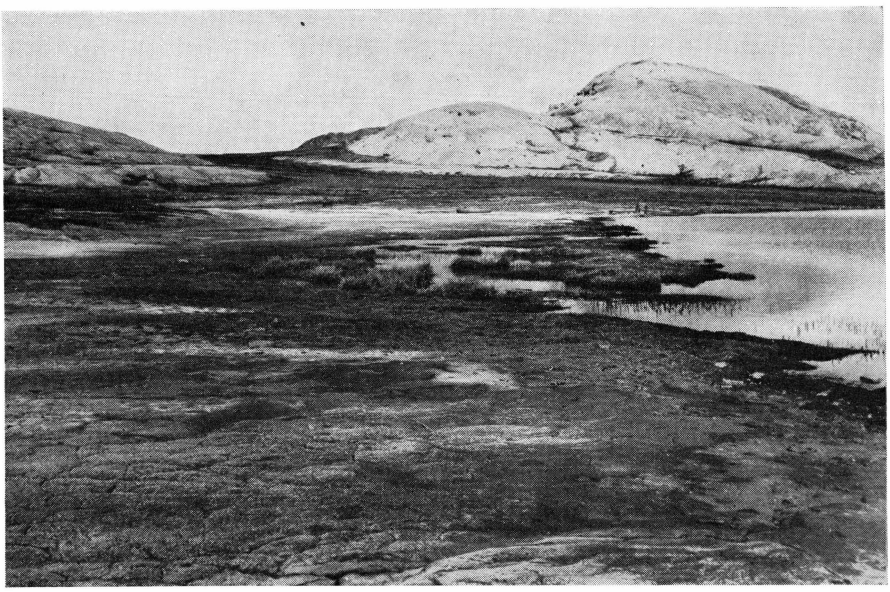


Fig. 22. Systems of ice-ramparts beside Loc. 143, Store Sø, Maria Ø. The ramparts pressed up last winter are completely surrounded by water and very distinct, while older ones are becoming blurred.

Thickness of the ice. The greatest thickness of ice found by me is 2.1 m, viz. in the Water Lake in Umanak and in the Lake rich in plants in Ikerasak. The greatest thickness of ice found in Greenland fresh waters is 2.5 m, measured on Annekssø in Northeast Greenland (JOHANSEN 1912, p. 324). In all other Greenland lakes examined in winter the maximum thickness of ice was 2 m, and on the great majority it was about 1.5 m.

The amount of snow is of great importance for the maximum thickness of ice. In the winter of 1955–56 poor in snow the ice on the lakes in Disko Fjord was, on the whole, 20 cm thicker than in the winters of 1954–55 and 1956–57, which were rich in snow. Furthermore it should be noted that in Umanak District, where I found the greatest thickness of ice, there is a considerably lower snowfall than e.g. in Godhavn District.

Effects of the ice on the banks of the lakes. In a good number of cases it has been shown by previous authors (BUCKLEY 1901, GILBERT 1884) as well as through the present investigations that the ice has given rise to various effects on the appearance of the banks. These effects can be divided into three types the mechanism as well as the effect of which are widely different.

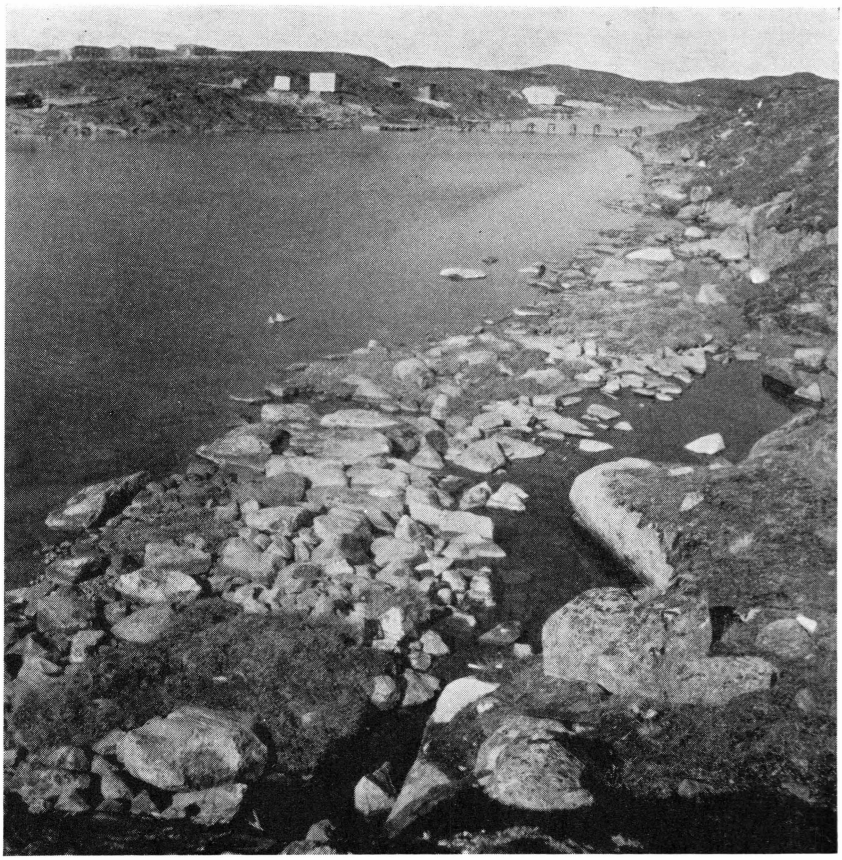


Fig. 23. Partially overgrown ice-rampart, consisting of stones. Loc. 107, the Water Lake, Egedesminde.

(1) Pressure by the ice. This arises when the lakes are completely frozen over, and because of fluctuations in the temperature vertical clefts are formed in the ice. When water from below forces its way into these clefts and freezes there, tensions arise in the ice cover, and these tensions are released by the ice pressing along the banks. Where the banks do not consist of firm rock, the uppermost layers are folded up and the so-called ice ramparts arise. Often it is possible to see several lines lying concentrically round the lakes, each line corresponding to one winter. Sometimes the pressure does not reach the land, but only acts in the shallowest water along the banks. There loose materials will be washed away, while large stones will remain as barriers immediately off the banks.

(2) Planing off the banks. In the spring the ice will mostly melt first along the banks, and a larger or smaller ice floe will for a prolonged



Fig. 24. Rests of ice-rampart. The loose materials have been washed away, only large stones having been left. Loc. 176, T-sø, Nathorst Land.

time be kept in the middle of the lake. This floe may be pressed against the shore by the wind and plane off the bottom and the bank, so that in places where the bank consists of loose materials an almost vertical bank develops which descends to a depth of about one metre.

(3) Tearing up the bottom in shallow water. In lakes with shallow water along the banks the ice during the winter will freeze together with the bottom material. If large quantities of water are supplied to the lake during the spring thaw, the ice-cover will be raised and the bottom will be torn up. If there is vegetation in a lake, the innermost zone in low water will mostly be vegetationless, as the vegetation there will be torn up, too, when the ice rises.

Conditions of Temperature.

Haberbosch (1920, p. 157) offers a list of the highest temperatures measured in various lakes. It does not appear from the list where the temperatures were measured, but they were presumably measured at the surface near the bank. In the same paper he has a survey of freshwater temperatures previously known from Greenland.

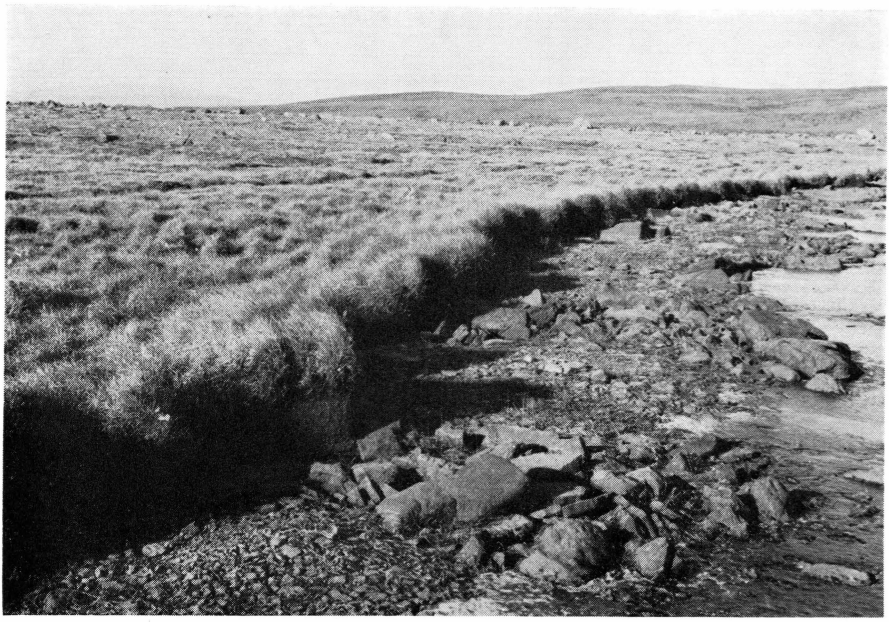


Fig. 25. Sharply cut-off shore of a lake, produced by the ice. The water level is somewhat lower than the normal, so that the stony, vegetationless bottom near the edge of the lake is seen. Loc. 16, Lake at Dundas.



Fig. 26. Sharply cut-off shores of lakes, which continue almost vertically below the level of the water. Loc. 1, Great Lake, MacCormick Fjord.

It is evident from the measurements which I have made in fairly deep lakes and which are represented as curves on pp. 29–43 that the deep layers of water are influenced only to a small extent by the fluctuations in the temperature of the air and by the insolation. The

temperatures of the upper layers of water, especially those near the banks, on the other hand, are extremely susceptible to insolation as well as the temperature of the air. However, the shape of the banks play an extremely great role in this connexion, so that it is only to a very small degree possible to compare the temperatures measured from the various latitudes directly. If a comparison is wanted, it is necessary to take lakes with approximately the same shape of the banks from the various areas and compare their temperatures. On this basis it is possible to set up the following table of the maximum temperatures found:

	Flat banks	Steep banks	Free surface
Godthåb (about lat. 64°N.)		11.0° (30.6)	
Gieseckes Sø (ab. lat. 67½°N.) ...			8.5° (30.8)
Disko Bugt (ab. lat. 69°N.)	15.4° (18.7)	14.2° (21.7)	13.6° (30.7)
Umanak Fjord (ab. lat. 71°N.) ...	11.0° (5.8)		9.8° (7.8)
Upernavik (ab. lat. 74°N.)	10.0° (14.7)	9.0° (15.7)	
Thule (ab. lat. 77°N.)	8.5° (20.8)	3.5° (20.8)	
Rypefjord (ab. lat. 71°N.).....	11.5° (30.7)		
Charcots Land and.....	11.5° (4.8)		
Nathorst Land (ab. lat. 72°N.)..	9.5° (11.8)	5.0° (10.8)	
Kejser Frantz Josephs Fjord (about lat. 73°N.)	14.0° (16.7)	5.0° (23.8)	

These maximum temperatures are only fairly comparable, as they have not been measured simultaneously, in several cases not even in the same year. Still, they clearly show partly that the temperature near flat banks gets higher than near steep banks or in free surfaces, and that the maximum temperatures decrease towards the north.

Furthermore, it is seen that probably there is no appreciable difference between the temperatures on the west coast and those on the east coast.

The Various Types of Greenland Lakes.

Previous authors, BACHMANN (1921), SØGAARD ANDERSEN (1946), and BÖCHER (1949) have made attempts at classifying the Greenland lakes. BACHMANN only distinguishes between deep lakes and "Teichseen", while SØGAARD ANDERSEN tries to range the lakes investigated by him in the system of oligotrophic-eutrophic lakes constructed by NAUMANN and THIENEMANN, remarking (*loc. cit.* p. 57) "that if the vegetation period had been longer, the lakes would have been eutrophic." Thus it is evident that the long ice-cover in the whole of Greenland reduces the productivity of all the lakes, however rich in nutrients they are, so that they all

must be characterised as oligotrophic. So the NAUMANN-THIENEMANN system cannot be used for a classification of the lakes.

BÖCHER (*loc. cit.*) therefore adopted another method, and classified the lakes investigated by him according to the contents of salts in the water. In this way he obtained an applicable system, the utility of which is only limited by the fact that not all Greenland lakes can be ranged in it, which is due to his having worked in only a very restricted part of the country. If, however, the contents in the water of suspended particles and of salts are used, the following table is obtained:

A. Lakes with large quantities of suspended material in the water.
   (1) Ice-dammed lakes.
   (2) Lakes through which glacial streams flow.
B. Lakes with clear water.
   (1) Lakes with slight contents of salts.
   (2) Lakes with high contents of salts.
   (3) Salt lakes.
C. Lagoons.

Lakes with Large Quantities of Suspended Material in the Water.

All the lakes included in this main group are characterised by the fact that large quantities of clayey ooze are suspended in the water so that the transparency is very slight, as a rule about 0.25 m. This causes the bottom of such lakes to be quite vegetationless, as the light cannot penetrate the water and create favourable conditions for vegetation. Furthermore the production of plankton is very slight, as it is restricted to very uppermost layers of the water. The bottom material in the lakes consists of fine clayey ooze, and it is not possible to find remains of plankton organisms in it.

Another condition characteristic of the lakes is the great fluctuations occuring in the water level because of the greatly changing supplies of water. As all the lakes in this group receive the greatest part by far of their inflow from the melting of glaciers, a small change in the temperature of the air can give rise to very great changes in the water level, as the outlets are only to a slight degree capable of having an immediate regulating effect on the water level.

Ice-dammed Lakes.

Only two of these lakes have been visited by me, viz. Loc. 19, Lake Tuto, and Loc. 170, Ice-dammed Lake in Charcots Land.

What distinguishes these lakes from the following group is the fact that the banks of them for a greater or smaller stretch are consti-

tuted by a glacier. This means that the temperature is considerable lower and thawing takes place later and freezing over earlier than is the case of lakes in the neighbourhood which are not ice-dammed. Furthermore, the total contents of ions in these lakes are low, as the greater part of the water supplied consists of pure melt water. In the two lakes examined the conductivity is 15 and 34, respectively.

Lakes through whish Glacial Streams Flow.

Four lakes of this type have been examined, viz. Loc. 1, Great Lake, MacCormick Fjord, Loc. 59, Navdluarssuk, Loc. 203, Blaasø, Gåseland, and Loc. 205, Faxa Sø, Gåseland.

These lakes in many ways remind one of the ice-dammed lakes, but because of the distance from the glacier, their summer temperature may be somewhat higher, as the glacial streams are heated somewhat on the way and the lakes do not receive calf-ice. As regards temperature and ice-cover these lakes hold an intermediate position between the ice-dammed lakes and the following groups.

On the whole the contents of salts in these lakes are low, the conductivity being 45, 17, 65, and 65, respectively. The comparatively high figures for the lakes in Gåseland are no doubt due to the fact that these lakes besides melt water also receive tributaries of a different kind.

Lakes with Clear Water.

The great majority of the lakes examined belong to this main group. As indicated by the name, they differ from the first group by having clear water and by the fact that at any rate their surface temperature fluctuates with the air temperature. They can be distinguished from the last group, the lagoon type, by the fact that they are not subjected to any demonstrable influence from the sea. The group is highly variable according to conditions of temperature and inflow of water in the place where they are situated. All the lakes examined by BÖCHER (1949) thus belong to this main group, but to different sections within it.

Lakes with Slight Contents of Salts.

Out of the total of 64 lakes examined 39 — or more than 60 per cent. — belong to this group, but no doubt a still higher percentage of all Greenland lakes must be included in the group. These lakes occur everywhere in Greenland where conditions of inflow are such that the lakes during the whole of the ice-free period receive more water than they succeed in evaporating. Therefore no accumulation of salts takes place in the lakes, and the conductivity of the water in them is rather

low, the highest figure found in such a lake during the ice-free period being about 100 μmho.

Among the lakes investigated by BÖCHER (*loc. cit.*) A. "Lakes with acid water poor in salt" and B. "Lakes with circumneutral water poor in salts" belong to this group. They have all outlets which are water-bearing throughout the summer.

It is, however, possible to find great differences between the lakes within the group and to make a classification into subgroups, but these subgroups are not by far so sharply defined, and intermediate types may be found.

A special position is held by the very deep lakes, among which Loc. 58, Taserssuaq, Atâ, and Loc. 110, Gieseckes Sø are more than 100 m deep, while the depths in Loc. 22, the Water Lake, Kraulshavn; Loc. 48, Lake at Kingigtoq; Loc. 152, Basaltsø; Loc. 176, T-Sø, and Loc. 177, Holger Danskes Briller, which should no doubt be included here, are not known. Among these lakes at any rate the two first mentioned are old branches of fiords which have been cut off from the sea.

It is characteristic of these lakes that the annual variation in temperature practically only asserts itself in the upper layers of the water, while the fluctuations near the bottom are only a few tenths of a degree. The highest summer temperature in the surface is also rather low, as the highest surface temperature measured in such a lake is 8.5°. Furthermore, there is no loss of oxygen near the bottom, neither in summer nor under the ice in winter.

The large amount of water also causes the decrease in the total amount of water that takes place in winter during the freezing over to be of no importance for the contents of salts in the water, as the conductivity does not rise under the ice-cover—in contrast to the case in shallower lakes.

Furthermore, a comparison of these deep lakes with the others shows that the consumption of potassium permanganate on the whole is low and that the water is quite colourless or only very slightly coloured.

There is no sessile vegetation other than mosses in the large lakes.

The bottom material in these lakes consists of pale mud, which in a dried state is very light. It mainly consists of valves of diatoms, cysts of Chrysophyceae, and grains of minerals, while other components are less prominent.

In the rest of the Greenland lakes within this group conditions are somewhat different. The annual variation in temperature near the bottom can, according to the depth of the lake, vary from about 2° to about 6°. The surface temperature varies greatly with the air temperature, and especially in winter under the ice, but also, in a less marked degree, in summer, there is loss of oxygen near the bottom.

Because of the ice-cover, which in the shallowest lakes takes up a very appreciable part of the volume of the lake (e.g. Loc. 85, Tasersuaq (Thygesens Sø), about 65 per cent., Loc. 62, Lake at Evqitsoq, Loc. 64, Lake at Qivítut, and Loc. 69, Moræneso, Blæsedalen, 35–40 per cent.) a fairly high concentration of the salts of the lake takes place in the lower layers of the water so that the conductivity in winter is considerably higher than in summer. This applies to a lesser degree to the lakes of medium depth (e.g. Loc. 60, Mellemsø), as it is only possible to demonstrate an increase in conductivity in the layers of water immediately below the ice, while it is not very pronounced in the deeper layers of the water. This concentration of the nutritive salts becomes of great biological importance at the beginning of the spring thaw, as in the thawed zone which at that time is developing along the bank, there may be rather high temperatures, and this fact, together with the large contents of nutritive salts, creates conditions suitable for rather a great production of plankton in the littoral zone.

The consumption of potassium permanganate as well as the colour of the water is considerably higher in shallow lakes than in deep ones. Furthermore, it is characteristic that while the consumption of potassium permanganate and the colour in the deep lakes is rather constant all the year round, a violent intensification of the colour of the water takes place under the ice in very shallow lakes, e.g. Loc. 85, "Thygesens Sø".

The higher vegetation in these lakes may be more or less strongly developed. As a general rule it may be said that the farther north the locality is situated and the deeper the locality is, the more slightly developed is the higher vegetation. On the west coast I have not found any other sessile vegetation than mosses in lakes in Thule and Upernavik Districts, while the shallow lakes farther south, Localities 61, 62, 64, 69, 85, 99, 103, 107, 123, and 125 all had greater or smaller parts overgrown mainly with *Hippuris* and *Callitriche*. The rest of the lakes, like the northernmost ones, had only growths of moss. On the east coast conditions were similar, as bottom and bank vegetations other than mosses were found only in the two lakes Loc. 175 and Loc. 192.

The bottom material in the lakes consists of darker, greyish to brownish mud, which has a large content of valves of diatoms, while cysts of Chrysophyceae and mineral grains are rarer. On the other hand there are, especially in the shallowest lakes, large quantities of decayed remains of organic origin, bits of leaves, remains of entomostraca and insects.

Lakes with High Contents of Salts.

14 of the lakes examined belong to this group, viz. Loc. 7, Lake North of the Settlement Qeqertat; Loc. 9, Lake Immediately East of the Settlement

Qeqertat; Loc. 16, Lake near Dundas; Loc. 51, the Water Lake, Umanak; Loc. 54, Kakissalik, Ikerasak; Loc. 55, Lake Rich in Plants, Ikerasak; Loc. 112, Small Alkaline Lake near Strømfjordshavn; Loc. 115, Lille Saltsø; Loc. 122, Lake on Angujârtorfik; Loc. 143, Store Sø, Maria Ø; Loc. 147, Rundsø, Ella Ø; Loc. 148, Langsø, Ella Ø; Loc. 150, Ulvesø, Ella Ø, and Loc. 163, Grønnesø, Charcots Land.

Some of the lakes which have previously been investigated by SØGAARD ANDERSEN (1946) and BÖCHER (1949) belong to this group and have also been investigated by me. Among them are three of the lakes on Ella Ø, viz. Rundsø, Langsø, and Ulvesø (my Localities 147, 148, and 150), while the fourth of the lakes of Ella Ø, Bjørnesø, is considered a pond, in addition Type C. in BÖCHER (*loc. cit.*) p. 48), "lakes with rather saline, alkaline water", include my Localities 112 and 115.

It is characteristic of these lakes that their contents of salts are rather high. Only during the spring thaw do the lakes receive more water than evaporates from their surfaces, and this surplus is so small that only a small part of the salts which are supplied to the lakes through the inflow leaves them again. It should even be considered that in the case of a few of the lakes (e.g. Loc. 112 and Loc. 115) the outlets only function after winters particularly rich in snow. Consequently the conductivity in these lakes is fairly high, varying from about 200 to about 700 μmho.

While lakes with a constant outlet can be found in the whole of Greenland, the lakes in the group mentioned here are gathered in some few regions with a continental climate poor in precipitation.

The lakes included in this group are not particularly deep. The deepest are the two lakes near Qeqertat (Loc. 7 and Loc. 9), the depths of which are unknown, and Rundsø (Loc. 147), the greatest depth of which is 11 m. In the localities where temperatures and contents of oxygen have been measured down through the whole lake, conditions in that respect do not differ from those in the shallower lakes with permanently functioning outlets.

Where chemical analyses of the water have been made, all the lakes mentioned here, with the exception of Ulvesø (Loc. 150), show a high consumption of potassium permanganate, and all the localities on the west coast and Grønnesø in Charcots Land have an intense brown colouring of the water. As to the localities on Ella Ø and Store Sø, Maria Ø, the water is almost colourless, but SØGAARD ANDERSEN (*loc. cit.* p. 16) states about Langsø (Loc. 148) that "on 25.3.1934 the smell (of H_2S) was intense and the water yellow brown."

The vegetation in all lakes was well-developed, in the localities in Thule District only consisting of large cushions of mosses, while in

the other localities it consisted of i.a. *Hippuris*, *Batrachium*, *Myriophyllum*, and *Potamogeton*.

Where the bottom material has been examined, it consists of pale, brown mud, containing many valves of diatoms, mineral grains, and decayed organic particles, but besides there were remains of green algae, such as *Pediastrum boryanum* and various desmids.

Salt Lakes.

Only four lakes of this type have been examined, viz. Loc. 56, Tarajornitsoq, Ikerasak; Loc. 113, Limnaeasø; Loc. 114, Brayasø, and Loc. 116, Store Saltsø. They correspond to the group denoted by BÖCHER (*loc. cit.* p. 52) as "D. Lakes with saline, highly alkaline water."

As the lakes have no outlets, a high concentration of salts has taken place in them. The conductivity is high, viz. 1300, 4400, 3000, and 3100 μmho, respectively. As a consequence of the high contents of salts the period of ice-cover of the lakes is a little shorter than of other lakes in the same area. While Loc. 112 had new ice on the greater part of the surface on 21.9.1936, Loc. 113 and Loc. 116 were quite ice-free at the same time, and Loc. 114 had only new ice in protected creeks.

In all the four lakes the consumption of potassium permanganate was high, but the colour intensity was low, the most intensely coloured lake, Loc. 116, being measured at 6 Ohle units.

Sessile vegetation was found in only one of the four localities, viz. Loc. 114, the other three were completely devoid of vegetation on bank and bottom. The bottom material mainly consists of mineral constituents mixed with unidentifiable plant residue. Furthermore, there are a few valves of diatoms.

Lagoons.

Only one of the localities examined, Loc. 50, Lake at Niaqornat, can be referred to this group; hence no generalizations can be made.

Because of the constant supply of sea water, the conductivity is rather high. Among the various constituents of the total content of salts chloride especially asserts itself. The consumption of potassium permanganate is also rather high, but the water is only pale brown.

Vegetation is missing in the lake.

The bottom material is very dark, almost quite black, with a distinct smell of sulphuretted hydrogen. It mainly consists of decayed plant residue (marine algae?), but there are some tourmaline crystals in it. Among remains of plankton organisms there are some valves of diatoms and ephippia of *Daphnia*.

2. Ponds.

Descriptions.

2. Pond A. MacCormick Fjord.

Situated immediately south of the western end of Great Lake (Loc. 1), about 300 m long and 20 m broad, longitudinal direction E—W. The depth nowhere exceeds 1.5 m. The banks consist of moss cushions with distinct traces of lines from glaciation. The bottom is soft with a few stones and here and there detached moss cushions. A small brook coming from the south and running into Great Lake flows through the western end of the pond.

	Temperatures		
	Air	Water	Bottom
28.8.1959	4.5°	3.0°	3.0°

3. Pond B. MacCormick Fjord.

Small pond situated 50 m southwest of the preceding locality (Loc. 2). Almost circular, 25 m in diameter with an indentation in the SW, where there is a small tributary to the pond. No outlet. The depth does not exceed 50 cm, the bottom is very soft, with a few stones, a few of them rising over the surface. The banks, which are everywhere overgrown with moss, have been sharply cut off by the ice.

	Temperatures			Remarks
	Air	Water	Bottom	
28.8.1959	3.5°	1.5°	2.5°	Thin new ice on the southern end of the pond.

4. Pond C. MacCormick Fjord.

Large pond shaped like a dumb-bell, about 200 m SW of Loc. 3. The length is about 300 m, longitudinal direction NE—SW, greatest breadth about 80 m, narrowest breadth about 30 m. The edges of the pond descended vertically to 0.75 m, a depth found in the greater part of the pond. The bottom is soft, here and there with large growths of moss. No permanent inflow or outlet.

	Temperatures		
	Air	Water	Bottom
28.8.1959	3.0°	2.5°	3.0°

5. Pond D. MacCormick Fjord.

Situated close to the head of MacCormick Fjord, on the plain immediately above the slope towards the sea, about half a kilometre south of the mouth of the river. The pond is very irregular in shape, covering in all about 100 sq. m. Depths to 1 m. The bottom is covered by thick moss cushions.

	Temperatures			Remarks
	Air	Water	Bottom	
28.8.1959	–4.5°	1.5°	2.9°	Thin new ice along the banks.

6. Pond E. MacCormick Fjord.

Situated a little southeast of Loc. 5, somewhat larger in extent, about 70 × 50 m, depths not more than 20 cm. In a few places in the pond some sharply cut-off islands of moss cushions project. The bottom is very soft, without vegetation.

	Temperatures			Remarks
	Air	Water	Bottom	
28.8.1959	–4.5°	0.7°	1.5°	Thin ice on most of the pond.

8. Pond at Settlement Qeqertat.

Pond situated about 2 km NE of the settlement Qeqertat, 50 m above sea level. It is large in extent, about 200 × 100 m, but quite shallow, with no depths greater than half a metre. Along the banks there are large growths of cotton-grass, which here and there grow into the pond, but otherwise there is only a little growth of moss and algae on the bottom, which is very soft. There is neither outlet nor inflow.

	Temperatures		
	Air	Water	Bottom
20.8.1959	1.2°	6.0°	6.2°

13. Pond at the Settlement Igánaq.

Situated in the middle of the settlement Igánaq on Booth Sund. The pond is round, about 20 m in diameter. The depth is 1.5 m. The pond is very much polluted by refuse from the settlement, and the water is quite green from plankton algae. The very soft bottom is without vegetation.

	Temperatures		Remarks
	Air	Water	
4.9.1959	–1.5°	1.5°	Very thin new ice along the bank.
11.9.1959	–8.2°	0.7°	The pond covered by ice, 8 cm thick.

14. Pond Supplying Igánaq with Drinking Water.

Situated about 500 m south of the settlement at the foot of a small range of hills. The pond is oblong, longitudinal direction E—W, length 50 m, breadth 25 m. Greatest depth 1 m. The bottom consists of stones with soft, dark ooze between them. Very sparse vegetation of moss.

	Temperatures		Remarks
	Air	Water	
4.9.1959	–3.5°	1.5°	Thin new ice along the south bank.
11.9.1959	–9.4°	0.8°	10 cm ice all over the pond.

15. Pond Southeast of Igánaq.

Large shallow pond situated 1 km southeast of the settlement Igánaq. Almost circular, 100 m in diameter. The depth nowhere exceeds 0.5 m. The bottom everywhere consists of a firm pavement of rather small stones. Along the banks there

is a vigorous vegetation of mosses and cotton-grass, which grows somewhat into the pond.

	Temperatures		Remarks
	Air	Water	
4.9.1959	–3.5°	1.0°	Thin new ice over the greater part of the pond.
11.9.1959	–9.6°	0.5°	10 cm ice all over the pond.

17. Western Pond near Dundas.

Situated about 300 m south of Loc. 16. Almost circular, 100 m in diameter, 50 cm deep. The banks covered with vegetation, very sharply cut-off. The bottom is everywhere stony, near the banks overgrown with large cushions of moss. No permanent outlet or inflow, but small rills, which no doubt only function during the spring thaw.

	Temperatures		Remarks
	Air	Water	
8.9.1959	–1.0°	2.5°	Everywhere 8 cm thick, quite transparent ice.

18. Eastern Pond near Dundas.

Is situated about 500 m east of Loc. 17. Almost circular, about 200 m in diameter. The depth does not exceed three quarters of a metre. The banks slope evenly into the bottom, which in the middle is stony, while close to the banks there is a zone with a soft bottom and with vigorous vegetation. No outlet or inflow.

	Temperatures		Remarks
	Air	Water	
8.9.1959	–1.0°	3.0°	10 cm clear ice all over the pond.

21. Pond at Savigsivik.

Situated in a very moist fen, through which a small stream flows from the mountain Søkongefjældet near Savigsivik, about 1 km east of the trading station. The pond is oblong, 30×10 m, but somewhat irregular in shape. The depth is about 50 cm. Round the pond there is a very vigorous vegetation, but the bottom is vegetationless and very soft.

	Temperatures	
	Air	Water
13.8.1959	5.3°	5.5°

24. Pond Between the Water Lake and the Trading Station Tasiussaq.

Irregular, kidney-shaped pond situated about 50 m above sea level half-way between the Trading Station Tasiussaq and the water lake. The greatest dimensions of the pond are 20×25 m. The depth is about 0.5 m. The bottom consists partly of firm rock, partly of sand and gravel. A few stones rise above the water. In the middle of the pond there is a little growth of *Hippuris*.

	Temperatures	
	Air	Water
18.7.1959	3.5°	8.5°

25. Pond in the Northern Part of the Trading Station Tasiussaq.

Pond with an extent of 50 × 30 m situated in the northern part of the Trading Station Tasiussaq. The greatest depth is half a metre. The bottom is densely overgrown with mosses. In many places the plants rise right up to the surface so that it looks as if the locality is divided up into a great many small ponds.

Previously (1931) FRITS JOHANSEN has made collections in this locality, but his findings have not been published.

	Temperatures	
	Air	Water
18.7.1959	4.0°	6.0°

26. Smallest Pond in the Southern Part of the Trading Station of Tasiussaq.

The pond is approximately circular, about 35 m in diameter and with depths down to 0.5 m. The bottom is soft, with some large, flat stones and a little vegetation. The locality is rather much polluted by refuse from the Trading Station. The pond has previously (1931) been the object of collections by FRITS JOHANSEN, but his findings have not been published.

	Temperatures	
	Air	Water
18.7.1959	3.0°	8.5°

27. Largest Pond in the Southern Part of the Trading Station of Tasiussaq.

Situated immediately east of the preceding locality, from which it is only separated by a three-metre-broad rampart. The pond is oblong, 150 × 35 m and has depths to 1.5 m. Where the bottom was visible it consisted of large stones, between which there was dark mud. Very sparse vegetation of mosses. The pond was much polluted, the water was very turbid, and transparency was only 0.5 m.

In this pond FRITS JOHANSEN also made collections in 1931 without any results being published.

	Temperatures	
	Air	Water
18.7.1959	3.0°	6.8°

29. Pond at Ivnarssuit.

Oblong pond about 500 m east of the settlement Ivnarssuit. It measures 25 × 8 m. Towards the north the pond is demarcated by an almost vertical rock wall, while the southern bank consists of large stones. At the ends of the pond there is a vigorous vegetation of cotton grass. The bottom consists of stones, the greatest depth is 0.4 m.

	Temperatures	
	Air	Water
17.7.1959	6.0°	8.5°

30. Pond at Tuvssâq.

Situated in the middle of the very small island on which the settlement Tuvssâq is placed. The pond is situated in a rock cleft and is 20 × 7 m. Large parts of the pond are occupied by growths of *Batrachium*. The depth is about 30 cm, the bottom

is very soft, black ooze. The pond is greatly polluted and the water is quite green with plankton algae.

	Temperatures	
	Air	Water
17.7.1959	3.5°	6.0°

32. Pond near Tuvssâq.

Situated on the same island as Loc. 31, about 50 m east of this locality. The pond is round, about 30 m in diameter and 0.5 m deep in the deepest place. The bottom is soft and vegetationless apart from a littoral zone with cotton grass and some mosses. The water is quite clear. There is no inflow, but there is a small outlet to Loc. 31 in the west.

	Temperatures	
	Air	Water
17.7.1959	8.5°	11.0°

33. Pond at Augpilagtoq.

Situated about 500 m east of the Trading Station 50 m above sea level in a narrow valley leading towards the east to Loc. 34. The pond is 75 m long and 40 m broad, somewhat irregular in shape. The depth is about 1 m all over the basin. The bottom of the valley is very fertile, and the bottom of the pond, which in part consists of fallen boulders, has large growths of mosses. At the western end of the pond there is a small outlet towards the Trading Station. In 1931 the pond was examined by FRITS JOHANSEN, but his findings have not been published.

	Temperatures	
	Air	Water
15.7.1959	9.0°	12.0°
1.8.1959	3.3°	11.4°

35. Largest Pond on the Northern Part of Upernavik Ø.

Pond, 50 m long, 25 m broad, situated in the northernmost corner of the Upernavik Island. Depth everywhere about 1 m. The bottom is soft with a few large stones and a very vigorous growth of *Hippuris* and a few mosses. Round the lake the vegetation is very luxuriant.

	Temperatures	
	Air	Water
21.7.1958	9.5°	17.0°

36. Smallest Pond in the Northern Part of Upernavik Ø.

Situated immediately south of Loc. 35. 10×15 m, 0.8 m deep. The bottom consists of large flat stones with a little growth of *Hippuris* between them. The edges of the pond descend completely vertically into the water.

	Temperatures	
	Air	Water
21.7.1959	9.5°	14.0°

37. Middle Pond in the Northern Part of Upernavik Ø.

Situated about 75 m southeast of Loc. 38. The pond is square, 15×15 m, and 30 cm deep. The banks consist of bare rock and the bottom is stony with a few mosses.

	Temperatures	
	Air	Water
21.7.1959	9.5°	16.0°

38. Pond in the Ravine of Severance, Upernavik.

In the western part of the valley which separates the northern part of the Upernavik Island from the rest, there is a large shallow pond. Its shape is very irregular. The average extent is about 100 m. The greatest depths are between 1.5 and 2 m. The bottom consists of sand with many large flat stones. There is no vegetation. The pond receives a small tributary from the lake Loc. 39 and has a short outlet towards the east to a small lagoon.

	Temperatures		
	Air	Surface	Bottom
14.7.1959	7.5°	11.5°	8.5°

40. Pond Immediately Southwest of the Ravine of Severance, Upernavik.

Small pond situated 50 m above sea level at a distance of 10 m from a steep cliff facing the sea. Very irregular in shape, about 4×4 m. Greatest depth 75 cm. The bottom consists of large stones with some mosses. Neither outlet nor inflow.

	Temperatures	
	Air	Water
14.7.1959	8.0°	9.3°

41. Pond North of the Cairn, Upernavik.

Approximately in the middle of the Upernavik Island, on its highest point there is a large cairn. North of this there is a flat plateau with a couple of ponds. Loc. 41 is situated 75 m north of the cairn. It is about 20 m in every direction and is 50 cm deep. The banks are bare rock, and the bottom, which consists of rock with a thin layer of ooze, is also without vegetation.

	Temperatures	
	Air	Water
4.8.1959	6.5°	11.0°

42. Pond Immediately North of the Cairn, Upernavik.

Situated south of Loc. 41, immediately north of the Cairn. The pond is irregularly square, the sides being about 15 m, and it is 40 cm deep. The banks are mainly rock, but on the north side a moist fen reaches the water. The bottom, which is covered by a thick layer of mud, is densely overgrown with mosses.

	Temperatures	
	Air	Water
4.8.1959	6.5°	11.0°

43. Pond near the Beacon Station, Upernavik.

Situated about 100 m north of the Beacon Station of Upernavik in a small depression strewn with rocks. The pond is 6×20 m. Its shape is somewhat irregular, and the depth is 30–50 cm. The bottom consists of stones covered with a large amount of mainly dead moss, and between the stones there is soft bottom. There is a little inflow from a snowpatch and there is an outlet to the sea.

	Temperatures		
	Air	Surface	Bottom
14.7.1959	7.0°	10.0°	3.8°

45. Pond Between "Livets Top" and the Highest Point, Upernavik.

"Livets top" is the name of the southernmost peak on Upernavik Island. Between this and the highest point with the cairn there is a valley with a pond in the middle. The shape of the pond is somewhat irregular. The greatest extent is 20×8 m. The depth is 30 cm. The bottom consists of stones with a great many filamentous algae and a sparse vegetation of mosses. Here and there stones rise out of the water. The banks are stony and almost without vegetation. There is neither outlet nor inflow.

	Temperatures	
	Air	Water
19.7.1959	7.5°	12.5°

46. Pond near the Radio Station of Upernavik.

Situated about 100 m southeast of the Radio Station of Upernavik. The shape of the pond is somewhat irregular, it is 15 m long and 6 m broad and has a stony bottom and depths down to 40 cm. The only vegetation in the pond is filamentous algae. The banks of the pond consist partly of rock, partly of moist fens overgrown with cotton grass. There is neither outlet nor inflow.

	Temperatures	
	Air	Water
19.7.1959	6.5°	12.5°

47. Pond on the Slope Above Old Upernavik.

Situated on a small terrace on the slope northeast of the old part of Upernavik. The pond is oval, 25×15 m, and 25 cm deep. The water is almost full of luxuriant vegetation, especially cotton grass and mosses. There is a small outlet over the slope to the sea. The water in the pond is very brown.

	Temperatures		
	Air	Surface	Bottom
19.7.1959	8.0°	14.0°	9.5°

49. Pond in Prøven.

Situated somewhat to the southwest of the hill on which the residence of the manager of the trading station stands, between this house and the cemetery. The pond is oval, 30×20 m being the longest measurements. The depth is about 1.5 m. The bank, as regards the northern part, consists of boulders, while towards the south

the pond passes evenly into a very moist fen. In the pond there are large growths of *Hippuris*. In 1931 a sample from this locality was taken by FRITS JOHANSEN.

	Temperatures	
	Air	Water
6.8.1959	7.5°	9.8°

52. Lillesø, Umanak.

Situated southwest of the Radio Station of Umanak, between this and the water lake. Roundish, but of a somewhat irregular shape, diameter about 100 m. The depth nowhere exceeds 1 m. The bottom is very soft, with some vegetation, especially near the edge of the pond, consisting of *Batrachium* and various mosses. The surroundings consist of gneiss and marshy areas with fen vegetation. The locality has neither inflow nor outlet.

	Temperatures		Remarks
	Air	Water	
29.8.1955	3.8°	4.9°	
6.8.1956	18.7°	10.4°	
12.3.1957			Frozen solid. The ice was free of snow, with large crevices, which in several places reached the bottom.
3.7.1957	15.2°	18.0°	

53. Pond Northwest of the School, Umanak.

Situated at the top of a 75-metre-high crag between the town and the water lake of Umanak. The surroundings consist of gneiss without vegetation. The shape of the pond is very irregular, about 2 × 3 m. The depth varies somewhat. The bottom consists of rock with a very thin layer of ooze. On all visits in summer the water was full of vegetation, especially *Batrachium* and *Scorpidium*.

	Temperatures			Remarks
	Air	Surface	Bottom	
29.8.1955	3.2°	3.5°		10 cm deep.
6.8.1956	18.4°	15.0°	11.1°	20 cm deep.
12.3.1957				The pond frozen solid; with a very thin layer of snow.
6.7.1957	15.5°	13.0°		20 cm deep.

57. Pond at Nordfjord.

Situated on the south side of the Nordfjord, 5 km from the mouth of the fiord. The distance from the fiord is 50 m and the altitude 60 m. The pond is situated in a scree consisting of large blocks of basalt. It is somewhat irregularly roundish, about 5 m in diameter. The deepest place is half a metre. The bottom consists of larger and smaller stones. Poorly developed mosses constitute the only vegetation.

	Temperatures	
	Air	Water
1.7.1957	13.9°	12.1°

65. Pond in Rodebay.

Situated in the northwesternmost part of the Trading Station Rodebay, about 10 m above sea level, but towards the north only separated from it by a beach ridge about 25 m broad, mainly covered with vegetation. The pond is somewhat irregularly oval, the longitudinal axis east-west is 100 m, the breadth is 70 m. The water level is variable, so that large parts of the bottom occasionally may be dry. The bottom material is soft and black and smells strongly of H_2S. Dried-up expanses of the bottom are light yellow, but this layer is few mm deep. The surroundings are marshy, with a vigorous vegetation characterized by a great supply of manure. In the locality itself there is here and there refuse from the Trading Station.

	Temperatures			Remarks
	Air	Surface	Bottom	
17.6.1957	10.4°	17.1°	8.8°	High water level, the whole pool being full. Depth 50 cm.
19.7.1957	13.1°	9.2°	9.0°	Inconsiderably lower water level.
20.8.1957	10.0°	11.0°	9.1°	25 cm in the deepest place. Only one third of the pool contains water.

66. Pond on Kangârssuk, Fortunebay.

Mountain pond situated on basalt terrace about 50 m above sea level, immediately north of Loc. 67. The surface of the terrace is very irregular from bank-shaped tussocks. The pond is almost round, though with somewhat irregular banks. The diameter is about 35 m, the depth in the deepest place is 0.5 m. The bank and shallow parts of the pond are densely overgrown with *Equisetum arvense*, of which a few specimens also grow on the otherwise bare and very soft bottom of the pond.

	Temperatures		
	Air	Surface	Bottom
6.9.1956	4.0°	6.2°	7.5°

68. Littoral Pond on Kangârssuk, Fortunebay.

Situated on the shore east of Loc. 18, between the beach and the closed-down Trading Station of Fortunebay. Actually it is an expansion of the outlet from Loc. 67 in the depression between the outmost beach ridge and the outmost ridge but one. The ground round the locality is very stony shore almost without any vegetation. The pond is oblong, longitudinal direction N—S, receiving drainage from Loc. 67 at the southern end. It is 25 m long and 5 m broad in the broadest place. The bottom is very soft, consisting of dark mud, and covered by a dense layer of filamentous algae. The greatest depth is 25 cm. The distance to the sea is 20 m. The inflow is very slight, and there is no outlet proper, but the water at the northern end oozes away between the stones to the sea.

	Temperatures		
	Air	Surface	Bottom
6.9.1956	5.5°	7.5°	7.5°
9.8.1957	8.1°	7.5°	7.5°

72. Pond North of the Scientific Leader's Residence, Godhavn.

Shallow pond situated on the gneiss about 200 m north of the residence of the scientific leader of the Arctic Station, about 50 m above sea level. The greatest extent is 15×8 m and the greatest possible depth 40 cm. The bottom consists of large flat stones, here and there with soft expanses of ooze with a growth of *Drepanocladus*. The surroundings mainly consist of bare rock, but in a few places there are small moist fens. The water level varies very little.

	Temperatures		
	Air	Surface	Bottom
12.6.1957	15.1°	16.1°	13.4°
6.8.1957	11.5°	11.5°	12.2°

73. Hippurissø, Godhavn.

This pond is probably the one which BACHMANN (1921, p. 111) mentions as "25. Teich. Grosser Teich mit einer kleinen Insel."

FOGED (1958, p. 10 and p. 48) has a water analysis of the pond and describes it like this: "Greatest length (W—E) about 45 m, greatest breadth (N—S) about 18 m (1/8 1952)."

The pond is 60×75 m, longest in the direction E—W, somewhat irregularly shaped. In the middle of it there are a few banks, which normally rise above the surface. The bottom is very soft, sparsely grown with *Hippuris vulgaris* and *Callitriche*. The surroundings have a dry moor vegetation. The water level is somewhat fluctuating.

	Temperatures			Remarks
	Air	Surface	Bottom	
20. 6.1954	11.0°	11.0°	7.0°	Approximately highest water level.
9. 7.1954	9.2°	13.1°	11.5°	
31. 7.1954	12.1°	14.5°	9.0°	
25. 8.1954	12.0°	10.5°	9.0°	Water level low. The pond almost divided in two parts by an isthmus containing the islets.
20. 9.1954	1.8°	2.0°	4.3°	Somewhat higher water level. A little thin new ice along the banks.
24.10.1954				The pond frozen solid.
15. 6.1955	7.3°	0.4°	–1.2°	Considerably more than normal water level. Old ice on the northern part of the pond.
7. 7.1955	13.2°	10.5°	9.5°	Normal water level.
7. 9.1955	3.1°	2.0°	2.2°	Slightly below normal water level.
18. 7.1956	13.2°	16.3°	8.9°	Water level rather low.
21. 8.1956	9.2°	10.2°	9.8°	Water level low, the bottom, however, covered everywhere.

(To be continued)

	Air	Surface	Bottom	
7.9.1956	3.2°	7.0°	7.3°	Water level very low, only 20×15 m left.
7.10.1956				Frozen solid, 25 cm snow.
17.12.1956				75 cm snow.
12.6.1957	10.0°	12.5°	10.4°	A little more than normal water level.
3.8.1957	10.5°	18.2°	12.4°	The water level low. The pond divided into two parts.

74. Holostomadam, Godhavn.

Situated 75 m south of Loc. 24. 25 m long, longitudinal direction E—W, and 20 m broad in the broadest place. In the eastern part of the pond the banks are steep, stony, about 1 m high, while the western part is surrounded by a moist fen. The bottom is also different in the two parts of the pond, firm and stony in the eastern part, soft in the western part. The depth in the greater part of the pond is 1 m, but the water level may vary a little according to the season so that the pond in the spring included part of the fen towards the west. There is no inflow, but in the spring there was a small outlet from the western end down to Loc. 79.

	Temperatures			Remarks
	Air	Surface	Bottom	
20. 6.1954	7.2°	9.5°	2.5°	Remnants of ice by the northwestern bank.
9. 7.1954	10.5°	11.8°	9.3°	
31. 7.1954	12.1°	14.5°	9.0°	
25. 8.1954	12.1°	9.5°	9.5°	The water level had sunk; only 75 cm in the deepest place.
20. 9.1954	0.9°	0.5°	3.9°	0.5 cm new ice all over the pond.
24.10.1954				The pond frozen solid.
15. 6.1955	7.4°	1.3°	–0.5°	In the southern part of the pond still a sheet of ice, 20 cm thick.
7. 7.1955	13.5°	10.5°	9.5°	
7. 9.1955	3.1°	3.0°	2.5°	Extraordinarily much water in the pond, largest volume ever observed. Thin new ice in the western part.
18. 7.1956	16.1°	15.0°	10.2°	Low water level.
21. 8.1956	9.2°	11.4°	10.8°	
7. 9.1956				Frozen solid, 50 cm snow.
17.12.1956				50 cm snow.
12. 6.1957	11.6°	12.8°	9.6°	
3. 8.1957	11.3°	16.1°	15.4°	Water level very low, only one third of the pond filled with water.

76. Pond in Langekær, Godhavn.

Situated about 300 m SE of Loc. 25 in the north side of a very marshy valley. Towards the north the locality is bounded by an almost vertical, 10 m high wall of gneiss, while in other directions it passes almost imperceptibly into a bog densely covered with cotton grass. Normally the free surface of water is about 20×10 m, of a very irregular shape, but during the spring thaw and in rainy periods in summer and autumn the surrounding parts of the bog are inundated. There are some stones at the bottom, but round the stones the bottom material is very soft. The depth is about 0.5 m. There are only some poorly developed mosses at the bottom. There is no real inflow but the whole bog is drained off towards the SW to Tranbrænderisø.

	Temperatures			Remarks
	Air	Surface	Bottom	
31. 7.1954	11.1°	16.0°	6.0°	
25. 8.1954	13.3°	10.0°	8.0°	
20. 9.1954				The pond frozen solid.
30. 6.1955	12.0°	16.0°	12.0°	Large parts of the surface of the bog inundated.
13. 7.1955	16.4°	16.1°	14.9°	
9. 8.1955	14.6°	12.8°	13.4°	
6. 9.1955	4.5°	6.3°	3.1°	
20.10.1955				Frozen solid.
18. 7.1956	14.2°	13.2°	8.3°	
21. 8.1956	9.6°	12.3°	11.4°	
7. 9.1956	4.9°	4.9°	5.3°	The nearest surroundings inundated.
7.10.1956				Frozen solid, 60 cm snow.
17.12.1956				1.2 m snow.
12. 6.1957	12.2°	18.1°	10.5°	
3. 8.1957	10.9°	15.2°	11.3°	
19. 9.1957	10.5°	7.0°	6.3°	

77. Pond on the South Border of Gravryggen, Godhavn.

Situated immediately north of the newest cemetery at Godhavn, about 10 m higher than the cemetery in a small valley. The pond is shaped like an isosceles triangle with the base-line of 30 m in the north and the perpendicular of 10 m. In the north the pond is bounded by a low wall of gneiss. The other surroundings are dry moor. The depth is about 50 cm, in a few places a little more. The bottom consists of stones with some vegetation, mainly mosses, but also a little *Hippuris vulgaris*. No real inflow, but water oozes into the pond from the rocks in the north, whereas there is an actual outlet towards the south.

	Temperatures			Remarks
	Air	Surface	Bottom	
9.6.1954	3.5°	8.5°	2.0°	Snow drift immediately
20.6.1954	10.5°	9.0°	2.5°	north of the pond.
9.7.1954	11.5°	11.5°	7.3°	
30.7.1954	11.0°	13.5°	12.0°	
25.8.1954	14.5°	10.5°	9.0°	
8.9.1954	12.5°	8.0°	6.0°	

(To be continued)

	Air	Surface	Bottom	
20. 9.1954	0.4°	0.6°	1.2°	2.5 cm snow all over the pond.
25.10.1954				The pond frozen solid.
30. 6.1955	18.0°	15.5°	13.0°	Very full of water; there is still a little snow round the pond.
17. 7.1955	13.8°	14.4°	14.2°	
21. 8.1955	10.2°	11.4°	12.1°	
6. 9.1955	4.1°	6.0°	4.0°	
20.10.1955				Frozen solid, covered with 50 cm snow.
18. 2.1956				Covered with about 3.5 m snow.
18. 7.1956	13.0°	17.1°	6.4°	
20. 8.1956	9.3°	11.4°	10.8°	
7. 9.1956	6.5°	7.2°	6.6°	
7.10.1956				Frozen solid.
27. 5.1957	6.8°	7.0°	5.6°	
13. 7.1957	12.6°	13.7°	10.7°	
6. 8.1957	13.0°	12.5°	12.8°	

79. Tranbrænderisø, Godhavn.

This pond was mentioned by BACHMANN (1921, pp. 109–111) with the description: "... eines grossen flachen Teich, dessen Boden mit Algenwatten bedeckt ist." Furthermore, it has been examined by FOGED (1958, p. 47 (description) and p. 10 (water analysis)).

The pond is situated about 150 m from the sea and 12.5 m above sea level. It is about 60 m long and 30 m broad; longitudinal direction NE—SW. The greatest depth measured was 1.7 m. The bottom is soft, with a few large stones, covered with a gelatinous layer of blue-green algae and with a very sparse vegetation of *Hippuris*. The banks are firm, mainly gravelly, except at the northeastern end, which is surrounded by a bog. There the pond also receives its only inflow, which is composed by the outlets from Localities 73, 74, and 76. From the southwestern end there is an outlet to the sea.

	Temperatures			Remarks
	Air	Surface	Bottom	
9. 6.1954	4.5°	6.7°	2.0°	Still remnants of ice close to the banks and on the bottom.
20. 6.1954	8.0°	10.0°	5.5°	
9. 7.1954	7.0°	9.8°	9.5°	Much *Hippuris* at the northern end.
31. 7.1954	10.0°	15.0°	9.0°	
25. 8.1954	12.1°	9.5°	8.0°	
20. 9.1954	1.1°	1.0°	3.8°	A little new ice in protected creeks.
24.10.1954		0.2°	0.6°	Ice about 1 m thick.
15. 6.1955	6.9°	1.2°		Northernmost third of the pond ice-free, the rest still frozen over.
7. 7.1955	14.5°	10.0°	5.0°	
7. 9.1955	2.0°	2.5°	2.5°	

	Air	Surface	Bottom	
28. 2.1956				Frozen solid.
18. 7.1956	12.3°	12.4°	8.8°	
21. 8.1956	8.7°	10.3°	10.6°	
7. 9.1956	4.6°	6.5°	6.5°	
7.10.1956		0.9°		50 cm ice on 70 cm water.
17.12.1956	18.2°	0.1°		20 cm snow, 1 m ice and 10 cm water.
12. 6.1957	9.5°	13.0°	6.5°	Ice-free. Some of the bottom has been churned up and floats about.
3. 8.1957	12.0°	15.2°	10.8°	The water level very low.

82. Pond East of Tranbrænderisø, Godhavn.

Situated about 200 m east of the southern end of Tranbrænderisø, Loc. 79, on a ledge covered with vegetation which is about four times the size of the locality. The pond is roundish, 22×14 m. There are some large stones at the bottom, but otherwise the bottom is very soft and completely covered with vegetation, mainly *Hippuris* and various mosses. The depth varies somewhat, but there is no real inflow or outlet.

	Temperatures			Remarks
	Air	Surface	Bottom	
9. 6.1954	5.0°	9.0°	5.5°	0.6 m deep.
20. 6.1954	8.0°	10.0°	5.5°	0.5 m deep.
9. 7.1954	10.7°	11.5°	10.0°	
31. 7.1954	9.0°	17.0°	14.0°	0.3 m deep.
25. 8.1954	12.0°	12.0°	9.0°	0.2 m deep.
20. 9.1954	1.0°	0.4°	3.2°	0.3 m deep. Thin new ice all over the pond.
24. 10.1954				Frozen solid.
15. 6.1955	6.2°	3.8°		Only thawed in small marginal zone.
7. 7.1955	16.0°	13.5°	8.0°	0.6 m deep.
7. 9.1955	2.0°	4.0°	3.5°	Thin new ice on the westernmost part of the pond.
18. 7.1956	13.2°	12.7°	8.2°	0.3 m deep.
21. 8.1956	8.3°	9.8°	8.9°	0.3 m deep.
7. 9.1956	5.0°	7.1°	6.5°	0.5 m deep.
7.10.1956				Frozen solid.
12. 6.1957	12.8°	14.9°	9.3°	0.5 m deep.
3. 8.1957	11.8°	18.9°	14.2°	0.2 m deep.

86. Spectacle-shaped Pond West of "Thygesens Sø", Godhavn.

Situated 150 m west of the middle of Loc. 85, 25 m above sea level. The pond is 75 m long, longitudinal direction E—W, and consists of two pools 25 m in diameter, with a somewhat narrower connexion. The western pool is the deeper one, about 2 m, while the eastern one is only 1 m deep. Towards the west the pond is bounded by a very moist bog, while the other sides are firm rock. The bottom is also rock, with a thin layer of ooze. There is a little vegetation in the pond, mainly consisting of mosses. There is no real inflow, but from the bog some water oozes into the pond, and towards the east it has an outlet through a narrow cleft in the rock to Thygesens Sø.

	Temperatures			Remarks
	Air	Surface	Bottom	
27. 6.1954	9.2°	13.0°	6.0°	
10. 7.1954	12.5°	12.8°	11.6°	
2. 8.1954	13.4°	19.0°	17.0°	
26. 8.1954	13.2°	10.5°	9.8°	
21. 9.1954	3.2°	1.1°	2.4°	A little new ice along the edge of the pond.
26.10.1954				Frozen solid.
4. 7.1955	11.0°	11.0°	9.0°	
7. 9.1955	3.6°	3.6°	3.0°	The water level considerably higher than usual. Heavy current in the outlet.
18. 7.1956	14.5°	13.5°	9.5°	
20. 8.1956	9.8°	8.4°	8.5°	
8. 9.1956	4.3°	4.9°	5.3°	
29. 5.1957	6.5°	2.3°	0.8°	The greater part of the pond frozen over, only thawed along the banks.
13. 7.1957	11.3°	14.0°	9.2°	
6. 8.1957	13.5°	13.5°	12.6°	

87. Pond Immediately South of Loc. 86.

Situated on a ledge 5 m south of and 3 m higher than Loc. 86. Almost circular pond, 20 m in diameter, but full of large boulders seen as larger and smaller islands. Between the boulders there are deep holes, the deepest of which is situated 2 m below the upper edge of the locality. Along the banks there are marshy areas overgrown with *Scirpus*. In the pond itself there are very large growths of mosses and filamentous algae. There is no inflow, and only when the water level is particularly high, the water oozes down over the rocks to Loc. 86.

	Temperatures			Remarks
	Air	Surface	Bottom	
27.6.1954	8.5°	12.5°	6.3°	
10.7.1954	12.4°	11.9°	7.2°	
2.8.1954	13.2°	15.0°	8.9°	
26.8.1954	13.5°	12.0°	9.3°	
21.9.1954	3.2°	1.2°	3.8°	In several places 1 cm thick ice between the stones.
4.7.1955	11.0°	13.2°	6.1°	
7.9.1955	2.8°	4.0°	4.0°	
18.7.1956	14.5°	12.2°	8.3°	
20.8.1956	9.8°	8.9°	8.5°	
8.9.1956	4.6°	4.8°	4.9°	
29.5.1957	6.5°	2.4°	1.2°	There is still some melting ice in the pond.
13.7.1957	11.4°	11.5°	9.1°	
6.8.1957	12.5°	14.2°	9.8°	

88. Shallow Pond Southeast of Loc. 86.

Situated about 50 m southeast of Loc. 86. The pond is very irregularly shaped, with many small headlands and with indentations between these. Extent about

40×40 m. In the indentations there is some vegetation consisting of *Hippuris*, cotton-grass, and mosses, while the bottom of the pond otherwise is only covered with quite a thin layer of ooze. The pond is very shallow, the depth nowhere exceeding 30 cm, but the water level is very constant. There is no inflow or outlet.

	Temperatures			Remarks
	Air	Surface	Bottom	
2. 8.1954	15.8°	18.1°	17.4°	
26. 8.1954	13.8°	12.9°	12.4°	
21. 9.1954	2.8°	0.6°	1.4°	3 cm thick ice all over the pond.
26.10.1954				Frozen solid.
4. 7.1955	15.0°	15.0°	13.0°	
7. 9.1955	3.5°	3.5°	3.5°	
18. 7.1956	15.5°	14.0°	10.8°	
20. 8.1956	10.5°	10.2°	9.4°	
9. 9.1956	2.5°	6.0°	6.3°	
29. 5.1957	6.8°	9.3°	4.1°	
13. 7.1957	11.9°	12.2°	11.7°	
6. 8.1957	14.4°	15.2°	15.1°	

89. Pond at the Highest Point Between Kirkegaardsbugt and "Thygesens Sø", Godhavn.

Situated immediately NE of the highest point between Thygesens Sø (Loc. 85) and Kirkegaardsbugt west of Godhavn. The point is marked by a flag-pole, 34 m above sea level. The surroundings consist of bare flat gneiss. The pond is quite regularly rectangular, 8×5 m, and the rock descends vertically to the bottom, which is quite flat and on which the rock is only covered with a thin layer of ooze and great many filamentous algae. From the upper edge of the rock to the bottom the distance is 1.2 m, but the water level may vary a little, so that the water sometimes is as much as 15 cm below the edge. There is an inflow, and only when the water reaches the edge does it ooze down over the rock.

	Temperatures			Remarks
	Air	Surface	Bottom	
27. 6.1954	7.2°	12.0°	10.0°	
10. 7.1954	11.3°	12.7°	11.3°	
2. 8.1954	13.5°	11.2°	10.4°	
26. 8.1954	12.1°	10.5°	10.8°	
21. 9.1954	1.8°	0.5°	2.8°	Very thin new ice all over the pond. Along the banks, however, it is 3 cm thick.
26.10.1954				Frozen solid.
4. 7.1955	9.0°	13.5°	9.3°	
7. 9.1955	2.8°	3.0°	3.6°	
18. 7.1956	12.3°	12.5°	6.3°	
20. 8.1956	7.9°	8.8°	7.4°	
9. 9.1956	3.5°	5.0°	4.7°	
29. 5.1957	5.8°	3.7°	2.1°	
13. 7.1957	9.5°	10.8°	8.9°	
6. 8.1957	14.5°	15.0°	12.2°	

90. Pond near Kirkegaardsbugten, Godhavn.

Situated on the low isthmus between Kirkegaardsbugten and Sangmissoq, 150 m north of the northernmost part of Kirkegaardsbugten. The pond is reniform, about 40×30 m. The substratum is sand and the vegetation round it is rather scarce. The bottom is very soft and everywhere has a vigorous vegetation consisting of *Hippuris*, cotton-grass, and mosses. Sometimes it may be so overgrown that it is difficult to see the water. The depth is about half a metre, but may fluctuate a little. There is neither inflow nor outlet.

	Temperatures			Remarks
	Air	Surface	Bottom	
27.6.1954	7.0°	9.5°	4.5°	
10.7.1954	11.2°	11.8°	9.3°	
2.8.1954	13.0°	10.6°	10.6°	
26.8.1954	12.8°	10.4°	9.9°	
21.9.1954	2.4°	0.8°	2.1°	Ice all over the pond, 2 cm thick.
26.10.1954				Frozen solid.
4.7.1955	11.0°	14.0°	12.0°	
7.9.1955	3.1°	4.0°	4.0°	
18.7.1956	10.0°	15.3°	7.5°	
20.8.1956	8.5°	11.8°	9.8°	
9.9.1956	5.1°	5.9°	6.1°	
29.5.1957	7.8°	5.3°	3.1°	Water oozes down from a large snow drift immediately east of the pond.
13.7.1957	10.8°	12.4°	11.1°	
6.8.1957	14.2°	13.0°	11.4°	

91. Pond South of "Thygesens Sø", Godhavn.

Situated about 50 m south of Thygesens Sø, Loc. 85, about 5 m higher. The pond is about 50 m in every direction, but is a little irregularly shaped. The banks are very luxuriant, with distinct lines of glaciation. The bottom, which close to the banks has a vegetation consisting of mosses and filamentous algae, while farther out it is vegetationless, mainly consists of large flat stones. The depth fluctuates between 1 and 1.5 m. The pond receives a couple of small tributaries from the south and at the northern end has an outlet to Loc. 85.

	Temperatures			Remarks
	Air	Surface	Bottom	
17.12.1956			0.2°	20 cm water under 1.3 m ice.
31.5.1957	6.3°	4.1°	3.2°	Small ice floe in the middle.
3.8.1957	11.2°	15.4°	12.9°	The water level low, the outflow almost stopped.

98. Pond South of the Pitorqeq Cairn, Jakobshavn.

Situated at an altitude of about 100 m 50 m south of the cairn on the highest point east of Pitorqeq. Consisting of two pools, each with a diameter of 35 m and a

short connecting canal, which is 20 m broad. In the pools the greatest depth is 2 m, in the canal just under one metre. The bottom is soft, with vegetation consisting of a little *Drepanocladus* and *Hippuris*. The vegetation round the pond is very luxuriant. Without inflow or outlet.

	Temperatures			Remarks
	Air	Surface	Bottom	
22.7.1956	3.1°	8.3°	6.4°	
24.8.1956	9.0°	11.0°	8.4°	
1.11.1956	–8.3°	0.8°	3.1°	40 cm ice over 1.3 m water. The canal frozen solid.
18.5.1957	4.2°	0.4°		The whole pond frozen solid except for a narrow thawing border by the left bank.
16.6.1957	10.4°	17.1°	8.9°	The water level a little higher than normal.
19.7.1957	10.8°	11.2°	10.3°	
21.8.1957	9.8°	9.0°	9.2°	

100. Pond in Bog on Hunde Eiland.

Situated in a small valley, which on the western island – north of the buildings of the Greenlandic Trade – separates the northern part of the island from the southern one. The middle part of this valley is very moist in an expanse of 50×100 m, and in the middle of this area there is a pond, the extent of which it is impossible to decide with certainty due to a very vigorous growth of mosses. The depth of the water in this pond is about 25 cm, and the whole bottom is covered with vegetation. There is no real inflow or outlet.

	Temperatures		
	Air	Surface	Bottom
21.5.1957	11.4°	8.2°	5.3°
28.6.1957	7.2°	13.8°	12.4°
22.7.1957	7.9°	11.5°	11.2°

102. Pond on Grønne Eiland.

Situated on the largest of the islands in the cluster of islands about 100 m north of the Nangissat, on a small moist meadow protected from the sea by a one metre high beach ridge. The pond is situated 50 m from the sea. If anything, the shape of the pond is triangular, 3×5 m, but in size as well as depth it may vary much. The bottom is sandy and overgrown with some mosses and filamentous algae. The water is very dark.

	Temperatures			Remarks
	Air	Surface	Bottom	
26.8.1956	8.9°	5.2°	5.2°	The pond 30 cm deep.
19.5.1957	8.7°	6.2°	4.2°	The whole of the small meadow flooded with very shallow water. The pond 40 cm deep.
20.6.1957	11.2°	12.3°	7.1°	The extent of the pond is 4×5 m, 35 cm deep.

106. Pond in Akúnâq.

Situated about 250 m NW of the cemetery close to the sea, at an altitude of about 30 m. Constitutes the lowest part of a very moist fen in a luxuriantly overgrown valley surrounded by low gneissic rocks. Of a slightly irregular shape, varying somewhat in size. The bottom consists partly in loose boulders, partly in very soft mud. At the bottom vegetation consisting of *Drepanocladus* and filamentous algae. The latter are also found higher in the water.

	Temperatures			Remarks
	Air	Surface	Bottom	
26.8.1956	9.8°	11.0°		Diameter about 8 m, depth 0.5 m.
19.5.1957	8.4°	2.1°		Diameter about 12 m, depth 0.75 m. The bottom frozen. Here and there with clear ice. A small snow drift goes down to the pond.
20.6.1957	11.2°	12.3°	7.1°	Size as on 26.8.1956.
23.8.1957	4.0°	4.5°		Diameter 8 m, depth of the water only 20 cm.

117. Pond near Store Saltsø, Søndre Strømfjord.

Between the peat terraces immediately NW of Store Saltsø there is a depression filled with water. The pond is 20 m long and 10 m broad. On my visit it was 35 cm deep, and there is no reason to believe that it ever dries up when there is water in it so late in the year. The water is full of filamentous algae. There is no inflow or outlet.

	Temperatures			Remark
	Air	Surface	Bottom	
20.9.1956	–1.5°	0.8°	0.9°	8 cm ice all over the pond.

121. Pond in Ũmánârssuk.

Situated immediately behind the houses, in a small valley with peat-cutting. The pond is crescent-shaped, situated round a low rock which is in the north. The breadth is about 6 m, the length about 25 m. The banks descend steeply to the greatest depth, about 1.5 m. Dense network of filamentous algae over the bottom, some of which is free-floating.

	Temperatures			Remark
	Air	Surface	Bottom	
24.9.1956	0.3°	0.2°	2.5°	Thin new ice along the banks and on the whole of the eastern part.

124. Pond in Itivdleq.

Situated 200 m south of the residence of the manager of the Trading Station about 50 m above sea level. The surroundings consist of glaciated gneiss, with a little vegetation in crevices. 35 × 20 m, longitudinal direction E—W. Depth 15–25 cm.

The bottom vegetation is very sparse, consisting of only a few specimens of *Drepanocladus* sp. The bottom material is soft, dark, only about 10–15 cm thick.

	Temperatures			Remark
	Air	Surface	Bottom	
15.9.1956	2.9°	2.5°	2.5°	
24.9.1956	–0.5°	0.3°	1.5°	5 cm ice.

126. Northern Pond near Anders Olsens Sund.

Situated on the island west of Anders Olsens Sund, where this sound is narrowest, on the westernmost part of the island. The pond is a depression in the rock, in part filled with sharp-edged rocks. It is rather small, 4×4 m, but with depths down to 2 m between the rocks. There is no vegetation in the pond, and where the bottom does not consist of bare rock, this is only covered with a thin layer of clay.

	Temperatures	
	Air	Surface
15.9.1956	0.2°	1.9°

127. Southern Pond near Anders Olsens Sund.

Situated on the same island as Loc. 126, about 200 m south of it, close to the highest point of the island, 40 m above sea level. The extent of the pond is 35×35 m, the depth 30 cm. The bottom is vegetationless, consisting of very soft, brownish, fluffy material. Neither inflow nor outlet.

	Temperatures		
	Air	Surface	Bottom
15.9.1956	0.2°	2.1°	4.8°

128. Pond in Bog at the Bottom of Lille Malene Bugt, Godthåb.

About 150 m north of the creek situated north of the harbour of Godthåb (Lille Malene Bugt) there is a very marshy area. In the middle of this there is a pond about 20×30 m. The extent is not quite certain, as there was some snow round the pond on my visit and parts of the pond had a thin sheet of ice. The depth does not exceed 35 cm. The bottom is very soft with some mosses. There was inflow to the area from the northwest. No outlet was seen, but probably there was one under the snow.

	Temperatures			
	Air	Surface		Bottom
		Free	Under ice	
5.6.1956	4.0°	5.2°	0.4°	0.3°

129. Pond at the Bottom of Lille Malene Bugt, Godthåb.

Situated approximately halfway between Loc. 128 and the beach in an area at a somewhat higher altitude than the boggy area. 40×10 m, the depth a little more than 50 cm. The bottom is stony, without vegetation. Apparently there is neither inflow nor outlet; but this could not be decided with certainty as there was some snow round the pond.

	Temperatures	
	Air	Water
5.6.1956	6.0°	4.2°

131. Rock Pool NE of the Training College, Godthåb.

Situated near the top of the crag which from the dam of the water lake stretches down towards the Training College. Somewhat irregularly shaped, about 40 m long and 10 m broad. Longitudinal direction NE—SW. About 1 m deep in the greater part of the pool. Situated at an altitude of about 65 m. The bottom consists of firm rock and a few stones. There is no vegetation. The surroundings are bare, too; only in a few creeks there is a little grass vegetation. The pond receives melt water from snow drifts round it and there is a very small outlet towards the water lake.

	Temperatures	
	Air	Water
1.6.1956	1.3°	4.0°

132. Pond Immediately East of the Home for the Aged, Godthåb.

Situated in the marshy area between the Training College and the Home for the Aged. Approximately circular with somewhat irregular banks, 40 m in diameter. The pond is about 30 cm deep all over. The bottom is soft, with a luxuriant vegetation of moss. Here and there some large stones. Furthermore there are plenty of empty tins at the bottom. The pond is undoubtedly somewhat polluted, as it receives discharge water from the surrounding houses. An outlet ditched on part of the area leads the water to the boat harbour.

	Temperatures		
	Air	Surface	Bottom
26.5.1956	4.7°	7.0°	3.5°

133. Pond South of the Water Lake, Godthåb.

Large shallow pond situated about 150 m south of the southern dam of the water lake. Of a very irregular shape, consisting of an eastern and a western pool connected with several broad and narrow canals. The two parts are approximately the same size, about 80×40 m. The depth hardly exceeds 50 cm anywhere. The bottom is stony and gravelly, here and there with some vegetation of *Drepanocladus exannulatus*. The surroundings are moist fen. The pond has some small tributaries and probably is somewhat polluted by water from the surrounding houses. There is an outlet towards the southeast.

	Temperatures		
	Air	Surface	Bottom
31.5.1956	7.5°	11.0°	6.3°
30.6.1959	17.0°	17.0°	16.0°

134. Pond on the Plain, Godthåb.

Situated on the large marshy area, about 250 m NE of the Hostel, Godthåb. The pond is L-shaped, the longest branch being 40 m long, the shortest one 20 m. The breadth is 8 m. In the greater part of the pond the depth is 75 cm. The bottom is soft, peaty, densely overgrown with *Sphagnum*. There is no open inflow or outlet, but no doubt there is a constant exchange of water with the very moist surroundings.

	Temperatures		
	Air	Surface	Bottom
26.5.1956	4.5°	9.0°	3.5°
30.6.1959	16.0°	17.0°	8.0°

136. Pond on Quagssúnguaq, Godthåb.

Situated at an altitude of about 60 m on the southern part of the ridge that separates Godthåb from Lille Malene Bugt. The pond is long and narrow, 50 × 5 m, the depth about 1.5 m. The edges of the pond along the long sides are bare rock walls which descend almost vertically into the water, whereas there are small moist fens at both ends. The longitudinal direction is NE—SW. The bottom is gravel with a few large stones and a scarce mossy vegetation. There is no inflow or outlet.

	Temperatures		Remark
	Air	Water	
29.5.1956	3.5°	2.8°	Thin ice on the southern part of the pond.

140. Pond South of the Transmitting Station, Godthåb.

Pond situated exactly halfway between the Transmitting Station and Ny Herrnhut, 50 m above sea level. It is somewhat oblong, well over 20 m in the longitudinal direction, somewhat smaller across, a little more than half a metre deep. The bottom consists of large boulders with growths of moss. No inflow or outlet.

	Temperatures			Remark
	Air	Surface	Bottom	
28.5.1956	–0.2°	1.0°	1.0°	Very thin new ice.

142. Lille Sø, Maria Ø.

Situated in the highest place in the valley which from the northern end of Store Sø goes northwest. The surroundings consist of very moist fens with a luxuriant vegetation. Reniform, longest axis about 400 m, about 200 m broad. The depth hardly exceeds 1 m anywhere. The bottom is somewhat soft, close to the banks densely, farther out sparsely overgrown with *Calliergon trifarion*, *Scorpidium* sp., and *Potamogeton filiformis*. There is no direct inflow, but the pond receives some melt water from the surroundings. The outlet probably only functions immediately after the spring thaw.

	Temperatures		
	Air	Surface	Bottom
20.7.1958	16.0°	17.5°	17.2°
22.8.1958	9.0°	12.5°	13.1°

144. Pond A on Kap Oswald, Ella Ø.

Situated halfway between Loc. 147, Rundsø, and the point of Kap Oswald in gneissic terrain. The size is 25 × 6 m, longitudinal direction NE—SW. The banks are mainly bare rock, but towards the NE the pond passes into a marshy fen with *Eriophorum*. The bottom is rock with a layer of mud 2 cm thick. No vegetation on the bottom. Neither inflow nor outlet. Water level fluctuating.

	Temperatures		Remarks
	Air	Water	
17.7.1958	17.5°	15.3°	Depth about 35 cm.
21.8.1958	8.5°	10.5°	Depth about 20 cm.

145. Pond B on Kap Oswald, Ella Ø.

Situated immediately SE of Loc. 144, only separated from it by a crag, but it does not seem that these two localities can be connected at high water level. 30 × 8 m (longitudinal direction NE—SW). The banks are everywhere rocky, descending steeply to the bottom, which consists of large stones and soft, dark mud. Some *Hippuris vulgaris* and *Potamogeton filiformis* grow in the pond.

	Temperatures			Remarks
	Air	Surface	Bottom	
17.7.1958	17.5°	15.1°	12.3°	Water level 50 cm.
21.8.1958	8.5°	10.5°	10.3°	Water level 40 cm.

155. Pond, Geographical Society Ø.

Situated about 2 km west of the west end of Loc. 152 on a west-facing terrace about 50 m above sea level. The pond is approximately circular, about 200 m in diameter. The depth hardly exceeds 50 cm. The bottom is rather hard, gravelly with a thin layer of ooze. The only vegetation is mosses. North of the pond there is a very large, probably permanent snow drift, from which rather large quantities of melt water flow into the pond, which, again, has an outlet to Vega Sund.

	Temperatures		
	Air	Surface	Bottom
26.8.1958	4.2°	2.1°	1.8°

156. Pond A near Airfield, Mesters Vig.

Extensive pond immediately north of the eastern part of the airfield, towards Nyhavn. The shape is somewhat irregular, the size about 600 × 500 m. The greater part of the pond is about half a metre deep, but the depth of the central part is about one metre. The bottom consists of firm sand, here and there with muddy, soft areas. There is no vegetation on the bottom.

	Temperatures		
	Air	Surface	Bottom
31.8.1958	4.5°	6.8°	4.8°

157. Pond B near Airfield, Mesters Vig.

Situated between the airfield and Loc. 156. Small pond, 20 × 15 m, not more than 20 cm deep in the deepest place. The bottom is extraordinarily soft, overgrown with *Calliergon trifarion* and *Scorpidium* sp. Round the pond there is a zone, about 5 m broad, which shows the greatest extension of the pond in the spring. There is neither inflow nor outlet.

	Temperatures		
	Air	Surface	Bottom
31.8.1958	4.5°	4.8°	4.9°

158. Pond C near Airfield, Mesters Vig.

About 200 SE of Loc. 157 this pond is situated only 300 m from the beach. Approximately circular, with a diameter of 35 m. The bottom is very soft,

vegetationless. Round the pond there is a dried-up zone of 5 m. There is no inflow or outlet.

	Temperatures		
	Air	Surface	Bottom
31.8.1958	5.0°	8.6°	6.3°

159. Pond near the Radio Station of the Airfield, Mesters Vig.

Situated immediately south of the Radio Station of the Airfield, Mesters Vig. The shape is somewhat irregular, the main extent is 150×100 m. The depth does not exceed 50 cm. The bottom is everywhere stony with scattered moss vegetation. The pond is somewhat polluted, partly because it receives discharge water from the houses around the Radio Station, partly because some refuse has been thrown into it. There is a small, slow outflow.

	Temperatures		
	Air	Surface	Bottom
31.8.1958	4.5°	4.8°	5.3°

160. Pond South of Airfield at Mesters Vig.

Situated 2 km south of Loc. 159 in a small valley. 20× 40 m, 40 cm deep. The bottom of the pond and the nearest surroundings consist of firm rock and sand, without vegetation. The pond has no distinct inflow or outlet, but the slopes round it are very moist, so no doubt a little water oozes down into it from there.

	Temperatures		
	Air	Surface	Bottom
31.8.1958	4.2°	4.0°	5.3°

161. Northern Pond near Rungsted Elv, Mesters Vig.

Close to the river Rungsted Elv, 3.5 km SW of the airfield of Mesters Vig, there are two ponds in a valley. A small stream flows through them and from there into the river. The northern pond is 200 m long (N—S) and 75 m broad. In the deepest place it is about 1 m deep. The bottom is stony with enormous growths of moss (*Cambylium?*). From this pond the water flows to the southern pond.

	Temperatures		
	Air	Surface	Bottom
31.8.1958	4.2°	6.4°	6.6°

162. Southern Pond near Rungsted Elv, Mesters Vig.

Situated about 10 m south of Loc. 161 and with the same longitudinal direction. The size is 300×100 m, and the greatest depth is about 1.5 m. Close to the bank the bottom consists of stones and gravel, but farther out there is a sandy bottom with a few large stones. There is very little vegetation in the pond.

	Temperatures		
	Air	Surface	Bottom
31.8.1958	4.2°	6.3°	6.9°

164. Uppermost Fen, Charcots Land.

The outflow from Loc. 163, Grønne Sø, Charcots Land, is towards the south down over some terraces. On these some very moist fens have developed and in

the uppermost and the lowermost of these there are ponds. The pond on the uppermost terrace is approximately circular, 10 m in diameter and a little less than one metre deep. Growths of cotton-grass, sedges, and some mosses stretch into the pond.

	Temperatures		
	Air	Surface	Bottom
4.8.1958	9.8°	12.5°	10.3°

166. Lowermost Fen, Charcots Land.

This fen receives water not only from the outlet of Grønne sø, which, for that matter, does not flow in the summer, but also from a spring about 200 m NE of the fen. Therefore it is a very moist area, almost square, with a side of 300 m. In the middle there are a great many water holes, which are all connected with each other, about one metre in diameter, and normally 35 cm deep. They are full of filaments of green algae.

	Temperatures		
	Air	Surface	Bottom
4.8.1958	12.0°	7.0°	4.3°

167. Northern Pond on the Moraine, Charcots Land.

On the uppermost part of the ground moraine which stretches from the western end of Loc. 170 towards the west there are a few ponds. The moraine is without any vegetation there, and the surface is covered with thin salt crusts. This pond is oblong, 10×5 m and 30 cm deep. It is situated at an altitude of 800 m. The bottom consists of fine clay with a few large stones and has no vegetation apart from a few algal filaments. There is neither inflow nor outflow.

	Temperatures		
	Air	Surface	Bottom
5.8.1958	8.8°	11.0°	9.6°

168. Southern Pond on the Moraine, Charcots Land.

Situated a little south of and about 100 m lower than Loc. 167. Its size is 8×5 m, the depth 50 cm. Otherwise this locality is exactly like the preceding one.

	Temperatures		
	Air	Surface	Bottom
5.8.1958	8.5°	10.0°	9.3°

169. Hippuris Pond, Charcots Land.

At the bottom of the large valley which from the western end of Loc. 170 cuts towards the southwest, there is, about 4 km into the valley, a shallow pond. At the highest water level it is 20×30 m, but during the summer it decreases somewhat, so that, when it was examined, its extent was only 15×10 m. The depth was 25 cm. The bottom consisted of large sharp-edged rocks, between which there were soft parts. There were large amounts of *Hippuris vulgaris* growing in the pond, and furthermore the water was filled with filamentous algae. The pond had neither inflow nor outflow.

	Temperatures		
	Air	Surface	Bottom
8.8.1958	12.5°	10.0°	8.6°

172. Pond on Mountain Plateau, Charcots Land.

Situated halfway between the lakes Loc. 171 and Loc. 173. Irregularly circular pond with a diameter of about 50 m, with depths down to 40 cm. The bottom is stony, here and there with large boulders. On the bottom there is a very vigorous vegetation of filamentous algae, and along the banks there are growths of cotton-grass and sedges. There is no inflow, but earlier in summer there had been an outflow to Loc. 171, which, however, had dried up.

	Temperatures	
	Air	Water
7.8.1958	11.5°	13.0°

181. Western Border Pond, Scoresby Land.

Round the outlet from Loc. 177 there is a bare plain which towards the north is bounded by three ponds. They receive their water from the heights in the north through small brooks and as the plain is slightly convex, this water is forced to flow through these ponds, before it reaches the river by flowing NE of the plain.

The western pond is the smallest and shallowest. The longitudinal direction is NS and the size 25×10 m. The deepest place is 50 cm. The bottom is very soft and clayey, with scattered growths of *Hippuris vulgaris*.

	Temperatures		
	Air	Surface	Bottom
16.8.1958	13.0°	13.0°	12.1°

182. Middle Border Pond, Scoresby Land.

Situated about 25 m west of Loc. 181 and resembling this locality somewhat, but it is larger and deeper. Size 50×20 m, longitudinal direction E—W. The depth does not exceed 1 m. Vigorous growths of *Hippuris vulgaris* along the banks and somewhat into the pond; but in the middle the bottom is overgrown with *Drepanocladus exannulatus*. The water from this pond flows to Loc. 183.

	Temperatures		
	Air	Surface	Bottom
16.8.1958	13.0°	13.0°	11.2°

183. Eastern Border Pond, Scoresby Land.

Situated about 250 m east of Loc. 182. The pond is about 200×80 m with depths down to 1.5 m. The bottom is covered with vegetation consisting of *Hippuris vulgaris*, *Potamogeton filiformis*, *Ranunculus confervoides*, and *Scorpidium* sp. A drain leads from the southeastern end of the pond to the river draining off the lake Holger Danskes Briller, but when the locality was visited, it was dried-up and seemed to have been so for a long time.

	Temperatures		
	Air	Surface (diurnal fluctuation)	Bottom
17.8.1958	8.2°	5.8°–11.1°	7.3°

186. Pond Immediately South of the River, West, Scoresby Land.

Situated immediately south of the river draining off Holger Danskes Briller, about 3.5 km from the lake, as the crow flies, there is a small system of ponds. Most of the ponds are only expansions of rivulets, but two of them, those mentioned here, normally have neither inflow nor outlet. In the spring they receive some melt water and do not get any further supply of water throughout the summer. The western pond is 50×20 m and about 1 m deep. The bottom consists of very soft ooze and has a scattered vegetation of *Hippuris vulgaris*, *Potamogeton filiformis*, and *Ranunculus confervoides*.

	Temperatures		
	Air	Surface	Bottom
17.8.1958	9.5°	10.2°	8.1°

187. Pond Immediately South of the River, East, Scoresby Land.

Situated about 25 m east of Loc. 186. Like this the pond has no inflow or outlet. 15×5 m and with no greater depths than 0.5 m. Extremely luxuriant vegetation of the same species as in the preceding pond. The surface of the water is almost concealed by *Hippuris*.

	Temperatures		
	Air	Surface	Bottom
17.8.1958	9.5°	14.3°	10.5°

188. Pond System South of the River, Western, Scoresby Land.

About 1 km south of the river draining off Holger Danskes Briller East, about 4 km from this lake as the crow flies, there is another pond system. A total of 12 ponds have been counted in the system, but as they were very much alike, only three were examined. They are situated on a large flat plain with moor vegetation and are completely without inflow or outlet.

The surface of this pond is 25×10 m and its depth is about 75 cm. Previously in the year it was somewhat larger and deeper, as there is a drying-up zone of about 4 m round it. However, there is no possibility for the pond to dry up completely before winter. The bottom is very soft, overgrown by scattered specimens of *Hippuris vulgaris*.

	Temperatures		
	Air	Surface	Bottom
17.8.1958	12.5°	12.5°	11.2°

189. Pond System South of the River, Middle, Scoresby Land.

Situated about 25 m east of Loc. 188, 50×20 m and about 1 m deep. This pond has steep banks, for which reason there is no drying-up zone round it, but it no doubt had a somewhat higher water level previously in the year. The bottom is like that of Loc. 188.

	Temperatures		
	Air	Surface	Bottom
17.8.1958	12.5°	12.0°	10.1°

190. Pond System South of the River, Eastern, Scoresby Land.

Situated 20 m east of Loc. 189. The surface of the water is 25×10 m, but with a drying-up zone of about 15 m round it. Water level 50 cm. The dried-up zone and

the greater part of the pond is very densely overgrown with *Hippuris vulgaris*. The bottom of this locality is somewhat firmer than that of the preceding two localities.

	Temperatures		
	Air	Surface	Bottom
17.8.1958	12.5°	13.8°	11.8°

191. Pond on Rypenæs.

Rypenæs is the small headland which lies on the west side of Rypefjord, approximately halfway into the fiord, and just out towards the NE. The headland consists of almost bare, highly glaciated gneiss. The pond is situated in a small depression farthest out on the headland. The size is 6×4 m and the depth 30 cm. The bottom consists of a layer of soft mud 25 cm thick, with a dense growth of *Drepanocladus exannulatus* and near the edge scattered growths of *Eriophorum* sp.

	Temperatures		
	Air	Surface	Bottom
29.7.1958	12.2°	15.6°	11.4°

193. Pond A, Rypefjord.

About 2.5 km south of Loc. 191 there is along the fiord a low gneissic ridge with some crevices and depressions. There is a large number of small ponds in this area, and 9 of these (Localities 193–201) were examined. The ponds are very different in appearance, but have this in common, that they have no distinct inflow or outlet, and that none of them seems to be inclined to dry up throughout the summer.

Pond A is a depression in the gneiss, 4×2 m and 40 cm deep. The soft bottom has along the banks and somewhat into the pond a vigorous growth of *Eriophorum triste*.

	Temperatures (diurnal variation)		
	Air	Surface	Bottom
27.7.1958	4.0°–13.8°	5.3°–11.4°	8.5°–10.7°

194. Pond B, Rypefjord.

Size 2×3 m, only 15 cm deep. Dense growth of *Eriophorum triste* round the pond, and on the stony bottom some *Callitriche verna*. The pond is filled with filamentous algae.

	Temperatures (diurnal variation)		
	Air	Surface	Bottom
28.7.1958	3.8°–14.2°	3.6°–16.8°	5.2°–14.4°

195. Pond C, Rypefjord.

Size 8×2 m. Greatest depth 20 cm. The bottom is soft, overgrown with *Carex* sp. The pond is shaded during the greater part of the day, as it is bounded in the south by a 10 m high, almost vertical rock wall.

	Temperatures		
	Air	Surface	Bottom
27.7.1958	11.0°	10.5°	10.3°

196. Pond D, Rypefjord.

Size of the surface of the water 4×3 m, but previously in the summer it was 7×4 m. Present depth 25 cm. The depth cannot have been much greater previously, as the areas now dried-up are quite flat and only a few cm above the present surface. The bottom is gravelly with a sparse vegetation of *Callitriche verna* and *Carex* sp.

	Temperatures		
	Air	Surface	Bottom
28.7.1958	9.0°	11.0°	10.8°

197. Pond E, Rypefjord.

The pond is 10×3 m, the depth in the greater part of the area is 15 cm, in a hole in the middle it is 50 cm. The bottom consists of firm rock covered with a brown crust of algae. The pond has a pronounced southern exposure.

	Temperatures		
	Air	Surface	Bottom
28.7.1958	9.0°	15.5°	8.3°

198. Pond F, Rypefjord.

Approximately circular, 3 m in diameter. 35 cm deep, the bottom very soft, without any vegetation but mosses. It is surrounded by a very moist fen.

	Temperatures		
	Air	Surface	Bottom
28.7.1958	10.5°	12.3°	11.1°

199. Pond G, Rypefjord.

15×10 m, depth about 50 cm. Surrounded partly by firm rock, partly by fen; the banks are somewhat irregular. The bottom is strewn with stones, overgrown with *Callitriche verna.*

	Temperatures		
	Air	Surface	Bottom
28.7.1958	10.5°	11.8°	9.3°

200. Pond H, Rypefjord.

Almost square, 4×4 m. Surrounded by firm gneiss, into which the edges of the pond have been cut down to a depth of 35 cm. The bottom has some large flat stones covered with crusts of algae. In the gaps between the stones there is a sparse growth of *Callitriche.*

	Temperatures		
	Air	Surface	Bottom
28.7.1958	10.5°	14.5°	12.8°

201. Pond I, Rypefjord.

Lengthy pond, the sides and bottom of which consist of greatly weathered stones. Size 20×4 m, depth 45 cm. Towards the south and west the pond is shaded by a vertical rock wall.

	Temperatures		
	Air	Surface	Bottom
28.7.1958	8.0°	11.5°	10.3°

202. Pond in Bog near Rypefjord.

A number of small, boglike water holes situated in a valley between two gneissic ridges about 2 km south of Loc. 193–201. The holes are connected with each other and their total area is 20 × 40 m. A small rivulet flows through them. The holes are about 1 m deep, with a soft bottom without vegetation. There are some filamentous algae in the water. The surroundings consist of a moist fen area with a very luxuriant vegetation.

	Temperatures		
	Air	Surface	Bottom
28.7.1958	10.2°	7.8°	6.3°

204. Pond Between Blaasø and Faxa Sø.

Mountain pond situated halfway between Blaasø and Faxa Sø about 400 m south of the connecting river. The pond is situated approximately on the highest point between the two lakes, about 300 m above the surface of Faxa Sø. The extent of the pond when visited was 30 × 10 m, with a greatest depth of 75 cm, but previously in the year it had been almost circular, with a diameter of about 40 m and a depth of 1.5 m. There were large black crusts of algae on the dried-up area. The bottom, which mainly consists of firm rock, is sparsely grown with *Callitriche verna*, *Drepanocladus* sp., and filamentous algae. No inflow or outlet.

	Temperatures	
	Air	Water
27.7.1958	16.0°	10.5°

206. Northern Pond near Faxa Sø.

Situated at an altitude of about 200 m, 2 km south of the connecting river between Blaasø and Faxa Sø, 500 m west of Faxa Sø. The pond is reniform, 100 × 40 m, longitudinal direction E—W. The surroundings consist partly of firm gneiss, partly of moist fen area. Greatest depth well over one metre. The bottom is very soft, close to the bank sparsely grown with *Hippuris vulgaris*, *Potamogeton filiformis*, and *Drepanocladus* sp. No inflow or outlet.

	Temperatures		
	Air	Surface	Bottom
23.7.1958	8.2°	14.5°	12.1°

207. Southern Pond near Faxa Sø.

Situated at an altitude of 250 m in a small depression about 1 km south of Loc. 206. Circular, about 50 m in diameter. Depth 0.7 m in the deepest place. There is no vegetation on the bottom, which consists of gravel and stones, in part covered by reddish brown crusts of algae. Immediately round the pond there is an extremely luxuriant vegetation, which is in contrast to the almost bare fellfields otherwise constituting the surroundings. There is no inflow or outlet.

	Temperatures		
	Air	Surface	Bottom
23.7.1958	9.0°	13.5°	8.3°

Analytical Tables, Ponds.

Locality	Date	Conductivity μmho	Hydrogen Ion Concentration (pH)			Alkalinity	Acidity	Ca^{++} mg/l	Mg^{++} mg/l	Cl^{-} mg/l	Fe^{++} mg/l	Total Iron mg/l	Consumption of Potassium Permanganate mg/l	Colour (Ohle)
			Actual	Highest	Lowest									
2. Pond A. MacCormick Fjord	28.-8. 1959	..	7.3	..	..	..	..	..	..	..	..	..	..	..
3. Pond B. MacCormick Fjord	28.-8. 1959	..	6.8	..	..	..	..	..	..	..	..	..	..	..
4. Pond C. MacCormick Fjord	28.-8. 1959	325	7.1	7.2	5.8	12.8	—	13.9	10.2	85.6	..	0.02	38	12
5. Pond D. MacCormick Fjord	28.-8. 1959	..	7.3	..	..	..	..	..	..	..	..	..	..	..
6. Pond E. MacCormick Fjord	28.-8. 1959	600	7.0	7.3	6.2	17.2	—	48.2	7.6	148.6	..	..	36	14
8. Pond at the Settlement Qeqertat	20.-8. 1959	450	7.0	7.1	6.2	16.0	—	27.7	20.9	65.2	..	..	28	4
13. Pond at the Settlement Igánaq	4.-9. 1959	250	6.6	6.7	6.1	5.1	2.2	8.8	2.7	60.6	..	..	46	10
14. Pond Supplying Igánaq with Drinking Water	4.-9. 1959	140	6.2	6.3	5.3	2.9	2.3	8.8	4.3	27.0	..	..	25	6
17. Western Pond near Dundas	8.-9. 1959	290	7.2	7.2	6.5	12.8	—	16.0	8.0	61.1	..	..	32	8
18. Eastern Pond near Dundas	8.-8. 1959	96	6.8	7.1	6.2	5.7	—	6.5	4.3	11.7	..	..	27	8
21. Pond at Savigsivik	13.-8. 1959	..	6.2	..	..	..	..	..	..	..	..	..	..	..
24. Pond between the Water Lake and the Trading Station Tasiussaq	18.-7. 1959	19	7.2	7.3	5.2	1.8	—	0.5	0.7	1.4	..	..	12	2
25. Pond in the Northern Part of the Trading Station Tasiussaq	18.-7. 1959	..	6.4	..	..	..	..	..	..	..	..	..	..	..
27. Largest Pond in the Southern Part of the Trading Station Tasiussaq	18.-7. 1959	50	6.6	6.9	5.4	2.3	1.1	3.0	0.7	4.9	..	..	27	6
29. Pond at Ivnarssuit	17.-7. 1959	21	5.1	5.4	4.8	1.6	2.0	1.0	0.4	1.6	..	..	11	1
32. Pond at Tuvssâq	17.-7. 1959	..	5.1	..	..	..	..	..	..	..	..	..	..	..
33. Pond at Augpilagtoq	15.-7. 1959	32	5.8	5.9	4.8	1.5	3.4	—	1.2	4.0	..	..	14	3
35. Largest Pond in the Northern Part of Upernavik Ø	21.-7. 1959	..	6.2	..	..	..	..	..	..	..	..	..	..	..
37. Middle Pond in the Northern Part of Upernavik Ø	21.-7. 1959	56	6.5	6.7	5.8	0.15	2.3	2.2	0.4	9.1	..	..	18	3
38. Pond in the Ravine of Severance, Upernavik	14.-7. 1959	580	7.4	7.6	6.9	3.4	—	6.5	9.3	180.3	..	..	22	8
40. Pond Immediately Southwest of the Ravine of Severance, Upernavik	14.-7. 1959	..	5.4	..	..	..	..	..	..	..	..	..	..	..

42. Pond Immediately North of the Cairn, Upernavik	4.-8. 1959	40	6.3	6.5	5.3	1.8	1.2	1.8	0.1	4.4	..	..	28	12
43. Pond near the Beacon Station, Upernavik	14.-7. 1959	62	6.5	7.0	5.6	2.7	—	1.7	1.3	9.5	..	..	32	18
45. Pond between "Livets Top" and the Highest Point at Upernavik	19.-7. 1959	37	6.6	6.8	5.3	1.9	1.1	1.4	0.6	5.1	..	..	18	9
46. Pond near the Radio Station, Upernavik	19.-7. 1959	82	6.7	6.8	5.7	3.8	1.0	2.4	1.9	15.2	..	..	29	5
47. Pond on the Slope above Old Upernavik	19.-7. 1959	..	5.9	..	..	..	..	..	..	..	..	..	..	..
49. Pond in Prøven	6.-8. 1959	120	6.7	6.7	6.0	7.0	3.8	10.1	4.0	13.8	..	..	38	10
52. Lillesø, Umanak	29.-8. 1955	800	7.1	7.9	6.3	15.8	—	16.9	11.2	..	0.01	0.1	75	3
	6.-8. 1956	810	8.9	8.9	6.5	13.3	..	17.8	10.3	..	0.1	0.52	25	11
	3.-7. 1957	750	8.9	8.9	6.7	17.7	..	14.5	17.0	205.2	..	..	33	8
53. Pond Northwest of the School, Umanak	29.-8. 1955	440	6.4	7.9	5.8	4.5	—	7.8	7.1	..	0.06	0.57	90	23
	6.-8. 1956	500	6.7	7.5	6.0	6.0	—	10.2	6.5	..	0.09	0.36	47	62
	6.-7. 1957	650	7.0	7.5	6.0	6.0	—	8.8	8.1	..	..	..	50	46
57. Pond at Nordfjord	1.-7. 1957	39	6.1	6.9	5.2	3.2	1.2	2.4	1.0	..	..	..	17	3
65. Pond in Rodebay	17.-6. 1957	4100	8.3	8.3	6.6	12.0	—	56.3	92.0	..	..	..	48	45
	19.-7. 1957	>5000	..	..	..	17.1	—	298.8	139.6	3856.4	..	..	79	50
	20.-8. 1957	..	..	..	..	..	..	..	..	7455.0	..	..	..	..
66. Pond on Kangârssuk, Fortunebay	6.-9. 1956	66	7.5	7.5	6.0	5.4	—	4.3	1.5	..	..	..	38	12
68. Littoral Pond on Kangârssuk, Fortunebay	6.-9. 1956	67	7.2	7.5	6.0	3.2	—	2.9	0.4	..	..	..	34	9
72. Pond North of the Scientific Leader's Residence, Godhavn	12.-6. 1957	59	6.4	6.7	5.1	1.1	1.9	1.2	2.0	..	..	..	21	3
73. Hippurissø, Godhavn	7.-7. 1955	16.5	7.4	7.5	5.1	0.5	—	1.6	—	..	0.03	0.05	32	4
	12.-6. 1957	40	6.7	6.8	5.1	1.1	1.2	1.9	0.7	..	..	..	18	8
74. Holostomadam, Godhavn	7.-7. 1955	29	6.7	7.1	5.0	0.7	—	2.5	0.3	..	0.03	0.04	38	7
	12.-6. 1957	52	6.6	6.8	5.3	1.6	1.0	3.2	1.3	..	..	..	16	8
76. Pond in Langekær, Godhavn	30.-6. 1955	42	6.4	7.7	5.8	2.5	—	2.5	1.3	..	0.03	0.1	42	2
77. Pond on the South Border of Gravryggen, Godhavn	30.-6. 1955	29	6.8	7.2	5.4	0.8	—	1.5	0.6	..	0.07	0.11	37	5
79. Tranbrænderisø, Godhavn	7.-7. 1955	40	7.1	7.2	5.7	2.7	—	3.7	1.0	..	0.03	0.05	27	1
	17.-12. 1956	410	7.6	7.7	7.0	38.6	—	45.5	11.1	..	..	..	39	28
	12.-6. 1957	68	7.2	7.3	5.4	2.5	—	3.4	2.3	..	..	..	33	6
82. Pond East of Tranbrænderisø, Godhavn	7.-7. 1955	58	6.7	7.0	5.1	1.7	—	3.1	0.4	..	0.05	0.14	38	7
	12.-6. 1957	172	7.1	7.2	5.1	2.2	—	7.9	5.2	..	..	..	25	11
86. Spectacle-shaped Pond West of "Thygesens Sø", Godhavn	4.-7. 1955	32	6.4	7.2	4.9	2.1	—	3.4	0.2	..	0.04	0.17	27	5
	29.-5. 1957	88	6.0	7.2	5.0	3.2	—	3.7	2.3	..	..	..	18	12

(To be continued)

Analytical Tables, Ponds (cont.).

Locality	Date	Conductivity μmho	Hydrogen Ion Concentration (pH)			Alkalinity	Acidity	Ca^{++} mg/l	Mg^{++} mg/l	Cl^{-} mg/l	Fe^{++} mg/l	Total Iron mg/l	Consumption of Potassium Permanganate mg/l	Colour (Ohle)
			Actual	Highest	Lowest									
87. Pond Immediately South of Loc. 86	4.-7. 1955	27	6.1	6.4	4.8	0.2	0.5	2.7	—	..	0.03	0.06	30	3
	29.-5. 1957	340	8.1	8.3	5.5	2.1	—	12.4	7.1	..	..	..	27	9
88. Shallow Pond Southeast of Loc. 86	4.-7. 1955	30	5.7	6.5	4.4	0.2	0.4	1.9	—	..	0.06	0.07	25	3
	29.-5. 1957	55	6.9	7.0	5.6	1.5	—	1.1	1.3	..	..	..	22	4
89. Pond at the Highest Point between Kirkegårdsbugt and "Thygesens Sø", Godhavn..	4.-7. 1955	24	5.5	6.5	4.3	0.2	0.6	1.5	—	..	0.06	0.16	35	1
	29.-5. 1957	55	6.9	7.0	5.6	1.3	—	0.3	1.3	..	..	..	20	1
90. Pond near Kirkegårdsbugt, Godhavn	4.-7. 1955	32	6.2	7.0	5.2	1.3	—	2.5	0.4	..	0.04	0.06	47	7
	29.-5. 1957	43	6.8	7.2	5.3	1.9	—	1.8	0.9	..	..	..	22	5
91. Pond South of "Thygesens Sø", Godhavn	17.-12. 1956	340	7.3	7.5	6.7	13.3	—	18.0	7.9	..	..	..	33	18
	31.-5. 1957	140	6.8	7.2	5.3	1.6	—	1.7	2.6	..	..	..	22	5
98. Pond South of the Pitorqeq Cairn, Jakobshavn.....	24.-8. 1956	46	7.2	7.3	5.5	1.9	—	1.9	0.8	..	..	..	31	9
	1.-11. 1956	31	7.1	7.5	5.3	1.5	—	1.5	1.2	..	..	..	31	9
	17.-6. 1957	23	7.1	7.1	5.2	1.3	—	1.3	0.7	..	..	..	24	7
100. Pond in Bog on Hunde Eiland.....	28.-6. 1957	450	7.2	7.5	6.5	20.4	—	56.3	12.2	..	..	..	61	136
102. Pond on Grønne Eiland.....	26.-8. 1956	139	6.0	6.4	5.2	3.7	7.9	3.7	1.6	..	..	..	58	205
	20.-6. 1957	790	6.8	6.8	5.7	3.3	1.0	4.8	11.4	..	0.08	0.14	43	32
106. Pond in Akúnâq	26.-8. 1956	245	6.7	7.4	5.9	3.8	—	7.6	1.5	..	..	..	39	28
	20.-6. 1957	210	6.1	6.6	5.5	3.8	0.6	6.6	4.6	..	0.16	0.21	39	18
117. Pond near Store Saltsø.....	20.-9. 1956	148	8.2	8.4	6.5	17.0	—	14.4	14.6	..	0.98	1.04	75	140
121. Pond in Ũmánârssuk	24.-9. 1956	129	6.6	7.8	5.8	6.5	—	4.8	4.1	..	0.5	0.5	27	16
124. Pond in Itivdleq	15.-9. 1956	132	6.6	7.1	5.3	7.5	—	3.5	1.7	..	0.02	0.05	24	3
127. Southern Pond near Anders Olsens Sund	15.-9. 1956	158	7.1	7.6	5.6	5.2	—	7.7	3.2	..	0.02	0.06	29	9
133. Pond South of the Water Lake, Godthåb	31.-5. 1956	42	6.8	7.5	5.0	1.9	—	0.7	2.0	..	0.09	0.6	24	4
134. Pond on the Plain, Godthåb.....	26.-5. 1956	50	6.6	7.0	5.3	2.2	—	2.5	0.9	..	—	0.05	45	11
142. Lille Sø, Maria Ø.....	20.-7. 1958	380	7.7	7.8	6.6	26.0	—	39.6	14.3	42.2	..	..	29	8
	22.-8. 1958	..	7.7	..	..	..	..	..	..	..	..	..	..	..

144. Pond A on Kap Oswald, Ella Ø	21.-8. 1958	..	7.3	..	..	..	..	..	..	..	..	..	..	..
145. Pond B on Kap Oswald, Ella Ø	17.-7. 1958	145	7.3	8.4	6.5	14.1	—	23.3	3.2	1.5	..	..	32	4
	21.-8. 1958	..	7.3	..	..	..	..	..	..	..	..	..	..	..
155. Pond, Geographical Society Ø	26.-8. 1958	..	6.3	..	..	..	..	..	..	..	..	..	..	..
156. Pond A near Airfield, Mesters Vig	28.-8. 1958	..	7.0	..	..	..	..	..	..	..	..	..	..	..
157. Pond B near Airfield, Mesters Vig	28.-8. 1958	..	7.3	..	..	..	..	..	..	..	..	..	..	..
158. Pond C near Airfield, Mesters Vig	28.-8. 1958	41	6.8	7.0	5.9	5.4	—	7.6	0.3	0.4	..	..	42	12
159. Pond near the Radio Station, Mesters Vig	28.-8. 1958	..	7.0	..	..	..	..	..	..	..	..	..	..	..
160. Pond South of the Airfield, Mesters Vig	28.-8. 1958	..	7.2	..	..	..	..	..	..	..	..	..	..	..
161. Northern Pond near Rungsted Elv, Mesters Vig	28.-8. 1958	127	6.9	7.1	5.9	14.8	—	21.7	1.4	0.6	..	..	18	3
164. Uppermost Fen, Charcots Land	4.-8. 1958	..	7.7	..	..	..	..	..	..	..	..	..	..	..
166. Lowermost Fen, Charcots Land	4.-8. 1958		7.3	..	..	..	..	..	..	..	..	..	..	..
167. Northern Pond on the Moraine, Charcots Land	5.-8. 1958	520	6.6	7.0	5.9	38.7	—	62.8	13.3	0.5	..	..	8	4
168. Southern Pond on the Moraine, Charcots Land	5.-8. 1958	..	5.8	..	..	..	..	..	..	..	..	..	..	..
169. Hippuris Pond, Charcots Land	8.-8. 1958	..	6.4	..	..	..	..	..	..	..	..	..	..	..
172. Pond on Mountain Plateau, Charcots Land	7.-8. 1958	..	7.2	..	..	..	..	..	..	..	..	..	..	..
181. Western Border Pond, Scoresby Land	16.-8. 1958	54	6.6	7.1	5.1	6.1	—	8.7	0.7	0.5	..	..	28	6
182. Middle Border Pond, Scoresby Land	16.-8. 1958	..	6.6	..	..	..	..	..	..	..	..	..	..	..
183. Eastern Border Pond, Scoresby Land	17.-8. 1958	..	7.5	..	..	..	..	..	..	..	..	..	..	..
186. Pond Immediately South of the River, West	17.-8. 1958	..	7.5	..	..	..	..	..	..	..	..	..	..	..
187. Pond Immediately South of the River, East	17.-8. 1958	..	7.7	..	..	..	..	..	..	..	..	..	..	..
188. Pond System South of the River, Western	17.-8. 1958	..	7.2	..	..	..	..	..	..	..	..	..	..	..
189. Pond System South of the River, Middle	17.-8. 1958	45	7.0	7.3	5.4	5.1	—	4.5	1.6	1.6	..	..	32	9
190. Pond System South of the River, Eastern	17.-8. 1958	..	7.0	..	..	..	..	..	..	..	..	..	..	..
191. Pond on Rypenæs	29.-7. 1958	..	6.0	..	..	..	..	..	..	..	..	..	..	..
194. Pond B, Rypefjord	27.-7. 1958	24	6.2	7.2	4.9	2.1	—	1.8	0.4	0.8	..	..	31	5
196. Pond D, Rypefjord	28.-7. 1958	..	6.0	..	..	..	..	..	..	..	..	..	..	..
198. Pond F, Rypefjord	28.-7. 1958	..	6.2	..	..	..	..	..	..	..	..	..	..	..
201. Pond I, Rypefjord	28.-7. 1958	..	6.4	..	..	..	..	..	..	..	..	..	..	..
202. Pond in Bog near Rypefjord	28.-7. 1958	47	6.0	7.5	5.8	3.9	—	5.6	1.1	0.7	..	..	49	44
204. Pond between Blaasø og Faxa Sø, Gåseland	26.-7. 1958	90	7.5	7.8	6.0	8.3	—	14.8	1.3	0.4	..	..	23	6
206. Northern Pond near Faxa Sø, Gåseland	23.-7. 1958	120	7.0	7.1	5.9	13.6	—	20.9	2.0	0.4	..	..	28	5
207. Southern Pond near Faxa Sø, Gåseland	23.-7. 1958	90	7.0	7.4	6.1	10.0	—	14.3	1.7	0.4	..	..	17	3

Summary remarks on Ponds.

Conditions of Ice.

As I have previously (p. 23) defined an arctic pond as a sheet of fresh water which does not dry up, but which may freeze solid, the only thing of interest here is the length of the ice-free period. For this the following table may be set up:

	Freezing-up	Breaking-up of ice
Godthåb (about lat. 64°N.)		About 10.5
Holsteinsborg (about lat. 67°N.)	About 20.9	
Disko Bugt (about lat. 69°N.)	– 20.9	– 30.5
Umanak Fjord (about lat. 71°N.)	– 15.9	– 15.6
Thule (about lat. 77°N.)	– 1.9	– 1.7

The table, the time indications of which, however, should be taken with certain reservations, seems to show that the ponds, as compared with the lakes, on the whole have a somewhat longer ice-free period. It is especially clear that the breaking up of the ice in the ponds comes considerably before the breaking up in the lakes, while the freezing up as a rule takes place in the ponds a week or two earlier than in the lakes. The time passing from the first constant freezing until the pond is frozen solid, varies much according to the depths of the ponds. Thus the two rather deep ponds, Loc. 79 and Loc. 91, in Godhavn had not yet frozen solid on 17.12.1956, about three months after the constant freezing up had started.

Conditions of Temperature.

The highest temperature previously measured at all in a Greenland fresh water is indicated by HABERBOSCH (1920, p. 158) to be 15.6° C. in a pond in Godhavn. All maximum temperatures in the ponds examined by BACHMANN (1921) were found in the month of July, and HABERBOSCH has on the basis of BACHMANN's material set up a table in which he shows that the temperatures in the ponds during the period from 3.7. to 15.8.1908 in Godhavn fluctuated between 15.6° and 7.8°. Unfortunately all the minimum temperatures indicated were from dates either earlier or later than the period within which the maximum temperatures were found, so in my opinion the figures are not direct comparable.

In the following table I have from the various areas examined set up all the maximum and minimum temperatures I have measured during the summer months.

	Maximum temperature	Minimum temperature
Godthåb (about lat. 64°N.)	17.0° (30.6.)	
Disko Bugt (about lat. 69°N.)	19.0° (2.8.)	8.3° (22.7.)
Umanak Fjord (about lat. 71°N.)	18.0° (3.7.)	10.4° (6.8.)
Upernavik (about lat. 74°N.)	17.0° (21.7.)	6.0° (17.7.)
Thule (about lat. 77°N.)	6.0° (20.8.)	0.7° (28.8.)
Scoresbysund Fjord (about lat. 71°N.)	16.8° (28.7.)	3.6° (28.7.)
Kejser Franz Josephs Fjord (about lat. 73°N.)	17.5° (20.7.)	8.5° (21.8.)

The maximum temperatures from Godthåb to Thule are probably too low, as these areas were not visited during the real summer time.

The temperatures indicated have all been measured near the surfaces of the localities. In the spring and in summer the bottoms of the ponds often have considerably lower temperatures than the surfaces, while, especially in deep ponds, the reverse is the case in the autumn.

It is remarkable that whereas the maximum temperature close to the banks of lakes decreases highly from Disko Bugt to Upernavik, the maximum surface temperature of ponds in Upernavik is only two degrees lower than in Disko Bugt.

During and immediately after the breaking-up of the ice rather high temperatures can be measured in the ponds. Thus on 15.6 3.8° was measured in quite a narrow thawed littoral zone and 6.7° and 9.5° on 9.6. and 20.6, respectively, while there was still some ice left on the pond. Finally, 13.0° was found on 12.6., immediately after the last ice had disappeared.

On the other hand, a constant supply of melt water may result in a high decrease in temperature even long after the ice has disappeared, as e.g. in Loc. 155, where only 2.5° was measured in the surface layer on 28.8.

The Various Types of Ponds in Greenland.

As in the case of the lakes, it is possible to distinguish between a number of different types of ponds. The first who tried to do so was Bachmann (1921), but as he only used the depth as classificatory factor, it is difficult to see whether, in the case of the deepest sheets of water, he had to do with lakes or ponds, and whether in the case of the shallowest waters he was referring to ponds or puddles.

What decides the type of an arctic pond is partly whether the bottom consists of firm rock or whether it consists of loose material, as this is decisive of the question whether higher plants can grow in it, partly whether larger or smaller quantities of nutrient salts are

dissolved in the water, and finally whether the pond is situated in such a way that sea water can influence its contents of chloride. The ponds visited by me can all be fitted into the following table:

A. Ponds with low contents of salts.
   (1) The bottom consists of firm rock or stones, perhaps with a thin layer of ooze.
   (2) Ponds with a soft bottom.

B. Ponds with high contents of salts.
   (1) Polluted ponds.
   (2) Ponds naturally rich in salts.

C. Ponds influenced by sea water.

Ponds with Low Contents of Salts.

This main type of ponds is the commonest in Greenland by far. These ponds are first of all characterized by the fact that the contents of salts in the water are low. The conductivity is normally well below 100 μmho, only by reduction of the amount of water because of evaporation or freezing-up will the conductivity increase to more than 100 μmho.

Among the total of 107 ponds examined, 72, or 66 per cent., may be referred to this group.

Ponds with a Stony Bottom.

A total of 28 localities, or between one third or half of all ponds poor in nutrient salts, belong to this group. As indicated by the name, they are characteristic by the fact that the bottom consists of firm rock or of large stones, which either are quite bare, or only have quite a thin layer of ooze. The contents of salts in these ponds on the whole are very low, normally below 40 μmho, and the contents of organic substance in the water are lower than in the other types of ponds. With few exceptions the water is very little coloured.

If there is any sessile vegetation at all in these ponds, it almost exclusively consists of filamentous algae and mosses. Only in three localities, viz. Loc. 194, Loc. 199, and Loc. 200, all near Rypefjord, East Greenland, *Callitriche verna* was found.

Ponds with a Soft Bottom.

A total of 43 localities belong to this group, which is the commonest type of freshwater locality in Greenland.

Within this type of locality there are great variations. It is common to these ponds that the conductivity ranges from about 30 μmho to about 90 μmho. In a single case so low an conductivity as 16.5 μmho has been found, and in a few cases more than 150 μmho has been measured. On the whole the contents of organic substance are rather high.

The great majority of these ponds have a luxuriant vegetation, consisting of various mosses, *Hippuris*, *Callitriche*, *Batrachium*, *Potamogeton*, *Eriophorum*, and in a few cases *Equisetum*. In very few localities, Loc. 21, Loc. 156, Loc. 158, the bottom is completely vegetationless.

Among all the ponds included in this type two main groups can be isolated, one of them with very intensely coloured water, a high hydrogen ion concentration, and a bottom material which is markedly dark brown, in part consisting of decayed vegetable matter, the other group including such ponds whose water is little coloured, in which the hydrogen ion concentration is rather low, and in which the bottom consists of paler mud with very small amounts of vegetable matter the structure of which can be recognized. The former of these groups contains ponds in bogs which always are surrounded by moist fens, while such fens never surround the latter group.

Ponds with High Contents of Salts.

This main type includes ponds the conductivity of which is constantly above 100 μmho. Within this main type a distinction must be made between two fundamentally different subtypes, viz. one with a high content of salt because of a supply of discharge water, thus polluted ponds, and ponds which because of climatic conditions have a high content of salts.

Polluted Ponds.

Among the ponds examined six, viz. Localities 13, 49, 91, 106, 121, and 124, must be referred to this group. They are all situated close to inhabited places and receive large quantities of discharge water, while at the same time large quantities of refuse are often thrown into them. These ponds have a very characteristic appearance, the water in them being more or less greenish from large amounts of *Chlorella*. The consumption of potassium permanganate is high, and with the exception of Loc. 124 the water is very brown.

Ponds Naturally Rich in Salts.

The 24 ponds referred to this group are all, with the exception of two (Loc. 161 and Loc. 162), situated in continental areas, viz. in Thule District Localities 2, 3, 4, 5, 6, 8, 14, 15, 17, and 18, in Umanak

Fjord Localities 52 and 53, the head of Søndre Strømfjord Loc. 117, the inner part of Kejser Franz Josephs Fjord Localities 142, 144, and 145, Charcots Land Localities 164, 166, 167, and 168, and Gåseland Localities 204, 206, and 207.

These ponds are characterized by the fact that their contents of salts are rather high. Conductivity values from 90 μmho to 810 μmho have been found in them, but the kinds of salts found in them are very different. Thus in most of the localities on the west coast and those in Kejser Franz Josephs Fjord considerable amounts of chloride have been found, whereas very small quantities of chloride have been shown to occur in the more southerly localities on the east coast. In these southern east-coast localities the presence of considerably larger quantities of calcium and in part magnesium has been established. With the exception of two of the localities in Charcots Land, Loc. 167 and Loc. 168, in which only filamentous algae were found, the vegetation in these ponds is very vigorous. There are always enormous cushions of mosses and there may also be large growths of higher plants. In great majority of these ponds the consumption of potassium permanganate is high and the water is intensely coloured.

Ponds Influenced by Sea Water.

Six of the ponds examined are situated so that they are now and then exposed to supplies of sea water so that their contents of chloride, and hence their conductivity, become higher than would be expected from the area in which the locality is situated. Four of these, Localities 38, 65, 100, and 102, if anything, are to be considered very low lagoons, as they are situated at a very low altitude, only separated from the sea by a beach ridge, while the two others, Localities 126 and 127, are situated on an open outer coast, where spray from the surf can reach them.

The most characteristic of these ponds by far is Loc. 65 in Rodebay, as its content of chlorine was measured at 7455 mg/l or 13.4 per cent salinity at the measurement which gave the highest result. At that time, however, an evaporation of the water in the pond had taken place, as it only contained rather a small quantity of water as compared with the quantity it contained at the highest water level.

In two of these ponds, Localities 65 and 102, the water was very intensely coloured and the consumption of potassium permanganate was also very high. In the others these conditions were not particularly pronounced.

3. Temporary Waters.

Descriptions.

10. Temporary Pond on Herbert Ø.

Situated on the north side of Herbert Ø, about 1 km east of the settlement Qeqertarssuaq, on a sandstone terrace, about 25 m above sea level. The pond is rapidly being dried up as it only constitutes between one third and one fourth of its original extent. The remaining surface of the water is almost circular, about 30 m in diameter,with a depth of the water which never exceeds 10 cm. The bottom consists of large flat sandstones, between which there is soft mud. There was a small outlet, but it was dried up at the visit. There was no vegetation in the locality.

	Temperatures	
	Air	Surface
27.8.1959	1.5°	2.5°

28. Puddle near Ivnarssuit.

Situated in a snowpatch about 200 m east of the settlement Ivnarssuit. The puddle is 2×3 m, with a great many stones and a vigorous vegetation of mosses. In the deepest place it is 20 cm deep.

	Temperatures	
	Air	Surface
17.7.1959	6.0°	9.1°

63. Puddle at the Trading Station of Disko Fjord.

Melt-water puddle immediately west of the powder-magazine at the trading station of Diskofjord. Situated on a basalt terrace, about 30 m above sea level. The extent of the puddle is 25×15 m, its greatest depth 30 cm, average depth 15 cm. The bottom is firm and covered with grass.

	Temperatures			Remark
	Air	Surface	Bottom	
10.6.1957	12.1°	18.2°	9.8°	
29.7.1957				Dried up.

70. Puddle in Østerdalen, Godhavn.

Small puddle situated on the left side of the valley Østerdalen, about 200 m into the valley. Round the puddle the bottom of the valley is very fertile; the vegetation mainly consists of cotton-grass and a few shrubs of *Salix*, and furthermore there are dense cushions of moss. In the spring the bottom is very moist, while it becomes drier in late summer.

The puddle is oval, its greatest extent is 1×1.5 m and its greatest depth 0.3 m. The bottom of the puddle is moss-grown. 10 cm under the bottom there is firm rock. The puddle almost exclusively receives inflow from melting snow in the spring. There is no outlet.

	Temperatures			Remarks
	Air	Surface	Bottom	
26.5.1954	10.5°	1.5°	0.5°	Melting snow drift about 2 m north of the puddle.
14.6.1954	2.0°	1.5°	1.0°	Snow drift gone. The puddle 0.2 m deep.
7.7.1954	3.5°	2.5°	1.5°	
30.7.1954				Dry.
26.8.1954				Dry.
22.9.1954				Dry.
21.6.1955	19.0°	1.0°	0.3°	Large quantities of melting snow immediately north of the puddle.
8.8.1955				Dry.
6.9.1955	1.0°	2.0°	2.0°	Heavy precipitation has almost filled the puddle.
17.7.1956	18.0°	4.5°	2.0°	The puddle is small, only 0.1 m deep.
20.8.1956				Dry.
7.9.1956				Dry.
6.6.1956	6.3°	1.8°	1.1°	No snow around the locality, but it is very moist.
3.8.1957 and 19.9.1957				Dry.

71. Pond North of the Flagpole of Arctic Station, Godhavn.

Mountain puddle situated on a small ledge in the gneiss about 100 m north of the flagpole of the station. The puddle is very irregularly shaped; towards the west it is bounded by a rock wall, while on the other sides it is surrounded by a marshy fen area. The size is about 10×4 m, when the puddle holds the greatest possible amount of water, but the water level varies much. The bottom consists of boulders between which there is soft material in a few places. In the puddle itself there is only a sparse moss vegetation.

	Temperatures			Remarks
	Air	Surface	Bottom	
14. 6.1954	2.5°	9.5°	7.0°	High water level, greatest depth about 30 cm.
7. 7.1954	4.8°	7.5°	6.5°	Only half filled, greatest depth about 20 cm.
30. 7.1954	13.2°	12.5°	10.5°	1 sq. m free surface of the water left; depth 15 cm.
26. 8.1954				The locality dry.
22. 9.1954				The locality dry.
22.10.1954				Frozen solid, 15 cm snow.
10. 4.1955				Frozen solid, ab. 75 cm snow.
21. 6.1955	21.0°	14.3°	6.5°	Highest possible water level.
6. 7.1955	14.3°	12.3°	10.1°	Slightly less than highest water level.

(To be continued)

	Air	Surface	Bottom	
8. 8.1955	13.2°	8.5°	6.0°	Greatest depth 15 cm.
6. 9.1955	1.0°	0.0°	0.5°	Ice about 5 cm thick, though not in a narrow border round projecting stones.
2.11.1955 and 22. 4.1956				Frozen solid, greatest thickness of snow 55 cm.
17. 7.1956	13.5°	12.5°	7.3°	Somewhat less than half of full size.
20. 8.1956	8.5°	7.3°	8.2°	About 2 sq. m surface of water.
7. 9.1956				The locality dry.
6. 6.1957	7.4°	3.5°	2.3°	Almost completely filled.
3. 8.1957				The locality dry.
19. 9.1957	10.5°	6.0°	8.1°	Well over half of the highest water level, depth 25 cm.

75. Circular Puddle North of Tranbrænderisø, Godhavn.

Situated about 200 m north of Loc. 79, Tranbrænderisø, Godhavn. The locality is situated like a ring round an island. It is 30×15 m, and the island is 20×5 m, hence the breadth of the ring is 5 m. The area round the puddle is dry with large growths of *Empetrum* and *Ledum*. The bottom of the puddle consists of large flat stones and there is no vegetation. There is neither inflow nor outlet; the locality gets its whole supply of water from the spring thaw.

	Temperatures			Remarks
	Air	Surface	Bottom	
9. 7.1954	11.5°	12.0°	10.5°	Greatest depth 0.5 m.
31. 7.1954	10.0°	16.0°	12.0°	Depth 0.3 m.
25. 8.1954				
20. 9.1954				Dry.
24.10.1954				
15. 6.1955	6.7°	4.9°	0.2°	Melting snow and ice on the greatest part of the locality. Open water only at the northern end.
7. 7.1955	14.2°	12.5°	6.0°	
7. 9.1955	2.5°	2.0°	3.0°	Much water in the puddle, 0.5 m deep.
18. 7.1956	18.6°	18.5°	12.3°	0.3 m deep.
21. 8.1956	8.8°	9.4°	9.3°	
7. 9.1956	4.4°	7.0°	6.9°	Only two puddles of respectively 5×3 m and 4×4 m left, the rest dry.
7.10.1956				Dry, covered with snow.
12. 6.1957	11.5°	14.3°	8.6°	0.6 m deep.
3. 8.1957	14.5°	16.1°	16.1°	Conditions approximately as on 7.9.1956.
19. 9.1957				Dry.

78. Puddle West of the Gravel-Pit, Godhavn.

Situated immediately west of the gravel-pit in Godhavn, about 10 m above sea level. It is found in a small valley and is drained off through the gravel-pit. As the gravel-pit was dug deeper and deeper, the puddle dried up earlier and earlier in the year, so that water was to be found in the locality only immediately after the spring thaw. The nearest surroundings and the bottom of the locality consisted of gravel and coarse sand. The vegetation round the locality consisted of *Equisetum* and a few shrubs of *Salix*, but the locality itself was free of vegetation.

The greatest extent was 28×12 m and the greatest depth 0.7 m, but this size was only reached immediately after the spring thaw, after which the water level always was lower.

	Temperatures			Remarks
	Air	Surface	Bottom	
9.6.1954	6.0°	8.0°	8.5°	Slightly less than highest possible extent.
20.6.1954	9.0°	11.0°	9.5°	10×5 m, greatest depth 20 cm.
7.7.1954	4.5°	9.0°	11.0°	15×8 m, depth 30 cm. Heavy rain the day before.
30.7.1954				Dry, no water for the rest of the summer.
30.6.1955	15.0°	14.0°	9.5°	Greatest possible extent and depth.
7.7.1955				Dry for the rest of the summer.
6.9.1955				Dry, 5 cm snow.
17.7.1956				Dry for the rest of the summer.
27.5.1957	5.3°	9.8°	4.8°	20×10 m, 0.5 m deep.
12.6.1957				Dry, no more water that summer.

80. Western Mountain Puddle on Gravryggen, Godhavn.

Situated on the westernmost part of Gravryggen. The puddle is oblong, 12×4.5 m, longitudinal direction E—W. The bottom is quite flat, vegetationless, consisting partly of flat stones, partly of fine gravel and sand. Round the puddle the ground is stony, dry, and has a sparse vegetation.

	Temperatures			Remarks
	Air	Surface	Bottom	
9.6.1954	3.5°	9.5°	7.5°	20 cm deep.
20.6.1954				Dry.
9.7.1954	12.5°	11.2°	8.7°	15 cm deep.
30.7.1954				Dry.
25.8.1954				Dry.
8.9.1954	10.0°	7.0°	6.0°	15 cm deep.
20.9.1954				Frozen solid.
30.6.1955	13.0°	18.5°	9.0°	25 cm deep.
17.7.1955	14.3°	16.4°	15.2°	15 cm water.

(To be continued)

	Air	Surface	Bottom	
21. 8.1955	10.4°	9.8°	10.2°	25 cm deep.
6. 9.1955	3.1°	6.0°	2.5°	25 cm deep.
20.10.1955				Frozen solid, covered with snow.
18. 7.1956				Dry.
20. 8.1956				Dry.
7. 9.1956				Dry.
27. 5.1957	3.0°	10.0°	5.0°	20 cm deep.
13. 7.1957	11.3°	12.8°	11.2°	15 cm deep.
6. 8.1957				Dry.
19. 9.1957	11.0°	9.5°		2 cm deep.

81. Eastern Mountain Puddle on Gravryggen, Godhavn.

Situated 30 m east of Loc. 80. The size is about 9×7 m, the shape somewhat irregular. The bottom consists of irregular stones, between a little soft bottom with vegetation mainly of mosses. The surroundings of the puddle are stony, though with large moist, vegetation-covered spots in between.

	Temperatures			Remarks
	Air	Surface	Bottom	
9. 6.1954	3.5°	7.5°	5.0°	30 cm deep.
20. 6.1954	8.2°	13.5°	7.5°	20 cm deep.
9. 7.1954	12.5°	12.2°	9.2°	30 cm deep. Vegetation vigorous.
30. 7.1954	9.5°	13.2°	12.5°	25 cm deep.
25. 8.1954				Dry.
8. 9.1954	10.0°	10.0°	7.0°	15 cm deep.
20. 9.1954	–0.1°		2.3°	10 cm ice on 2 cm water.
25.10.1954				Frozen solid.
30. 6.1955	13.0°	18.5°	9.0°	30 cm deep.
17. 7.1955	14.3°	15.2°	14.4°	25 cm deep.
21. 8.1955	10.4°	8.2°	9.1°	30 cm deep.
6. 9.1955	3.1°	6.1°	3.0°	30 cm deep.
20.10.1955				Frozen solid.
18. 7.1956	15.5°		18.2°	Only a little water on the bottom.
20. 8.1956				Dry.
7. 9.1956				Dry.
27. 5.1957	6.5°	9.0°	3.0°	20 cm deep.
13. 7.1957	10.9°	12.9°	10.9°	20 cm deep.
6. 8.1957	11.5°	11.0°	10.8°	10 cm deep.
19. 9.1957	11.0°	8.0°	9.2°	20 cm deep.

83. Branchipusdam, Godhavn.

Situated immediately west of the mouth of the large lake Taserssuaq east of Godhavn on Sorte Sand. The size is very varying according to the amount of water, but the hollow normally filled by the locality is 8×20 m. The surroundings as well as the bottom of the locality consist of dark basalt sand. In the locality there is no sessile vegetation, but round it there is some growth of lyme-grass and *Honckenya.*

In the locality there may, however, be large quantities of filamentous algae floating about.

	Temperatures			Remarks
	Air	Surface	Bottom	
6. 6.1954	5.5°	10.0°	7.0°	Very high water level, a little of the surrounding vegetation inundated. Greatest depth 60 cm.
9. 6.1954	6.0°	9.0°	8.0°	
14. 6.1954	6.6°	9.5°	7.0°	
20. 6.1954	8.5°	9.5°	7.5°	50 cm deep. The locality just filled.
27. 6.1954	5.5°	12.5°	11.0°	45 cm deep.
7. 7.1954	2.5°	9.5°	9.0°	50 cm deep.
30. 7.1954	9.0°	16.0°	15.0°	Size of the surface 8×4 m, depth 20 cm. The surface covered with a mat of algal filaments.
25. 8.1954				Dry.
20. 9.1954				Dry.
16. 6.1955	13.0°	13.0°	10.0°	Great inundation round the locality, depth 70 cm.
17. 7.1955	13.2°	13.4°	11.2°	50 cm deep.
8. 8.1955	16.6°	13.8°	10.9°	35 cm deep, some algal filaments in the water.
6. 9.1955	3.0°	6.5°	6.5°	10×5 m, 25 cm deep. Large amounts of filamentous algae.
4.10.1955	–2.8°		1.2°	10 cm ice on 5 cm water.
20.10.1955				Frozen solid.
17. 7.1956	17.5°	16.3°	10.4°	40 cm deep.
20. 8.1956	20.5°	12.1°	8.1°	30 cm deep. Large amounts of algal filaments.
8. 9.1956	5.2°	8.8°	7.1°	The locality only 4×2 m. 10 cm deep.
27. 5.1957	6.8°	7.0°	5.6°	60 cm deep.
12. 6.1957	16.1°	18.0°	16.2°	50 cm deep.
21. 6.1957	8.9°	13.5°	12.2°	30 cm deep.
29. 6.1957	12.3°	18.3°	14.0°	20 cm deep. Large carpets of filamentous algae.
13. 7.1957	14.1°	17.3°	15.4°	10 cm deep.
6. 8.1957	11.4°	11.2°		5 cm water in two small puddles, which are completely filled with filamentous algae.
24. 9.1957				Dry.

84. Pond at Magnetic Station, Godhavn.

Situated immediately southeast of the magnetic station, Godhavn. The locality is triangular, the southern boundary, which is constituted by the dam for the road

from the Arctic Station to Godhavn, is 100 m, while the extent N—S is 50 m. The bottom is soft, vegetationless. The locality is somewhat polluted through a tributary coming from the north.

	Temperatures			Remarks
	Air	Surface	Bottom	
9. 6.1954	5.5°	4.0°	3.0°	75 cm deep.
20. 6.1954	9.2°	8.3°	6.2°	50 cm deep.
7. 7.1954	3.1°	10.6°	10.1°	15 cm deep.
30. 7.1954 and the rest of the year				Dry
16. 6.1955	8.0°	8.0°	4.0°	85 cm deep.
17. 7.1955	13.5°	14.1°	10.8°	50 cm deep.
8. 8.1955	16.3°	15.2°	12.5°	35 cm deep.
6. 9.1955	3.5°	5.0°	4.5°	Water only in the northern third of the locality, 15 cm deep.
4.10.1955				Frozen solid.
17. 7.1956				Dry. No water that summer.
27. 5.1957	6.9°	2.4°	2.1°	Snow drift covering the northern part of the locality. 85 cm deep.
12. 6.1957	16.0°	14.2°	12.0°	50 cm deep.
13. 7.1957 and the rest of the summer				Dry.

92. Puddle in the Valley South of the Children's Sanatorium, Jakobshavn.

Situated immediately south of the Children's Sanatorium at Jakobshavn, on the south side of the bottom of the valley leading to the bottom of the canal.

The puddle is 4 m long and 1 m broad. 20 cm deep in the deepest place. The bottom, which consists of clay covered by a thin layer of dark ooze, is vegetationless.

	Temperatures			Remarks
	Air	Surface	Bottom	
31. 5.1954	6.0°	12.5°	8.0°	
17.10.1954				Disappeared in snow.
19. 7.1955	7.9°	8.5°	6.2°	
11. 9.1955				Dry.
22. 7.1956				Dry.
24. 8.1956				Dry.
1.11.1956				Disappeared in snow.
18. 5.1957				Disappeared in snow.
17. 6.1957	3.2°	10.5°	11.8°	
19. 7.1957				Dry.
21. 8.1957				Dry.

93. Puddle on Slope of Valley East of the Children's Sanatorium, Jakobshavn.

25 m south of Loc. 92 there is on the slope of the valley a small ledge, on which this locality is situated. The puddle consists of two parts connected by a narrow rill, each of 2×2 m and 20 cm deep. The bottom is clayey, with some vegetation, mainly cotton-grass.

	Temperatures			Remarks
	Air	Surface	Bottom	
31. 5.1954	8.0°	15.0°	6.0°	
17.10.1954				The locality dry, with a thin layer of snow.
19. 7.1955	7.9°	8.3°	5.4°	
11. 9.1955				The locality dry.
22. 7.1956				The locality dry.
24. 8.1956				The locality dry.
1.11.1956				Disappeared in snow.
18. 5.1957	3.1°	0.7°	0.2°	Bounded towards the south by a snow drift.
17. 6.1957	4.1°	11.2°	11.1°	
19. 7.1957				The locality dry.
21. 8.1957				The locality dry.

94. Pond in Valley, Jakobshavn.

Situated in a small valley east of Loc. 95. The valley is marshy and has a very luxuriant vegetation. The pond covers the greater part of its bottom, being almost circular when having its greatest extent, with a diameter of about 25 m. In this case its greatest depth is 35 cm. In the middle there is a bare clayey bottom, but along the banks there are some growths of mosses. There is no actual inflow, but during the spring thaw the locality receives a large amount of melt water. Simultaneously an outlet functions which runs towards the west to the valley and further to the canal.

	Temperatures			Remarks
	Air	Surface	Bottom	
31. 5.1954	8.0°	15.0°	6.0°	30 cm deep, 15 m in diameter.
17.10.1954				Frozen solid. 10 cm ice.
19. 7.1955	8.2°	7.0°	5.3°	25 cm deep, 15 m in diameter.
11. 9.1955				The locality dry.
22. 7.1956	3.6°	7.4°	7.1°	20 cm water, 10 m in diameter.
24. 8.1956	7.8°	7.9°	6.3°	15 cm water, 10 m in diameter.
1.11.1956				Frozen solid.
18. 5.1957	3.1°	0.4°	0.2°	Snow and ice on the greater part of the locality, 35 cm deep, 25 m in diameter.
17. 6.1957	4.1°	12.1°	13.2°	30 cm deep, 15 m in diameter.
19. 7.1957	14.5°	13.2°	15.3°	10 cm deep, 6 m in diameter.
21. 8.1957				The locality dry.

95. Lowest Pond East of the Bridge at the Cemetery, Jakobshavn.

Situated about 200 m east of the bridge which from the cemetery of Jakobshavn crosses the marshy valley east of Pitorqeq. In the west, south, and east the locality

is bounded by vegetationless rock, and in the north it passes evenly into a moist fen. The pond is almost regularly circular, about 15 m in diameter. The bottom consists partly of stones, partly of dark mud, and is quite vegetationless. Sometimes there is outflow from the northern side into the valley at the bridge.

	Temperatures			Remarks
	Air	Surface	Bottom	
31. 5.1954	5.5°	11.0°	11.0°	30 cm deep.
17.10.1954	–1.3°	0.6°	1.4°	10 cm ice, 10 cm water.
19. 7.1955	7.5°	9.3°	7.5°	30 cm deep.
11. 9.1955				The locality dry.
22. 7.1956				The locality dry.
24. 8.1956				The locality dry.
1.11.1956				In the middle a little ice, otherwise dry.
18. 5.1957	4.9°	1.4°	0.8°	25 cm deep. A little ice in the southern part.
7. 6.1957	3.8°	12.8°	11.5°	10 cm deep.
19. 7.1957				The locality dry.
21. 8.1957				The locality dry.

96. Uppermost Pond East of the Bridge at the Cemetery, Jakobshavn.

Situated about 1 m higher than Loc. 95, southeast of this locality and only separated from it by a 2 m broad isthmus consisting of firm rock. The shape is somewhat irregular, diameter about 15 m. It is bounded in all directions by rock, with some crevices with growth of rather a poor vegetation. The bottom is strewn with large stones, and only along the bank there is a little vegetation of mosses. The water level varies much. There is neither real inflow nor outlet, but when the water level is very high, water spills over the dam where it is lowest, into Loc. 95.

	Temperatures			Remarks
	Air	Surface	Bottom	
31. 5.1954	5.5°	12.0°	11.0°	The locality 30 cm deep.
17.10.1954	–1.3°	0.7°	1.3°	10 cm ice. The water 25 cm deep.
19. 7.1955	7.5°	8.9°	7.3°	30 cm deep.
11. 9.1955	–2.0°	0.8°	1.4°	3 cm thick ice. 15 cm water.
22. 7.1956	2.8°	8.3°	6.1°	10 cm water in the middle of the locality.
24. 8.1956	9.5°	12.5°	10.9°	Unchanged.
1.11.1956				Frozen solid.
18. 5.1957	4.9°	2.4°	0.5°	Ice-free. 45 cm water, outflow to Loc. 95.
17. 6.1957	3.8°	12.0°	8.7°	Water level 40 cm, no outflow.
19. 7.1957	11.2°	11.2°	10.8°	Water level 20 cm.
21. 8.1957				The locality dry.

97. Pond Immediately North of the Pitorqeq Cairn, Jakobshavn.

Situated immediately north of and 3 m lower than the peak with the cairn east of Pitorqeq, Jakobshavn. The surroundings consist of gneiss, with a sparse

vegetation. The locality is shaped like a regular rectangle, 2×3 m. The greatest possible depth of water, from the bottom to the lowest part of the edge is 0.6 m, but the degree of filling varies much. The bottom has quite a thin layer of ooze on firm rock, and there is much vegetation in the water, mainly *Drepanocladus* and filamentous algae.

	Temperatures			Remarks
	Air	Surface	Bottom	
31. 5.1954	5.0°	10.0°	9.0°	Highest possible water level.
17.10.1954	–1.3°	0.5°	1.7°	15 cm ice. The ice 10 cm below the highest water level.
19. 7.1955	6.5°	7.0°		Few cm below the highest water level.
11. 9.1955	–2.3°	0.2°	0.2°	5 cm ice. 15 cm below the highest water level.
22. 7.1956	2.7°	6.1°	5.2°	25 cm below the highest water level. Vegetation very vigorously developed.
24. 8.1956	9.0°	4.2°	5.3°	40 cm below the highest water level. Vegetation everywhere sticks up out of the water.
1. 1.1956	–6.8°		0.1°	Frozen solid, 25 cm ice. The bottom still soft.
18. 5.1957	4.3°	0.8°	–0.6°	A little ice left in the shaded southern part. Water 10 cm below the highest water level.
17. 6.1957	7.0°	9.5°	11.5°	20 cm below the highest water level.
21. 8.1957				The locality dry.

101. Puddle on Hunde Eiland.

Puddle in the valley immediately north of the large cairn on the southern part of the western one of the two islands in Hunde Eiland. The locality is oblong, 15×3 m, the southeastern long side being bounded by an almost vertical rock wall. On the other sides large stones are strewn. The bottom, which consists of 20 cm soft mud, under which there is firm rock, is quite vegetationless. The depth of the water is 20 cm. There is no inflow or outlet.

	Temperatures			Remark
	Air	Surface	Bottom	
28. 6.1957	6.8°	10.5°	8.3°	
22. 7.1957				The locality dry.

104. Puddle near Large Lake, Christianshåb.

Temporary pond situated about 25 m from the southern end of the large lake situated about 2 km northeast of Christianshåb.

The pond is situated in a very marshy area, so its exact size is difficult to establish. It is circular and, to judge from the vegetation, its greatest possible diameter is about 35 m. At the visit the free surface of the water was 25 m in diameter. The greatest depth was 15 cm. The bottom is very soft and without any vegetation other than some lumps of blue-green algae.

	Temperatures		
	Air	Surface	Bottom
22.8.1957	9.2°	11.2°	10.5°

109. Puddle at Orpigsôq Qarajaq.

Situated halfway between the lake (Loc. 108) and the fiord, about 50 m west of the outlet from the lake, on a gravelly terrace with sparse vegetation. Extent 15×8 m. The bottom rather soft and vegetationless.

	Temperatures			Remarks
	Air	Surface	Bottom	
19.6.1957	11.6°	18.8°	12.3°	0.5 m deep.
21.7.1957				The locality dry.
23.8.1957				The locality dry.

118. Puddle in Holsteinsborg.

Situated on the eastern outskirts of Holsteinsborg immediately south of the road to the water lake, where the road turns from running east towards the south. The puddle is situated in marshy area and is 30×30 m. The locality is encircled by mosses and cotton-grass, which plants also grow somewhat into it. In the middle the water is about 20 cm deep. The very soft bottom is vegetationless. The water is very dark brown.

	Temperatures			Remarks
	Air	Surface	Bottom	
14.9.1956	6.9°	7.2°	7.1°	
26.9.1956	0.5°	0.8°	2.3°	10 cm thick ice all over the locality.

135. Puddle near "Østerbro", Godthåb.

A pudde formed by melt water between "Østerbro" and the road to the harbour. Great extent, about 50×25 m, but shallow, not more than 15 cm deep. The bottom is vegetationless, covered by a thin layer of whitish ooze.

	Temperatures			Remarks
	Air	Surface	Bottom	
29.5.1956	3.7°	4.0°	5.0°	Thin ice on the puddle, except at the southern end.
30.6.1959				The locality dry.

137. Western Puddle near the Transmitting Station, Godthåb.

South of the Transmitting Station, Godthåb, there are three small puddles in a row. The present one is 10× 6 m, 25 cm deep in the deepest place. Surrounded by rock with a little vegetation. The bottom is covered with black ooze and some mosses.

	Temperatures	
	Air	Surface
1.6.1956	0.8°	5.9°

138. Middle Puddle near the Transmitting Station, Godthåb.

20×10 m, in the deepest place 35 cm deep. Bare rock round the locality, but vigorous vegetation on the bottom.

	Temperatures	
	Air	Surface
1.6.1956	0.8°	5.0°

139. Eastern Puddle near the Transmitting Station, Godthåb.

Extent 15×5 m, depth 25 cm. Situated in a cleft with bare walls and a little vegetation at the ends. The bottom consists of gravel with a little vegetation of mosses.

	Temperatures	
	Air	Surface
1.6.1956	0.8°	5.7°

141. Puddle at Ny Herrnhut, Godthåb.

Puddle in a small depression in the northern corner of the enclosure with the ruins of houses east of the Herrnhut church, Godthåb. The extent is 5×2 m, the depth about 25 cm. The bottom is soft, overgrown with grasses and mosses. Covered with about 3 cm brash ice.

	Temperatures		
	Air	Surface	Bottom
28.5.1956	1.0°	0.5°	0.8°

146. Puddle on Kap Oswald, Ella Ø.

Indicated on the map in SØGAARD ANDERSEN (1946, Pl. 1). Situated 64 m above sea level. Greatest extent 50×10 m (longitudinal direction NE—SW). The bottom is very soft with a sparse vegetation.

	Temperatures		Remarks
	Air	Surface	
17.7.1958	17.5°	16.2°	Extent 20×5 m, depth 20 cm.
21.8.1958	8.4°	7.5°	Extent 15×3 m, depth 10 cm.

149. Puddle on the Plateau of Ulvesø, Ella Ø.

Situated NW of Ulvesø between this lake and the steep wall down to the river Storeelv, about 140 m above sea level. The locality is oval, about 25×30 m. The bottom, which consists of a mixture of fine gravel and clay, is almost bare, only with a sparse vegetation of *Potamogeton filiformis*.

	Temperatures			Remarks
	Air	Surface	Bottom	
18.7.1958	21.0°	21.5°	14.8°	Depth about 50 cm.
23.8.1958				The locality dry.

151. Puddle in Bed of a Spring River, Geographical Society Ø.

In a bed of a glacial stream north of Basaltsø this locality is left between large stones. It is situated about 50 m from the bank of the lake; its extent is 1 sq. m, and its depth 15 cm. The bottom is overgrown with mosses and a few filamentous algae.

	Temperatures	
	Air	Surface
25.8.1958	5.0°	6.0°

153. Puddle near Basaltsø, Geographical Society Ø.

Very small water hole, 2 m north of the bank of Basaltsø. The locality is 0.5 × 0.5 m and 20 cm deep. The water contains a thick mass of mosses and filamentous algae.

	Temperatures	
	Air	Surface
25.8.1958	5.0°	6.5°

165. Puddle near Grønnesø, Charcots Land.

Very small water hole, 2 × 1 m, 15 cm deep, situated south of Grønnesø (Loc. 163), at some distance west of the fens (Loc. 164 and Loc. 166). It is surrounded by weathered limestone blocks. The bottom consists of stones, on which there is a vigorous vegetation of mosses.

	Temperatures	
	Air	Surface
4.8.1958	13.8°	6.5°

174. Puddle at an Altitude of 1350 m, Nathorst Land.

Situated on a fellfield near the top of the ridge north of T-sø. The extent is 2 × 0.5 m, the depth about 10 cm. The bottom consists of gravel and pebbles with some filamentous algae.

	Temperatures	
	Air	Surface
11.8.1958	3.4°	6.1°

178. Puddle 100 m North of Holger Danskes Briller, Scoresby Land.

Situated about 100 m north of the eastern end of Holger Danskes Briller, eastern part (Loc. 177). Very small water hole, which surrounds the north and east side of a large stone. The locality is a couple of metres long and well over one metre broad. The only vegetation in the water was a little amount of filamentous algae.

	Temperatures	
	Air	Surface
19.8.1958	12.0°	4.0°

179. Puddle 50 m North of Holger Danskes Briller, Scoresby Land.

Situated halfway between Loc. 178 and the lake in a dried-up river bed between some large stones. The locality is oblong, oval, 2 × 1 m, with a depth of down to 25 cm. The pool is very full of vegetation; there are especially some large cushions of mosses.

	Temperatures	
	Air	Surface
18.8.1958	12.5°	1.0°

Analytical Tables.

Locality	Date	Cunductivity μ mho	Hydrogen Ion tration	
			Current	Highest
10. Temporary Pond on Herbert Ø	27.–8. 1959	85	7.0	7.2
28. Puddle near Ivnarssuit	17.–7. 1959		5.4	
63. Puddle near the Trading Station of Disko Fjord	10.–6. 1957	81	7.1	7.1
70. Puddle in Østerdalen, Godhavn	21.–6. 1955	48		
	6.–6. 1957	71	7.2	7.3
71. Pond N. of Flagpole of Arctic Station ..	21.–6. 1955	40	6.3	7.1
	8.–8. 1955	41	6.7	7.5
	6.–6. 1957	60	7.3	7.4
75. Circular puddle N. of Tranbrænderisø ...	7.–7. 1955	44	6.8	7.4
	12.–6. 1957	62	6.9	7.1
78. Puddle W. of Gravel-Pit, Godhavn.....	30.–6. 1955	36	6.8	7.2
	27.–5. 1957	56	6.2	6.7
80. Western Mountain Puddle on Gravryggen, Godhavn	30.–6. 1955	36	6.5	7.3
	27.–5. 1957	54	6.4	6.6
81. Eastern Mountain Puddle on Gravryggen, Godhavn	30.–6. 1955	39	6.6	7.1
	27.–5. 1957	52	7.1	7.4
83. Branchipusdam, Godhavn	16.–6. 1955	46	7.0	7.2
	8.–8. 1955	169	8.4	8.5
	27.–5. 1957	120	6.9	7.2
84. Pond at Magnetic Station, Godhavn	16.–6. 1955	42	6.4	7.0
	12.–6. 1957	59	6.8	7.1
93. Puddle on Slope of Valley, E. of Children's Sanatorium, Jakobshavn	19.–7. 1955	47	6.3	6.8
94. Pond in Valley, Jakobshavn	19.–7. 1955	40	6.4	7.4
	17.–6. 1957	48	7.1	7.2
95. Lower Pond E. of Bridge, Jakobshavn ..	19.–7. 1955	32	6.0	6.7
	18.–5. 1957	52	5.5	5.7
96. Upper Pond E. of Bridge, Jakobshavn ..	19.–7. 1955	20	6.2	6.6
	11.–9. 1955	30	6.0	6.7
	18.–5. 1957	71	5.8	5.9
97. Pond Immediately N. of Pitorqeq Cairn.	19.–7. 1955	21	6.2	6.7
	11.–9. 1955	26	6.3	6.7
	17.–6. 1957	64	6.7	6.8
101. Puddle on Hunde Eiland	28.–6. 1957	255	7.1	7.3
138. Middle Puddle near Transmitting Station, Godthåb	1.–6. 1956	50	6.8	6.9
141. Puddle at Ny Herrnhut, Godthåb	28.–5. 1956	175	6.0	6.6
146. Puddle on Kap Oswald, Ella Ø	17.–7. 1958	330	7.3	8.4
149. Puddle on Plateau of Ulvesø, Ella Ø ...	18.–7. 1958	115	7.0	7.9
151. Puddle in Spring River, Geograph. Soc. Ø	25.–8. 1958		6.5	
153. Puddle near Basaltsø, Geogr. Soc. Ø.....	25.–8. 1958		6.7	
165. Puddle near Grønnesø, Charcots Land ..	4.–8. 1958		8.0	
174. Puddle at an Altitude of 1350 m, Nathorst Land	11.–8. 1958		6.0	
184. Puddle on Elvsletten, Scoresby Land ...	16.–8. 1958		8.0	

Temporary Waters.

Concen- (pH) Lowest	Alkali- nity	Acidity	Ca++ mg/l	Mg++ mg/l	Cl- mg/l	Fe++ mg/l	Total Iron mg/l	Consump- tion of Potassium Perman- ganate mg/l	Colour (Ohle)
6.0	1.9	–	1.4	1.9	19.4			18	8
6.1	3.8	–	4.0	2.1				40	36
6.4	1.5	–	5.1	1.3				22	16
5.4	2.9	–							6
5.7	2.4	–	3.8	0.3				12	9
6.3	1.5	–	2.8	1.9				16	8
5.6	3.1	–	6.1	0.4		0.08	0.09	45	7
4.6	3.5	–	6.4	1.1				28	10
5.7	1.9	–	1.2	0.9		0.03	0.04	37	–
4.9	2.0	1.8	2.0	1.2				18	1
5.3	0.6	–	1.0	1.0		0.05	0.10	39	4
5.1	1.7	0.9	2.2	1.0				29	8
5.3	0.9		2.3	0.6		0.07	0.10	33	7
5.5	2.2	–	2.4	1.1				33	8
5.7	4.0	–							2
6.3	10.5	–	3.8	0.7				29	38
5.8	4.0	–	0.7	0.4				25	12
5.0	2.1	–							1
5.2	3.4	–	3.6	0.7				30	7
5.8	2.7	0.6	4.3	1.0		–	0.14	41	34
5.6	2.2	–	3.8	0.6		0.06	0.15	37	21
5.2	2.3	–	3.7	1.6				18	28
5.1	0.5	0.5	1.9	0.2		0.06	0.11	30	16
4.4	1.5	3.4	1.4	1.5				24	14
5.2	0.7	0.6	0.7	0.6		0.09	0.16	30	11
5.2	1.0	0.6	1.0	0.7				29	17
4.7	1.4	2.1	2.6	1.5				24	14
5.1	0.1	0.4	0.4	0.4		–	–	24	8
5.6	0.7	0.8	0.6	0.3				31	22
4.8	1.2	1.9	1.4	1.3				20	7
6.6	4.6	–	15.8	5.0				41	36
5.3	1.2	2.0	0.8	2.1		0.14	0.14	29	1
5.8	1.9	2.8	7.6	3.4		0.26	0.39	44	30
6.8	28.8	–	44.5	10.6	4.6			27	4
6.3	13.8		13.8	6.0	2.1			19	2

180. Puddle East of Holger Danskes Briller, Scoresby Land.

Puddle left in the bed of a rivulet which in spring carries water from the north to the Western Border Pond (Loc. 181). The puddle is almost circular, 1 m in diameter, about 15 cm deep. Round the locality there is a vigorous vegetation of cotton-grass, sedges, and mosses, but the bottom is vegetationless, covered by brownish, fluffy mud.

	Temperatures	
	Air	Surface
18.8.1958	10.5°	9.5°

184. Puddle on Elvsletten, Scoresby Land.

Bare puddle in clay, situated on the large, bare plain north of the outlet from Holger Danskes Briller, approximately halfway between this outlet and the Western Border Pond (Loc. 181). The puddle is long and narrow, about 20 × 2 m, slightly curved. It is 45 cm deep in the deepest place. There is no vegetation at all, neither in nor around the puddle.

	Temperatures	
	Air	Surface
16.8.1958	11.5°	12.5°

Summary Remarks on Temporary Waters.

Conditions of Ice.

The puddles examined fall into two types according to the way in which they freeze up. In the cases in which the puddles are water-bearing in spring as well as autumn, the freezing is of exactly the same type and duration as those found in ponds, but in the case of a good number of Greenland puddles it is not possible to assume the occurrence of any proper freezingup at all, viz. if the puddles are dry at the time when permanent freezing-up appears in the other localities. During the winter the puddle is filled with snow, the lowest layers of which become more and more firm and crystalline. In the spring the whole mass of snow softens and melts rather quickly, while at the same time melt water runs to the locality from the surroundings. These puddles therefore mostly become quite ice-free somewhat earlier than the ponds.

The type of freezing-up to which a puddle belongs, first of all depends on the amount of precipitation and the temperature in summer. Many puddles after wet summers belong to the former type, while after dry and warm summers they belong to the latter type.

Conditions of Temperature.

In principle the temperatures in the puddles do not differ from those measured in the ponds, as they normally occur within the limits found there. Only in one case, Loc. 149, on Ella Ø in East Greenland,

a temperature was measured which is appreciably higher than any others measured in the area. This temperature, 21.5° C., in the surface of the locality is also the highest temperature measured at all in any Greenland fresh water.

Amounts of Water.

As mentioned above (p. 23), I include a locality among puddles if only it dries up at intervals of years. Three different types of puddles can be set up according to their contents of water during the summer.

(1) Only water-bearing from the spring thaw to late summer.
(2) Water-bearing after the spring thaw and in the autumn, with an intervening dry period.
(3) Water-bearing during the whole of the summer.

In the case of about half of the puddles examined it has been possible, at any rate in one summer, to establish the time of the dry period. The rest of the localities mentioned here were only visited once or twice, so that it was not possible to obtain information in that respect. In what follows the puddles have been grouped according to the type to which they belonged in the various summers.

(1) Localities 63 (1957), 70 (1954, 56, 57), 71 (1956), 75 (1954, 56, 57), 78 (1954, 55, 56, 57), 80 (1956), 81 (1956), 83 (1956, 57), 84 (1954, 56, 57), 92 (1954, 55, 56, 57), 93 (1954, 55, 56, 57), 94 (1955), 95 (1955, 57), 96 (1957), 97 (1957), 101 (1957), 109 (1957), 135 (1959), and 149 (1958).
(2) 70 (1955), 71 (1954, 57), 80 (1954, 57), 81 (1954), 95 (1956).
(3) 71 (1955), 75 (1955), 80 (1955), 81 (1955, 57), 83 (1955, 56), 84 (1955), 94 (1954, 56, 57), 95 (1954), 96 (1954, 55, 56), 97 (1954, 55, 56).

Leaving out of account the puddles for which observations are only available for a single summer, there are only three localities, 78, 92, and 93, which have belonged to the same type for four successive summers, and they all belonged to Type 1. All the other localities behaved differently according to the dampness or dryness of the summer. Thus it is evident that the summer of 1955, during which there was more precipitation than usual, prevented Localities 71, 75, 80, 81, 83, and 84 from drying up, and caused Loc. 70 to bear water in the autumn.

Various Types of Greenland Puddles.

The Greenland puddles all fit into one of the following two main types: A type within which the bottom is quite vegetationless and one

within which the bottom has a vigorously developed vegetation of mosses or higher plants. Within either of these main types there may be subtypes.

Puddles with Vegetationless Bottom.

This type of puddle is the commonest type by far in Greenland and may be found practically everywhere. It is found where the hollows in which the puddle is situated, become completely dry, so that there is no trace of moisture at the bottom. The bottom of puddles of this type may during the dry season have different appearances, but two types of bottom are the most prevalent by far. In one case the bottom consists of firm, bare rock. On such an expanse nothing can grow during the dry period, and as the water-bearing period generally is short, the puddle becomes vegetationless. In the other case the puddle during the water-bearing period is filled with filamentous algae. When the puddle dries up, these filamentous algae form a dense carpet on the bottom, and this carpet is soon changed into a firm, black crust, which is capable of smothering any possibly developing vegetation. Under this crust of algae the bottom is completely dry.

In the dry season these vegetationless puddles are a very characteristic feature of the Greenland scenery and it is always easy to recognize that in such places there is sometimes a puddle.

The water in puddles of this kind nearly always have very low contents of salts, the reaction is neutral to slightly acid, and the water is more or less coloured according to whether the puddle receives its supply of water from rocky surroundings or from surroundings with high contents of humus in the strata of the soil. Good examples of such puddles with clear water are Localities 8, 78, and 84, whereas Localities 95, 96, and 101 are typical examples of puddles with intensely coloured water.

Puddles with Vigorous Vegetation at the Bottom.

In the cases in which the bottom of the puddles does not consist of bare rock and in which no crust of algae develops on the bottom, a vigorous vegetation develops in the puddles, especially in such places where, in the depression in which the puddle is situated, there is still moisture in the soil. The kind of vegetation may vary much and is partly dependent on the banks of the locality, partly on the vegetation found in the surroundings. Many of the localities are grass-grown, e.g. Loc. 63 and Loc. 94. This especially applies to puddles situated on flat areas with a vigorous surrounding vegetation, while others, especially such as are situated in rocky terrain, e.g. Localities 70, 81, 97, and 138, are moss-grown.

Nearly all the puddles belonging to this main group have intensely coloured water and a high consumption of potassium permanganate. Furthermore, the water generally has a higher content of salts, i.e. a higher conductivity than is the case of the vegetationless puddles.

D. List of Collections Not Made by the Present Author.

The following list includes samples which have been kept unsorted at the Zoological Museum of the University of Copenhagen (KUZM), the Freshwater-Biological Laboratorium of the University of Copenhagen (KUFL), and Riksmuseet in Stockholm (RS), and samples which have been collected in Greenland and placed at my disposal. The latter samples are mentioned only under the collector's name.

In the case of some of these samples there is information available which indicates the type of locality (lake, pond, or puddle) from which the sample originates, but as this completely depends on the collector's estimate, I have not found it advisable to deal with these samples together with those collected by myself and therefore have kept them in a group of their own. In a very few cases I have been unable to discover whether the present collections have been made in a locality where I have made collections myself. This may e.g. be the case of localities near Thule (especially Loc. 4 and Loc. 5), Holsteinsborg (42, 43), Godthåb (54–59), and Nordostbugt (106), but in all these cases I have in my own samples found a composition of the fauna which is different from that in the samples here. In my description of localities (pp. 22–128) it has been mentioned whether collections have previously been made in the locality. In one case a locality has been included both here and among my own localities, viz. the lake above the harbour, Upernavik, which is the same as my Tyfussø, Upernavik (Loc. 44). During the 28 years passing between the collections so great a change has taken place regarding the locality that it is actually a question of two different localities. In some cases material from the samples worked up here have been published previously (Wesenberg Lund 1894, Stephensen 1913 a, b, 1916, Poulsen 1940 a), but I have only used the material here in such cases in which the samples were kept as they were collected and had not been sorted out.

1. Bjørlings Ø (Carey Øerne). Shallow freshwater lake. 15.8.1928. The "Godthaab" Expedition 1928 (KUZM).
2. The peat bog, Thule.
   7.7.1916. 15°. Lauge Koch (KUZM)
   17.7.1916. 10°. Cloudy. P. Freuchen (KUZM)
   19.7.1916. 14°. Sunshine. – –
   20.7.1916. – –
   26.7.1916. 6.5°. – –
   9.8.1916. 9°. – –

3. Mosehullet, Hendriks havn, Thule.
   13.7.1916. 14.2°. P. FREUCHEN. (KUZM)
4. Apussøen, Thule.
   17.7.1916. 9°. – –
   19.7.1916. 12°. – –
   26.7.1916. 6°. – –
5. Havlitsøen, Thule.
   13.7.1916. 8°. Sunshine. P. FREUCHEN (KUZM)
   17.7.1916. 7°. Cloudy. – –
   19.7.1916. 9°. Sunshine. – –
   20.7.1916. 9°. – –
   26.7.1916. – –
   9.8.1916. 8°. – –
6. Water hole, Thule.
   16.7.1916. 14°. – –
7. Thule.
   18.7.1920. – –
8. Freshwater lake, Wolstenholme Fjord.
   22.7.1911. P. FREUCHEN (KUZM)
9. Puddles at the settlement of Iglulik, lat. 74°22′ N. 22.7.1931. FRITS JOHANSEN.
10. Water hole between rocks, the settlement, Íkamiut øen, lat. 24°21′ N. 22.7. 1931, FRITS JOHANSEN.
11. The lake near the settlement of Kûk, lat. 73¾° N. long. 56¼° W. 17.8.1931, FRITS JOHANSEN. (KUZM).
12. Water hole at Ikerasârssuk, lat. 73½° N., long. 56½° W. 6.8.1931. FRITS JOHANSEN. (KUZM).
13. Three water holes on Sâtok øen, lat. 73½° N. 21.8.1931. (KUZM).
14. Small lake on the peak of Erqordleq øen, lat. 73¼° N, long. 56°20′ W. 22.8. 1931. FRITS JOHANSEN. (KUZM).
15. The lake at Kingigtoq, Upernavik Isfjord. Lat. 72°55′ N. 7.8.1931. FRITS JOHANSEN. (KUZM).
16. Water hole at the settlement of Tunorqo. 19.8.1931. FRITS JOHANSEN. (KUZM).
17. The lake above the harbour, Upernavik. 17.7.1931 and 15.9.1931. FRITS JOHANSEN. (KUZM).
18. *Lepidurus* water hole near the harbour, Upernavik. 10.9.1931. FRITS JOHANSEN. (KUZM).
19. Water hole near the harbour, Upernavik. 15.7.1931 and 15.9.1931. FRITS JOHANSEN. (KUZM).
20. Water holes on Smedeøen, Upernavik. 30.7.1931. FRITS JOHANSEN. (KUZM).
21. Ritenbenk. 10.8.1890. W. A. LUNDBECK. (KUZM).
22. Lake in bog, Ritenbenk. Pelagic under new ice. Depth of water 2 m. Air – 3.5°. 8.10.1931. FRITS JOHANSEN. (KUZM).
23. Lowest lake beyond the colony of Jakobshavn. 28.8.1906. G.G.U. AD. S. JENSEN and P. HARDER. (KUZM).
24. 2 m deep lake in bog at Jakobshavn. New ice 7–8 cm thick. 5.10.1931. FRITS JOHANSEN. (KUZM).
25. Lake in bog near "Nipisæt", Diskofjord. 21.9.1931. FRITS JOHANSEN. (KUZM).
26. The small pond (lake) 6 m deep opposite the camp of tents at Safârssuit. Growth of *Hippuris*. 29.7.1906. Plankton, AD. S. JENSEN and P. HARDER. (KUZM). 3.8.1906. AD S. JENSEN and P. HARDER. (KUZM).

27. Water holes opposite the camp (of tents) at Safârssuit. 3.8.1906. Ad. S. Jensen and P. Harder. (KUZM).
28. The small shallow lake (pond) immediately above the head of the Qarajaqfjord (Orpigsôq in Sydøstbugten):
    Landing-net and plankton net along the bank 2.7.1906. Ad. S. Jensen and P. Harder. (KUZM).
    Coarse plankton nets thrown from the bank about ten times and dragged to the bank. 2.7.1906. P. Harder. (KUZM).
    Coarse plankton nets dragged along the bank. 2.7.1906. P. Harder. (KUZM)
    Finest plankton net dragged along the bank. 2.7.1906. – –
    Water temperature 15° 7.7.1906. – –
29. Orpigsôq. 14.7.1890. W. Lundbeck. (KUZM).
30. Lake on Hunde Eiland in Disko Bugt. 9.7.1935. Poul M. Hansen. (KUZM).
31. Lake on the eastern outskirts of Egedesminde. 17.8.1957. B. Fredskild and Tyge Christensen.
32. Almost dried-up hole in bog at Egedesminde. 10.8.1931. Frits Johansen. (KUZM).
33. Pond 400 m east of the hospital, Egedesminde. 3.8.1931. C. Löfting. (KUZM).
34. 1328. "Sarpiursak (i.e. Sarpiussaq), Grönland. Insjö," Öberg. 27.7.1870. Nordiske Cladocera. 509. (RS).
35. 1614. "Grönland. Aulistsivikfjord (i.e. Aulatsivik) nr. 519. Från en liten sjö nära inlandsisen." Sofia Exp. 4.7.1883. Nordiska Cladocera. 334. (RS).
36. 1612. "Grönland. Aulistsivikfjord (i.e. Aulatsivik) nr. 519. Från en färskvattensamling." Sofia Exp. 2.7.1883. Sofia Exp. nr. 519. Nordiske Cladocera. 332. (RS).
37. 2083. "Grönland vid Aulistsivikfjorden (i.e. Aulatsivik). I färskvattensamling." Sofia Exp. 1.7.1883. Sofia Exp. nr. 517. Nordiske Cladocera. 383. (RS).
38. 1611. "Grönland. Aulistsivikfjord (i.e. Aulatsivik). Öster om Sofias Ankarplats." Sofia Exp. 2.7.1883. Nordiske Cladocera 331. (RS).
39. "Agpelitas (= Augpiletok), in a shallow pond." 27.7.1897. C. Kruuse. (KUZM).
40. "Kangatsiaq, in a pond" 30.7.1897. C. Kruuse. (KUZM).
41. Holsteinsborg, Tømmermandssøen, 8.7.1895. The Ingolf Expedition. (KUZM).
42. Lake near Holsteinsborg. 8.7.1895. The Ingolf Expedition. (KUZM).
43. Holsteinsborg, Pond 1, 12.8. and 15.9.1931. C. Löfting. (KUZM).
44. "Pond in Ausakotaq (i.e. Avssaqutaq), Amerdloq," Holsteinsborg Distrikt. 15.9.1931. C. Löfting. (KUZM).
45. "Pond in Ausakotaq (i.e. Avssaqutaq), Amerdloq," Holsteinsborg District. 15.9. 1931. C. Löfting. (KUZM).
46. Itivdleq. 12.9.1931. C. Löfting. (KUZM).
47. Store sø behind Muslingebugten. 6.7.1958. Deep, steep-sided, clear. Tyge Christensen.
48. Naqerdloq, eastern lake. In the place visited, shallow with a stony bottom. 9.7.1958. Tyge Christensen.
49. Shallow puddle about 3 m across near Naqerdloq, eastern lake, 9.7.1958. Tyge Christensen.
50. Sukkertoppen, in a small lake. 17.7.1895. (KUZM).
51. Sukkertoppen, in another small lake. 17.7.1895. (KUZM).
52. Sukkertoppen, 10.9.1931. C. Löfting. (KUZM).
53. The lake in lat. 64°27½′ N, long. 51°35½′ W. Nordlandet near Godthåb. Shallow with scattered stones sticking up out of the water for some distance into the lake. *Menyanthes* along the bank. Tyge Christensen.

54. Godthåb. 12.7., 20.9.1891. BRUMMERSTEDT. (KUZM).
55. Godthåb. 12.7., 20.9.1891. BRUMMERSTEDT. –
56. Godthåb. 12.7., 20.9.1891. BRUMMERSTEDT. –
57. Godthåb, Strandklippesøen. 22.9.1931. C. LÖFTING. (KUZM).
58. Godthåb. 22.9.1931. C. LÖFTING. (KUZM).
59. Godthåb. 23.9.1931. C. LÖFTING. –
60. Lake near Godthåb. Between the colony and Thorhallesen's cairn. Pelagic under 12 cm new ice. Depth of the water 10 m. 15.10.1931. FRITS JOHANSEN. (KUZM).
61. Pond on radio island, Kookøerne. Well over half a metre deep. Bare rock walls, a little moss at the bottom. 14.8.1958. TYGE CHRISTENSEN.
62. Frederikshåb. 12.7., 20.9.1891. P. PETERSEN. (KUZM).
63. Langesø, Arsuk Fjord.

7.10.1956.	Littoral sample. BENT LAUGE MADSEN.				
21.10.1956.	–	–	–	–	–
4.11.1956. 15 cm ice.	Vertical	–	–	–	–
17.11.1956. 15 cm ice.	–	–	–	–	–
29.12.1956. 65 cm ice.	–	–	–	–	–
24. 2.1957. 90 cm ice.	–	–	–	–	–
10.3.1957. 100 cm ice.	–	–	–	–	–

64. Nyresø. Arsuk Fjord.

10.3.1957. 105 cm ice.	–	–	–	–	–
16.6.1957.	Littoral	–	–	–	–

65. Xenolithsø. Arsuk Fjord.

17.3.1957. 110 cm ice.	Vertical	–	–	–	–
16.6.1957.	Littoral	–	–	–	–

66. Tolvsøerne, Arsuk Fjord.

25.5.1957.	–	–	–	–	–

67. Lake near Bjørnesø, Arsuk Fjord.

1.6.1957.	Littoral sample.	–	–	–	

68. Lake between Turistsø and Langesø, Arsuk Fjord.

16.6.1957.	Littoral sample. BENT LAUGE MADSEN.

69. Grönland. Ivigtut. Sheet of fresh water about 900 feet above sea level. Sofia Exp. 21.8.1883. Nordiske Cladocera. 336. (RS).
70. Grönland. Near Ivigtut. Sheet of fresh water 900 feet above sea level. Sofia Exp. 21.8.1883. Nordiska Cladocera. 381. (RS).
71. 1796. Grönland. Ivigtut. No. 566. Sofia Exp. 1883. Nordiske Cladocera. 340. (RS).
72. "Bredefjord. Small water holes above the Norsemen's ruin on Akuliaritsouq." Water 0.1 m deep. 28.8.1912. K. STEPHENSEN. (KUZM).
73. Small lake at the inmost end of Tasiussaq, Bredefjord. 9.8.1912. K. STEPHENSEN. (KUZM).
74. Lake between Tasiussaq and Kagsiarssuk. 12.8.1926. H. ØDUM. (KUFL).
75. "Angmagssivik tasia", Igaliko. 12.8.1926. H. ØDUM. (KUFL).
76. Pit-bog near "angmagssivik tasia", Igaliko. 12.8.1926. H. ØDUM. (KUFL).
77. Water above Narssaq, Skovfjord. Water 0.1 m deep. K. STEPHENSEN. (KUZM).
78. Small lake behind St. 123. 26.8.1912. K. STEPHENSEN. (KUZM).
79. Unartoq. Outlet from the spring. The water 23.5°. 3.10.1929. POUL M. HANSEN. (KUZM).
80. The fen in Sydprøven. Under the ice. 3.11.1931. FRITS JOHANSEN. (KUZM).
81. 2082. Grönland. Frederiksdal in collection from sea water. Sofia Exp. 28.8. 1883. Sofia Exp. 575. Nordiske Cladocera 382. (RS).

82. Klaresø, south side of Jørgen Brønlund Fjord. Heilprin Land.
6.8.1947. Plankton. Palle Johnsen. (KUZM).
6.8.1947. Littoral zone. – – –
11.9.1948. Bottom sample. – – –
12.9.1948. Plankton. – – –
22.9.1948. – – – –
22.9.1948. Bottom sample. – – –
29.9.1948. Plankton. – – –
7.6.1949. Plankton from melted zone along bank. Palle Johnsen. (KUZM).
29.6.1949. Plankton 2–0 m. Palle Johnsen. (KUZM).
30.6.1949. Landing-net sample along bank. Palle Johnsen. (KUZM).
3.8.1949. Plankton 2–0 m. Palle Johnsen. (KUZM).
3.8.1949. Plankton, horizontal haul. Palle Johnsen. (KUZM).
3.8.1949. Plankton with bottom material from a depth of 3 m. Palle Johnsen. (KUZM).
3.8.1949. Littoral zone. Palle Johnsen. (KUZM).
8.8.1949. Bottom sample, near bank. Palle Johnsen. (KUZM).
8.8.1949. Landing-net sample along bank. Palle Johnsen. (KUZM).
8.8.1949. Plankton. Palle Johnsen. (KUZM).

83. Lersø, south side of Jørgen Brønlund Fjord. Heilprin Land.
9.8.1947. Landing-net sample along bank. Palle Johnsen. (KUZM).
9.8.1947. Plankton. Palle Johnsen. (KUZM).
25.6.1949. Plankton near bank. Palle Johnsen. (KUZM).
5.8.1949. Bottom sample, 0.4 m. Palle Johnsen. (KUZM).

84. Vårfluesø, about 300 m above sea level. South side of Jørgen Brønlund Fjord, Heilprin Land.
3.8.1947. Plankton. Palle Johnsen. (KUZM).

85. Nostocsø, about 300 m above sea level. South side of Jørgen Brønlund Fjord, Heilprin Land.
3.8.1947. Plankton. Palle Johnsen. (KUZM).

86. Apussø. Mørkefjord.
22.8.1939. N. Haarløv. (KUZM).
23.8.1939. – –
26.8.1939. Near the bank. N. Haarløv. (KUZM).
21.9.1939. About 2°. Thin ice on about half of the lake. N. Haarløv. (KUZM).

87. Decimetersø. Mørkefjord.
21.8.1939. About 11°. N. Haarløv. (KUZM).

88. Triangelen. Mørkefjord. 2.9.1939. Plankton. N. Haarløv. (KUZM).

89. Storesøen. Mørkefjord. 5.9.1939. N. Haarløv. (KUZM).

90. Freshwater lake at 3rd camp (of tents; Stormkap). "Danmarks Exp." St. 19 a. Depth about 1 m. The bottom was rock with thick mud and green algae. 3.9.1906. Frits Johansen. (KUZM).

91. Freshwater lake in 2nd camp. 2–300 foot above sea level. Snow- and ice-free. 20.8.1906. Frits Johansen. (KUZM).

92. Freshwater puddle between rocks on Maroussia øen. 30.7.1907. Frits Johansen. (KUZM).

93. Sandøen. Tyrolerfjord. 17.7.1930. B. Löppenthin. (KUZM).

94. Sandøen. Tyrolerfjord. 24.7.1930. Depth 0.25 m. Detritus from fresh water. B. Löppenthin. (KUZM).

95. Shallow small lake in Zackenberg Bugt. 25.8.1947. Palle Johnsen. (KUZM).

96. Two small puddles, Kap Stosch. Depths down to 0.5 m. 1.8.1930. B. LÖPPENTHIN. (KUZM).
97. Kap Stosch. Depth 0.75 m. 1.8.1930. B. LÖPPENTHIN. (KUZM).
98. Freshwater lake, 1 ha. Kap Stosch. Depth 0.75 m. 3.8.1930. B. LÖPPENTHIN. (KUZM).
99. Kap Stosch. 20.7.1932. H. MADSEN. (KUZM).
100. Borlasse Warren. 14.7.1900. SØREN JENSEN. (KUZM).
101. River near Loch Fyne. 30.7.1930. B. LÖPPENTHIN. (KUZM).
102. Knudshoved (Karlshavn). Depth 1 m. 5.8.1930. B. LÖPPENTHIN. (KUZM).
103. Small freshwater lake, Moskusoksefjord. 15.8.1930. B. LÖPPENTHIN. (KUZM).
104. Small water hole in Charcots Land. Containing few litres of water. Drying up. 900 m above sea level. 4.8.1958. K. HOLMEN, E. EINARSEN.
105. Fleming Inlet. 25.8.1900. SØREN JENSEN. (KUZM).
106. Freshwater lake near Nordøstbugt. 14.8.1900. SØREN JENSEN. (KUZM).
107. Small shallow freshwater lake near Gurreholm, Jameson Land. About 15 m in diameter. With *Hippuris* and *Drepanocladus exannulatus* (no doubt slightly acid). 17.8.1958. K. HOLMEN.
108. Puddles. Jameson Land. 17.8.1900. SØREN JENSEN. (KUZM).
109. Freshwater puddle without outlet. Hurry Inlet. 3.7.1900. SØREN JENSEN. (KUZM).
110. Freshwater puddle. Clear water. Overgrown. Hurry Inlet. 5.7.1900. SØREN JENSEN. (KUZM).
111. Hurry Inlet. 13.8.1900. SØREN JENSEN. (KUZM).
112. Freshwater puddle on islet north of Stewart Land. Water 15°. 30.7.1900. SØREN JENSEN. (KUZM).
113. Lomsø. Bay Watkins Fjord. 200 × 5 m. On the bottom algae and mosses. Clear water. 24.8.1932. (KUZM).
114. A small puddle. Eskimoø. Lat. 66°14′ N. 3.8.1899. Amdrup's East Greenland Expedition. (KUZM).
115. Freshwater puddle at Angmagssalik. 14.9.1900. SØREN JENSEN. (KUZM).
116. Angmagssalik. 14.9.1900. SØREN JENSEN. (KUZM).
117. "Arnica" fen, Tasiussaq (lat. 65°32′ N.). 15.8.1902. C. KRUUSE. (KUZM).
118. Small marsh at Angmagssalik. 26.7.1933. 7th Thule Exp. (KUZM).

IV. SYSTEMATIC PART

In what follows I shall deal with the freshwater entomostraca which I have found in the collections available to me. Furthermore, some species will be mentioned which have been recorded in the literature, but which I have not myself succeeded in finding.

A. Methods of Collection and Preparation.

Samples of the entomostracal fauna from the localities examined have in the great majority of cases been taken with Møller gauze nets of sizes 16 and 20. As a rule the nets were used as casting-nets from the bank, but in localities with a vigorous vegetation or on which there was thin ice, the net was mounted on a light bamboo rod. Plankton samples from fairly large lakes were taken by horizontal as well as vertical hauls from a boat.

In order to obtain samples from the bottom in deepish lakes, a dredge and an Ekman bottom-sampler were used in some cases. The bottom material was strained through a metal-wire strainer, with a width of meshes of 0.4 mm.

Only in a few cases, by sampling from localities in the closest environs, the samples were examined without preservation. In all other cases 2–3 per cent. formalin was added immediately after the sampling. In this the animals were kept until at the sorting out they were transferred to 80 per cent. alcohol.

B. Freshwater Entomostraca Found in Greenland.

Euphyllopoda.

Branchinecta paludosa (O. F. MÜLLER) 1777.

Greenland records:

Cancer stagnalis: O. FABRICIUS (1780).
Branchipus stagnalis: BERGENDAL (1891).
Branchipus paludosus: KRÖYER (1838), SCHIØDTE (1857), HOLM (1886), REINHARDT (1857).

Branchipus (*Branchinecta*) *arcticus*: MIERS (1877).
Branchipus sp.: VANHÖFFEN (1893 a, b).
Branchinecta paludosa: LILLJEBORG (1877), WARMING (1886), DE GUERNE et RICHARD (1889), WESENBERG-LUND (1894, 1937), OHLIN (1895), VANHÖFFEN (1897), ORTMANN (1901), DADAY (1910), STEPHENSEN (1913a), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN et LESSE (1951), RØEN (1958b, 1962).

The specimens in my collections in every way agree with the previous descriptions.

Artemiopsis stefanssoni var. ***groenlandicus*** LINDER 1932.

Greenland records:

Branchipus sp.: BERGENDAL (1891).
Artemia gracilis: WESENBERG-LUND (1894), VANHÖFFEN (1897), STEPHENSEN (1913a).
Artemia salina: DADAY (1910), HABERBOSCH (1916, 1920) VIBE (1949).
Artemiopsis stefanssoni: RØEN (1958a).
Artemiopsis stefanssoni var. *groenlandicus*: LINDER (1932, 1941).

It is with some doubt that I refer the *Branchipus* sp. described by BERGENDAL (1891, p. 16) to this species. After mentioning various entomostraca occurring in the small ponds at Jakobshavn BERGENDAL writes: "In einem anderen von diesen sah ich den grossen gewöhnlichen *Branchipus*, in einem dritten einen kleineren, schwächer gefärbten *Branchipus*, ob wirklich eine getrennte art, weiss ich noch nicht."

It does not seem that these collections have ever been worked up, and I have been unable to find the specimens, but to judge from the description given, it seems very probable that they were actually specimens of *Artemiopsis*.

LINDER's setting up a new variety of the species, which, i.e., includes all previously known Greenland finds, seems well-founded to me. Partly are the Greenland specimens much smaller than indicated in the original description of the main species (JOHANSEN 1922a), partly is the terminal segment of the second antenna in the male of a deviating structure on one or two points, as the spine at the base of the segment is very small or missing.

Lepidurus arcticus (PALLAS) 1793.

Greenland records:

Apus glacialis: KRÖYER (1847), REINHARDT (1857), SCHIØDTE (1857), LILLJEBORG (1877), JOHANSEN (1912), BRAEM (1893), STEPHENSEN (1913a).
Lepidurus glacialis: DE GURNE et RICHARD (1889), WESENBERG-LUND (1894, 1895, 1937), OHLIN (1895), ORTMANN (1901).
Lepidurus arcticus: BREHM (1911), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), MADSEN (1936), POULSEN (1940 a, b), SØGAARD ANDERSEN (1946), POULSEN et LESSE (1951), RØEN (1959).

My specimens by no means differ from the previous descriptions of the species.

Cladocera.

Latona setifera (O. F. Müller) 1785.

Greenland records:

Latona glacialis: Wesenberg-Lund (1894), Lilljeborg (1900), Stephensen (1913a, 1916).
Latona setifera var. *glacialis*: Haberbosch (1916, 1920).
Latona setifera incl. *L. glacialis*: Linder (1932).
Latona setifera: Haberbosch (1920), Bachmann (1921).

On the basis of the individuals of the species which I have had at my disposal, I do not think that there is any reason for maintaining the species set up by Wesenberg-Lund (1894, p. 104), neither as an independent species nor as a variety. I have had an opportunity to examine the slide which Wesenberg-Lund no doubt used when he set up the species *Latona glacialis*. The individual is in good agreement with the drawings found in Wesenberg-Lund (*loc. cit.* Plate II), but the animal has been somewhat deformed by the preparation so that the characteristics which are referred to as typical of the species, the pointedly recurrent lobe on the ventral side of the head, the shorter and broader body, no doubt have been intensified appreciably by the mounting. In the individuals I have otherwise had an opportunity to examine, these characters are not different from those found in Danish individuals of the species. Even if Greenland is the only place in which *Latona setifera* occurs in an arctic area, I do not think, either, that this is sufficient to maintain a special name.

As to the name of *glacialis*, it is not quite clear to me what Haberbosch (1920) and Linder (1932) actually think. Haberbosch in the footnote on p. 141 uses the name of *Latona setifera* var. *glacialis*, whereas elsewhere in his work (e.g. the list of species on p. 173 and in the tables in the Appendix) he uses *Latona setifera*, and Linder includes *L. glacialis* in *L. setifera* without stating his attitude to the problem of species, even though he deals with the whole of the arctic fauna, of which, as stated above, the Greenland occurrence of *Latona setifera* is the only one known.

Holopedium gibberum Zaddach 1855.

Greenland records:

Holopedium gibberum: de Guerne et Richard (1889), Lilljeborg (1900), Stephensen (1913 a), Haberbosch (1916, 1920), Bachmann (1921), Linder (1932), Røen (1962).

Lilljeborg (1900) writes in his description of this species (p. 59) that the females in northern regions are considerably larger than those in southern regions. He gives measures of 2.2 mm in length and 2.5 mm in height, without the gelatinous mantle. My specimens of the species

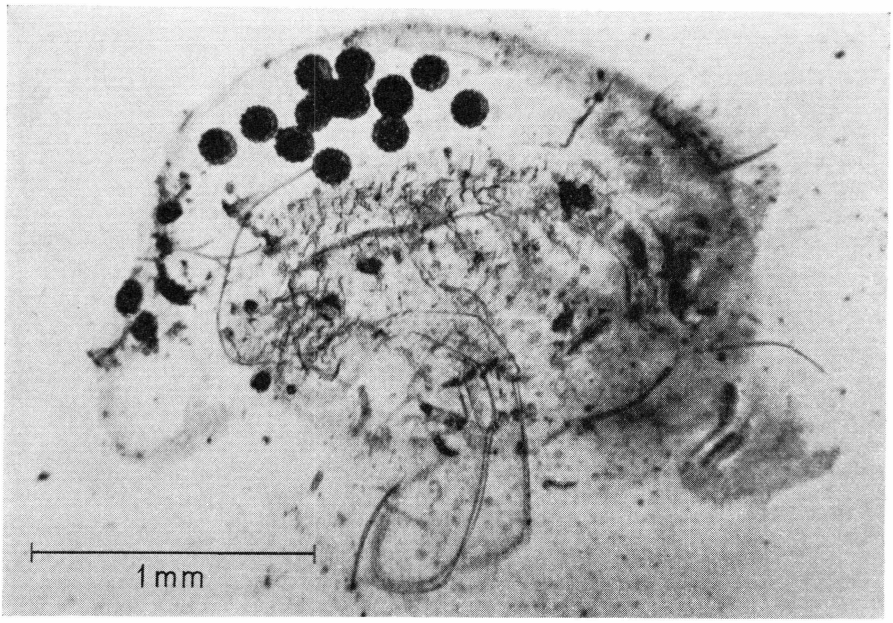


Fig. 27. *Holopedium gibberum* ZADDACH. Photomicrograph. Loc. 62, Lake at Evqitsoq, Disko Fjord. 29.7.1957.

do not attain to this size at all. The largest specimens I have measured, was 1.8 mm in length and 0.8 mm in height. It is characteristic of all the specimens I have seen from Greenland, that their height is considerably smaller than their length, while the reverse seems to be the case of the species in more southerly regions. As, however, the specimens do not on any other point differ from the description of the species given by LILLJEBORG, I do not think there is any reason to suppose that there is a particular high arctic variety, but only that the species in Greenland, because of the short growing season, cannot obtain the size which characterizes the species farther south.

Fig. 27 shows a typical Greenland specimen.

Daphnia pulex (DE GEER) 1778.

Greenland records:

Daphne pulex: FABRICIUS (1780).

Daphnia rectispina: KRØYER (1838), REINHARDT (1857), SCHIØDTE (1857), ORTMANN (1901).

Daphnia groenlandica: WESENBERG-LUND (1894, 1895), STEPHENSEN (1913 a).

Daphnia pulex: WESENBERG-LUND (1894, 1895), VANHÖFFEN (1897), LILLJEBORG (1900), BREHM (1911), JOHANSEN (1912), STEPHENSEN (1913 a, b, 1916), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1940 a, b), SØGAARD ANDERSEN (1946), POULSEN et LESSE (1951), RØEN (1958 a, b, 1959).

Daphnia middendorffiana: BROOKS (1957).

It is with some doubt that I list *Daphnia rectispina* KRØYER as a synonym of *D. pulex*. The description is not unambiguous and for that matter as well fits the species *D. longispina* and *D. catawba*, and unfortunately it is not possible at present to clear up the question of the specimens KRØYER had before him. But as he had received his specimens from Godthåb, collected by VAHL, and as no other species of the genus *Daphnia* are known with certainty from Godthåb, it seems justifiable to consider the two species as synonymous, a point of view which was shared by WESENBERG-LUND (1894, p. 115). On the other hand the species from Greenland determined by WESENBERG-LUND as *Daphnia Schäfferi* (BAIRD) (= *D. magna* STRAUSS) was also collected by VAHL "from an unspecified locality" (WESENBERG-LUND 1894, p. 113), so it might be this specimen which was examined by KRØYER, as it is not possible on the basis of KRØYER's text to decide whether he had one or more specimens at his disposal.

As to *D. groenlandica* WESENBERG-LUND, it may be stated that I have had the material from Danmarks Ø at my disposal for examination, and I cannot see that it differs from *D. pulex*.

BROOKS (1957, p. 47 ff.) is of opinion that the *Daphnia* species found in Greenland is *D. middendorffiana* FISCHER. He bases this on the drawings found in POULSEN (1940 a, pp. 11–12). According to BROOKS (p. 49) the characteristic differences between *D. pulex* and *D. middendorffiana* are as follows:

	pulex	*middendorffiana*
Size (length, head and valves)	Usually between 2 and 2.5 mm, rarely up to 3.5 mm.	2–3.5, often over 2.5 mm.
Coloration of exoskeleton	Although tissues sometimes brown, exoskeleton of dorsal region of head never distinctly brown.	Dorsal region of head and first joint of antennae often distinctly brown.
Spinulation of ventral margin of valves.	Confined to posterior half of margin	Often extends on to anterior $^1/_2$ of margin.
Shell spine	Usually short, less than $^1/_4$ length of valves.	Usually long, up to $^1/_3$ length of valves, rarely short.
Anal teeth	Usually 12–17, rarely 18.	Usually 18–24, may be as few as 12.

Drawings and information in POULSEN as compared with the table above in my opinion show that POULSEN had *D. pulex* before him.

Size: The largest specimen is 3.00 mm (– spine), while the normal is 2.00 mm. Colour: There may occur populations consisting of exclusively pale animals, exclusively dark animals, or mixed populations. The spinulation cannot be seen in POULSEN. Spine: In dark as well as pale adult animals it always constitutes less than 20 per cent of the total length (= less than 25 per cent of the length less the spine). In very young animals the length of the spine is comparatively much greater. On the animal drawn (p. 12) it constitutes $^1/_7$ of head + valves. Anal teeth: In the drawing (p. 11) 11 anal teeth are seen. Thus there is no doubt that the individuals POULSEN had before him belong to what BROOKS describes as *D. pulex*.

Nor have I in my own collections found specimens which can justly be referred to *D. middendorffiana*. In some of the populations, especially those from East Greenland and Thule, there may be many dark-coloured individuals, but this character is never combined with other characters typical of *D. middendorffiana*. The spinulation of the posterior part of the valves may be more or less pronounced, but never projects over the anterior half. The number of anal teeth varies between 10 and 18, is generally 14–17, and the spine in adult specimens is quite short or almost only suggested. The middle pecten on the furcal claws consists of 4–8 strong teeth, which normally increase in size distally.

The largest individuals are 4.1 mm (– the spine), and the smallest adults (the smallest ♀ found with ova) are 1.3 mm.

Daphnia catawba COKER, 1926.

New to Greenland.

As far as I can see from the available literature, this species has not previously been found in Greenland. It is considerably smaller than the other *Daphnia* species found there, and is quite hyaline. It differs from *D. longispina* by the arrangement of the pectens on the furcal claws, and from *D. pulex* by the shape of the anterior edge of the head. In *D. pulex* this is always pronouncedly concave, but in *D. catawba* it is straight or only slightly concave. Furthermore, the eye, as seen from one side, is clearly separated from the anterior edge of the head. The only species for which it can be mistaken, is *D. schödleri*, but it can be distinguished from this species by its long spine, which mostly is more than half of the length of the valves, while in *D. schödleri* it is only one third of this length.

The species is quite hyaline, and besides the characters mentioned above, it is characterized by the following: the ocellus is situated closer to the eye than to the anterior edge of the head, the number of anal teeth is 8–11, the median pecten of the furcal claws has only 2–5 teeth.

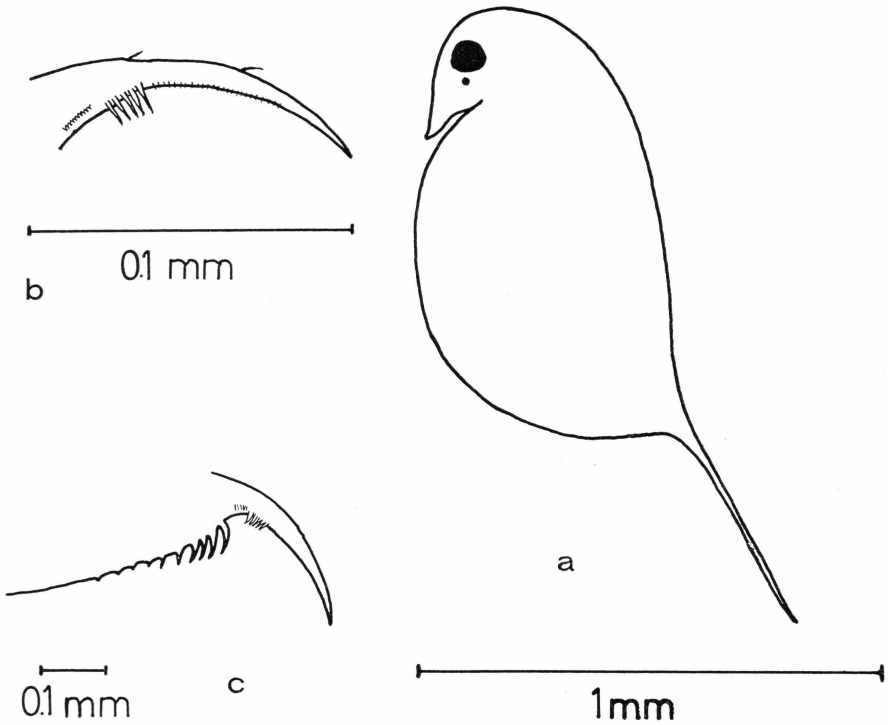


Fig. 28. *Daphnia catawba* Coker. (a) Total. (b) Furcal claw. (c) Distal part of abdomen with furcal claw. Loc. 154, Small Lake, Geographical Society Ø. 25.8.1958.

It is a rather small species, which normally has a length (including the spine) of 1.6–2.0 mm.

Daphnia longispina O. F. Müller 1785.

Greenland records:

Daphnia longispina: de Guerne et Richard (1889), Linder (1932).
Daphnia hyalina: Lilljeborg (1900).
Daphnia galeata: Wesenberg-Lund (1894), Lilljeborg (1900), Stephensen (1913a).

Haberbosch (1920, pp. 167–169) considers the occurrence of *D. longispina* in Greenland as very doubtful, as he was unable to demonstrate the occurrence of the species in his own material. He would not, however, exclude the possibility.

I have only found the species in two localities, in which it was the only occurring *Daphnia* species. It differs clearly from *D. pulex* by lacking the clear division of the row of true teeth of the furcal claws into three pectines, and even if sometimes there may be tentative efforts at a division of the row of fine teeth, these are always of the same size.

The previous findings of the species from Greenland have been referred to the variety *galeata*, but as far as I can judge, the specimens found by me approach to *D. longispina pulchella* G.O.SARS, as they are characteristic by being rather small, the largest specimen (– spine) found being 1.6 mm and hyaline. The rostrum is short, truncated, and the spine is mostly somewhat retroflex. The crista is missing or is very poorly developed.

The animals found by me thus correspond to the description of the species given by LILLJEBORG (1900) and WAGLER (1912).

Scapholeberis mucronata (O.F.MÜLLER) 1785.

Greenland records:

Scapholeberis mucronata: DE GUERNE et RICCARD (1889), WESENBERG-LUND (1894, 1895), VANHÖFFEN (1897), LILLJEBORG (1900), STEPHENSEN (1913 a, 1916), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1940 a), POULSEN et LESSE (1951), RØEN (1959, 1962).

The specimens of this species found by me are all in good agreement with the description given by LILLJEBORG (1900). The forma *cornuta* seems to be very rare in Greenland, having been found in two localities only, one on the east coast and one in South Greenland.

Simocephalus vetulus (O.F.MÜLLER) 1776.

Greenland records:

Simocephalus vetulus: WESENBERG-LUND (1894), LILLJEBORG (1900), STEPHENSEN (1913 a), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1940 a), SØGAARD ANDERSEN (1946), POULSEN et LESSE (1951).

Simocephalus exspinosus?: WESENBERG-LUND (1894, 1895), LILLJEBORG (1900), STEPHENSEN (1913 a).

POULSEN (1940 a, p. 20) supposes that the species described by WESENBERG-LUND as *S. exspinosus* (KOCH)? was described on the basis of poor specimens of the species *S. vetulus* common on both the east coast and the west coast of Greenland. HABERBOSCH (1920, p. 34) is of opinion that the specimens in question may belong to *S. sibiricus* SARS, as *S. exspinosus* is not an arctic species. I have had an opportunity to examine the specimens which WESENBERG-LUND had at his disposal and cannot see that they differ in structure from *S. vetulus*. WESENBERG-LUND mentions that "mac. cerebralis has the rhomboidal structure characteristic of *S. exspinosus*;" but this character is much more typical of *S. vetulus*. Besides, the specimens used by WESENBERG-LUND as microscopical preparations are highly compressed and somewhat deformed, and as furthermore they have a vigorous ephippial formation, they look a little odd, but they all belong to the species *S. vetulus*.

Nor have I in my own material found other species of the genus *Simocephalus* than *S. vetulus*. They are all in good agreement with the description in LILLJEBORG (1900).

Ceriodaphnia quadrangula (O.F. MÜLLER) 1785.

Greenland records:

Ceriodaphnia quadrangula: WESENBERG-LUND (1894), VANHÖFFEN (1897), LILLJEBORG (1900), STEPHENSEN (1913 a, b, 1916), HABERBOSCH (1916, 1920), BACHMANN (1921), POULSEN et LESSE (1951), LINDER (1932).

The specimens found by me are in good agreement with the description in LILLJEBORG (1900).

Several authors, especially WAGLER (1937) and BERG and CLEMENS PETERSEN (1956), have shown that *Ceriodaphnia quadrangula* s. str. is connected with f. *hamata* through an even transition. In several localities I have, indeed, found this form, which especially is characteristic by the fact that the fornix is prolonged by a more or less vigorous spine, though not in its most typical development. BERG and CLEMENS PETERSEN (*loc. cit.* p. 150) have set up four types, a, b, c, d, of which a is *C. quadrangula* s. str., d is f. *hamata* and b and c are less, respectively more strongly developed intermediate forms. In my material I have only found the types a, b, and c, whereas typical f. *hamata* has not been found in Greenland.

Bosmina longirostris (O.F. MÜLLER) 1785.

Greenland records:

Bosmina longirostris: HABERBOSCH (1916), BACHMANN (1921), LINDER (1932), POULSEN (1940 a), SØGAARD ANDERSEN (1946).

Bosmina longirostris-brevicornis: HABERBOSCH (1920).

Bosmina longirostris-pellucida: HABERBOSCH (1920).

Of this species LILLJEBORG (1900) has set up a series of varieties which have the common feature that the furcal claw is set with a row of fine bristles. Among the specimens of the species found by me there are representatives of a number of the varieties, often several varieties together in the same locality.

Bosmina coregoni obtusirostris G.O. SARS 1861.

Greenland records:

Bosmina arctica: DE GUERNE et RICHARD (1889), WESENBERG-LUND (1894, 1895), STEPHENSEN (1913 a).

Bosmina obtusirostris: WESENBERG-LUND (1895), VANHÖFFEN (1897), STEPHENSEN (1913 b, 1916), HABERBOSCH (1916), LINDER (1932).

Bosmina obtusirostris var. *arctica*: LILLJEBORG (1900).

Bosmina obtusirostris var. *alpina*: WESENBERG-LUND (1894), STEPHENSEN (1913 a).
Bosmina coregoni: POULSEN et LESSE (1951).
Bosmina coregoni-obtusirostris: HABERBOSCH (1920), BACHMANN (1921) POULSEN (1940 a), RØEN (1962).

The row of denticles on the furcal claws clearly shows that the specimens I have referred to this form belong to the species *Bosmina coregoni* BAIRD. Descriptions and figures of *B. c. obtusirostris* in LILLJEBORG (1900) also are in complete agreement with the form of which I have had specimens at my disposal; thus it is characteristic that in the Greenland form there is no seasonal variation.

Macrothrix hirsuticornis NORMAN and BRADY 1867.

Greenland records:

Macrothrix arctica: WESENBERG-LUND (1894), STEPHENSEN (1913 a).
Macrothrix rosea: WESENBERG-LUND (1894), STEPHENSEN (1913 a).
Macrothrix hirsuticornis var. *groenlandica*: LILLJEBORG (1900).
Macrothrix hirsuticornis: BREHM (1911), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1940 a), RØEN (1962).

HABERBOSCH (1920, p. 170) and POULSEN (1940 a p. 25) discuss WESENBERG-LUND's statement of *M. rosea*, and both of them find that it cannot be this species that has been drawn in WESENBERG-LUND's Plate III, fig. 12, d. HABERBOSCH points out that it must be *Streblocerus serricaudatus*, as "die Figur 12. d. zeigt aber deutlich (4 Borsten am Unterrand der Vorderfühler), dass es sich um *S. serricaudatus* handelt," whereas POULSEN shows that this drawing says nothing to that effect, as the two species of *Macrothrix* as well as *Streblocerus* have six setae in the place in question. Furthermore, he says that HABERBOSCH's statement is erroneous, as the drawing in question only shows three setae. This is perfectly correct, WESENBERG-LUND's drawing of his *M. rosea* only shows three setae; but there is no doubt that HABERBOSCH must have looked at the wrong drawing, as WESENBERG-LUND's drawing of *M. arctica*, Plate III, fig. 12 a, shows four setae and three spines (whereas the drawing of the first pair of antennae of *M. arctica*, Plate III, fig. 12 c, shows six setae). Because of the club-shaped first antennae in fig. 12 d POULSEN concludes that WESENBERG-LUND neither had *M. rosea* nor *S. serricaudatus*. I agree with him in this, but want to add that in my opinion WESENBERG-LUND only had *M. hirsuticornis* at his disposal, and merely the fact that the specimen pictured had a well-developed ephippium, which had given it a slightly different shape and appearance, made him believe that he had *M. rosea* before him.

The specimens available in the material collected by me do not attain to the maximum size stated by WESENBERG-LUND, 2 mm, but

are of the same size as the specimens POULSEN had from the east coast. For that matter, they are in good agreement with the description of the species given by BERG (1933).

Streblocerus serricaudatus (FISCHER) 1849.

Greenland records:

Streblocerus serricaudatus: HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932).

In my material the species was found only in a few, but distinctly developed individuals. As stated under *Macrothrix hirsuticornis* (p. 146) I cannot recognize the supposition that WESENBERG-LUND should have reported this species from Greenland. Unfortunately HABERBOSCH (1920) does not give any description of his specimens of *Streblocerus serricaudatus*, so it must be concluded that they did not in any way deviate from the normal form.

My specimens do not attain to the maximum size stated in the literature (LILLJEBORG 1900), as the largest specimen is 0.5 mm long. However, the sigmoid first antenna and the serrate dorsal margin of the abdomen clearly show that this is the species examined.

Eurycercus glacialis LILLJEBORG 1887.

Greenland records:

Lynceus lamellatus: REINHARDT (1857), SCHIØDTE (1857), KRÖYER (1838).
Eurycercus lamellatus: WESENBERG-LUND (1894, 1895), STEPHENSEN (1913 a, 1916).
Eurycercus glacialis: DE GUERNE et RICHARD (1889), VANHÖFFEN (1897), LILLJEBORG (1900), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1940 a) POULSEN et LESSE (1951), KAISER (1959).

All the specimens collected by me are in good agreement with the description given by LILLJEBORG (1900).

In the literature there is some uncertainty whether *Eurycercus lamellatus* has actually been found in Greenland. WESENBERG-LUND is of opinion that *E. glacialis* must be considered a synonym of *E. lamellatus*, as he has not on the basis of the description been able to distinguish between the two species. In this connexion it should be considered that WESENBERG-LUND only had LILLJEBORG's description of *E. glacialis* from 1887 at his disposal, and this is not complete, as the first complete description of the species is the one by LILLJEBORG from 1900. WESENBERG-LUND is of opinion that certain animals, viz. the large autumnal forms, are identical with LILLJEBORG's *E. glacialis*, while the spring and summer forms are *E. lamellatus*.

HABERBOSCH (1916, 1920) in Greenland found only *E. glacialis* and was of opinion that this is the only species occurring there, while

POULSEN (1940 a), who also only had *E. glacialis*, does not think it out of the question that *E. lamellatus* also may occur in Greenland.

I have had an opportunity to examine WESENBERG-LUND's material and have been unable to find specimens different from typical *E. glacialis*. All specimens had less than 100 teeth on the posterior margin of the abdomen, and the ratio between height and length was also in good agreement with LILLJEBORG's description. As to the other characters set up by LILLJEBORG, such as the form and armament with setae on the second antenna, indentations in the dorsal margin immediately behind the main carapace, I have not been able to find specimens which might be referred to *E. lamellatus*, either. Therefore I take it for granted that the only representative of the genus *Eurycercus* in Greenland is *E. glacialis*.

Acroperus harpae (BAIRD) 1835.

Greenland records:

Acroperus leucocephalus: DE GUERNE et RICHARD (1889) WESENBERG-LUND (1894, 1895), VANHÖFFEN (1897), STEPHENSEN (1913a, 1916).

Acroperus angustatus: WESENBERG-LUND (1894), LILLJEBORG (1900), STEPHENSEN (1913a).

Acroperus harpae: LILLJEBORG (1900), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1946), POULSEN et LESSE (1951), RØEN (1962).

The specimens found by me are in good agreement with descriptions given by LILLJEBORG (1900).

Acroperus harpae f. *angustatus*, which by WESENBERG-LUND with some uncertainty was reported from Jakobshavn on the basis of one specimen, does not occur in my collections. I have had an opportunity to examine WESENBERG-LUND's specimen. It is 0.67 mm long and 0.39 in height, i.e. that the height constitutes 58 per cent of the length, not, as stated by HABERBOSCH, 56 per cent. As WESENBERG-LUND did not give any measures, HABERBOSCH must have got his figures from measurements of WESENBERG-LUND's drawing, which does not resemble the available specimen very clearly. In fig. 29 I have indicated length and height of those specimens of WESENBERG-LUND which are available in a prepared state, as compared with specimens from my own collections made in one locality at different times. The two specimens from Danmarks Ø have quite the same dimensions as the animals from my collections, whereas the specimen from Jakobshavn is a little lower than mine, though no lower than it being possible to refer the specimen to *Acroperus harpae* s. str. It should be noted that oblique embedment in the preparation, as supposed by HABERBOSCH (*loc. cit.* p. 34), is out of the question.

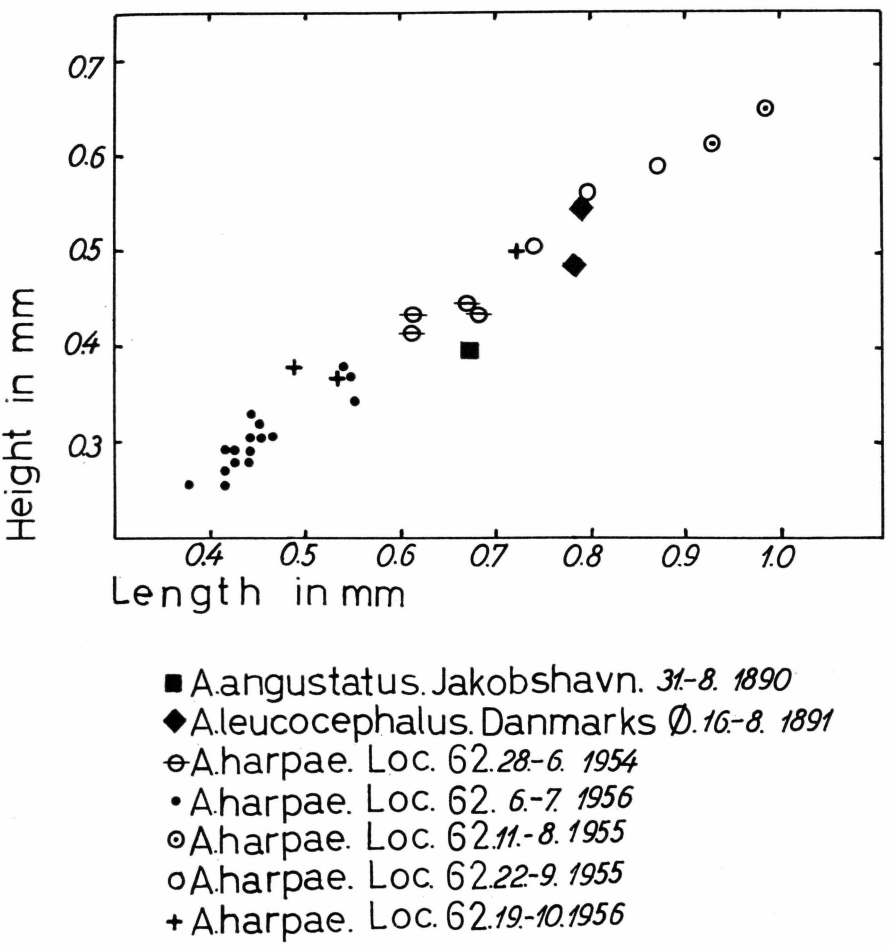


Fig. 29. *Acroperus harpae* (BAIRD). Height and length of the specimens in WESENBERG-LUND's microscopical preparations as compared with those of specimens from Loc. 62, Lake at Evqitsoq, Disko Fjord.

On the other hand I have in a few collections found specimens which must be referred to *A. harpae* var. *frigida* EKMAN, which differs from the main species by the fact that the carina of the head is missing.

Alona guttata G. O. SARS 1862.

Greenland records:

Alona guttata: HABERBOSCH (1916, 1920), LINDER (1932).

Alona guttata is the most easily recognizable Greenland species of the genus *Alona*, as this species is the only one having a distally tapering

post-abdomen. The individuals which have been at my disposal all belong to the typical form as described by LILLJEBORG (1900), with a smooth or slightly striated carapace.

Alona intermedia G.O.SARS 1862.

Greenland records:

HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932).

The specimens collected of this species all agree very well with the descriptions of the species LILLJEBORG (1900); with the great dorsal extension of the distal end of the post-abdomen, with the small size (largest 0.44 mm), and with the longitudinal striation of the carapace.

Alona rectangula G.O.SARS 1861.

Greenland records:

Lynceus rectangulus: BREHM (1911), STEPHENSEN (1913 a).
Alona rectangula: HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1940 a).

The specimens of this species do not differ from the typical *A. rectangula* as described by LILLJEBORG (1900). Individuals with rows of small hamuli on the carapace (var. *pulchra*) have not been found in collections.

Alona quadrangularis (O.F.MÜLLER) 1785.

Greenland records:

Alona quadrangularis: HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932).

The specimens found agree in all respects with the description given by LILLJEBORG (1900).

Alona affinis (LEYDIG) 1860.

Greenland records:

Lynceus affinis: WESENBERG-LUND (1894), LILLJEBORG (1900), STEPHENSEN (1913 a, 1916).
Alona affinis: DE GUERNE et RICHARD (1889), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1940 a), POULSEN et LESSE (1951), RØEN (1962).

The specimens of the species examined are in good agreement with the description in LILLJEBORG (1900), though I have not in any case seen individuals with a hexagonal structure on the carapace. Only a marked longitudinal striation with transversal connexions has been observed.

Graptoleberis testudinaria (Fischer) 1848.

Greenland records:

Graptoleberis testudinaria: Lilljeborg (1900), Haberbosch (1916, 1920), Bachmann (1921), Linder (1932).

My specimens of the species are all rather small, the maximum size being 0.5 (♀) and 0.4 (♂) mm, while the other structural features are in perfect agreement with the individuals described by Lilljeborg (1900).

Alonella nana (Baird) 1850.

Greenland records:

Pleuroxus nanus: de Guerne et Richard (1889), Wesenberg-Lund (1894), Stephensen (1913 a).

Alonella nana: Lilljeborg (1900), Haberbosch (1916, 1920), Bachmann (1921), Linder (1932), Poulsen et Lesse (1951).

This is the smallest species of Cladocera occurring in Greenland. I have examined many individuals, but I have not found any specimens differing from those described by Lilljeborg (1900).

Alonella excisa (Fischer) 1854.

Greenland records:

Pleuroxus excisus: De Guerne et Richard (1889).

Pleuroxus exiguus: Wesenberg-Lund (1894), Vanhöffen (1897), Stephensen (1913 a).

Alonella excisa: Lilljeborg (1900), Haberbosch (1916, 1920), Bachmann (1921), Linder (1932), Poulsen (1940 a), Poulsen et Lesse (1951), Røen (1962).

Haberbosch (1920, p. 171) and Poulsen (1940 a, p. 35) are of opinion that the species reported by Wesenberg-Lund and Vanhöffen actually is *A. excisa*, as Wesenberg-Lund's drawing of the species by the low height shows that this is the species he had before him and not *A. exigua*. However, it is not possible in Wesenberg-Lund's drawing to see the systematically important teeth on the posterior lower corner of the carapace. I have had an opportunity to see the specimen on the basis of which Wesenberg-Lund in all probability made his drawing, as this was the only one found as a preparation, and this specimen was a typical *A. excisa*. The fact that this preparation was marked *A. excisa* proves that Wesenberg-Lund himself was in doubt as to the determination.

I have been unable to find *A. exigua* also in the other material which I have had at my disposal.

Chydorus sphaericus (O.F.MÜLLER) 1785.

Greenland records:

Chydorus sphaericus: DE GUERNE et RICHARD (1889), WESENBERG-LUND (1894, 1895), VANHÖFFEN (1897), LILLJEBORG (1900), BREHM (1911), STEPHENSEN (1913 a, 1916), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN 1940 a, b,) SØGAARD ANDERSEN (1946), POULSEN et LESSE (1951), RØEN (1959, 1962).

WESENBERG-LUND (1894, p. 127) states that in his material he had a few larger, tawny specimens, which he for a long time had separated out as *Ch. ovalis* KURZ. However, he would not list this species under the Greenland species, as there seemed to be even transitions between the two species. I have examined WESENBERG-LUND's collections and only found *Chydorus sphaericus* in them. No individuals have the very short second antenna characteristic of *Ch. ovalis* which is only half the length of the rostrum, and in all of them the ocellus is a little smaller than the compound eye. Furthermore, all males have the very long and narrow abdomen.

Polyphemus pediculus (L) 1761.

Greenland records:

Polyphemus pediculus: DE GUERNE et RICHARD (1889), WESENBERG-LUND (1894, 1895), LILLJEBORG (1900), STEPHENSEN (1913 a, 1916), HABERBOSCH (1916, 1920), BACHMANN (1921), LINDER (1932), POULSEN (1940 a), SØGAARD ANDERSEN (1946), POULSEN et LESSE (1951), RØEN (1959).

WESENBERG-LUND (1894, p. 128) states that the specimens from the east coast examined by him have a longer abdomen and furca than other specimens he had seen. Such a structural feature has not been found by me in Greenland individuals, nor is it mentioned by other authors who have dealt with Greenland material. The Greenland specimens are in perfect agreement with those described by LILLJEBORG (1900).

Ostracoda.

Cypris pubera (O.F.MÜLLER) 1776.

Greenland records:

Cypris pubera: HABERBOSCH (1916, 1920), BACHMANN (1921).

The specimens from this species which I have examined, by no means differ from the descriptions of the species (VAVRA 1891, ALM 1916). In all my specimens the spine on the lower part of the posterior margin of the left carapace is very well-developed.

Eucypris affinis hirsuta (Fischer) 1851.

Greenland records:

Eucypris affinis hirsuta: Haberbosch (1916, 1920), Bachmann (1921).

Nor have I in this species found individuals differing from the typical form as described by Alm (1916). I have not succeeded in finding males of this species, so the male is still unknown from Greenland, although males have been found in several places in North America and Siberia (Alm 1914 a, p. 4).

Eucypris virens (Jurine) 1820.

Greenland records:

Eucypris virens: Alm (1914 b), Haberbosch (1916, 1920), Bachmann (1921).
Cypris virens: Vanhöffen (1897), Stephensen (1913 a).

My specimens of this species by no means differ from the description given by Vavra (1891) and Alm (1916).

Cypris incongruens (Ramdohr) 1808.

Greenland records:

Cyprinotus incongruens: Alm (1914 b), Poulsen (1940 a).

The specimens of this species which have been available to me are in all conditions in close agreement with previous descriptions of the species (Alm 1914 a).

Prionocypris glacialis (G. O. Sars) 1890.

Greenland records:

Herpetocypris glacialis: Brehm (1911), Stephensen (1913 a).
Prionocypris glacialis: Poulsen (1940 a), Søgaard Andersen (1946).
Eucypris glacialis: Alm (1914 b).

Prionocypris glacialis var. *albida* (Alm) 1914.

Greenland records:

Eucypris glacialis var. *albida*: Haberbosch (1916, 1920), Bachmann (1921).
Prionocypris glacialis var. *albida*: Poulsen (1940 a).

In the literature there seems to be some uncertainty whether the main species and its variety show sufficient dissimilarity for the distinction to be allowable. Olofsson (1918 b, p. 514) is of opinion that the division is only allowable if the colour of the carapace alone is taken as a criterion, as he has found that the types pass gradually into one another as regards the relation between the lengths of the dorsal seta of the furca and the proximal claw. Poulsen (1940 a, p. 53) on the other

hand finds that besides the colour there may be a small, but distinct difference in the conditions mentioned.

The specimens which I have had at my disposal seem by measurements to give results close to those obtained by POULSEN. Unfortunately the numbers from each individual locality have been fairly small, so that it is impossible for me to say with certainty whether the variations are due to a definite difference between main species and variety, or whether local variations are decisive. It seems to me, however, that the white glossy carapace as compared with the greyish to brownish one of the main species, offers a sure criterion. Physically there is also a difference between the two forms. The carapace in var. *albida*, in the case of specimens preserved in formalin, very easily go to small sharp-edged pieces, while in the main species under the same conditions it is tough and elastic and is fairly easily removed whole.

It seems somewhat doubtful to me whether HABERBOSCH (1916, 1920, p. 176 actually had var. *albida* before him, as he without remarks considers *Eucypris glacialis* var. *albida* to be synonymous with the species *Herpetocypris glacialis* reported by BREHM.

My specimens of the species and the variety by no means differ from previous descriptions.

Candona candida (O. F. MÜLLER) VAVRA (1776) 1891.

Greenland records:

Candona candida: ALM (1914 b), HABERBOSCH (1916, 1920), BACHMANN (1921), POULSEN (1940 a), SØGAARD ANDERSEN (1946), POULSEN et LESSE (1951).

The specimens examined are in good agreement with former descriptions, VAVRA (1891), POULSEN (1940 a).

Candona lapponica EKMAN 1908.

Greenland records:

Candona lapponica: HABERBOSCH (1916, 1920), BACHMANN (1921).

My specimens of the species are in good agreement with those pictured by ALM (1916, p. 123). In all examples the genital lobe is rhomboidal, highly reminiscent of that in *C. candida*, whereas I have found no specimens which on this point remind of *C. caudata*.

Candona groenlandica BREHM 1911.

Greenland records:

Candona groenlandica: BREHM (1911), ALM (1914 b), HABERBOSCH (1916, 1920).

The specimens of this species examined by me are in good agreement with the description given by ALM (1914 a), particularly in the

form of the posterior part of the genital lobe, which tapers into a conical, rounded point.

Candona rectangula Alm 1914.

Greenland records:

Candona rectangula: Alm (1914 b), Haberbosch (1916, 1920), Bachmann (1921).

Regarding the shape of the genital papilla as well as the arrangement of the chitinous sculpturing the specimens which I have referred to this species, are in good agreement with the description of the species given by Alm (1914 b, p. 13).

Candona subgibba G.O.Sars 1926.

New to Greenland.

Among my specimens of the genus *Candona* there proved to be some that agreed with the above-mentioned species, which is most

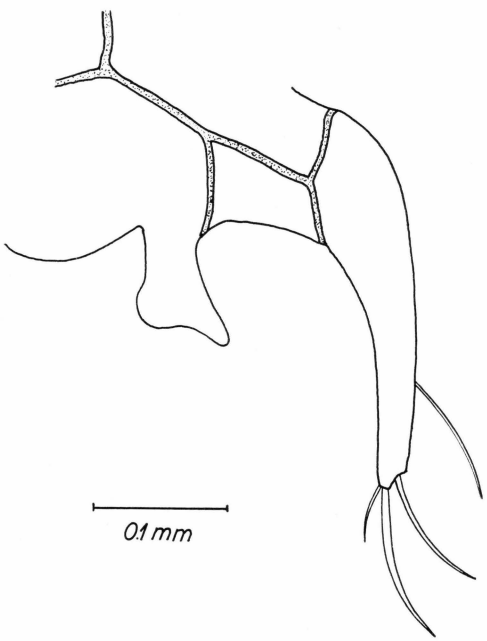


Fig. 30. *Candona subgibba* G.O.Sars. Furca and genital papilla. Loc. 16, Lake at Dundas. 8.9.1959.

easily recognizable by the shape of the genital lobe, which is very large and the posterior corner of which is drawn into a point. The shape of the furca and the arrangement of the chitinous sculpturing in my speci-

mens also are in good agreement with the drawing of the species given by SARS (*loc. cit.*, Plate IV).

There were no males in my material, so these are still unknown in this species.

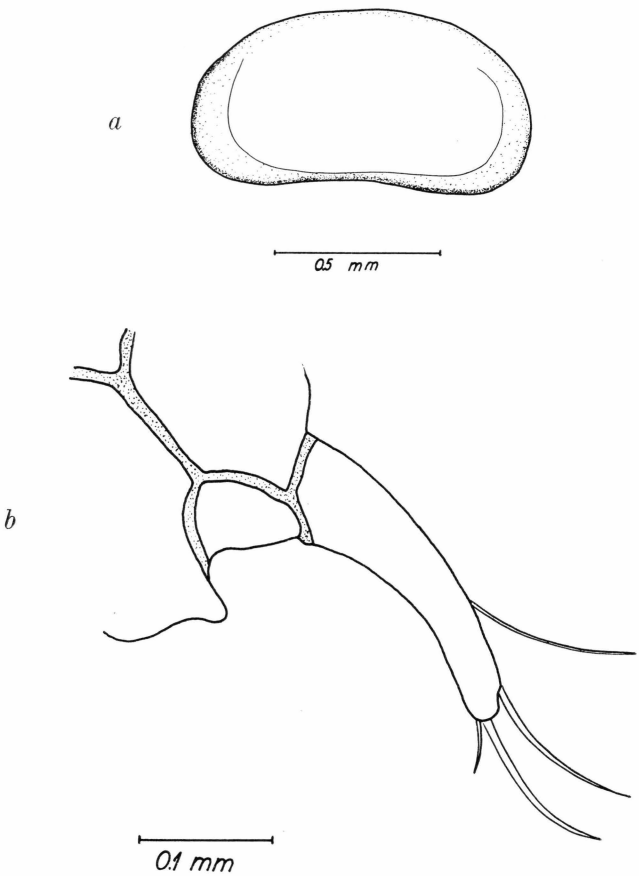


Fig. 31. *Candona falcata* ALM. (a) Valve. (b) Furca and genital papilla. Loc. 15, Mellemsø, Disko Fjord. 14.9.1954.

Candona falcata ALM 1914.

New to Greenland.

Among the specimens of the genus *Candona* collected by me there are some which must be referred to this species. It is true that ALM's species is set up on the basis of immature specimens, the genital papilla and copulatory organ of which were not fully developed, but still there is hardly any doubt that this is the species I had before me. The genital papilla posteriorly and below has a vigorous, rounded projection, while anteriorly it is low and plane as in *C. candida*. The shape only deviates

slightly from the drawing in ALM (1914 b, p. 15). The shape of the chitinous sculpturing, on the other hand, differs somewhat, as in my specimens there is a branch connected to the genital papilla, which ALM expressly states that his specimens have not. There is, however, hardly any doubt that this is due to the fact that I had fully developed specimens. Unfortunately there were no males in my material, so it has not been possible to have the copulatory organ described.

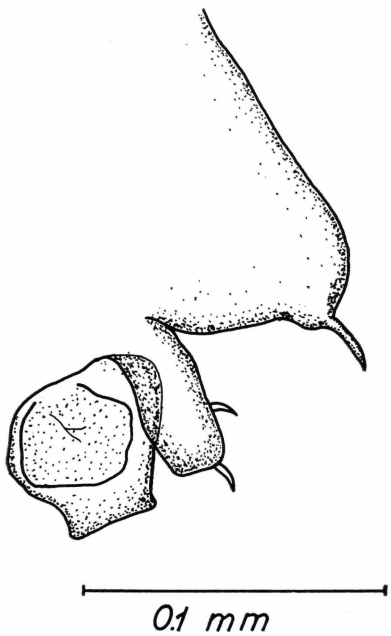


Fig. 32. *Limnocythere sanctipatrici* BRADY and ROBERTSON. Furca. Loc. 66, Pond on Kangârssuk, Fortunebay. 6.9.1956.

Limnocythere sanctipatrici BRADY and ROBERTSON 1869.

New to Greenland.

In my material there are a few Ostracoda which must be referred to this species. The specimens examined agree extremely well with the available descriptions of the species, VAVRA (1909), SARS (1928). The only deviation I have been able to find is that the dorsal margin of the furcal stem in my specimens is slightly curved, whereas in SARS's drawing it seems to be straight. However, this is hardly of importance for the identification of the species.

Copepoda.

Diaptomus castor (JURINE) 1820.

Greenland records:

STEPHENSEN (1916), HABERBOSCH (1916, 1920), BACHMANN (1921), MARSH (1929).

Besides the authors mentioned, BUCHHOLZ (1874, p. 392) has reported the species from East Greenland. This must, however, be due to an erroneous determination. It is stated that the specimen in question is 5.8 mm in length, that it was caught on February 22, and that it was caught in salt water. Furthermore it is stated "dass das Tier geleuchtet habe". These facts make it quite impossible that the specimen could be a *Diaptomus castor*.

The specimens found by me are in agreement with the descriptions given by SCHMEIL (1896) and GURNEY (1931).

Diaptomus minutus LILLJEBORG 1889.

Greenland records:

DE GUERNE et RICHARD (1889), VANHÖFFEN (1897), BREHM (1911), JOHANSEN (1912), STEPHENSEN (1913 a, b, 1916), HABERBOSCH (1916, 1920), BACHMANN (1921), MARSH (1929), POULSEN (1940 a), POULSEN et LESSE (1951), RØEN (1962).

My collections of the species agree in every way with the description given by STEPHENSEN (1913 b).

Eucyclops serrulatus (FISCHER) 1851.

New to Greenland.

In the literature this species has not previously been mentioned as belonging to the Fauna of Greenland. JOHNSEN (1953, p. 22), however, among the freshwater crustaceans in the lake Klaresø near Jørgen Brønlund Fjord mentions the species *Cyclops strenuus*. I have examined the material from Klaresø (p. 135) and found *Eucyclops serrulatus*, but not *Cyclops strenuus* in it. Habitually the two species resemble each other a good deal, but they can easily be distinguished by the number of segments of the first antenna, the shape of the fifth pair of legs, and the serration on the exterior side of the furcal branches in *Eucyclops serrulatus*. The formula of spines in this species is 3 4 4 3.

Cyclops (Cyclops) scutifer G.O.SARS 1863.

Greenland records:

Cyclops strenuus: VANHÖFFEN (1897), BREHM (1911), JOHANSEN (1912), STEPHENSEN (1913 a, b, 1916), HABERBOSCH (1916, 1920), BACHMANN (1921), POULSEN (1940 a), SØGAARD ANDERSEN (1946), POULSEN et LESSE (1951), RØEN (1958 b, 1959).

Cyclops rubens medianus (*groenlandicus*): LINDBERG (1957).
Cyclops rubens s. lat.: LINDBERG (1957).
Cyclops scutifer: DUSSART (1958), RØEN (1962).

I have been very much in doubt as to the determination of this species. LINDBERG (1957) seems to be of opinion that there are two different subspecies or varieties of *Cyclops rubens* (= *C. strenuus* s.str.) in Greenland, of which *Cyclops rubens medianus* (*groenlandicus*) occurs on the east coast (pp. 173, 227, 239, 249, and 257). The author is not quite

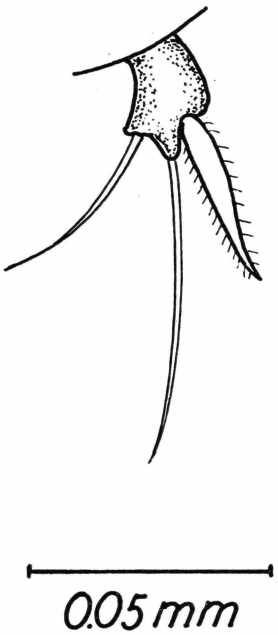


Fig. 33. *Eucuclops serrulatus* (FISCHER). Leg 5. Loc. 42, Pond Immediately North of the Cairn, Upernavik. 4.8.1959.

consistent, as (*groenlandicus*) is sometimes omitted or a ? is added, while the West Greenland form is mentioned partly as *Cyclops rubens* s. lat. (p. 175), partly as ? *Cyclops rubens medianus* (pp. 237, 257, 261), partly as ? *Cyclops rubens rubens* (*islandicus*) (p. 237), and finally as ? (p. 249). It should, however, be noted that LINDBERG, apart from one female from lat. 69°N., long. 50°13'W., only had specimens from the east coast at his disposal (specimens which had previously been treated by POULSEN (1940a)).

DUSSART (1958, p. 287) thinks that the form occurring in Greenland is *Cyclops scutifer*. It is not stated whether the author had any specimens at his disposal, but if so, they were most probably some of those treated by POULSEN et LESSE (1951), as these were collected by a French expedition. DUSSART furthermore (pp. 274–280) gives a key to the determination of *Cyclops strenuus* s. lat.

By examining the specimens I have had at my disposal, I have come to the following conclusions: It has not been possible for me to demonstrate any difference between specimens from the east and from the west coast. LINDBERG, indeed, writes about his specimen from the west coast: "cette femelle a differé considérablement de celles du Groenland Est," but he does not state in what characters the difference consists, and furthermore the locality is that from which POULSEN et LESSE have treated specimens under the name of *Cyclops strenuus* and which LINDBERG (p. 249) denotes with ? for the determination. This lack of

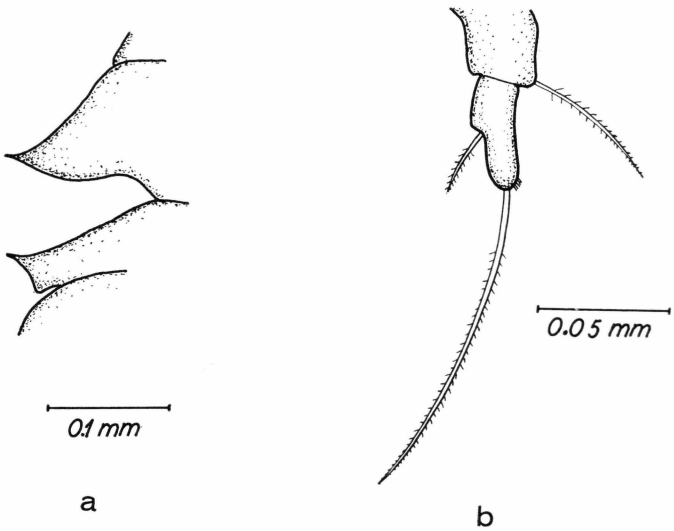


Fig. 34. *Cyclops scutifer* G.O.SARS. (a) Lateral part of 4th and 5th thoracal segment. (b) Leg 5. Loc. 48, Lake at Kingigtoq. 25.7.1959.

differences between my specimens of course makes me refer them to the same species, which according to DUSSART's key can only be *Cyclops scutifer scutifer*. The fourth and fifth thoracal segments are highly protracted laterally (fig. 34), the formula of spines is 3.4.3.3, and the ratio between length and breadth of the furcal branches is between 4.2 and 5.1. The only point on which my specimens seem to differ from DUSSART's description is in the size, as I have found specimens right up to a length of 1.85 mm, whereas DUSSART states the average to be 1.25 mm, though without indicating the range of variation.

Cyclops (Megacyclops) magnus MARSH 1920.

New to Greenland.

This very vigorous *Cyclops* species clearly differs from the other Greenland *Cyclops* species by the structure of the fourth and fifth pairs

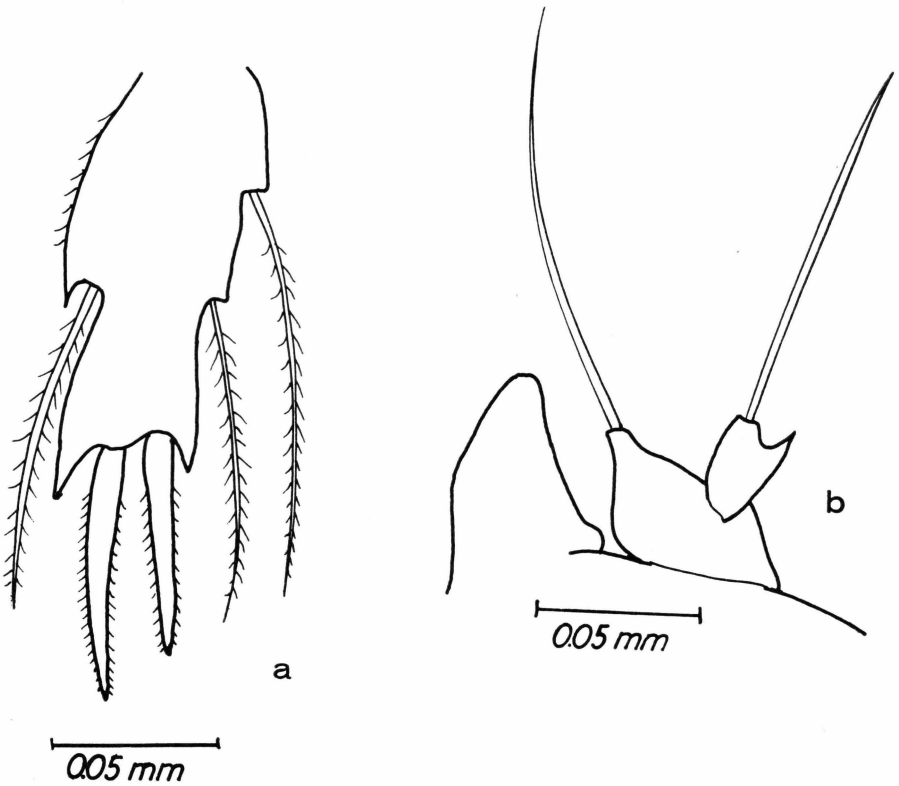


Fig. 35. *Cyclops* (*Megacyclops*) *magnus* MARSH. (a) Endopod 3 of Leg 4. (b) Leg 5 and lateral corner of 5th thoracal segment. Loc. 8, pond at the settlement Qeqertat. 20.8.1959.

of legs. On the fourth pair of legs the outmost terminal spine of Endopod 3 is longer than the inmost one. COMITA (1952, p. 338) states the ratio between them to be 1.16 and I have by measurements found between 1.08 and 1.19. On the outmost segment of the fifth pair of legs, the spine may be distinctly demarcated from the segment, while this limit is lacking in the closely related species *C. viridis*. The formula of spines of the species is 2 3 3 3.

My specimens of the species agree very well with the descriptions and drawings given by MARSH (1920), GURNEY (1933), and COMITA (1952).

GURNEY (1933, p. 192–193) discusses the problem whether *C. magnus* can be considered an independent species or whether it belongs to the species *C. gigas* CLAUS. To me there is no doubt that *C. magnus* is a good species, as among all species of the *viridis-vernalis* group it is the only one in which the outmost terminal spine of Endopodite 3 of

the fourth leg is longer than the inmost one. In this structural feature it is more clearly distinct from *C. gigas* than *C. gigas* is from *C. viridis*.

Cyclops (Acanthocyclops) vernalis FISCHER 1853.

Greenland records:

Cyclops brevicornis?: REINHARDT (1857).
Cyclops viridis: DE GUERNE et RICHARD (1889), STEPHENSEN (1916).
Cyclops vernalis: HABERBOSCH (1916, 1920), BACHMANN (1921).

HABERBOSCH (1920, p. 172) carefully explains why he considers the specimens described by DE GUERNE et RICHARD and STEPHENSEN as *C. viridis* to be *C. vernalis*. I have gone over his arguments, as I, too, have samples from the lake at Egedesminde and have had an opportunity to see the animals from Bredefjord determined by STEPHENSEN and like HABERBOSCH have found that these specimens belong to *C. vernalis* and *C. scutifer*. However, in STEPHENSEN's case there was a mistake of labels, the sample from 26. August 1912 from which the animals had been sorted out, containing some specimens of *C. vernalis*.

My specimens in all characters agree with the descriptions of the species. The formula of spines is 2 3 3 3.

It is difficult to judge whether this was really the species which REINHARDT had at his disposal; but it is the most probable, as the name used by him today is considered a synonym of *C. vernalis americanus* MARSH and *C. viridis* (JURINE).

Bryocamptus (Arcticocamptus) tikchikensis M. S. WILSON 1958.

Greenland records:

Canthocamptus cuspidatus: BREHM (1912), STEPHENSEN (1913 a), HABERBOSCH (1916, 1920), BACHMANN (1921), POULSEN (1940 a).
Bryocamptus (*Arcticocamptus*) *cuspidatus*: LANG (1948).
Bryocamptus (*Arcticocamptus*) *tikchikensis*: WILSON (1958).

The new species set up by M. S. WILSON (1958, p. 321 ff.) agrees in every respect with the specimens of the species which I have had at my disposal. It differs from *B.* (*A.*) *cuspidatus* in structure and in the armament of the furca and the third pair of legs. In *B.* (*A.*) *cuspidatus* the furcal branches are almost square, without a dorso-medial group of spinules, the outer seta is a little above the middle one, and the inner, curved seta has a swelling at its base. The third segment of the exopodite of the third pair of legs has six appendages. In *B.* (*A.*) *tikchikensis* the furcal branches are 1.5 times as long as broad, with a dorso-medial group of spinules. The outer and middle setae sit side by side and the

inner curved seta has no swelling at its base. The exopodite of the third pair of legs has only five appendages on the third segment.

The drawings in BREHM (1912, Plate 19, fig. 17) and POULSEN (1940a, fig. 19) show the conditions characteristic of *B.* (*A.*) *tikchikensis*,

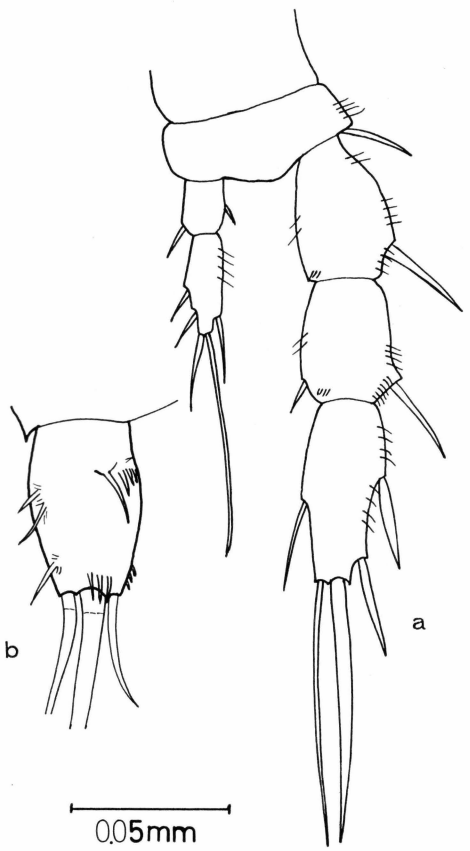


Fig. 36. *Bryocamptus* (*Arcticocamptus*) *tikchikensis* M.S. WILSON. (a) Leg 3. (b) Branch of furca. Loc. 12, larger lake, at Kangerdlugssuaq. 20.8.1959.

and I have furthermore gone through some of their material and have not found *B.* (*A.*) *cuspidatus* in it. WILSON (p. 327) writes about HABERBOSCH: "If Haberbosch (1916) is correct, both *cuspidatus* and Brehm's form (? *tikchikensis*) occur in Greenland— —." This remark must be referred to the footnote in HABERBOSCH (1916, p. 142), where i.a. it says: "*Canthocamptus cuspidatus* liegt nicht nur in der von Brehm als für Grönland charakteristisch angesehenen Form vor, sondern auch in der Ausbildung, wie sie in Nordschweden auftritt."

However, I have never seen types of *Bryocamptus tikchikensis* in Greenland other than that described by WILSON, even though several of my localities in Godhavn presumably are the same as those from which HABERBOSCH had specimens. Therefore I think that all specimens referred to *Bryocamptus cuspidatus* actually belong to *B. tikchikensis*.

Bryocamptus (Arcticocamptus) arcticus (LILLJEBORG) 1902.

Greenland records:

Canthocamptus arcticus: HABERBOSCH (1916, 1920), BACHMANN (1921).
Bryocamptus (Arcticocamptus) arcticus: LANG (1948).

The specimens of this species which I have had at my disposal, in no way differ from the description of the species given by LANG (*loc. cit.* p. 1096f.).

Moraria mrazeki T. SCOTT 1903.

Greenland records:

? *Canthocamptus duthiei*?: BREHM (1911), POULSEN (1940a).
Moraria schmeili: HABERBOSCH (1916, 1920), BACHMANN (1921).
Moraria mrazeki: LANG (1948).

It has been impossible for me to have the problem unravelled whether the ♂ of *C. duthiei* mentioned by BREHM (1912, pp. 312–313) is actually identical with *M. mrazeki*, as the specimen does not exist any longer. BREHM was not himself quite sure of the determination of the specimen, as he writes: "Da von diesem mit *C. duthiei* verwandten oder vielleicht identischen *Canthocamptus* nur ein ♂ zur Beobachtung gelange, bin ich nicht in der Lage zu entscheiden, ob es sich um eine neue oder um eine bekannte Art handelt." And further: "... der 1. Antenne und z. T. auch der Bau des rudimentären Füsschens würden für *duthiei* sprechen." Now, there is a great similarity in structure of the fifth pair of legs between *M. duthiei* and *M. mrazeki*, so great that the remark "z. T." is fully justified. Indeed, HABERBOSCH (1916, p. 137, and 1920, p. 170) is of opinion that BREHM's specimen belongs to *M. schmeili*, arguing that it is the only species of the genus *Moraria* which has otherwise been found in Greenland. LANG (1948, p. 1040f.) refers all Greenland finds of the genus *Moraria* to *M. mrazeki*, and indeed all the specimens of the genus *Moraria* found by me are in good agreement with the description given by LANG (*loc. cit.*).

Maraenobiotus brucei (Richard) 1898.

Greenland records:

Maraenobiotus brucei?: Brehm (1911), Stephensen (1913 a), Poulsen (1940 a).
Maraenobiotus brucei: Johansen (1913), Haberbosch (1920), Lang (1947).
Maraenobiotus Danmarkii: Brehm (1911), Stephensen (1913 a), Poulsen (1940 a), Søgaard Andersen (1946).
Maraenobiotus vejdovskyi?: Haberbosch (1916).
Maraenobiotus sp.: Bachmann (1921).

The specimens of this species examined by me in every respect agree with the description of the species given by Olofsson (1917). In this work he emphasized (pp. 20–21) that it is not possible on the basis of Brehm's description of *M. Danmarkii* to distinguish this species from *M. brucei*. Lang (1948, p. 1024) refers *M. Danmarkii* to the species *incerta*, stating: "Die Art steht offenbar *M. brucei* sehr nahe und ist vielleicht mit dieser identisch."

Some of the specimens examined by me originate from localities from which Poulsen (*loc. cit.*) has *M. Danmarkii*. Nor do these specimens differ from *M. brucei* (*fide* Olofsson), so I am of opinion that *M. Danmarkii* must be considered synonymous with *M. brucei*.

Maraenobiotus insignipes (Lilljeborg) 1902.

Greenland records:

Maraenobiotus insignipes: Haberbosch (1916, 1920), Lang (1948).
Maraenobiotus sp.: Bachmann (1921).

All specimens of this species examined are in good agreement with the descriptions of the species given by Olofsson (1917) and Lang (1948).

Heterolaophonte strömi (Baird) 1837.

Greenland records:

Laophonte curticauda: Wesenberg-Lund (1895), Stephensen (1913 a) Jespersen (1939).
Laophonte strömi: Madsen (1936), Jespersen (1939).

Previous Greenland findings have all been made in salt or brackish water.

From Loc. 62 I have in my collections two specimens of this species and one of the following species. In every respect the available specimens agree with the description of the species given by Lang (1948, p. 1368). The very slender legs of the first pair and the armament of spinules of the fifth pair of legs should be pointed out as particularly characteristic of the species.

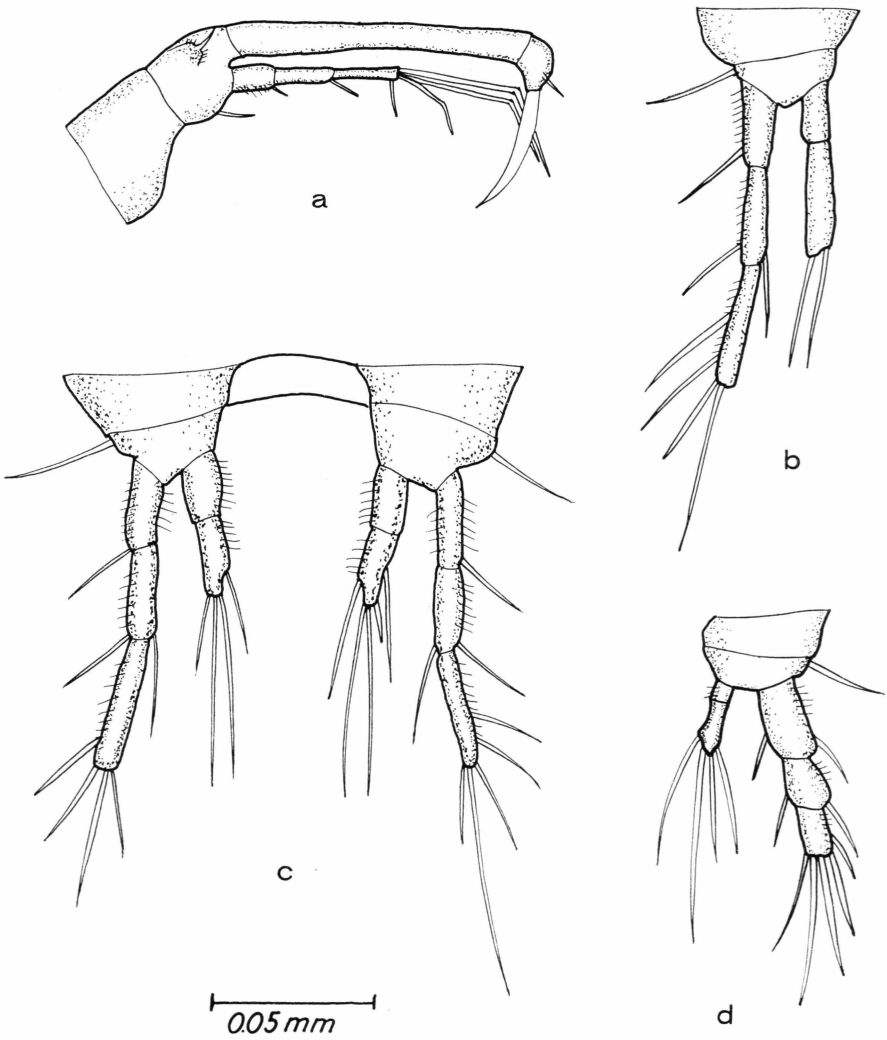


Fig. 37. *Heterolaophonte* sp. (a) Leg 1. (b) Leg 2. (c) 3rd pair of legs. (d) Leg 4. Loc. 62, Lake at Evqitsoq, Disko Fjord. 11.8.1955.

Heterolaophonte sp.

New to Greenland.

The specimen of the genus *Heterolaophonte* LANG to be discussed here cannot with certainty be referred to any known species within the genus, nor is it possible, because of asymmetry of the third pair of legs, to describe it as a new species. The specimen is a female, fully developed, and the key set up by LANG (1948, p. 1366) leads to *H. minuta* (BOECK).

In certain respects the specimen agrees completely with LANG's description of *H. minuta*. Thus the second antenna, the first and fifth pairs of legs and the furca of my specimen are just as described and pictured in LANG (1948, pp. 1371–72), but the armament of the second, third, as well as the fourth pairs of legs differ, even though the shape of the individual segments of these legs agree with those of *H. minuta*.

The formulae of setae on these pairs of legs in *H. minuta* and my specimen are as follows:

	P 2								P 3								P 4							
	Exp.				Enp.				Exp.				Enp.				Exp.				Enp.			
	2		3		1		2		2		3		1	2			2		3		1		2	
H. minuta	1	1	2	3	0	2	2	0	0	1	2	3	0	3	2	1	0	0	2	2	0	1	2	1
H. sp.	1	0	2	2	0	0	2	0	1	1	2	2	0	2	2	1	1	1	2	2	0	1	2	1
									1	1	2	1	0	2	2	0								

In some cases—as in the exopodite as well as the endopodite of the second pair of legs and the endopodite of the third pair of legs—there is reduction of the number of setae in relation to *H. minuta*, but in the exopodite of the fourth pair of legs there is a seta on the inner edge on the second as well as the third segment, which does not occur in *H. minuta*, but the number of setae on the outer edge of the third segment is reduced.

To me there is no doubt that this specimen belongs to a species which is closely related to *H. minuta*, perhaps it may even be a variety of it; but the asymmetry of the third pair of legs shows that my specimen is quite abnormal. As far as can be seen from the literature, no other species than *H. strömi* seems ever to have been found in fresh water within the genus, and the specimen in question cannot, amongst other things because of the structure of the furca, be a variety of *H. strömi*. It is imaginable that the specimen found by me belongs to a very small population which has been confined in fresh water, but the proper biotope of which is brackish or salt water, and which therefore has got out of balance. The original form is unknown.

Species Reported from Greenland, but not Found in my Material.

Polyartemia forcipata S. Fischer 1851.

Greenland records:

Polyartemia forcipata: DADAY (1910), WESENBERG-LUND (1937).

The information about the occurrence in Greenland of this species must have crept into the literature by a mistake. WESENBERG-LUND does not refer to his direct source, but he must have got his information from DADAY, as this work is mentioned as one of the most important as regards the Phyllopoda. DADAY (p. 104) in the list of occurrences of the species says: "Grönland sec. Sars G.O.". The only work by G. O. SARS that may be considered in this connexion is the *Fauna Norvegiae*, Vol. 1. Phyllocarida and Phyllopoda (1896). There it says (p. 66): "It has not, however, been heard of either from Greenland, arctic America or Spitzbergen." DADAY must have misunderstood this sentence and thus have introduced this species into the fauna of Greenland. There is nothing to suggest that this species should really occur in Greenland.

Daphnia magna STRAUS 1819–20.

Greenland records:

Daphnia Schäfferi: WESENBERG-LUND (1894).

WESENBERG-LUND (*loc. cit.*, p. 113) without indicating any locality states that this species was collected in Greenland by VAHL.

HABERBOSCH (1920, pp. 166–167) is of opinion that it cannot be said with certainty that this species has been collected in Greenland, and therefore cuts it out of the Greenland fauna list.

In my opinion HABERBOSCH is right, considering that it has not been possible to collect the species again for so many years. In all probability there has somehow been a mistake in the labelling. I have examined the specimen that WESENBERG-LUND had at his disposal, and there is no doubt that it belongs to *D. magna*, but in my opinion there is no proof that it originates from Greenland.

Daphnia atkinsoni var. *bolivari* RICHARD 1888.

Greenland record:

Daphnia crassispina: WESENBERG-LUND (1894).

WESENBERG-LUND (*loc. cit.*, p. 109–13) sets up his new species *D. crassispina* on the basis of three specimens collected by HOLBØL at

Holsteinsborg without statement of date or year, and nothing more can be said about it as HOLBØL stayed almost uninterruptedly in Greenland from 1822 to his death in 1856.

HABERBOSCH (1920, p. 167) shows that WESENBERG-LUND's species is identical with *D. atkinsoni* var. *bolivari*, but doubts that the species should have been collected in Greenland. He supposes that at some time there has been a mistake of these specimens for some Greenland ones. The problem is exactly the same as that of *D. magna*, as nobody has ever succeeded in collecting *D. atkinsoni* again, either. I have examined WESENBERG-LUND's preparation and can confirm HABERBOSCH's revision of the species. Like the latter I am of opinion that a mistake of the labels is the most probable explanation, not least as HOLBØL's collections were first sent to the Royal Museum of Natural History (SPÄRCK 1945, p. 56), and then in the years immediately after 1864 were transferred to the Zoological Museum of the University of Copenhagen.

Ophryoxus gracilis G.O.SARS 1861.

Greenland record:

Ophryoxus gracilis: LILLJEBORG (1900).

The only thing known about the occurrence of this species in Greenland is a remark in LILLJEBORG (*loc. cit.* p. 318): "während der schwedischen wissensch. Expeditionen nach Grönland wurde sie auch dort angetroffen."

HABERBOSCH (1920, p. 171) remarks on this: "Trotz sorgfältigster Durchsicht konnte ich diese Cladocere jedoch nicht finden. Ob sie als Bodenform dem Netz entgangen ist?"

It is very strange that LILLJEBORG does not state locality and date of the finding of the species, as, indeed, he gives here a first communication about a species from Greenland. Nor is it possible from his list of literature to find out to what scientific expedition to Greenland he is referring. The reference may be to several to the west coast as well as to the east coast. In October 1960 I had an opportunity to go through LILLJEBORG's collections and preparations at the Zoological Institution of Uppsala, Sweden, but did not succeed in finding any specimens of this species from Greenland, nor was anything to be found about it in LILLJEBORG's journals. If the species has been collected in Greenland, it must be very rare. It is no more a pronounced bottom form than e.g. *Graptoleberis testudinaria*, of which species I have collected several specimens. There is a possibility that in Greenland it is a markedly southern, or even a southeastern form, so that it occurs in areas where very few collections have been made. I cannot explain its absence from HABERBOSCH's as well as my own samples in any other way.

Eucypris fuscata affinis.

Greenland record:

Eucypris fuscata-affinis: BACHMANN (1921).

This species is found to have been reported by BACHMANN from Godhavn, Loc. 26, puddle, 21.7.1908 (p. 113). This report must have crept into the lists of species by mistake, as HABERBOSCH, who has determined all BACHMANN's entomostraca and used them in his work (1920) does not report this species from Greenland. For that matter, the name is peculiar, as I have been unable to find any ostracod described under this name. However, the species *Eucypris affinis hirsuta* FISCHER has also been described under the name of *Eucypris fuscata minor* G.W.MÜLLER 1912. It seems probable to me that HABERBOSCH originally used MÜLLER's name for the species, later discovered FISCHER's name, and corrected the name in his own work, while the two names in BACHMANN's lists were mixed up by mistake.

Cypridopsis vidua (O. F. MÜLLER) 1785.

Greenland record:

Cypridopsis vidua: HABERBOSCH (1916, 1920), BACHMANN (1921).

Only a few specimens of the species have been found in a small mountain lake near Struiak east of Holsteinsborg. I have not found the species again during my investigations.

Limnocalanus grimaldi (DE GUERNE) 1886.

Greenland records:

Limnocalanus macrurus: BREHM (1911), JOHANSEN (1912), STEPHENSEN (1913 a), HABERBOSCH (1916).

Limnocalanus grimaldi: EKMAN (1913), HABERBOSCH (1920), POULSEN (1940 a).

This species, of which only a few specimens have been found in one lake, Sælsøen, in Northeast Greenland, has not been found in the material from other localities available to me.

Paracyclops fimbriatus (FISCHER) 1853.

Greenland record:

Cyclops fimbriatus: EKMAN (1904).

The only information about the occurrence of this species in Greenland is found in EKMAN (1904, pp. 53 and 57), where it partly in the text, partly in a table has been recorded as belonging to the Greenland

fauna. Like HABERBOSCH (1920, p. 36) I am of the opinion that there must be a mistake here and *Paracyclops fimbriatus* cannot be included in the Greenland fauna.

However, the possibility cannot be completely rejected that EKMAN should have had access to collections from Greenland which have not been accessible to later workers, as was the case of *Ophryoxus gracilis* and *Graptoleberis testudinaria* stated by LILLJEBORG (1900) to have been collected in "Greenland" by the Swedish expedition. However, it is curious that this easily recognizable species should not later have been collected by one of the many collectors, and I take this as the surest sign that it must be allowable not to include the species.

Bryocamptus (Arcticocamptus) vandouwei (KESSLER) 1914.

Greenland records:

Bryocamptus (*Arcticocamptus*) *van douwei*: CHAPPUIS (1929), WAGLER (1937).

This species has been included in the Greenland fauna by mistake. CHAPPUIS (1929) states as his source HABERBOSCH (1916), but in this work the species is only reported from Iceland, and in HABERBOSCH (1917) the species is mentioned together with some other species, among them several Greenland ones, but it does not say anything about its having been found in Greenland. WAGLER (1937) draws his information from CHAPPUIS.

Epactophanes richardi MRÁZEK 1893.

Greenland records:

Epactophanes richardi: BREHM (1911), HABERBOSCH (1916, 1920), POULSEN (1940a) LANG (1948).
Epactophanes muscicola: HABERBOSCH (1916).
Epactophanes richardi var. *muscicola*: HABERBOSCH (1920).
Epactophanes spec. juv.: BACHMANN (1921).

The species seems to be very rare in Greenland, as all the Greenland findings have been made in three localities, viz. in a rivulet near Stormkap, Northeast Greenland (BREHM) and in two ponds at Godhavn (HABERBOSCH). I have not found any in the samples at my disposal, but this may to some extent be due to the fact that I have only collected in the free water in the localities, not in cushions of moss.

Nannopus palustris BRADY 1880.

Greenland records:

Nannopus palustris: HABERBOSCH (1916, 1920), LANG (1948).

The species has been found only once in Greenland. The locality is stated by HABERBOSCH (1920, p. 176) to be "Itivnekfluss" (in LANG

(1948, p. 1291) it has by a misprint become "Zwitnekfluss"), but the correct statement of locality must be: "River near Itivneq" (Greenlandic for 'hollow'). Itivneq is the head of the northernmost of the three branches of Ikertoq Fjord in the Holsteinsborg District. It is uncertain whether the species has actually been collected in fresh water in Greenland, as HABERBOSCH (1920, pp. 162–163) quotes a note from BACHMANN from which it appears that the species originates from a tributary to the fiord. If the sample was taken right out at the mouth it may very well belong to a brackish-water locality.

V. GENERAL PART

A. Ecological Conditions.

1. The Occurrence of the Species in Different Types of Localities.

In Tables 1, 2, and 3 a survey has been made of the localities examined in which the species have been collected. Table 1 contains the lakes, Table 2 the ponds, and Table 3 the temporary localities. At the bottom of the tables it can be seen how many species have been collected in the various localities and on the extreme right the frequency of occurrence of the species is indicated, i.e. how great a percentage of the species has been found in all localities of the group. If the species are arranged according to decreasing frequency in the three groups, the following three columns are obtained:

Lakes	Ponds	Temporary waters
Cyclops (Cyclops) scutifer	*Chydorus sphaericus*	*Chydorus sphaericus*
Chydorus sphaericus	*Daphnia pulex*	*Daphnia pulex*
Daphnia pulex	*Acroperus harpae*	*Cyclops (Acanthocyclops) vernalis*
Diaptomus minutus	*Polyphemus pediculus*	*Branchinecta paludosa*
Acroperus harpae	*Simocephalus vetulus*	*Bryocamptus (Arcticocamptus) tikchikensis*
Eurycercus glacialis	*Branchinecta paludosa*	*Alonella nana*
Simocephalus vetulus	*Cyclops (Acanthocyclops) vernalis*	*Candona candida*
Polyphemus pediculus	*Bryocamptus (Arcticocamptus) tikchikensis*	*Diaptomus castor*
Candona candida	*Scapholeberis mucronata*	*Simocephalus vetulus*
Bryocamptus (Arcticocamptus) tikchikensis	*Eucyclops serrulatus*	*Ceriodaphnia quadrangula*
Bosmina coregoni obtusirostris	*Eurycercus glacialis*	*Polyphemus pediculus*
Lepidurus arcticus	*Alonella nana*	*Maraenobiotus brucei*
Alonella nana	*Diaptomus minutus*	*Scapholeberis mucronata*
Cyclops (Acanthocyclops) vernalis	*Candona candida*	*Bosmina coregoni obtusirostris*
Macrothrix hirsuticornis	*Bosmina coregoni obtusirostris*	*Acroperus harpae*

Lakes	Ponds	Temporary waters
Alona quadrangularis	*Macrothrix hirsuticornis*	*Alonella excisa*
Alona affinis	*Eucypris affinis hirsuta*	*Diaptomus minutus*
Holopedium gibberum	*Lepidurus arcticus*	*Lepidurus arcticus*
Bosmina longirostris	*Alona rectangula*	*Prionocypris glacialis*
Maraenobiotus brucei	*Ceriodaphnia quadrangula*	*Cyclops (Cyclops) scutifer*
Branchinecta paludosa	*Cyclops (Cyclops) scutifer*	*Bryocamptus (Arctico-camptus) arcticus*
Ceriodaphnia quadrangula	*Maraenobiotus brucei*	*Macrothrix hirsuticornis*
Scapholeberis mucronata	*Artemiopsis stefanssoni* var. *groenlandicus*	*Alona rectangula*
Alona rectangula	*Alona affinis*	*Eucypris affinis hirsuta*
Eucyclops serrulatus	*Alona intermedia*	*Candona groenlandica*
Cyclops (Megacyclops) magnus	*Alonella excisa*	*Moraria mrazeki*
Alonella excisa	*Candona lapponica*	*Alona affinis*
Candona falcata	*Bosmina longirostris*	*Cyprinotus incongruens*
Daphnia longispina	*Prionocypris glacialis*	*Candona rectangula*
Graptoleberis testudinaria	*Moraria mrazeki*	*Candona lapponica*
Eucypris affinis hirsuta	*Alona quadrangularis*	
Cyprinotus incongruens	*Eucypris virens*	
Prionocypris glacialis	*Cyprinotus incongruens*	
Candona rectangula	*Candona groenlandica*	
Limnocythere sanctipatrici	*Cyclops (Megacyclops) magnus*	
Maraenobiotus insignipes	*Diaptomus castor*	
Daphnia catawba	*Streblocerus serricaudatus*	
Alona intermedia	*Alona guttata*	
Alona guttata	*Candona subgibba*	
Cypris pubera	*Candona falcata*	
Eucypris virens	*Limnocythere sanctipatrici*	
Candona subgibba	*Bryocamptus (Arcticocamptus) arcticus*	
Moraria mrazeki	*Maraenobiotus insignipes*	
Heterolaphonte strömi	*Holopedium gibberum*	
Heterolaophonte sp.	*Cypris pubera*	
	Graptoleberis testudinaria	

In 64 lakes a total of 45 species with an average occurrence of 5.7 species per locality was found. 107 ponds had 46 species, i.e. an average of 6.5 species per locality, and finally 36 temporary waters had 30 species with an average of 4.4 species per locality.

HABERBOSCH (1920, p. 271) on the basis of his material set up lists of a similar kind to those above, but the picture which he obtains in several ways differs from that of mine. There are several reasons for this. In the first place, besides "See", "Teich", and "Tümpel", he also uses the concept of "Grossteich", which in size is between "See" and "Teich". This group only includes four localities (Table 5), one of which, 29,

"See von Godhavn" (my Loc. 85, "Thygesens Sø", Godhavn), at any rate, according to the basis of classification used by me is a lake. I am unable to estimate whether I should classify the other three localities in this group as lakes or ponds, as I have not been able to find out what localities are referred to.

Secondly, HABERBOSCH in the lake localities, with the exception of *Alona rectangula* and *Alonella nana*, only has species which must be characterized as plankton forms. No samples of a littoral or benthic fauna were taken. Thus the number of species in the lakes becomes much too small.

Thirdly, HABERBOSCH's material includes only samples from rather a limited part of Greenland, viz. from Umanak in the north to Godthåb in the south. Of the total of 86 localities on which his calculations of frequency are based, only 7 are situated outside Disko Bugt, viz. 3 near Holsteinsborg and 4 near Godthåb. If the 18 localities where samples had been taken by the Tjalfe Expedition and placed at HABERBOSCH's disposal, had been included in the calculations of frequency, he would partly have obtained a more even distribution, partly, at any rate in the case of the lakes, have attained a larger number of species, as at least seven of the localities of the Tjalfe material in my opinion must be characterized as lakes proper. By grouping the species in these seven lakes and the "See von Godhavn" as well as the four localities denoted as lakes by HABERBOSCH, we get the following list as an expression of the sequence of frequency HABERBOSCH ought to have found:

Diaptomus minutus, *Alona affinis*, *Holopedium gibberum*, *Acroperus harpae*, *Bosmina coregoni obtusirostris*, *Chydorus sphaericus*, *Cyclops* (*Acanthocyclops*) *vernalis*, *Scapholeberis mucronata*, *Simocephalus vetulus*, *Ceriodaphnia quadrangula*, *Eurycercus glacialis*, *Alonella nana*, *Polyphemus pediculus*, *Bosmina longirostris*, *Alona rectangula*, *Cyclops* (*Cyclops*) *scutifer*, *Latona setifera*, *Daphnia pulex*, *Alonella excisa*, *Macrothrix hirsuticornis*, *Graptoleberis testudinaria*, and *Maraenobiotus* sp., a total of 22 species.

Finally HABERBOSCH did not include the Ostracoda in his calculations of frequency.

Taking all the types of locality together, there is no doubt at all that *Chydorus sphaericus* is the commonest Greenland species by far. This is corroborated by the fact that HABERBOSCH (*loc. cit.*) has it as the commonest species in puddles and the next commonest in ponds, and that POULSEN (1940 a, p. 63) in East Greenland found it as the next commonest species with a frequency of 44.2. Finally, WESENBERG-LUND (1894, p. 126) writes that *Chydorus sphaericus* undoubtedly is one

of the most frequent Greenland Cladocera. The case of *Daphnia pulex* is almost the same. POULSEN (*loc. cit.*) found it to be the commonest East Greenland species, whereas on the west coast HABERBOSCH did not find it quite so frequently.

Of the total number of species, 51, found in localities examined by me, 25 species occur in all types of locality, 15 have only been found in ponds and puddles, 1 species has been found in lakes and puddles, and finally 4 species have only been found in lakes, while 2 species have exclusively been found in ponds.

The 25 species found in all the three types of locality fall into four groups:

(1) A few species are very common in lakes, but rarer in ponds and puddles. Typical of this group are *Diaptomus minutus* and *Cyclops* (*Cyclops*) *scutifer*, but also *Lepidurus arcticus*, *Bosmina coregoni obtusirostris*, and *Alona affinis* show the same tendency.

(2) Species which are commoner in ponds and puddles than in lakes. Here belong: *Branchinecta paludosa*, *Ceriodaphnia quadrangula*, *Alonella nana*, *Alonella excisa*, *Prionocypris glacialis*, *Cyclops* (*Acanthocyclops*) *vernalis*, *Bryocamptus* (*Arcticocamptus*) *tikchikensis*, and *Moraria mrazeki*.

(3) Species occurring with approximately the same frequency in all types of locality: *Daphnia pulex*, *Chydorus sphaericus*, *Candona candida*, *Cyprinotus incongruens*, and *Maraenobiotus brucei*.

(4) Finally there are a number of species which occur considerably oftener in ponds than in lakes and puddles. Here belong: *Scapholeberis mucronata*, *Simocephalus vetulus*, *Macrothrix hirsuticornis*, *Acroperus harpae*, *Alona rectangula*, *Polyphemus pediculus*, and *Eucypris affinis hirsuta*.

The 15 species occurring in lakes and ponds fall into three groups:

(1) Species commoner in lakes than in ponds: *Holopedium gibberum*, *Alona quadrangularis* and *Graptoleberis testudinaria*.

(2) Species commoner in ponds than in lakes: *Alona intermedia*, *Eucypris virens* and *Eucyclops serrulatus*.

(3) Species occurring equally frequently in the two types of locality: *Bosmina longirostris*, *Eurycercus glacialis*, *Alona guttata*, *Cypris pubera*, *Candona subgibba*, *Candona falcata*, *Limnocythere sanctipatrici*, *Cyclops* (*Megacyclops*) *magnus*, and *Maraenobiotus insignipes*.

The three of the four species found in ponds and puddles, but not in lakes, *Candona lapponica*, *Candona groenlandica*, and *Bryocamptus* (*Arcticocamptus*) *arcticus*, are approximately equally frequent in the two

types of locality, whereas *Diaptomus castor* is rare in ponds, but fairly common in puddles.

Finally, the one species only found in lakes and puddles is of rare occurrence in both places.

It is characteristic that the species only found in one type of locality, in lakes or ponds, have all been found in a small number of cases, only.

As to the distribution among the localities, the following remarks may be made: plankton organisms proper constitute a fairly small number of the total number of species. HABERBOSCH (1920, p. 284) is of opinion that only five species can be included in this group, viz. *Diaptomus minutus*, *Holopedium gibberum*, *Cyclops strenuus* (= *Cyclops* (*Cyclops*) *scutifer*), *Bosmina coregoni obtusirostris*, and probably *Bosmina longirostris* as well. This group, however, in my opinion must be extended by *Daphnia catawba*, *Daphnia longispina*, and *Ceriodaphnia quadrangula*, so that the group comes to include a total of eight plankton forms proper.

Another group is constituted by species which without being plankton forms proper still keep in the free water and are not attached to the bottom, the bank or the vegetation there. The species in question are *Branchinecta paludosa*, *Artemiopsis stefanssoni* var. *groenlandicus*, *Daphnia pulex*, and *Diaptomus castor*. A special position is held by *Lepidurus arcticus*, as the young individuals of this species, if anything, are planktonic, while the adults are benthic.

The rest of the Greenland fauna of freshwater entomostraca consists of species which to a more or less marked degree are attached to the bottom or the bank and its vegetation. Of these a few have been taken with the bottom sampler in deep water in the lakes. These species are:

Macrothrix hirsuticornis	Loc. 60. Mellemsø,	10 m.
Alona quadrangularis	Loc. 60. Mellemsø,	7 m.
Candona candida	Loc. 60. Mellemsø,	4 m.
Candona falcata	Loc. 60. Mellemsø,	1.5 m, 5.6 m, 6 m, 7 m, 8 m, 9 m, 10 m, 12 m, 13 m.
	Loc. 58. Taserssuaq,	Atâ, 7 m, 10 m, 11 m, 45 m.
Candona rectangula	Loc. 58. Taserssuaq,	Atâ, 12 m.
Cyclops (*Cyclops*) *scutifer*	Loc. 60. Mellemsø,	10 m, 16 m.

With a dredge over the bottom in shallow lakes, Loc. 62, Lake at Evqitsoq, Loc. 64, Lake at Qivítut, and Loc. 85, "Thygesens Sø," the following forms were collected: *Simocephalus vetulus*, *Eurycercus glacialis*, *Acroperus harpae*, *Alona intermedia*, *Alona rectangula*, *Graptoleberis testudinaria*, and *Eucypris affinis hirsuta*.

The forms mentioned here, which can be characterized as benthic forms, are not, however, in their distribution limited to the bottom, but

also, together with the other entomostraca, occur in the littoral fauna, especially in places where there is an abundant littoral vegetation.

2. Distribution of the Species in Relation to the Chemical Factors Measured.

In the following sections I have tried to find out what can be concluded as to the ecological requirements of the species examined on the basis of analytic material available. Pl. 2–7 show the magnitudes of the various factors in connexion with which the various species have been found. As the same magnitude of the individual factor has often been measured in different localities and at different dates, it is indicated at the bottom of the tables how many observations have been made in connexion with the sampling of entomostraca.

A. Hydrogen Ion Concentration (pH).

In Pl. 2 and 3 a survey has been made of the occurrence of the species in relation to the hydrogen ion concentration. Table 2 shows the distribution of the species in relation to the actual hydrogen ion concentration measured, while Table 3 shows the limits of the theoretical variation within which the species have been found.

In the literature there is some information about the occurrence of freshwater entomostraca in relation to the hydrogen ion concentration. The most important work is by LOWNDES (1952), who has prepared a list of the extreme limits of the occurrence of a large number of species. POULSEN (1928) has information about a number of Danish freshwater Cladocera, and other authors give information about individual species. Strangely enough there does not seem to be any information available about the conditions of the Euphyllopoda.

It applies to the great majority of Greenland species that in the cases in which a range of variation of the hydrogen ion concentration is known, the Greenland occurrences fall within this range. There are, however, a few exceptions. *Daphnia pulex*, which by LOWNDES (*loc. cit.* p. 61) is stated to occur within the range of pH 5.8–9.2, has by me been found within 5.6–9.4, and even in water the theoretically lowest value of which is 4.4. *Macrothrix hirsuticornis*, which has been stated to occur within pH 7.2–9.2, has by me been found in waters with pH 6.0–9.4 and with the theoretically lowest value of 4.9. I have found *Alona guttata* at pH 5.1, with the theoretically lowest value of 4.8, while the lowest value for this species is stated to be 6.2. *Candona candida* is stated to occur from 6.8 to 9.2, whereas I have found it at 5.7, with the theoretically lowest value of 4.4. Furthermore, there are a number of species for which

Lowndes (*loc. cit.*) only records a single value, but this is no doubt due to the fact that he knows only a single finding of the species in question, and in several of these cases I have been able to state a range of variation.

In the table of the theoretical variation the range of variation of some species is divided into smaller sections. This does not mean that the species can only occur within limited parts of its full variation of the hydrogen ion concentration, but that the species has only been found by me within such limited sections of the range of variation.

No clear picture of conditions can be given in the case of all species, as some species have been found few times, some of these even once only, and therefore I cannot assume that in such cases I have been able to find the whole range of variation within which the species can exist. It is also very probable that some of the species which I have found at a very high or very low hydrogen ion concentration will be able to exist at still higher or still lower hydrogen ion concentration, but localities with such chemical properties have not been found in Greenland by me.

Largely the entomostraca examined can be divided into four groups regarding their occurrence in relation the hydrogen ion concentration: (1) Species occurring at all hydrogen ion concentrations. (2) Species which mainly have been found in water with circumneutral reaction. (3) Species which mainly occur at a high hydrogen ion concentration (low pH), and (4) Species which mainly occur at a low hydrogen ion concentration (high pH).

(1) The most typical representative of this group is *Chydorus sphaericus*, but also *Branchinecta paludosa*, *Daphnia pulex*, *Simocephalus vetulus*, *Macrothrix hirsuticornis*, *Eurycercus glacialis*, *Acroperus harpae*, *Diaptomus minutus*, and *Cyclops* (*Cyclops*) *scutifer* must be included in the group.

(2) To Group 2 the following species must be referred: *Artemiopsis stefanssoni* var. *groenlandicus*, *Lepidurus arcticus*, *Holopedium gibberum*, *Daphnia longispina*, *Scapholeberis mucronata*, *Ceridaphnia quadrangula*, *Bosmina longirostris*, *Alona intermedia*, *Alona quadrangularis*, *Alona affinis*, *Alonella nana*, *Alonella excisa*, *Eucypris affinis hirsuta*, *Candona candida*, *Candona lapponica*, *Candona rectangula*, *Candona subgibba*, *Candona falcata*, *Eucyclops serrulatus*, *Cyclops* (*Megacyclops*) *magnus*, *Cyclops* (*Acanthocyclops*) *vernalis*, *Bryocamptus* (*Arcticocamptus*) *tikchikensis*, and *Moraria mrazeki*, which form quite an appreciable part of the Greenland fauna of freshwater entomostraca. Several of these species, however, besides being found evenly distributed at circumneutral reaction, have also been found in a few cases at a high or low hydrogen ion concentra-

tion. This applies e.g. to *Alonella nana* and *Candona candida*, but this does not change the fact that most findings of the species have been made at values around the neutral point.

(3) The following species must be referred to this group: *Bosmina coregoni obtusirostris*, *Streblocerus serricaudatus*, *Alona rectangula*, *Graptoleberis testudinaria*, *Polyphemus pediculus*, *Candona groenlandica*, *Diaptomus castor*, *Bryocamptus* (*Arcticocamptus*) *arcticus*, and *Maraenobiotus brucei*, and perhaps *Alona guttata*.

(4) Here belong the species *Eucypris virens*, *Prionocypris glacialis*, *Limnocythere sanctipatrici*, and *Maraenobiotus insignipes*.

Finally there are four species, viz. *Daphnia catawba*, *Cypris pubera*, *Heterolaophonte strömi*, and *Heterolaophonte* sp., which have not been referred to any groups, as only one finding has been made of each of them.

B. Conductivity.

In Pl. 4 there is a survey of the values of conductivity at which the species examined have been found.

In the literature there is some scattered information about the occurrence of entomostraca in relation to the conductivity, but there is no comprehensive survey, and there is information of only a few of the species occurring in Greenland. HAUGE (1957) found *Holopedium gibberum*, *Daphnia longispina*, *Scapholeberis mucronata*, *Bosmina coregoni obtusirostris*, *Polyphemus pediculus*, and *Cyclops scutifer* at very low values of conductivity, 13–16 μ mho, ELGMORK (1959) in a pond with a high conductivity (199–314 μ mho) found *Daphnia longispina* and *Bosmina longirostris*, and in other ponds, with a low conductivity throughout the summer, about 40 μ mho, amongst others *Daphnia longispina*, *Bosmina longirostris*, *Bosmina coregoni*, *Simocephalus vetulus*, *Ceriodaphnia quadrangula*, and *Polyphemus pediculus*. Finally RØEN (1954) had found *Acroperus harpae*, *Alona quadrangularis*, *Graptoleberis testudinaria*, *Chydorus sphaericus*, and *Polyphemus pediculus* at a conductivity of 40 μ mho, and later, RØEN (1957), *Daphnia pulex* (325 μ mho), *Diaptomus castor* (285 and 420 μ mho), *Eucyclops serrulatus* (350 μ mho), and *Cyclops* (*Acanthocyclops*) *vernalis* (350 μ mho).

It appears from the table that a number of Greenland species have an extremely high tolerance to variation of the conductivity. This applies to *Branchinecta paludosa*, *Daphnia pulex*, *Eurycercus glacialis*, *Chydorus sphaericus*, *Diaptomus minutus*, and *Cyclops* (*Cyclops*) *scutifer*, and to a smaller extent *Macrothrix hirsuticornis*. These species have been found from a conductivity of about 20 μ mho to 3000–4000 μ mho. Another group consists of species found at a conductivity up to a little more than

1000 μ mho, which also can manage at very low values of conductivity. Here belong *Lepidurus arcticus*, *Scapholeberis mucronata*, *Simocephalus vetulus*, *Acroperus harpae*, *Alona rectangula*, *Alonella nana*, *Alonella excisa*, *Polyphemus pediculus*, *Eucypris virens*, *Eucyclops serrulatus*, *Cyclops* (*Megacyclops*) *magnus*, *Cyclops* (*Acanthocyclops*) *vernalis*, *Bryocamptus* (*Arcticocamptus*) *tikchikensis*, and *Maraenobiotus brucei*.

Most of these species, however, have not been found evenly distributed within the interval at which they occur, but are much commoner at low than at high conductivity.

A third group includes species which exclusively have been found in localities with rather a low conductivity, from 200 μ mho and less. Here belong *Holopedium gibberum*, *Daphnia longispina*, *Ceriodaphnia quadrangula*, *Bosmina coregoni obtusirostris*, *Streblocerus serricaudatus*, *Alona quadrangularis*, *Alona affinis*, *Alona intermedia*, *Graptoleberis testudinaria*, *Candona falcata*, *Diaptomus castor*, *Bryocamptus* (*Arcticocamptus*) *arcticus*, and *Moraria mrazeki*. Strangely enough there are among these species a few, e.g. *Daphnia longispina* and *Diaptomus castor*, which in other geographical regions have been found at considerably higher values of conductivity.

Finally a fourth group can be separated out. This has not been found at low values of conductivity, but in some cases it will stand even very high ion concentrations. This group includes *Bosmina longirostris*, *Cyprinotus incongruens*, *Prionocypris glacialis*, most of the *Candona* species, *Limnocythere sanctipatrici*, and *Maraenobiotus insignipes*.

At such a division into groups it must in many cases be a matter of opinion whether a species should go to one group or another. It is of rather greater interest to compare the conditions of closely related species. If e.g. the two *Bosmina* species are compared, it is evident that *B. longirostris* mainly occurs at higher values of conductivity than *B. coregoni obtusirostris*. *Eucypris affinis hirsuta* and *Eucypris virens* have been found within almost the same range of variation, but the findings of *E. virens* mainly were made at a higher value of conductivity than the findings of *E. affinis hirsuta*. The two *Bryocamptus* species also show distinct differences, *B.* (*A.*) *tikchikensis* occurring under a very wide range of conductivity, while *B.* (*A.*) *arcticus* only has been found at very low values of conductivity.

In the case of a number of species examined it holds that they have been found in so few cases that it is not possible to evaluate their occurrence in relation to the conductivity.

C. Content of Cl^-.

Determinations of chloride in the localities were not made parallel with the investigations during the whole period of investigation, but

only in 1958 and 1959, and with a few measurements in 1957. Because of this fact only some of the species are included in Table 5. The other species have not been found in localities in which the content of chloride has been determined.

It is conspicuous that a very large number of the Greenland entomostraca have been found under conditions under which there was so little chloride in the water that it could not be detected with certainty, while on the other hand very few species have been found to occur in waters with a very high content of chloride, i.e. about 1000 mg/l. Of the species found at a very high content of chloride, *Daphnia pulex*, *Macrothrix hirsuticornis*, *Eurycercus glacialis*, *Chydorus sphaericus*, *Limnocythere sanctipatrici*, *Diaptomus minutus*, and *Cyclops* (*Cyclops*) *scutifer*, only two, viz. *Eurycercus glacialis* and *Diaptomus minutus*, have not been found in waters in which chloride has not been detected with certainty, i.e. that at any rate the other five species are quite independent of the presence of chloride in the water, at least if the quantity does not exceed the values found by me. At any rate in the case of *Daphnia pulex*, this is in good agreement with what has been demonstrated by LAGERSPETZ (1955) in Finland.

It is remarkable that several of the species which do not occur at quite low values of conductivity, still have been found in localities in which chloride has not been detected. This applies e.g. to *Bosmina longirostris*, *Cyprinotus incongruens*, and *Candona candida*. This must mean that chloride is not necessary for the distribution of these species. On the other hand, several of the species found most frequently at low values of conductivity have not been found in localities without chloride. This is e.g. the case of *Bosmina coregoni obtusirostris* and *Alonella nana*.

D. Content of Ca^{++} and Mg^{++}.

Pl. 6 and 7 show the finds of entomostraca in relation to the contents in the water of calcium and magnesium, respectively.

Even though in the literature there is a good deal of information about the contents of calcium and magnesium in fresh waters, information about the occurrence of entomostraca in connexion with such particulars measurements are infrequent. Therefore it is only in a very few cases possible to compare the Greenland fauna with other faunas in that respect.

It is strange to see that a number of species, *Branchinecta paludosa*, *Daphnia pulex*, *Acroperus harpae*, *Alona rectangula*, *Chydorus sphaericus*, *Polyphemus pediculus*, *Diaptomus minutus*, *Eucyclops serrulatus*, and *Cyclops* (*Megacyclops*) *magnus* have been found in localities in which no calcium at all has been detected in the water. Furthermore, a considerably larger number have been found in localities in which it was not

possible to detect magnesium, viz. the species *Branchinecta paludosa*, *Daphnia pulex*, *Simocephalus vetulus*, *Ceriodaphnia quadrangula*, *Bosmina coregoni obtusirostris*, *Streblocerus serricaudatus*, *Eurycercus glacialis*, *Acroperus harpae*, *Alona intermedia*, *Alonella excisa*, *Alonella nana*, *Chydorus sphaericus*, *Polyphemus pediculus*, *Prionocypris glacialis*, *Candona candida*, *Diaptomus minutus*, *Cyclops* (*Acanthocyclops*) *vernalis*, and *Bryocamptus* (*Arcticocamptus*) *tikchikensis*. Still, none of these species has been found under conditions under which neither calcium nor magnesium could be detected.

The largest quantities of calcium found in Greenland fresh waters generally are not larger than can be tolerated by the freshwater entomostraca. Only in a single case *Holopedium gibberum* was found at a value of calcium which was a little higher than is stated (HAMILTON 1958) to be the higher limit of the occurrence of the species.

A large number of the species examined have not been found at very low values of calcium. This need not mean anything regarding the species found in few cases, but in the case of some species it seems as if they have a lower limit as regards the content of calcium in the water. This applies e.g. to *Scapholeberis mucronata*, *Bosmina longirostris*, *Eurycercus glacialis*, *Alonella excisa*, *Eurycypris affinis hirsuta*, *Eurycypris virens*, *Cyprinotus incongruens*, *Prionocypris glacialis*, most of the *Candona* species, and *Maraenobiotus insignipes*. It is characteristic that so many of the Ostracoda manifest this fact, as most of the species within this group have not been found at a markedly low value of conductivity.

The normal condition in Greenland fresh waters is that there are considerably larger amounts of Ca^{++} in the water than of Mg^{++}. In a few lakes, all situated near the head of Søndre Strømfjord, there are, however, large amounts of Mg^{++} (more than 100 mg/l), while there are small amounts of Ca^{++}. Few of the species examined, *Daphnia pulex*, *Macrothrix hirsuticornis*, *Eurycercus glacialis*, *Chydorus sphaericus*, *Limnocythere sanctipatrici*, *Diaptomus minutus*, and *Cyclops* (*Cyclops*) *scutifer*, have been found under these conditions. Besides, *Branchinecta paludosa*, *Cyprinotus incongruens*, and *Candona lapponica* have been found at a high content of Mg^{++} in Loc. 65. As there are so few observations of high contents of Mg^{++}, it is quite impossible to tell whether the fact that so few species have been collected under these conditions, means that a high value of Mg^{++} may be a restricting factor, or whether other conditions which have not been measured, are decisive.

Zoogeographical Conditions.

1. The Occurrence of the Greenland Freshwater Entomostraca Outside Greenland.

The Greenland fauna of freshwater entomostraca, as far as can be established, contains no endemic species. It is true that *Heterolaphonte* sp. has been found only in Greenland, but there is no reason to suppose that it should be an endemic Greenland species.

In Table 5 all the species established with certainty in Greenland are arranged with indication of their occurrence in the holarctic area. (+) means, that, indeed, the species has been found in the area in question, but only in marine localities.

44 of the total of 55 species established in Greenland with certainty (in what follows *Heterolaophonte* sp. is disregarded) have been found to occur in both the palaearctic and the nearctic regions. Of the remaining 11 species, 5, viz. *Artemiopsis stefanssoni* var. *groenlandicus*, *Daphnia catawba*, *Candona subgibba*, *Cyclops* (*Megacyclops*) *magnus*, and *Bryocamptus* (*Arcticocamptus*) *tikchikensis*, have not been found in the palaearctic area. *Candona subgibba* besides in the nearctic area has been found in Japan. To this group of nearctic species should furthermore be added *Diaptomus minutus*, which is distributed in the greater part of North America and otherwise has been found only in Iceland.

6 species have not been found in the nearctic area, viz. *Prionocypris glacialis*, *Candona rectangula*, *Candona lapponica*, *Candona groenlandica*, *Candona falcata*, and *Diaptomus castor*. There is, however, a distinct difference between the distributions of the five Ostracoda on the one hand and *Diaptomus castor* on the other. Outside Greenland *Diaptomus castor* has not been found in arctic or subarctic areas at all, but only in temperate Europe. It is a palaearctic species, but HABERBOSCH (1920, p. 335) is wrong in referring it to the stenothermal cold-water species. The fact that the species has not been reported from North America cannot be due to its having been overlooked there, as the regions where it might be expected to be found, have been rather thoroughly examined, and a species the size of *Diaptomus castor* will always be recognized. Outside Greenland the five ostracods have only been found in arctic and subarctic regions, and only very sporadically. The parts of the nearctic regions where we should expect finding these species, Northern Canada and especially the North Canadian islands, have been very poorly investigated, especially the fauna of ostracods is almost unknown. Therefore it is natural to suppose that the five species of Ostracoda by fresh investigations into the regions mentioned may be found there, and that they must therefore be characterized as holarctic.

As to the distribution of the species found within climatic zones, a distinction may be made between three different groups: A group the members of which chiefly occur in arctic and subarctic areas, and which, when occurring outside these areas, are found in high mountain areas. This group includes the species *Branchinecta paludosa*, *Artemiopsis stefanssoni* var. *groenlandicus*, *Lepidurus arcticus*, *Prionocypris glacialis*, *Candona lapponica*, *Candona rectangula*, *Candona groenlandica*, *Candona falcata*, *Cyclops* (*Megacyclops*) *magnus*, *Bryocamptus* (*Arcticocamptus*) *tikchikensis*, and *Bryocamptus* (*Arcticocamptus*) *arcticus*. Connected with this group are *Eurycercus glacialis*, which, it is true (KAISER 1959), has been shown to be distributed along the northern part of the west coast of Europe, but which must have been introduced from the north by migratory birds, *Bosmina coregoni obtusirostris*, *Cyclops* (*Cyclops*) *scutifer*, *Candona subgibba*, *Maraenobiotus brucei*, and *Maraenobiotus insignipes*, all the five of which have been found, although rarely, in northern temperate areas. Thus this group includes a total of 17 species.

Another group includes species found widely distributed in arctic, subarctic as well as temperate regions, a few of them even occurring in the tropics. Here belong *Holopedium gibberum*, *Daphnia pulex*, *Daphnia longispina*, *Scapholeberis mucronata*, *Simocephalus vetulus*, *Ceriodaphnia quadrangula*, *Bosmina longispina*, *Macrothrix hirsuticornis*, *Streblocerus serricaudatus*, *Acroperus harpae*, *Alona guttata*, *Alona intermedia*, *Alona rectangula*, *Alona quadrangularis*, *Alona affinis*, *Graptoleberis testudinaria*, *Alonella nana*, *Alonella excisa*, *Chydorus sphaericus*, *Polyphemus pediculus*, *Cypris pubera*, *Eucypris affinis hirsuta*, *Cyprinotus incongruens*, *Candona candida*, *Cypridopsis vidua*, *Limnocythere sanctipatrici*, *Diaptomus minutus*, *Limnocalanus grimaldi*, *Eucyclops serrulatus*, *Cyclops* (*Acanthocyclops*) *vernalis*, *Moraria mrazeki*, *Epactophanes richardi*, *Nannopus palustris*, and *Heterolaophonte strömi*, a total of 34 species, thus the great majority of the Greenland fauna.

Finally there are four species which outside Greenland are exclusively found in temperate areas, viz. *Latona setifera*, *Daphnia catawba*, *Eucypris virens*, and *Diaptomus castor*.

2. Distribution of Freshwater Entomostraca in Greenland.

A number of the authors who have previously worked at the Greenland fauna of freshwater entomostraca, have also given information about the geographical occurrence of the species in Greenland and on the basis of this information tried to divide the country into faunal areas.

The first attempt of this kind was made by WESENBERG-LUND (1894, pp. 129–131). On the basis of the material he had at his disposal, he thought it justifiable to state that "It is almost the self-same forms

of *Cladocera* that are found in South and North Greenland." (It should, however, be considered that to WESENBERG-LUND North Greenland meant Disko Bugt). But he added that an element of four species, *Latona glacialis* (= *L. setifera*), *Macrothrix rosea* (presumably a wrong determination for *M. hirsuticornis*), *Pleuroxus exiguus* (= *Alonella excisa*), and *Daphnia galeata* (= *D. longispina*) presumably are southern, so that it must be said that the South Greenland fauna of freshwater entomostraca is richer than the North Greenland one. Furthermore, he thinks "that there is a particular East Greenland fauna of Cladocera, different from the West Greenland one, with a character of its own and showing a closer relationship with eastern types." This view is advanced on the basis of the fact that three of the nine species of Cladocera which WESENBERG-LUND had at his disposal from the east coast were not known from the west coast. These three, *Macrothrix arctica* (= *M. hirsuticornis*), *Simocephalus expinosus* (= *S. vetulus*), and *Daphnia groenlandica* (= *D. pulex*), have all of them later been found also on the west coast. Finally WESENBERG-LUND (*loc. cit.* p. 151) considers the problem how far north the arctic freshwater fauna goes, and in this connexion writes that as *Daphnia rectispina* (= *D. pulex*) and *Branchinecta paludosa* have been found in Grinnell Land on lat. 82°N., there must also be a possibility of finding freshwater entomostraca in similar latitudes in Greenland.

BREHM (1911, p. 305–306), who exclusively worked at the freshwater entomostraca of Northeast Greenland, like WESENBERG-LUND thinks that East Greenland, in this case especially Northeast Greenland, has a special fauna of its own. He especially bases this view on the fact that 8 out of the total of 14 species found had been collected in this area of Greenland only. These eight species were the following ones: *Lynceus rectangulus* (= *Alona rectangula*), *Limnocalanus macrurus* (= *L. grimaldi*), *Canthocamptus cuspidatus* (= *Bryocamptus* (*Arcticocamptus*) *tikchikensis*), *Canthocamptus duthiei* (= *Moraria mrazeki*), *Epactophanes richardi*, *Maraenobiotus Danmarkii* (= *M. brucei*), *Candona groenlandica*, and *Herpetocypris glacialis* (= *Prionocypris glacialis*). Furthermore, he thinks that the Northeast Greenland fauna really has not much to do with other faunas of freshwater entomostraca, as there are not only two species new to science in the material, viz. *Maraenobiotus Danmarkii* and *Candona groenlandica*, but also as other species, *Canthocamptus cuspidatus* and *Herpetocypris glacialis*, show structural features that make them somewhat different from other populations of the species.

HABERBOSCH (1920, p. 177 ff.) first of all emphasizes that the west coast shows more favourable conditions for the fauna of freshwater entomostraca than the east coast, and that therefore it is natural that more species have been found there. For that matter the faunas on the west and east coasts show the same character, as all the species which WESEN-

BERG-LUND and BREHM consider to be characteristic of the east coast—with the exception of one, *Limnocalanus grimaldi* — have later been identified with species from the west coast or directly shown to occur there. As to distribution from north to south HABERBOSCH is of opinion that along the West Greenland coast — from Svartenhuk to Kap Farvel — there is a uniform fauna of freshwater entomostraca, which includes the great majority of species known from Greenland. Besides he segregates special elements, one consisting of *Branchinecta paludosa*, *Lepidurus arcticus*, and *Daphnia pulex* — all are large species, which are easily observed and collected; they also occur in Northern Greenland; of these *Lepidurus arcticus* goes no farther south than Holsteinsborg — and one consisting of *Latona setifera* and perhaps *Daphnia longispina*, which are found only in southern West Greenland.

As the last so far, POULSEN (1940 a, p. 61 ff.) has occupied himself with the distribution of the fauna of freshwater entomostraca. He points out that the difference in number of species on the West Greenland and East Greenland coasts in the case of the investigations reported is 20 species, while before them the difference was 26 species. He supposes that the difference in the case of future investigations will be still smaller, as in his opinion the two faunas are fundamentally alike, but the East Greenland fauna for ecological reasons is poorer in individuals as well as species than the West Greenland one. Besides, he divides the east coast into four sub-areas, the Northeast coast, the Kejser Franz Josephs Fjord, the Scoresby Sund, and the Southeast coast areas. He finds it possible to prove that the number of species of Cladocera decreases towards the north. Still, he thinks that the Northeast coast area to some degree differs from the rest of East Greenland, as five certain and two uncertain species found there have not otherwise been shown to occur in East Greenland. These species are *Alona rectangula*, *Diaptomus minutus*, *Limnocalanus grimaldi*, *Epactophanes richardi*, *Candona groenlandica*, and the uncertain species *Canthocamptus duthiei* (= *Moraria mrazeki*?), and *Maraenobiotus brucei* (POULSEN like BREHM (*loc. cit.* pp. 309–311) distinguishes between *M. brucei* and *M. Danmarkii*, the latter of these having been found in the rest of the east).

As the material which has been at my disposal is so great—including samples from a total of 325 localities distributed in the greater part of Greenland (while all previous investigations together were based on about 200 localities)—it was possible for me to attempt a division of East Greenland as well as West Greenland into smaller areas in order in this way to bring out a more distinct picture of the composition of the fauna of freshwater entomostraca within each individual area and the changes from one area to the other. Furthermore, a map of the occurrence of each species has been prepared.

In the map (Pl. 8) all the places in Greenland are shown from which I have collections at my disposal, or from where in the literature findings of freshwater entomostraca are mentioned. Furthermore the faunal areas with which I have operated are shown.

Areas on the west coast:

I.	Thule District	29 localities
II.	Upernavik District	40 –
III.	Umanak District	7 –
IV.	The Disko Bugt Area	66 –
V.	The Holsteinsborg Area (from Disko Bugt to lat. 66°N.)	31 –
VI.	The Godthåb Area (from lat. 66° to Frederikshåbs Isblink)	29 –
VII.	Southwest Greenland	20 –

On the east coast I have used the same division into areas as POULSEN:

VIII.	The Northeast Coast Area	11 localities
IX.	The Kejser Franz Josephs Fjord Area	33 –
X.	The Scoresby Sund Area	53 –
XI.	The Southeast Coast Area	6 –

In Table 6 there is a survey of the frequency of occurrence of the various species in the various areas, the figures indicating the percentage of localities in which the species in question occurs, in relation to the total number of localities in the area. If there is only one + it means that the species has only been indicated from this area in the literature, or that it was found as sorted-out specimens in the Zoological Museum of Copenhagen, according to the list on p. 188. If Table 6 is compared with the maps of distribution of the individual species, there is a possibility of forming a fair picture of the distribution in Greenland of most of the species found.

On the maps the places from where I have seen the species myself, are indicated with a dot, whereas the places in which I only know the species from the literature, are indicated with a circle. On some maps the distribution of several species is shown. In such cases there is a list of signs beside the map.

a. Greenland Freshwater Entomostraca in the Zoological Museum of Copenhagen: an Examination of Previous Sorted-out but Unpublished Material.

Upernavik, a mountain water, 12.7.1931. C. LÖFTING: *Branchinecta paludosa.*
– 27.7.1931. FRITS JOHANSEN: *Branchinecta paludosa.*
– 10.7.1897. C. RYDER: *Lepidurus arcticus.*
Svartenhuk, Umîarfik Sø, 15.8.1952. N. FOGED: *Branchinecta paludosa, Lepidurus arcticus.*
– Narssaq, Small lake, 12.8.1952. N. FOGED: *Branchinecta paludosa.*

Svartenhuk, Narssaq, Larger lake, 12.8.1952. N. Foged: *Lepidurus arcticus*, *Daphnia pulex*.
– – Ephemeral pond, 12.8.1952. N. Foged: *Lepidurus arcticus*.
– Lake 400–500 m above sea level, 11.8.1952. N. Foged: *Lepidurus arcticus*, *Branchinecta paludosa*.
Umanak, Olrik. The Study Hall, 10.11.1917. *Daphnia pulex*.
Cypris, Umanak, Greenland, Mus. Chr. VIII. *Eucypris virens*.
Jakobshavn, 13.8.1890. Bergendahl: *Macrothrix hirsuticornis*.
– 31.8.1890, – *Chydorus sphaericus*, *Diaptomus castor*.
Godhavn, Lyngmarksdam, 22.7.1931. C. Löfting: *Branchinecta paludosa*, *Eurycercus glacialis*.
Qeqertarssuaq, Godhavn, in puddles, 8.7.1897. C. Kruuse: *Daphnia pulex*.
Godhavn, fresh water, 8.8.1931. G. Löfting: *Branchinecta paludosa*, *Daphnia pulex*, *Eurycercus glacialis*.
Lake at Godhavn, 27.7.1931. C. Löfting: *Daphnia pulex*, *Eurycercus glacialis*, *Eucypris affinis hirsuta*.
Orpigsôq, 17.7.1890. W. Lundbeck: *Diaptomus minutus*, *Diaptomus castor*.
– 19.7.1890. – *Ceriodaphnia quadrangula*.
Egedesminde 1895, Rev. Sørensen: *Lepidurus arcticus*, *Eurycercus glacialis*.
– Mrs. Lundager: *Daphnia pulex*.
Manermiut, 1.7.1890. Bergendahl: *Diaptomus castor*.
Kangâtsiaq, 31.7.1897. C. Kruuse: *Lepidurus arcticus*.
Agto, 1.7.1890. Bergendahl: *Diaptomus minutus*.
A lake inside Søndre Strømfjord, July 1917. L. N. Nielsen: *Lepidurus arcticus*.
Freshwater lake in the country behind Søndre Strømfjord (17.12.1915). Nielsen, Manager of the Trading Station, Kangamiut: *Lepidurus arcticus*, *Eurycercus glacialis*.
Itivnera, Godthåbsfjorden, 19.8.1931. G. Löfting: *Eurycercus glacialis*.
Godthåb, 12.7.–20.9.1891. Brummerstedt: *Daphnia pulex*.
Frederikshåb, 12.7.–20.9.1891. P. Petersen: *Eurycercus glacialis*, *Chydorus sphaericus*.
Frederikshåb: *Diaptomus castor*.
River near Jørgen Brønlund Fjord. Collected 7.5.1949 in frozen soil, hatched 17.6. 1949. Palle Johnsen: *Prionocypris glacialis*.
Pond near the east end of Midsommersø, Erlandsen Land, 24.7.1949. Palle Johnsen: *Branchinecta paludosa*.
Large puddle with a stony bottom, Heilprin Land, near Jørgen Brønlund Fjord 31.7.1947. Palle Johnsen: *Branchinecta paludosa*.
Almost dried-up freshwater puddle behind the plains near the second camp of tents. "Danmark" Exp. St. 18, 31.8.1906. Landing-net. Yellowish brown mud; water 5°: *Candona groenlandica*.
Lake near Stormkap. "Danmark" Exp.: *Prionocypris glacialis*.
Small lake in Lindemansdalen, west of the river, 27.7.1947. Palle Johnsen: *Lepidurus arcticus*.
Lindemansdalen near Zakkenberg, 25.8.1949. T. Andersen: *Lepidurus arcticus*.
Small lake off Vardekløft, 40 m a.s.l., 5.9.1926. Jameson Land. Rosenkrantz: *Lepidurus arcticus*.
Freshwater lake on the beach. Hurry Inlet, 11.8.1924. A. Petersen: *Lepidurus arcticus*.
Freshwater lake, Danmarks Ø, 31.7.1892. E. Bay: *Lepidurus arcticus*.
Lakes near Kap Leslie, August 1933. Dr. Aldinger: *Lepidurus arcticus*.

Ponds on the island of "Samat", Sermilik Fjord, 5.8.1901. P. RÜTTEL: *Lepidurus arcticus*.

Sermilik, lat. 63°32′ N., 14.8.1902. C. KRUUSE: *Lepidurus arcticus*.

Tasiussaq, among salt-water animals, 31.5.1899. The Amdrup Expedition: *Eurycercus glacialis*.

b. Distribution of the Various Species.

Branchinecta paludosa (O.F.MÜLLER). Fig. 38.

This species has a singular distribution in Greenland. It has been collected from Jørgen Brønlund Fjord in northernmost East Greenland, along the north coast (from which, however, only a single finding has been recorded) and on the west coast as far south as lat. 62°N. As is the case of *Lepidurus arcticus*, the species is commoner in the northern part of its distribution area than in the southern part. There is hardly any doubt that the Greenland distribution of the species is connected, but on the other hand, it is not very probable that it is found outside this area of distribution, as such a large and easily recognized species would be collected if it occurred in an investigated area.

Artemiopsis stefanssoni var. ***groenlandicus*** LINDER. Fig. 39.

This species has in Greenland a pronouncedly northwestern distribution, having been found only on the west coast from Thule District to Disko Bugt. Another peculiarity about its distribution is that it has mainly been found in localities situated far from the outer coast. I have no doubt that possible later investigations will prove the species to have a somewhat larger area of distribution in Greenland; thus it might be expected that it would be found on the westernmost part of the north coast; but it hardly occurs on the east coast or the southern part of the west coast.

Lepidurus arcticus (PALLAS). Fig. 40.

This species has in Greenland a northern distribution, which towards the south goes to about lat. 66°N. It is true that it has not on the east coast been collected farther north than lat. 77°N., and that it has not been collected at all on the north coast, but this fact is no doubt due to the small number of collections available from this area.

From the frequency of occurrence (Table 6) it clearly appears that the species in the northern part of its area of distribution is much commoner than in the southern part. POULSEN (1940 a, p. 66) on the basis of his own material from the east coast and HABERBOSCH's material from the west coast has calculated that the species has a frequency of

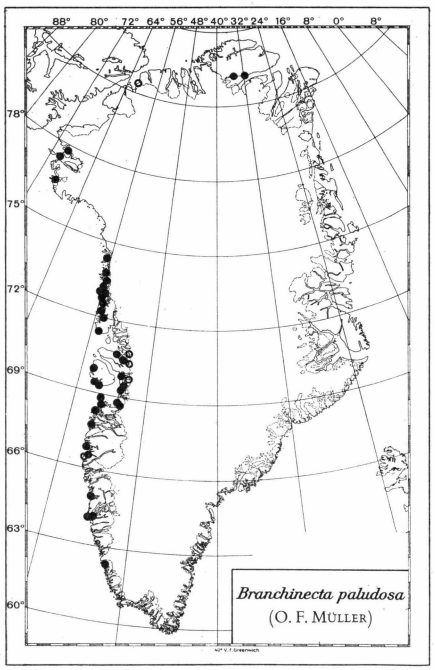


Fig. 38.

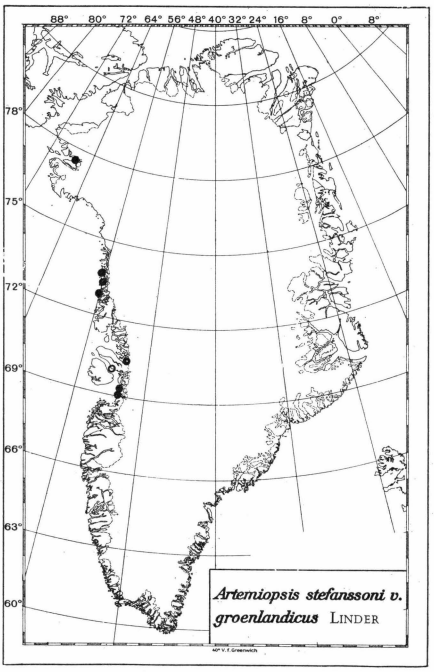
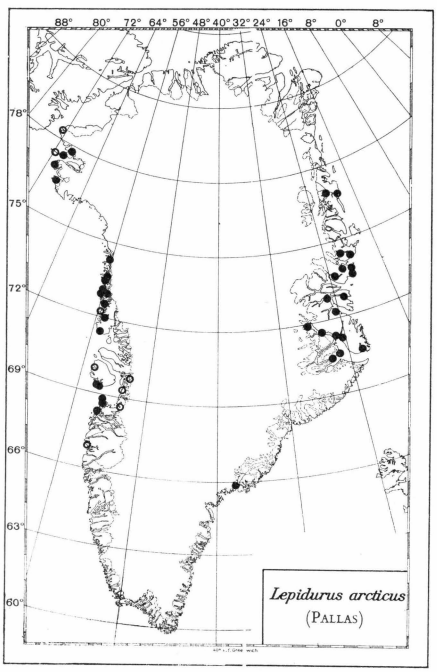


Fig. 39.



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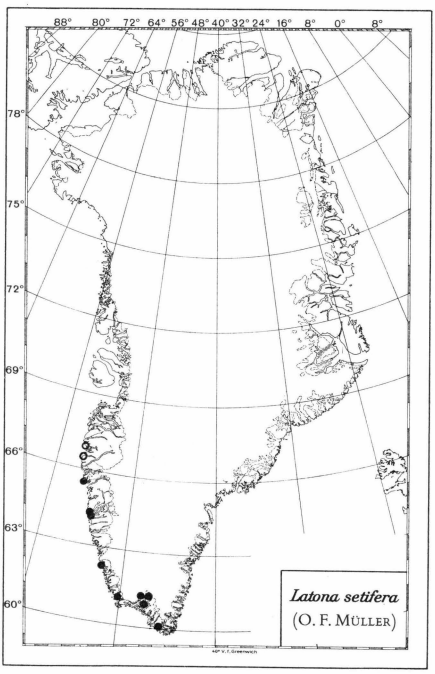


Fig. 41.

occurrence of 30 on the east coast and of 2 on the west coast. If my material is calculated in the same way (the percentage occurrence of the species in all localities investigated), we get in the case of the east coast the frequency 22.2, and on the west coast 11.8, thus frequencies somewhat lower than POULSEN's figures on the east coast and considerably higher on the west coast. The latter fact is easily explained by the fact that HABERBOSCH's material did not include samples from the Thule and Upernavik Districts, where the species occurs in the largest numbers.

Undoubtedly it will be possible to find the species on the north coast and the very northernmost east coast, so that there is a connected area of distribution in Northern Greenland. On the stretch between Scoresby Sund and Angmagssalik it will also no doubt be possible to find it, but very sporadically.

Latona setifera (O. F. MÜLLER). Fig. 41.

Latona setifera (fig. 41) is in Greenland exclusively distributed on the southern west coast from Frederiksdal in the south to Holsteinsborg in the north (about lat. 60°N.–lat. 67°N.). Its southern distribution is emphasized by the frequencies, as the species in the southernmost part of its area of distribution appears in more than half of the localities, while it has only been found once in the northern part. It is possible that the species can be found in the very southernmost part of the east coast, but unfortunately collections from there are missing.

Holopedium gibberum ZADDACH. Fig. 42.

The picture of the distribution of this species in Greenland is somewhat blurred. On the west coast it has been found from Godthåb (about lat. 62°N.) to the Umanak Fjord (about lat. 71°N.), while on the east coast it has only been found in two localities, both in Scoresby Sund area. If one only looks at the map of distribution, one may be tempted all the same to consider the species a southern form; but the frequencies of occurrence clearly show that the species is much commoner in the Disko Bugt area than in the other areas of distribution. There is hardly any possibility that the species should have been overlooked in southernmost Greenland. At any rate *Holopedium gibberum* ought to have a possibility of holding its own in a few lakes near the Arsuk Fjord, Langesø and Nyresø, according to the description of them given by MADSEN (1959, p. 43ff.). As the species has not been found there, it must be supposed that it does not occur in the area. The area of distribution of *Holopedium gibberum* in Greenland thus is hardly connected, but consists of one centre in Disko Bugt with a north–south distribution and another in central East Greenland.

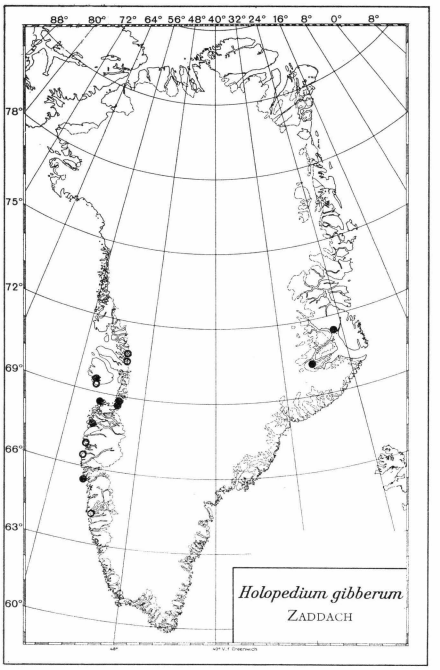


Fig. 42.

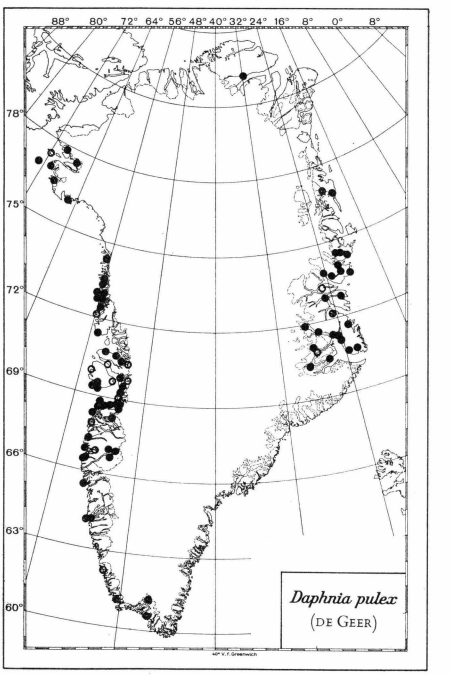


Fig. 43.

At the present investigations the species was found as new to the east coast.

Daphnia pulex (DE GEER). Fig. 43.

This species has been collected everywhere in Greenland except the southern part of the east coast.

Its absence in this littoral region might perhaps be explained by the fact that so few samples have been taken there that *Daphnia pulex* just does not happen to have been collected. The frequencies, however, show that the species is much commoner in the northern part of its area of distribution than in the southern part. There is a distinct decrease from both sides towards the area where *D. pulex* has not been found. I consider it probable that the species does not occur, or at any rate is extremely rare, in the southern part of the east coast.

POULSEN (1940 a, p. 66) considers the species to be somewhat commoner on the east coast than on the west coast. My material shows that taking all localities on the west and the east coasts, the species occurs with a frequency of 58.1 on the west coast and 63.0 on the east coast. If the localities in Southeast Greenland are left out of account, we get a somewhat greater predominance (67.0) on the east coast.

Daphnia catawba COKER. Fig. 44.

This species has been found in one Greenland locality only, viz. Geographical Society Ø in the Kejser Franz Josephs Fjord area in East Greenland.

Daphnia longispina O. F. MÜLLER. Fig. 44.

Daphnia longispina has in Greenland been found only in three localities, which are scattered between about lat. 61°N. and about lat. 71°N. on the west coast. Thus the species is very rare, and on the basis of the available material it is impossible to make any statement about its distribution in Greenland.

Scapholeberis mucronata (O. F. MÜLLER). Fig. 45.

This species has three centres of distribution in Greenland, viz. one in Disko Bugt and south and north of this locality, one in southernmost West Greenland, and one in the middle of East Greenland. The comparatively few collections available from the southern east coast might be the cause of the fact that the species has not been found in this region, but so many collections have been made between the two areas of distribution in West Greenland that it is not probable that the species should have been overlooked there.

Simocephalus vetulus (O. F. MÜLLER) Fig. 46.

On the west coast as well as the east coast this species is common south of about lat. 73°30′N. On the east coast its frequency increases towards the south, while on the west coast it seems to be commoner in Disko Bugt and the area south of Disko Bugt than on the rest of the coast. The picture is, however, veiled somewhat by the fact that the species has not been collected between lat. 61° and lat. 64°N. on the west coast. It is not possible with certainty to decide whether this is due to the fact that the species does not occur in this region and thus has two separate areas of distribution, one including the middle part of the west coast and another including the very southernmost part of the west coast, or whether it does occur in this region, but has not been collected there.

Ceriodaphnia quadrangula (O. F. MÜLLER). Fig. 47.

This species has a distinctly southwestern distribution in Greenland. It has only been found on the west coast, farthest north about lat. 70°30′N., and south of this latitude it occurs in all the four areas, being commonest in the Disko Bugt area and southernmost Greenland, it is rare in the Godthåb area.

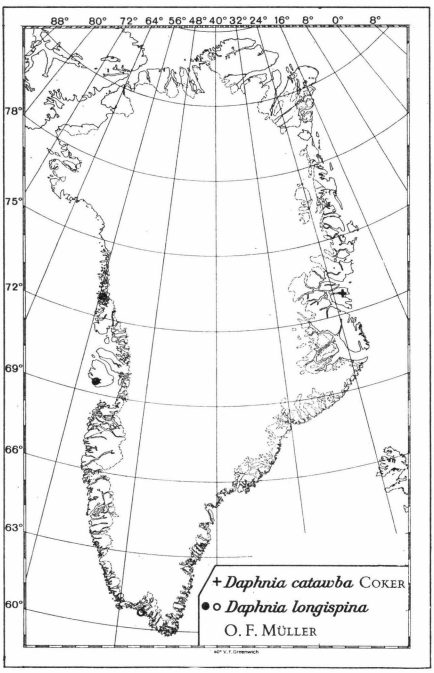
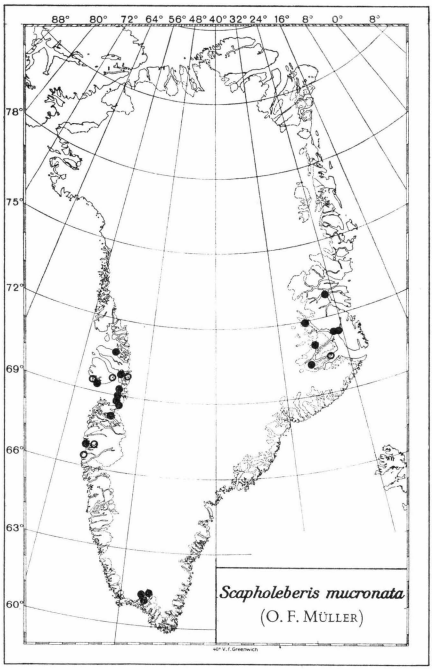


Fig. 44.



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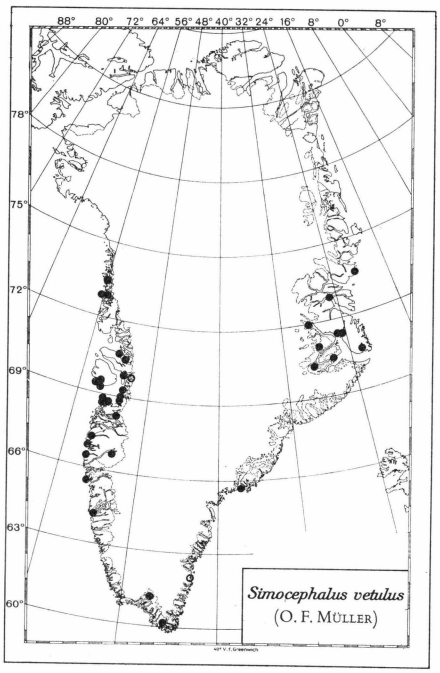


Fig. 46.

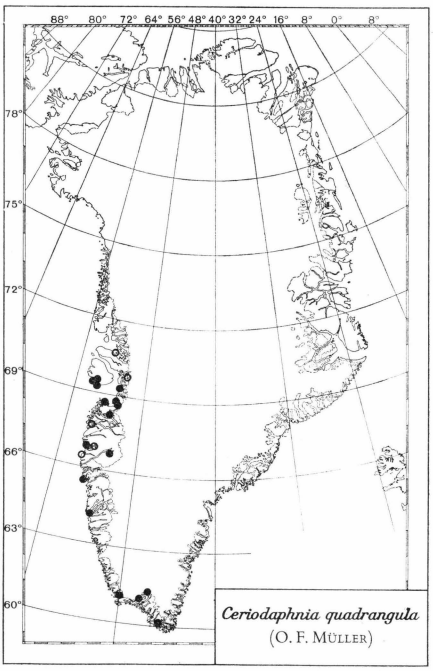


Fig. 47.

Bosmina longirostris (O.F.MÜLLER). Fig. 48.

The species has in Greenland been found in three widely separated areas of distribution, viz. on the west coast in the Thule District and the Disko Bugt-Holsteinsborg areas, and on the east coast in the Kejser Franz Josephs Fjord–Scoresby Sund areas. It is not possible to derive any geographical tendency from this distribution.

Bosmina coregoni obtusirostris G.O.SARS. Fig. 49.

On the west coast this species is evenly distributed in the whole region south of lat. 73°N., while it seems to be very rare on the east coast, where it is known from two localities only. A larger number of collections from the southernmost east coast, however, perhaps will show that the species is somewhat commoner there than appears from the map. In the case of the west coast the frequencies show a tendency to increase towards the south, although in the way that the species has its densest occurrence in the Disko Bugt area. Still, there is hardly any doubt that the species has a southern distribution in Greenland.

Macrothrix hirsuticornis NORMAN and BRADY. Fig. 50.

This species has been found in all areas except the Godthåb area. Furthermore, the frequencies show that it is fairly common on the east coast and the northern west coast, while the values are low in Southwest Greenland. The species has its highest frequency in the area of the Northeast coast and in the Scoresby Sund area. Thus it seems to have a tendency towards a northeastern distribution in Greenland, but it is probable that it can be found in the whole of Greenland, even though it will no doubt prove to be very rare in the middle of Southwest Greenland.

Streblocerus serricaudatus (FISCHER). Fig. 50.

Strangely enough this species has in Greenland been found only in one place, viz. Godhavn. It is true that HABERBOSCH also records it from southernmost West Greenland, but, as I have tried to show when going through the species (p. 147), this is probably due to a misinterpretation of the drawing in WESENBERG-LUND (*loc. cit.*). It is quite impossible on the basis of the findings to make any conclusions as to the distribution of the species in Greenland.

Eurycercus glacialis LILLJEBORG. Fig. 51.

On the west coast this species has been found to be common south of lat. 72°N. and on the east coast it has been collected in a few places south of lat. 70°30′N. In the northernmost part of its area of distribution

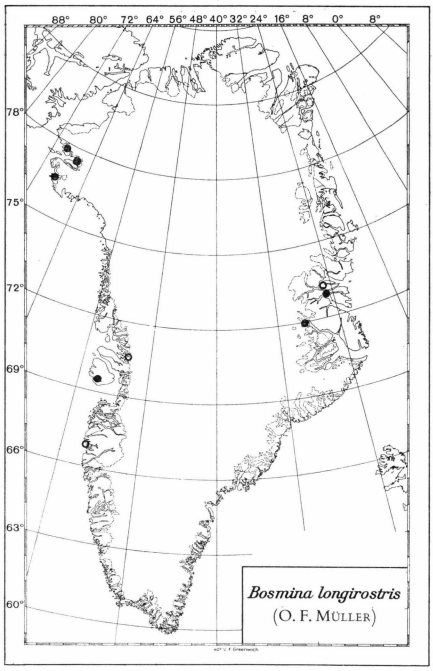


Fig. 48.

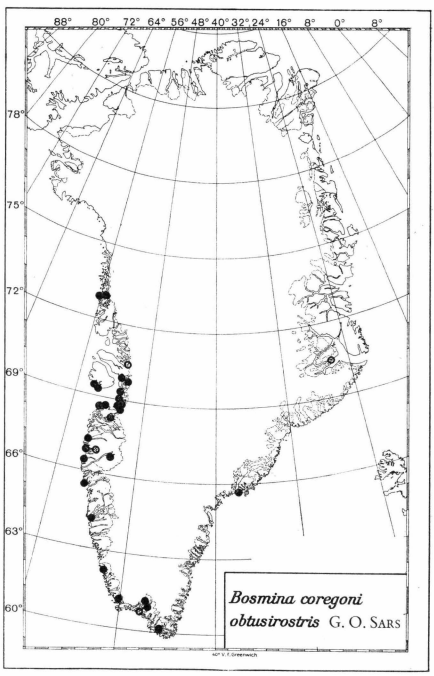
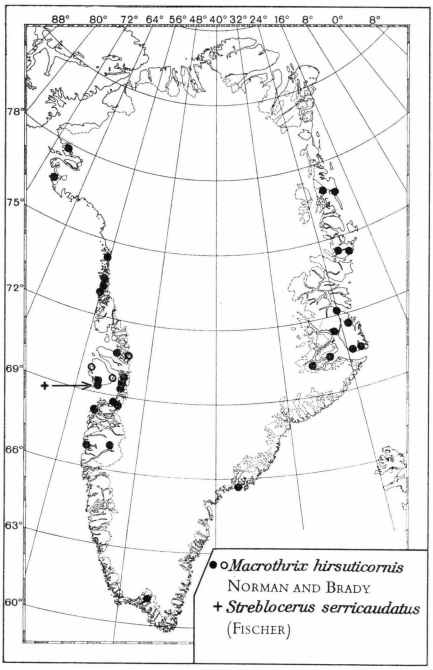


Fig. 49.



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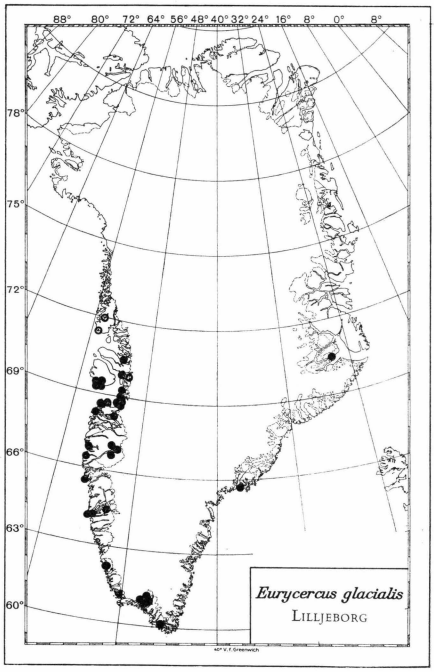


Fig. 51.

on the west coast, the Umanak area, it is fairly rare (14.3 per cent.), while increasing in frequency in the more southerly areas. On the east coast it is very rare in the Scoresby Sund area, and in the southern area it has only been collected at Angmagssalik, 4 times in all. Thus there is hardly any doubt that POULSEN (1940 a, p. 66) is right when stating that the species is considerably rarer in East Greenland than in West Greenland. Otherwise the species has a southern distribution in Greenland.

Acroperus harpae (BAIRD). Fig. 52.

On the west coast this species has been found evenly and rather commonly distributed south of lat. 74°30'N. and on the east coast south of lat. 72°N. The frequencies show that the species in its area of distribution in East Greenland is somewhat commoner than it is in West Greenland. This is the more peculiar as POULSEN (1940 a, p. 66) ascribes to it a frequency of 41 on the west coast, but only 2 on the east coast. The 41 per cent on the west coast are in fair agreement with my findings, especially considering that POULSEN derived his west-coast figure from HABERBOSCH's material, which as regards the greater part by far originates from the Disko Bugt area. The frequencies from the west coast show some fluctuation from area to area, but it is not possible from this fluctuation to derive any tendency towards the species being commoner in the northern or the southern part of its area of distribution. The species must be said to have a southern distribution in Greenland.

Alona guttata G.O.SARS. Fig. 53.

The species is of very scattered occurrence on the west as well as the east coast. There is hardly any reason to doubt that it can be found in the greater part of Greenland with the exception of the very northernmost regions, only it must be assumed that it is fairly rare everywhere.

In the present investigations it was found as new to the east coast.

Alona intermedia G.O.SARS. Fig. 54.

The very scattered findings of this species make it impossible to make any certain statement as to its distribution in Greenland. Presumably it is distributed on the west as well as the east coast, with a northern limit at about lat. 75°N.

In the present investigations the species was found as new to the east coast.

Alona rectangula G.O.SARS. Fig. 55.

On the west coast this species has been found south of lat. 73°30'N., and on the east coast in three localities between lat. 71° and 77°N.

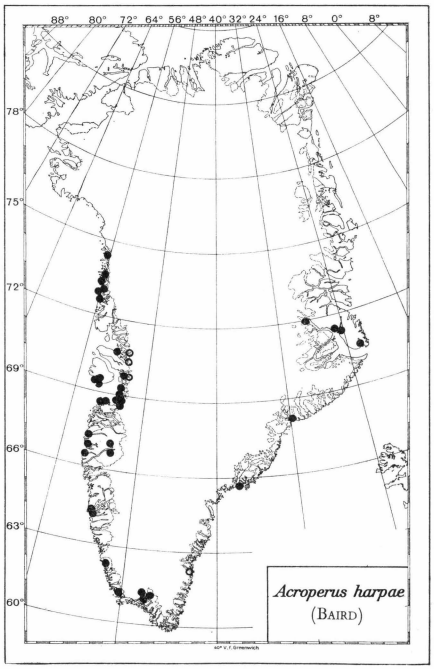
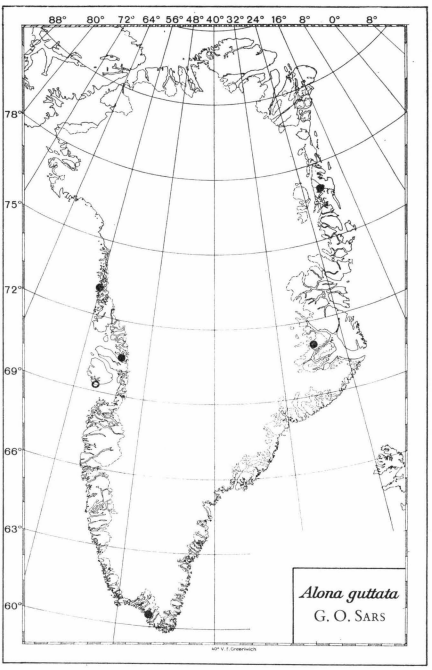


Fig. 52.



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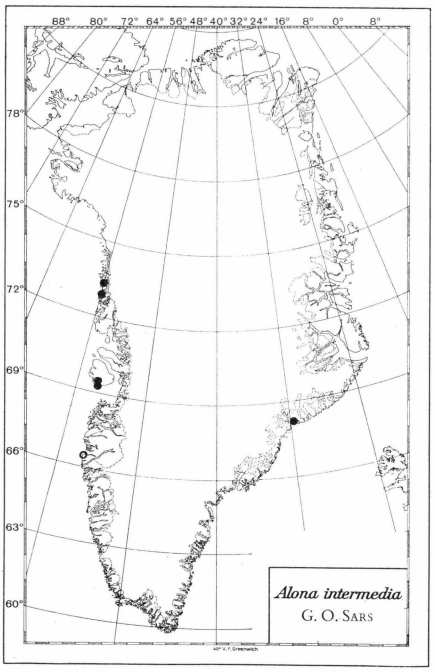

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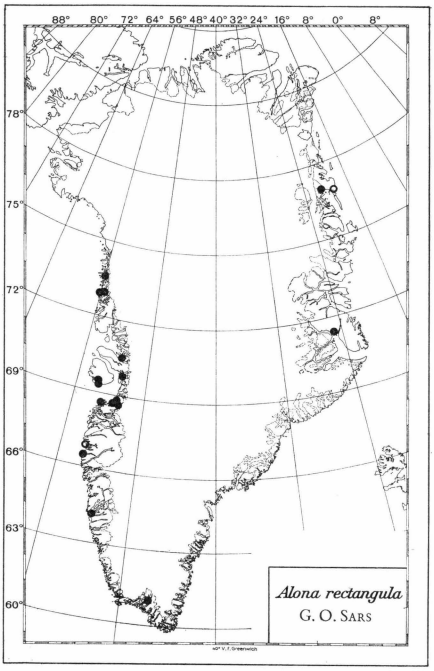


Fig. 55.

Considering that the species on the east coast has been found only in the northern part, it is remarkable that within its area of distribution on the west coast it has been found considerably more frequently in the northern regions than in the southern ones. The species cannot, however, be said to have any actually northern distribution in Greenland, as it has not been found at all in the very northernmost regions.

Alona quadrangularis (O. F. MÜLLER). Fig. 56.

In Greenland this species has been found in the five southern areas on the west coast and in the Scoresby Sund area on the east coast. Strangely enough the East Greenland findings were made somewhat farther north than the West Greenland ones. More thorough investigations in Southeast Greenland, however, will no doubt show that the species also occurs there and thus has a southern distribution in Greenland.

Alona affinis (LEYDIG). Fig. 57.

The information in the literature concerning the distribution of this species is encumbered with some uncertainty in respect of its occurrence in the Umanak Fjord. HABERBOSCH (1920) mentions it (p. 183) among the species that occur from the Umanak Fjord to South Greenland, and in Table 2 and on Map 2 he also records it from the Umanak Fjord. He does not, however, include the species in the list on p. 173 ff., and it has not been possible for me to discover the locality in the Umanak Fjord from which he records the species. As I have not myself found it in the Umanak area, I consider the statement by HABERBOSCH to be a mistake.

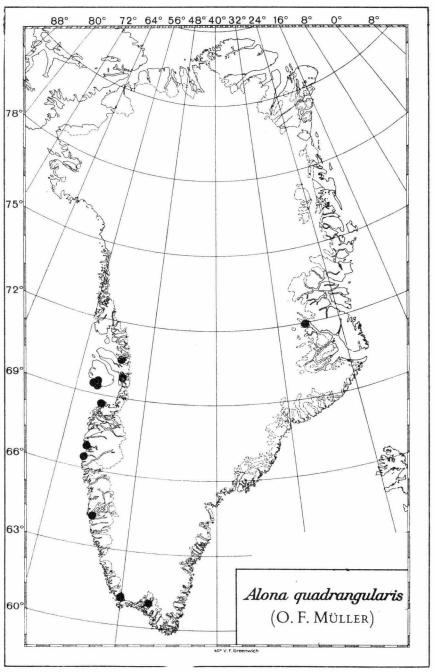
Otherwise the species has been found on the west as well as the east coast south of about lat. 73°N. It seems to occur considerably more frequently on the west coast than on the east coast. In the northernmost part of its area of distribution on the west coast, however, it seems to be very rare, as it has only been found in one locality north of Nûgssuaq, viz. in Upernavik.

Graptoleberis testudinaria (FISCHER). Fig. 58.

The rather few localities in which this species has been found are all situated on the west coast south of lat. 69°30′N. It is not possible from these findings to derive anything definite about the distribution of the species in Greenland, but if anything, it seems to me that the species has a southwestern distribution.

Alonella nana (BAIRD). Fig. 59.

Alonella nana has on the west coast been found only south of lat. 73°N. It is commonest in the Umanak–Disko Bugt areas, where it occurs



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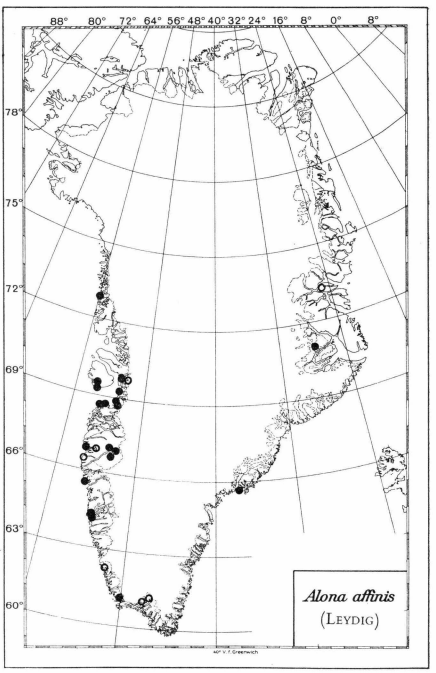

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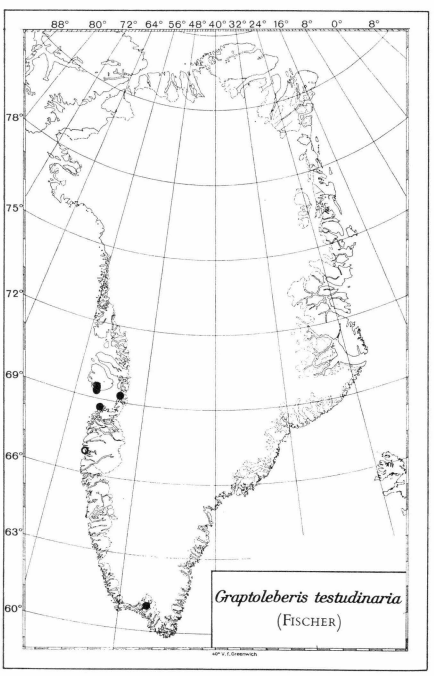

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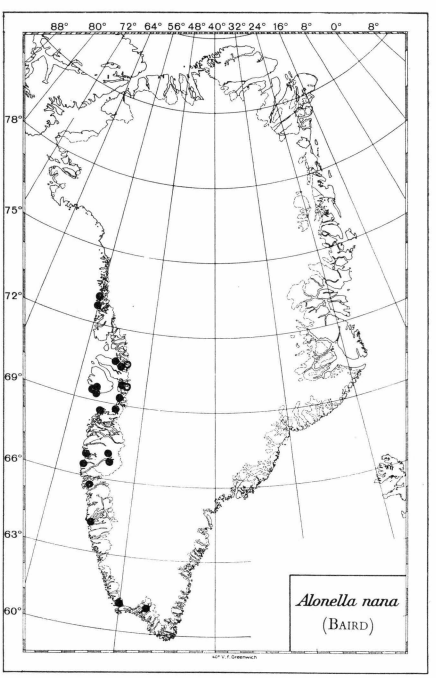


Fig. 59.

in more than one third of the localities, while in the other areas it occurs in about 10 per cent. of the localities. The species must, however, be said to have a southwestern distribution in Greenland.

Alonella excisa (FISCHER). Fig. 60.

Alonella excisa has been collected on the west coast south of lat. 72°30′N., and on the east coast south of lat. 71°30′N. The frequencies seem to show that the species is commoner in the southern areas than in the northern ones, but the figures are rather fluctuating. POULSEN (1940 a, p. 66) states that it is considerably more frequent on the west coast than on the east coast, 36 to 7, but as far as can be judged from my figures, it is equally common in the two littoral regions. There is hardly any doubt that the species has a connected southern area of distribution in Greenland.

Chydorus sphaericus (O.F.MÜLLER). Fig. 61.

There is hardly any doubt that this species occurs everywhere in Greenland. In all the areas investigated it has been found in nearly 50 per cent. of the localities or more. The frequencies show some fluctuations from area to area, but there is no reason to assume that these fluctuations should be expressive of the fact that the species is commoner in some parts of its area of distribution than in others.

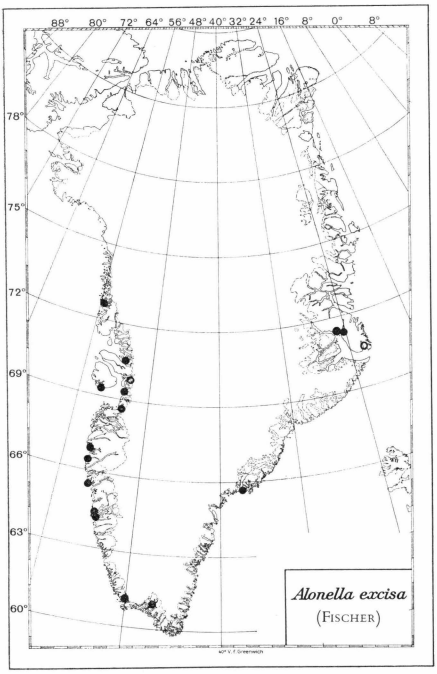
Polyphemus pediculus (L.). Fig. 62.

This species has been found on the west as well as the east coast south of about lat. 73°N. The findings are not, however, evenly distributed. Thus the species has not been found in Umanak, and it seems to have its highest frequency on the west coast in the Disko Bugt area with 53.0 per cent, and on the east coast in the Scoresby Sund area with 50.9 per cent. South of this latitude the frequency is somewhat lower, on the west coast, however, again rising towards the south. POULSEN (1940 a, p. 66) states the species to be very rare on the east coast. (2 per cent.), while for the west coast he gives a figure that is somewhat higher than my highest frequency for the species, viz. 71 per cent.

The species must be characterized as having a distinctly southern distribution in Greenland.

Cypris pubera O.F.MÜLLER. Fig. 63.

This species has in Greenland been found only in a total of three localities, which all are situated in the Holsteinsborg and Godthåb areas in West Greenland. Thus the findings would seem to indicate a south-



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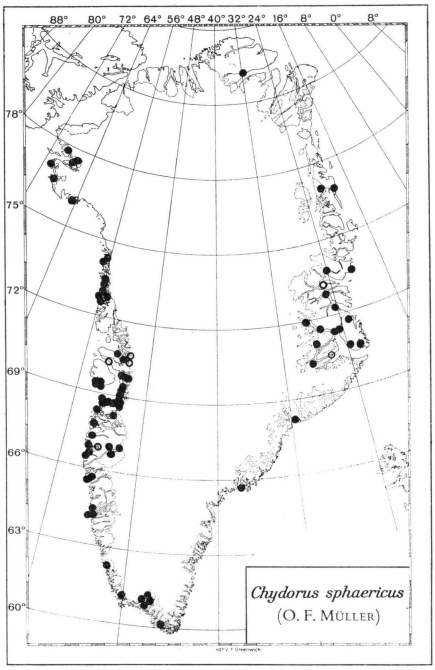

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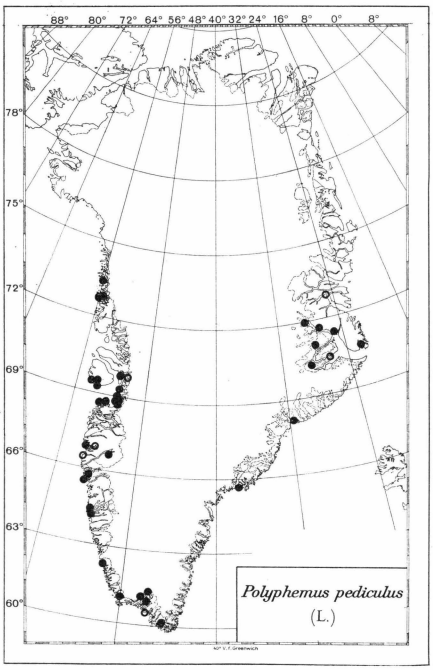

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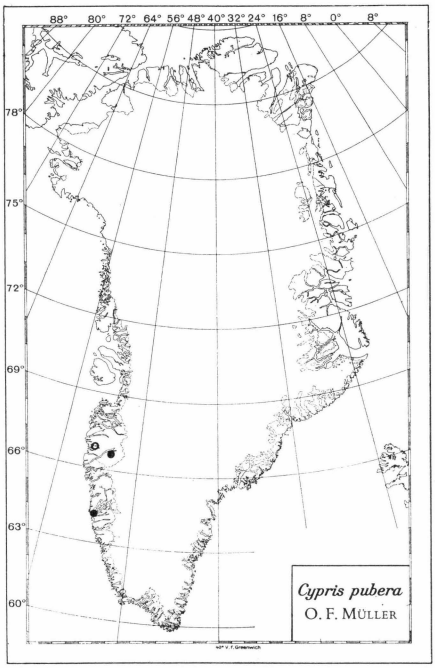


Fig. 63.

western distribution in Greenland, but due to the small number of findings this can only be established with some uncertainty.

Eucypris affinis hirsuta (FISCHER). Fig. 64.

On the west coast of Greenland the species has been found in the five southernmost areas, while on the east coast it has been found in the Kejser Franz Josephs Fjord area and the Scoresby Sund area. Strangely enough all the East Greenland findings have been made farther north than the northernmost West Greenland finding. However, the species no doubt has a southern distribution in Greenland, as apart from what is already known, it will undoubtedly be possible to find it in Southeast Greenland.

Eucypris virens (JURINE). Fig. 65.

In Greenland the species has been found on the west as well as the east coast, on the west coast in three areas, Umanak, Disko Bugt, and Holsteinsborg, while on the east coast it has only been found in the Scoresby Sund area. The northern limit is about lat. 71°N., while the southernmost finding was made in lat. 68°N.

Cyprinotus incongruens (RAMDOHR). Fig. 66.

There is quite a distinct difference between the occurrences of this species in East Greenland and West Greenland. In East Greenland it occurs with high frequencies in all the four areas, while in West Greenland it occurs with rather low frequencies, and has not been found in the Upernavik, the Umanak, and the Godthåb areas. Neither the map nor the frequencies show any distinct tendency regarding the distribution in the direction north–south, and, if anything, it should probably be considered that the species is distributed all over Greenland, although it is considerably more frequent on the east coast than on the west coast.

Prionocypris glacialis (G.O.SARS). Fig. 67.

The findings of this species have mainly been made in the northern part of Greenland, as on the west coast it has only been found in a single locality south of about lat. 68°N. and in East Greenland has not been found at all south of lat. 70°N. The frequencies of the species emphasize its northern distribution. Especially on the east coast this is evident, but it is also seen on the west coast, as the species only in the Thule area attains to a comparatively high figure (17.2 per cent.), while in the other areas it either is missing or has very low frequencies.

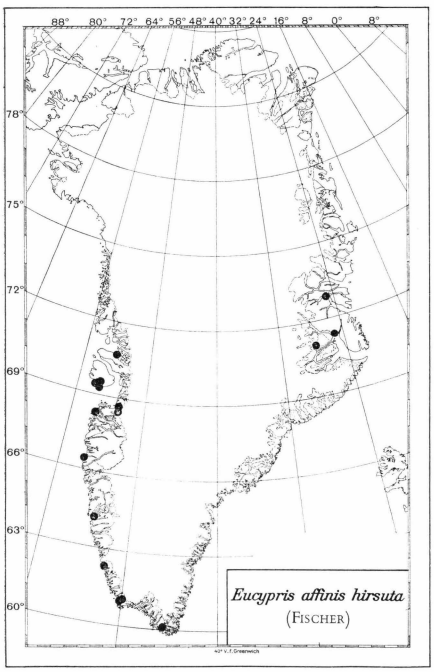
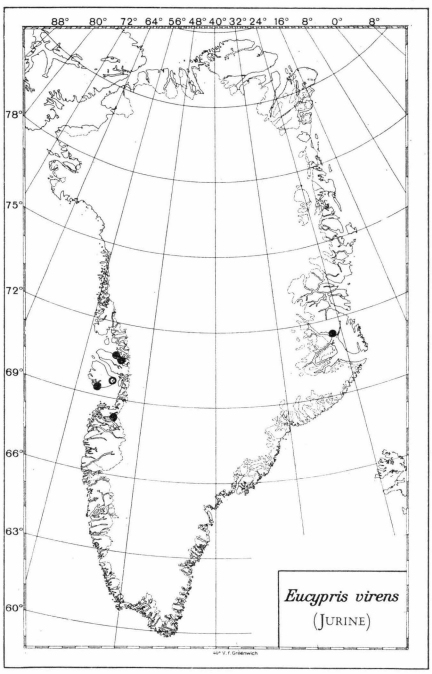


Fig. 64.



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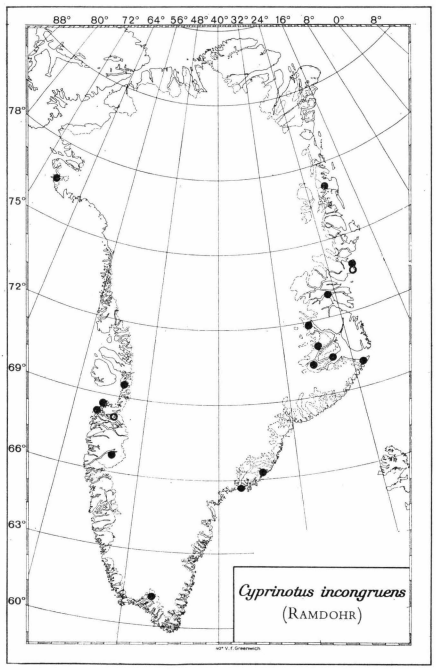

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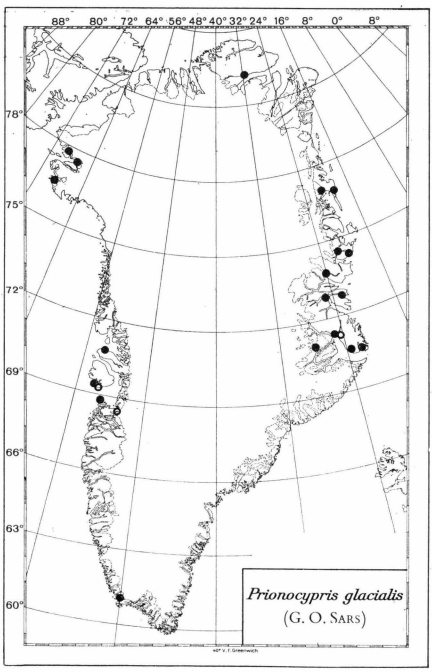


Fig. 67.

Candona candida (O. F. MÜLLER) VAVRA. Fig. 68.

This species is distributed all over West Greenland and in East Greenland occurs in the two middle areas. The fact that findings in the northern and southern areas of East Greenland are so few in number, would seem to make it probable that it will be possible to find the species in both of these littoral regions by more intensive collections. To me it seems probable that the species occurs in the whole of Greenland.

Candona lapponica EKMAN. Fig. 69.

What is said below about *C. rectangula* also applies to this species, as it has been found in the same areas, also in small numbers.

Candona groenlandica BREHM. Fig. 70.

This species has been collected very sporadically in Greenland. In East Greenland it has only been found in the northernmost area, while in West Greenland it occurs as far south as Søndre Strømfjord. It seems that the species has a northwestern distribution in Greenland, but the tendency is not distinct because of the small number of findings.

Candona rectangula ALM. Fig. 71.

This species seems to be rare in Greenland, as on the west coast it has only been found in the Disko Bugt and Holsteinsborg areas and on the east coast in the Kejser Franz Josephs Fjord and Scoresby Sund areas, always in a small number of localities.

Candona subgibba G. O. SARS. Fig. 72.

The distribution of this species in Greenland is markedly northern, as it has exclusively been found in the Thule District and in Pearyland. However, there may be a possibility that the species can also be found in other areas, especially along the north coast and perhaps also in the northern parts of the Upernavik District, from where few collections are available.

Candona falcata ALM. Fig. 72.

The species has been found in a small number of localities and only in two areas, the Disko Bugt area on the west coast and the Scoresby Sund area on the east coast. Thus it seems to have the same distribution as *C. rectangula* and *C. lapponica.*

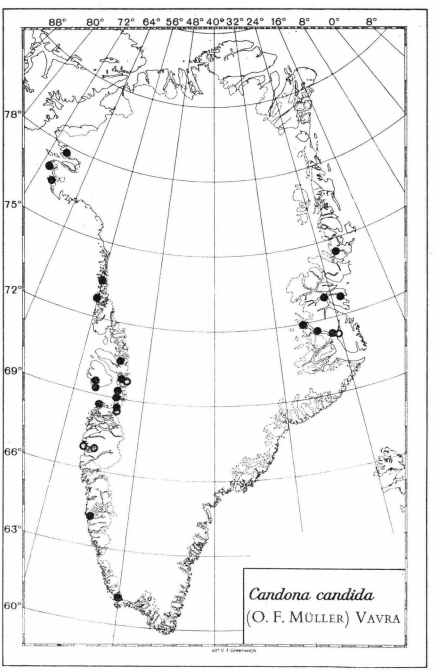
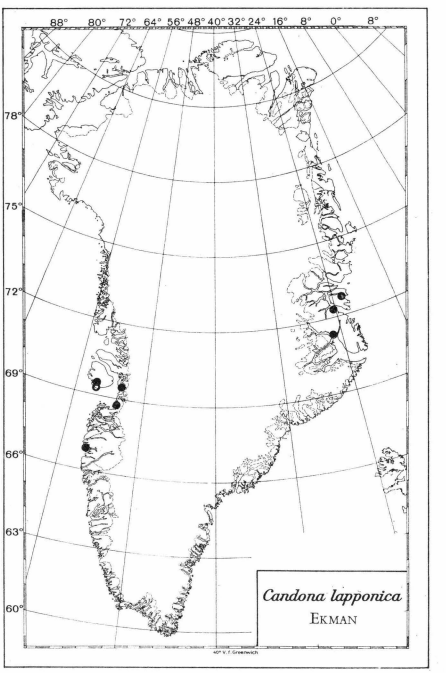


Fig. 68.



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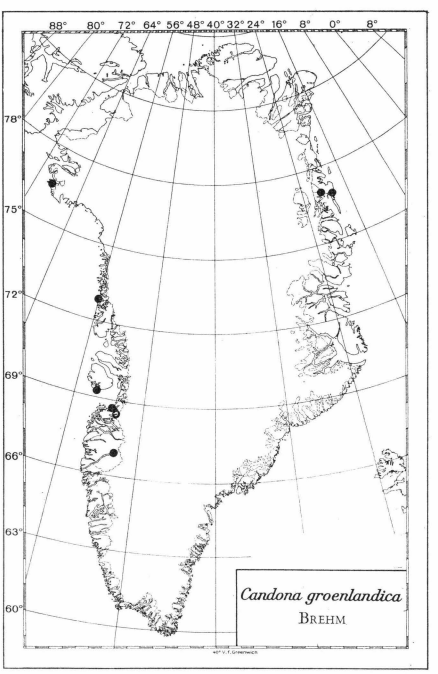

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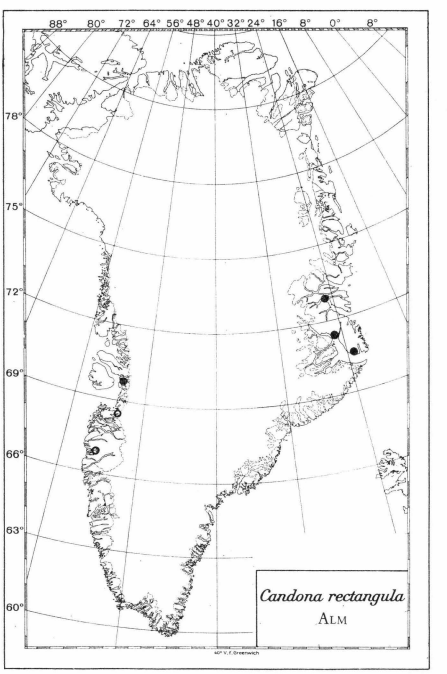


Fig. 71.

Cypridopsis vidua (O.F.MÜLLER) Fig. 73.

The one finding of this species made in Greenland cannot tell anything about the distribution of the species there.

Limnocythere sanctipatrici BRADY and ROBERTSON. Fig. 73.

The species has been found only in four localities, one in the Disko Bugt area, two in the Holsteinsborg area (Søndre Strømfjord) and one in the Scoresby Sund area on the east coast.

Limnocalanus grimaldi (DE GUERNE). Fig. 74.

This species has only been found in one locality, in northernmost East Greenland.

Diaptomus castor (JURINE). Fig. 74.

The species has been found with certainty only in West Greenland south of lat. 69°30′N. An early report on a finding of the species in East Greenland without statement of locality (BUCHHOLZ, 1874, p. 392) is too uncertain for it to be included here.

The findings of the species have been made in three demarcated areas, viz. one in the southern part of Disko Bugt, one at the head of Søndre Strømfjord, and one in southernmost West Greenland.

Diaptomus minutus LILLJEBORG. Fig. 76.

According to the available findings and the information in the literature this species has rather a strange distribution, as it is common on the west coast south of about lat. 74°N., and furthermore has been stated to have been found in Sælsøen in East Greenland in about lat. 77°N. (BREHM 1911). As this locality seems to me to be extremely isolated geographically, I shall make some comments on BREHM's statement. He writes on the finding (*loc. cit.* p. 313): "Nur in einer Probe kam dieser für Grönland recht charakteristisch *Diaptomus* in zwei Exemplaren vor, die mit *Limnocalanus*-Spermatophoren behaftet waren. In einem grossen See "Sælsøen ved Hvalrosodden, 116 m dyb. Planktontræk (vertikalt) 0–50 m 24.V.1908". Die Eisdecke war 176 cm stark." In the collections at the Zoological Museum of Copenhagen I succeeded in finding a tube with the label above, and furthermore a label was found on which was written *Diaptomus minutus*. The contents of the tube, however, were two specimens of *Limnocalanus grimaldi*, a male and a female, of which the female was set with spermatophores. Now there is of course a possibility that the labels at some time may have been mistaken for one another, but as far as I could find out, nobody has used this sample since BREHM determined the animals. It is another

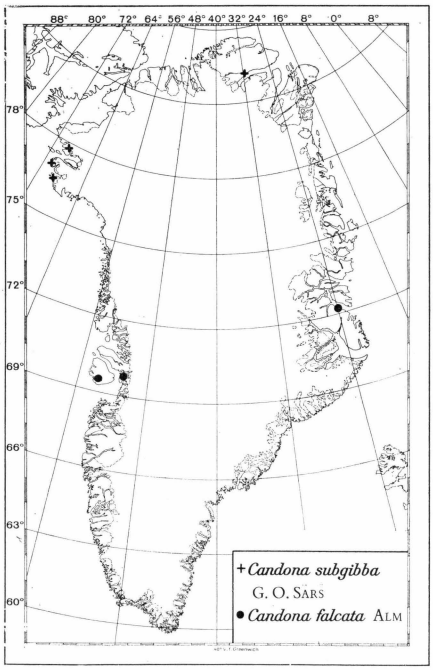
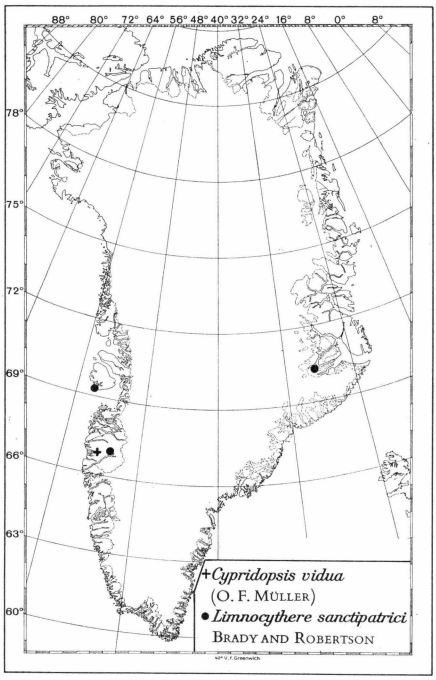


Fig. 72.



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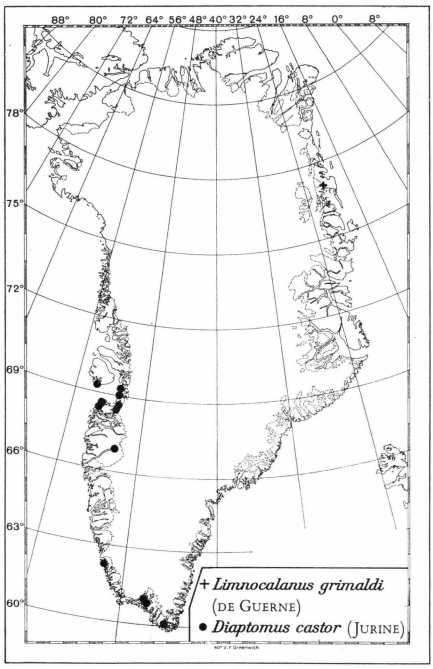


Fig. 74.

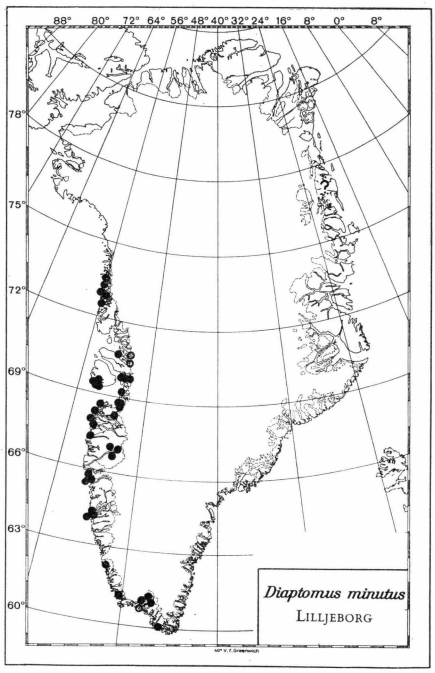


Fig. 75.

curious fact that the species nearly always occurs in large numbers in its habitat. In the place in question there were only two specimens in a column of water of 50 m. If furthermore we consider BREHM's remark about the *Limnocalanus* spermatophores, we may assume that it was actually these two specimens he had before him, and if so it is a case of erroneous determination. On the basis of these facts — and the distribution of the species elsewhere in Greenland — I shall put a ? against the occurrence of the species in East Greenland.

In the part of West Greenland in which the species occurs, it is common everywhere. Its highest frequency is in the southern part of the area, while it is not quite so common in the parts farther north.

Eucyclops serrulatus (FISCHER). Fig. 76.

The species has in Greenland a distinct northwestern distribution, as it has in West Greenland been found only in the three northernmost areas, towards the south down to about lat. 70°N., and in Pearyland. Its northern distribution is emphasized by the frequencies, as these show a distinct decrease towards the south.

Cyclops (Cyclops) scutifer G.O.SARS. Fig. 77.

This species is found on the west coast south of lat. 74°N. and on the east coast south of lat. 77°N. Thus it is found everywhere in Greenland except in the regions farthest north. In spite of this the species must still be said to have a southern distribution, as the frequencies largely show an increase towards the south. The only appreciable deviation from this fact is in the Godthåb area, where the frequency is very low. It is hardly probable that the species can be found in the Thule area, but perhaps it is possible to find it somewhat farther north on the east coast, thus farther north than the findings made so far.

Cyclops (Megacyclops) magnus MARSH. Fig. 78.

This species is the Greenland entomostracal form which has the most pronounced northwestern distribution, as it has exclusively been found in the Thule area. The species can hardly have been overlooked in the other areas examined, and a possible wider distribution of the species in Greenland thus is limited to the coastal region north of Thule to Pearyland. Occurrence on this stretch, however, would only further emphasize the northwestern distribution of the species.

Cyclops (Acanthocyclops) vernalis FISCHER. Fig. 78.

The map of distribution shows that the species has only been found in southern West Greenland south of about lat. 70°N. The frequencies

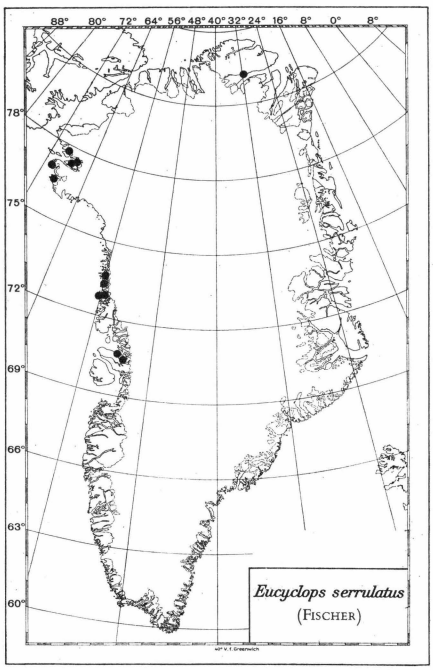
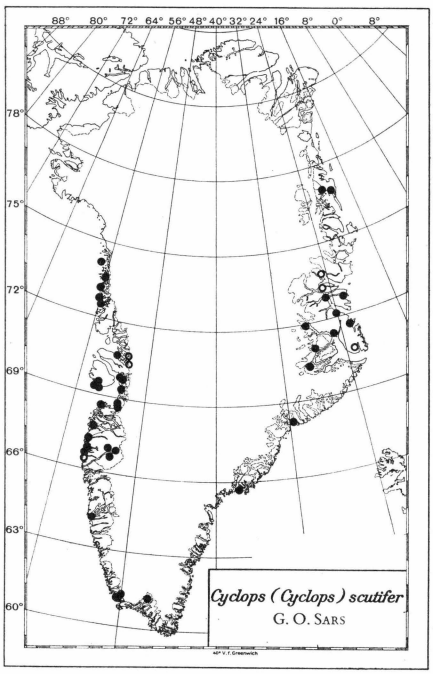


Fig. 76.



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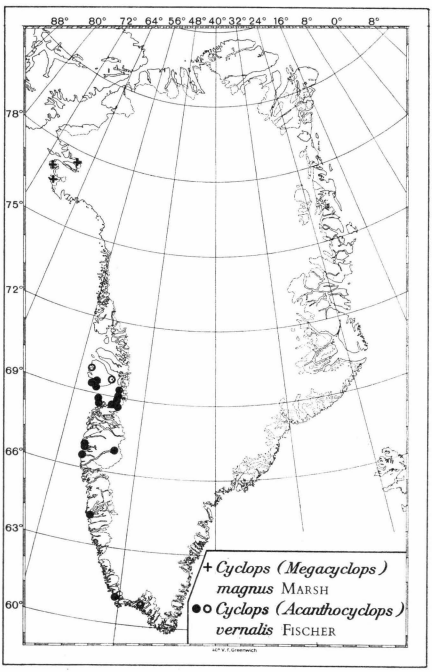

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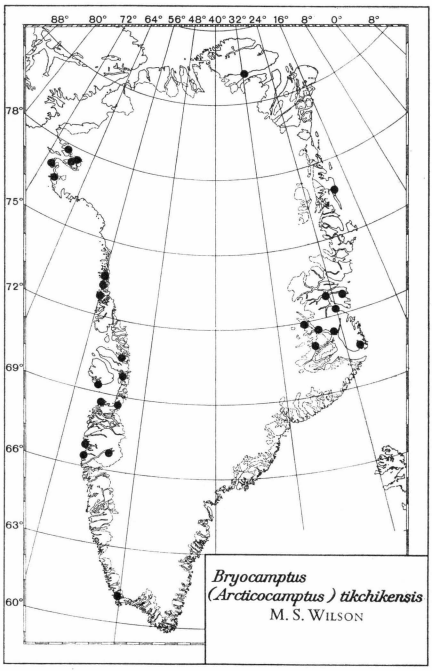


Fig. 79.

to a certain extent tell against a southwestern distribution as the most frequent occurrence — 57.6 per cent. — is found in the Disko Bugt area, whereas the species is comparatively rare in Southwest Greenland.

Bryocamptus (Arcticocamptus) tikchikensis M.S. WILSON. Fig. 79.

This species seems to have a northern distribution in Greenland. On the west coast it occurs in the five northernmost areas, and in one locality in the southernmost area. The frequency in the Thule District is considerably higher than that in the other areas on the west coast. Furthermore it must be emphasized that the locality in the southernmost area is situated at rather a high altitude, 900 feet, i.e. about 300 m above sea level. On the east coast the species has only been found in the three northernmost areas.

Bryocamptus (Arcticocamptus) arcticus LILLJEBORG. Fig. 80.

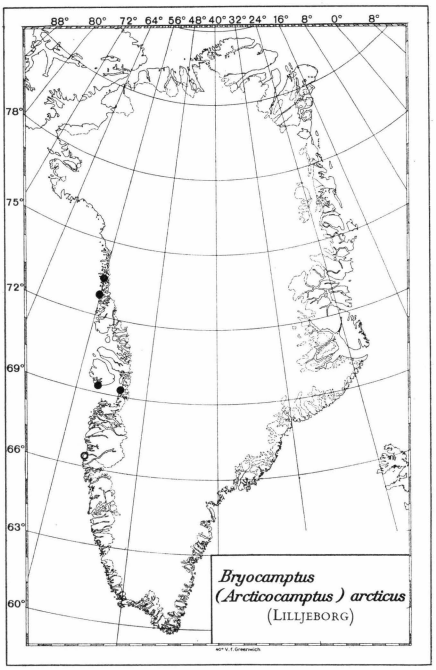
The species has only been found on the west coast of Greenland between lat. 66°N. and lat. 74°N., but the localities are situated far from each other and on the whole the species does not seem common. It seems to have a western distribution, but due to the small number of findings it is impossible to decide this with certainty.

Moraria mrazeki T. SCOTT. Fig. 81.

This species has been found only in a few places in West Greenland south of lat. 69°30′N. Furthermore, there is a possibility that the form given by BREHM (1911, p. 312) as *Canthocamptus duthiei* ? ? is the present species. At any rate HABERBOSCH thinks so (1920, p. 170). I have not succeeded in finding the specimen determined by BREHM and in this way having verified or weakened this explanation. On the present basis it is not possible with certainty to make any statement about the distribution of the species. If BREHM's species is not included in the present species, it seems, if anything, that it has a southwestern distribution in Greenland, but if BREHM's specimen is actually *Moraria mrazeki*, we must probably assume that the species is found in the greater part of Greenland, but that it is immensely rare in most places.

Maraenobiotus brucei (RICHARD). Fig. 82.

This species has been found in all the areas examined except the two southernmost ones in West Greenland. It has, however, in all areas on the west coast, except the Disko Bugt area, been collected in very few localities. In the two middle areas on the east coast it seems to be somewhat commoner. The species thus seems to have two centres of occurrence in Greenland, one in the middle of the west coast and another



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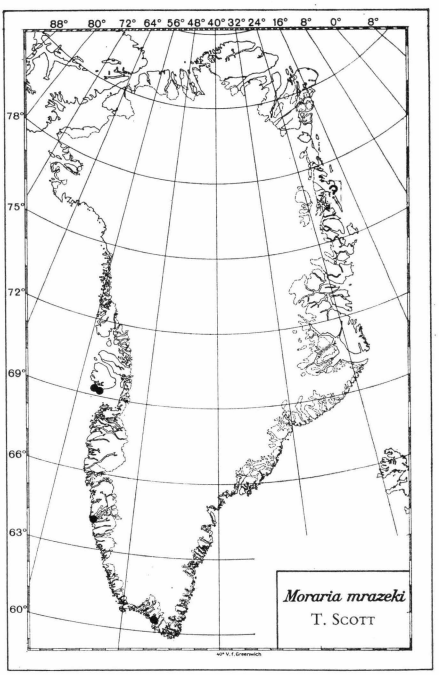

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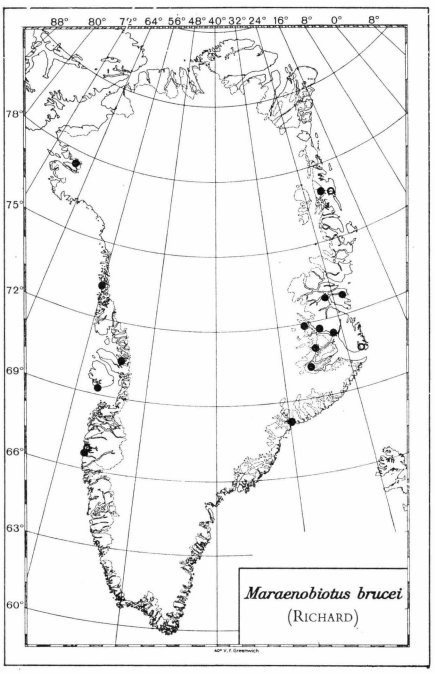

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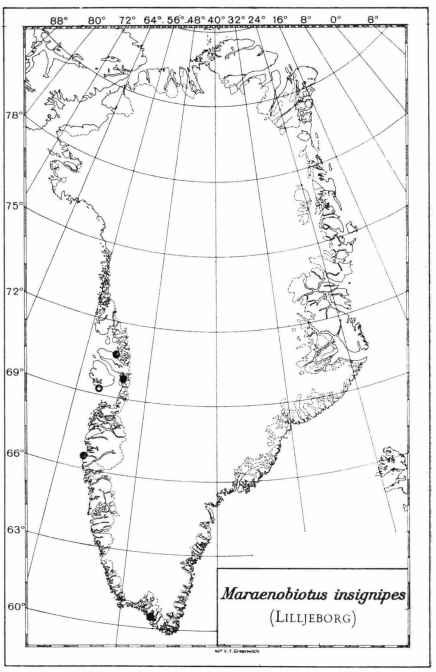

Fig. 83.

on the east coast, and apparently the occurrence is scarcer north and south of these centres.

Maraenobiotus insignipes (LILLJEBORG). Fig. 83.

This species has been found in West Greenland only south of lat. 70°30′N. and only in a small number of localities. Thus it seems to have a southwestern distribution, but it is dangerous to draw any definite conclusion on the basis of such small material.

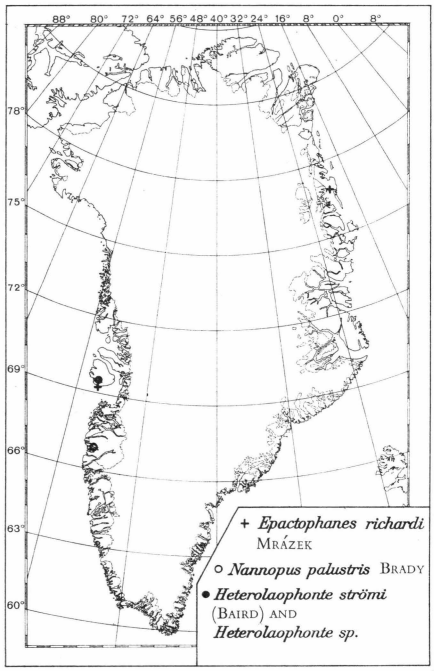

Fig. 84.

Epactophanes richardi MRÁZEK. Fig. 84.

The species has only been found in three localities, viz. two in Godhavn and one near Stormkap in Northeast Greenland. It is not possible on the basis of this material to infer anything about the distribution of the species in Greenland.

Nannopus palustris BRADY. Fig. 84.

The one locality in which the species has been found in Greenland gives no information about the geographical distribution of the species.

Heterolaophonte strömi (BAIRD). Fig. 84.
Heterolaophonte sp. Fig. 84.

Nor does the one finding-place give any information in the case of these two forms.

c. Faunal Elements in the Greenland Freshwater Entomostraca.

On the basis of the discussion of ecology and geographical distribution of the Greenland freshwater entomostraca it is possible to divide into four faunal elements each of which has its own characteristics as regards distribution and presumably its origin in Greenland as well.

These four faunal elements are as follows:

(1) An element found in the whole of Greenland.
(2) A northwestern faunal element.
(3) A southern faunal element.
(4) A brackish-water element.

It has been tried to refer some species which in Greenland have been found only once or twice to one of the four fauna elements on the basis of their occurrence outside Greenland, and the special conditions will be discussed under the element in question.

Species Found in the Whole of Greenland.

This element in the Greenland fauna of entomostraca consists of a small number of species, viz. only four sure species, *Macrothrix hirsuticornis*, *Chydorus sphaericus*, *Cyprinotus incongruens*, and *Candona candida*.

Of these *Chydorus sphaericus* is the most pronounced cosmopolitan and ubiquitous species in the Greenland fauna of freshwater entomostraca. In the investigations described here it was found as extremely common in all types of locality and with a very pronounced tolerance to all factors examined.

Conditions of *Macrothrix hirsuticornis* are rather similar to those of *Chydorus sphaericus*. Its distribution is so wide that it nearly must be termed cosmopolitan, too, and like *C. sphaericus* it has a very great ecological tolerance.

The two ostracods, *Cyprinotus incongruens* and *Candona candida*, also are very widely distributed and, although to a somewhat smaller

extent than the two cladocerans, are very tolerant to the environmental conditions. Thus both of them have been found in lakes as well as ponds and puddles and occur with a wide range of variation as regards the factors examined.

It is probable that some more species should be included in this faunal element, viz. such species as have been found very few times in Greenland and the distribution of which therefore does not stand out clearly. This may, e.g., be the case of *Moraria mrazeki*, the recording of which from the east coast, however, is uncertain (cf. p. 164, and 212). Furthermore there is a great possibility that it is the case of *Bosmina longirostris*. This species has in Greenland mainly been found in arid areas where there are freshwater localities with rather high concentrations of salt, thus the Thule area, the Umanak Fjord, the interior parts of Kejser Franz Josephs Fjord, and the Scoresby Sund Fjord, and furthermore at the head of Disko Fjord and north of Holsteinsborg. Only, it is strange that the species has not been found about the head of Søndre Strømfjord. The species has not been collected in Southwestern Greenland, but as at the heads of the deep fjords, e.g. Godthåbsfjord, there are possibilities of the formation of lakes rich in salt, there should also there be a possibility of finding this species outside the areas where it has been found so far.

Maraenobiotus brucei also seems to belong to this faunal element. The singular distribution of this species, with two centres of distribution, one in Disko Bugt and one in the middle of the east coast, may be ecologically conditioned, or perhaps has only apparently arisen by the fact that the two areas are those which have been most closely examined. That the species has not been found in the Godthåb area or in Southwest Greenland is no doubt due to the fact that these areas, even though a fairly large number of localities have been examined, have only to a slight extent been rationally investigated. The species (with various subspecies and varieties) is very widely distributed out of Greenland and has a very wide ecological tolerance.

This faunal element, including seven species in all, on the whole consists of species that are extraordinarily little sensitive to the various ecological factors. The fact that they are capable of holding their own in the high arctic regions of North Greenland and today have a distribution that includes the whole of Greenland, might suggest that we have to do with species that have been capable to surviving the Glacial Age in Greenland. It is not possible today to decide with certainty where and under what conditions they have survived, but five of them have been found in the seminunatak area Charcots Land in the interior part of the Scoresby Sund Fjord. From botanical quarters (BÖCHER 1956) it has been shown that even during the widest extension of the icecap

in Greenland there have been non-glaciated areas with a character closely corresponding to the nunataks we know today. The ecological conditions of the freshwater entomostraca in these "Glacial Age nunataks" can hardly have been perceptibly worse than conditions in Charcots Land today, and there are many indications that part of the preglacial fauna of freshwater entomostraca in Greenland can have held its own there. The faunal element treated here is presumably the last remnant of this preglacial fauna of freshwater entomostraca.

The Northwestern Faunal Element.

This faunal element of the Greenland freshwater entomostraca includes with certainty ten species, viz. *Branchinecta paludosa*, *Artemiopsis stefanssoni* var. *groenlandicus*, *Lepidurus arcticus*, *Daphnia pulex*, *Prionocypris glacialis*, *Candona groenlandica*, *Candona subgibba*, *Eucyclops serrulatus*, *Cyclops* (*Megacyclops*) *magnus*, and *Bryocamptus* (*Arcticocamptus*) *tikchikensis*.

Four of these species, *Artemiopsis stefanssoni* var. *groenlandicus*, *Candona subgibba*, *Cyclops* (*Megacyclops*) *magnus*, and *Bryocamptus* (*Arcticocamptus*) *tikchikensis* are nearctic species, which, with the exception of a single finding of *Candona subgibba* reported from Japan, exclusively occur in arctic areas. Of these four species only *Bryocamptus* (*Arcticocamptus*) *tikchikensis* has a wide distribution in Greenland, though being rare in Southwest Greenland and not having been found in Southeast Greenland, while the other three species have a limited and very pronouncedly northwestern distribution.

Another group is constituted by *Branchinecta paludosa* and *Lepidurus arcticus*. They are holarctic species, which have only exceptionally been found outside the arctic area, and then always at a high altitude. To this group presumably belong the two ostracods *Prionocypris glacialis* and *Candona groenlandica*, which, indeed, have not yet been shown to occur in the nearctic area, but which at future investigations will no doubt be found there. One of these four species, *Branchinecta paludosa*, has only been found on the west coast and the very northernmost part of the east coast, while the other three are distributed far south on both coasts of Greenland.

Finally the northwestern faunal element contains two species which, if anything, must be termed widely distributed ubiquists, viz. *Daphnia pulex* and *Eucyclops serrulatus*. The latter has in Greenland a very distinct northwestern distribution, whereas *Daphnia pulex* is so widely distributed that it is only by reducing the frequency of its occurrence towards the south on both coasts possible to show its attachment to this faunal element.

Finally, *Daphnia catawba* and *Epactophanes richardi* should perhaps be referred to the northwestern faunal element in Greenland. The former is a nearctic species, the latter is holarctic. Their distribution in Greenland is very little known, only one and three findings, respectively, having been made, but these findings have been made within the areas of distribution of such as *Lepidurus arcticus*, *Prionocypris glacialis*, *Candona groenlandica*, and *Bryocamptus* (*Arcticocamptus*) *tikchikensis*.

This northwestern element of the Greenland fauna of freshwater entomostraca has previously been mentioned by JENSEN (1928, p. 21), but there only the species *Lepidurus arcticus* is mentioned. Besides entomostraca also some other freshwater animals must be referred to this faunal element, e.g. the hydrachnid *Lebertia* (*Pseudolebertia*) *insignis* var. *porosa* (LETTEVAL, 1962, p. 37).

It is remarkable that all the four species of the Greenland freshwater fauna which can be characterized as pure nearctic species (*Diaptomus minutus* is, indeed, a nearctic species, but also occurs in Iceland) belong to this faunal element. *Candona subgibba* must also be referred here, even though it has been found in Japan. This might suggest that it is a faunal element immigrated into Greenland from America, more especially arctic America by way of the North Canadian islands, after the Glacial Age. It cannot with any fair reason be assumed that the species mentioned here can have survived the Glacial Age in possible refuges in Southern Greenland and from there later have spread towards the north after the withdrawal of the ice, while at the same time they disappeared from the southern regions.

HABERBOSCH (1920, p. 302) calls attention to the remarkable fact that he did not find *Eucyclops serrulatus* in Greenland, although this species is common in the North Scandinavian alpine areas. The ecological requirements of *E. serrulatus* have been met in all the parts of Greenland in which I have made water analyses so that it cannot be ecological conditions that fix a limit to the distribution of *E. serrulatus* in Greenland. In the Thule District *E. serrulatus* in several cases occurs in the same localities as *Cyclops* (*Megacyclops*) *magnus*, and even though *Cyclops* (*Cyclops*) *scutifer* is not found in the same localities as *E. serrulatus*, the species overlap in a large area, the Upernavik and Umanak Districts. As to *Cyclops* (*Acanthocyclops*) *vernalis*, this species does not occur in the same areas as *E. serrulatus*. Nûgssuaq forms the line of demarcation between their areas of distribution on the west coast, but there is no reason to assume that these two species should mutually oust each other on each side of this line, as they often elsewhere, e.g. in Europe, have been collected in the same locality. If these conditons are compared with the fact that the frequency of *E. serrulatus* decreases from the north

towards the south, it seems probable to me that this species, too, has immigrated from Arctic America.

Similar arguments can be advanced in the case of *Daphnia pulex*, even though the area of Greenland in which *D. pulex* has not been found, is comparatively small and unconditionally is the most poorly investigated area in Greenland.

The fact that two of the species in the northwestern faunal element, *Prionocypris glacialis* and *Candona groenlandica*, have not yet been found in arctic America, does not seem to me to exclude the conclusion that this faunal element has immigrated into Greenland from the west at a comparatively late time. As mentioned above, the fauna of freshwater entomostraca in the eastern arctic Canadian islands is very poorly investigated, especially the fauna of Ostracoda is completely unknown. Future investigations will presumably throw light on these conditions and more clearly show whether the above-mentioned element of the Greenland freshwater fauna can be considered immigrated into Greenland from these regions.

The Southern Faunal Element.

This faunal element is the greatest by far of the Greenland fauna of freshwater entomostraca, as it includes more than half of the species found. The distribution of the species in question is, however, very heterogeneous, so we must distinguish between two main types of distribution: (1) Species found only in West Greenland, and (2) Species found in both West and East Greenland. Common to all the species that can be referred to this faunal element is the fact that their distribution in Greenland has a northern limitation, but far from all the species within the two main groups have their northern limit situated in the same latitude. It is necessary within the two main groups to distinguish between different subgroups, within which the species have approximately the same northern limit.

(1) *Species found only on the west coast.*

(a) Pronounced southern forms the northern limit of which is situated in the Holsteinsborg area. This group includes only one certain species, *Latona setifera*, the southern distribution of which, as mentioned above (p. 192), is stressed by a frequency markedly falling from the south to the north, which presumably means that the species in Greenland has its main distribution in the subarctic area. It is characteristic that this holarctic species outside Greenland has not been found at all in an arctic region. Besides *Latona setifera* it is possible that *Cypris*

pubera and *Cypridopsis vidua* belong to this group, but the small number of findings makes an interpretation uncertain.

(b) Species the northern limit of which is about lat. 70°N.

Here belong the species *Ceriodaphnia quadrangula*, *Graptoleberis testudinaria*, *Diaptomus castor*, *Cyclops* (*Acanthocyclops*) *vernalis*, *Maraenobiotus insignipes*, and probably *Streblocerus serricaudatus*.

Diaptomus castor is a palaearctic species, which has not out of Greenland been found in arctic areas proper. The other species are holarctic. They have all been collected in arctic areas, but have their main distribution south of these.

(c) Species the northern limit of which is in about lat. 73°N.

Four species can be referred to this group, viz. *Daphnia longispina*, *Alonella nana*, *Diaptomus minutus*, and *Bryocamptus arcticus*.

Diaptomus minutus is a nearctic species, which, however, also occurs in Iceland, but the others are holarctic. All the four species have an essential part of their distribution in arctic areas.

(2) *Species found both on the west and the east coast.*

(a) Species the northern limit of which is between lat. 70° and 74°N.

A total of 17 species have been referred to this group: *Holopedium gibberum*, *Scapholeberis mucronata*, *Simocephalus vetulus*, *Bosmina coregoni obtusirostris*, *Eurycercus glacialis*, *Acroperus harpae*, *Alona affinis*, *Alona quadrangula*, *Alona intermedia*, *Alonella excisa*, *Polyphemus pediculus*, *Eucypris affinis hirsuta*, *Eucypris virens*, *Candona rectangula*, *Candona lapponica*, *Candona falcata*, and *Limnocythere sanctipatrici*.

All these species, however, are far from having the same northern limit, and to the individual species this limit is often different on the east and the west coast. Only in the case of six species, *Holopedium gibberum*, *Simocephalus vetulus*, *Alona affinis*, *Polyphemus pediculus*, *Eucypris virens*, and *Limnocythere sanctipatrici* the northern limits on the west and east coasts are very nearly in the same latitude. The northern limits of six other species, *Scapholeberis mucronata*, *Alona quadrangularis*, *Eucypris affinis hirsuta*, *Candona rectangula*, *Candona lapponica*, and *Candona falcata* are found to be farther north on the east coast than on the west coast. But it applies to all these species that the area north of the northernmost findings on the west coast has been poorly investigated (the Umanak District, the southernmost part of the Upernavik District), so that the species at closer examinations in these

regions very possibly will prove to have approximately the same northern limit on the west coast as on the east coast.

Finally there are five species, *Bosmina coregoni obtusirostris*, *Eurycercus glacialis*, *Acroperus harpae*, *Alona intermedia*, and *Alonella excisa*, the northern limit of which is considerably farther north on the west coast than on the east coast. In the case of these species there is hardly any doubt that there is an actual difference in the situation of the northern limits, as the areas north of the northernmost findings on the east coast have been rather closely examined.

All the 17 species which have been referred to this group are presumably holarctic. It is true that three *Candona* species have not yet been shown to occur in North America, but as the ostracods in Northern Canada, as mentioned above, have been extremely defectively investigated, there is a great possibility of finding them there. Most species in the group occur within the other arctic areas.

(b) Species the northern limit of which is about lat. 77°N.

Three of the species examined have this northern limit, viz. *Alona guttata*, *A. rectangula*, and *Cyclops* (*Cyclops*) *scutifer*. In the case of all the three species this northern limit has been demonstrated on the east coast, while the northern limit on the west coast is about lat. 73°N. to the two *Alona* species, and lat. 74°N. to *Cyclops* (*Cyclops*) *scutifer*. Undoubtedly the actual northern limit in West Greenland of these three species is somewhere on the littoral region of Melville Bugt, but as no collections at all have been made in the region from Kraulshavn to Savigsivik it is impossible with certainty to make any statement about this. It seems, however, that these three species in any circumstances are found a little farther north on the east coast than on the west coast, as there are comparatively many samples available from the Thule District, and the species have not been found there. This applies with the greatest certainty in the case of *Cyclops* (*Cyclops*) *scutifer*, which is very frequent in all the six southern districts on the west coast, while this cannot be said to apply with the same certainty to the *Alona* species, the occurrence of which is more sporadic.

All the three species in this group are holarctic, *Cyclops* (*Cyclops*) *scutifer* is a typical arctic-boreal species, while the two *Alona* species, even though they have been found in other arctic areas, have their main distribution south of these.

It is impossible at present to decide whether the division into the two groups, viz. species only found in West Greenland and species found in West as well as East Greenland is quite natural. Before the present investigations of the species from the southern faunal element, which are now known from both coastal regions, were known only

from the west coast, and it does not seem improbable that a few of the remaining 13 species only found on the west coast may also be found on the east coast. It is not probable, however, that very many new species will be found on the east coast from Scoresby Sund Fjord northwards, as now a fair number of collections from varied localities in this littoral region are available. On the other hand, there is a possibility between Kap Farvel and the mouth of Scoresby Sund Fjord of finding some species which have not been collected, as this littoral region is still very poorly investigated. From this about 1200 km long stretch of coast only eight real samples and three collections of single species have been worked up.

What decides the situation of the northern limit of the various species must be either the length of the ice-free period of the localities or the summer temperature of the localities, as these two factors are the only ones by means of which the more southerly localities can be distinguished from the northern ones. The lengths of the ice-free periods of the localities seem to decrease gradually from the south towards the north (pp. 60–62, p. 108, and p. 128), whereas it has not been possible to demonstrate a similar gradual decrease in the summer temperature of the localities. Furthermore, lakes, ponds, and puddles mostly have widely different summer temperatures in the same latitude, while the length of the ice-free period of heterogeneous localities in the same latitude seems to be approximately the same, even though the situation of the periods within the year has been displaced somewhat in relation to each other. That the temperature at any rate in the case of some species cannot be decisive appears from the fact that a number of species near their northern limit has been found in lakes with low temperatures, while they have not been found in ponds with considerably higher summer temperatures, if only these ponds are at a comparatively short distance farther north. The length of the ice-free period is thus probably the factor that determines the northern limit of the various species. The limitation then must be due to the fact that the animals are unable to complete their life cycle during a shorter ice-free period than the one existing at their northern limit.

Even though in the case of a few of the species examined here it is possible in the literature to find information about the length of the life cycle, the lengths stated are rather useless for a comparison, as the temperatures in the localities are not the same as those in the localities examined by me. However, the observations of *Holopedium gibberum* (p. 140) would seem to indicate that this species in arctic areas is capable of starting its production of ova at an earlier stage than is the case in regions farther south, so that the length of its life cycle in this way becomes shorter. One of the three species within the southern fauna element which will live farthest north, *Cyclops* (*Cyclops*)

scutifer, has its period of reproduction in winter in localities not freezing solid (RØEN 1958 b), and this fact makes this species capable of holding its own with a very short ice-free period.

It is not possible on the basis of the present material to decide whether the species within the southern faunal element have been capable of surviving the Glacial Age in Greenland, or whether this faunal element has been carried to Greenland after the Glacial Age from the nearctic or the palaearctic area.

However, it seems to me that most probably none of these species have survived the Glacial Age in Greenland, for it is difficult to imagine that if species of the southern faunal element had survived the Glacial Age, species of the northwestern element would be able to survive in South Greenland, and it would still be possible to find these species.

It is most probable that apart from the species which today are distributed all over Greenland, no freshwater entomostraca have survived the Glacial Age in Greenland itself.

As mentioned above, there are only two species, *Diaptomus minutus* and *D. castor*, which have not a holarctic distribution within the southern faunal element. Of these *Diaptomus minutus* is nearctic, *D. castor* palaearctic. Both species have only been found on the west coast, and their distribution gives no information whether the other species with a similar distribution have been conveyed to Greenland from the east or the west.

There are, however, some species, *Holopedium gibberum*, *Alona rectangula*, *Eucypris virens*, *Cyclops* (*Acanthocyclops*) *vernalis*, and *Maraenobiotus insignipes*, which have high frequencies in the northern areas of their occurrence, while the values are smaller farther south. This would seem to indicate that at any rate these species in a period after the Glacial Age, when the climate was milder than it is now, had a possibility of being carried to Greenland from the northwest. At the deterioration of the climate the northern limit of these species then was moved southwards to where it is today. If so, it must be assumed that part of the southern faunal element is of nearctic origin.

In another group the frequency of occurrence decreases from the south towards the north. Typical species of this group are *Latona setifera*, *Scapholeberis mucronata*, *Bosmina coregoni obtusirostris*, *Alona affinis*, *Polyphemus pediculus*, and *Diaptomus minutus*. These species can hardly have been distributed from the north, but must have been carried to the more southerly regions of Greenland and have spread northward from there. The fact that the nearctic species *Diaptomus minutus* has this distribution does not prevent the other species from having been carried to Greenland from the east. The way by which the entomostraca have been carried to Greenland, must have been by the migration of

birds. According to SALOMONSEN (1950) birds arrive in South Greenland from America as well as Europe during the spring migration.

The Faunal Element of Brackish Water.

This faunal element includes only four species of the Greenland fauna of freshwater entomostraca, which have all been found only in a single locality and in few specimens. These species are *Limnocalanus grimaldi*, *Nannopus palustris*, *Heterolaophonte strömi*, and *Heterolaophonte* sp.

HABERBOSCH (1920, p. 337), who also mentions this faunal element, does not include the two *Heterolaophonte* species, but he refers *Artemia salina* to the group. Apart from the fact that the Greenland *Artemia salina* is *Artemiopsis stefanssoni* var. *groenlandicus*, it must be considered a mistake to place *Artemia salina* in this company, as it is a species which normally lives in salt lakes and not in brackish or sea water.

In the Greenland freshwater fauna there is another couple of species which must be referred to this faunal element, viz. *Mysis litoralis* and *Gammarus setosus* (HOLMQUIST 1959, STEPHENSEN 1940).

As mentioned on p. 172, it is not certain that *Nannopus palustris* has been found in fresh water proper in Greenland, even though it is known with certainty that in other places (LANG 1948) it can live in fresh water. *Limnocalanus grimaldi* is recorded by HABERBOSCH (1920, p. 141) as a relict from the Yoldia sea. This is undoubtedly the case of the occurrences of the species in the lakes in North America, but regarding its occurrence in Sælsøen in Northeast Greenland conditions are slightly different. SEGERSTRÅLE (1957, p. 39) states that specimens of the species "are common in arctic estuaries." KOCK and WEGENER (1912, p. 22) write that there is a glacier calving into Sælsøen. This makes it probable that Sælsøen in the Yoldia Period was a valley full of glaciers. When the ice at a later time had melted off, the sea water would have surged in and an estuarine area have developed, which then was cut off from the sea. That the area was cut off from the sea at a late date appears from the fact that there is still salt water in the lake from a depth of 55 m downwards (TROLLE 1913), and that the *Limnocalanus* in the lake is the brackish-water form, not the freshwater form (EKMAN 1913), although the specimens of the species have been taken in the uppermost, fresh layers of water (JOHANSEN 1911, p. 325).

The two species of the genus *Heterolaophonte* in Loc. 62 are not difficult to explain either. The locality is situated but little above sea level and in immediate proximity of the coast. A few hundred metres west of the lake there are a few large lagoons with brackish water, into which the sea water can penetrate at spring tide. A very slight

elevation of the country will cause these lagoons to be changed into freshwater lakes of quite the same character as Loc. 62. The two species of *Heterolaophonte* must have lived in Loc. 62, when this lake was a lagoon and have succeeded in holding their own when the water was changed into fresh water. It is impossible to find out how long ago the locality was changed into a freshwater lake, as the depth is so low that the salt water has rapidly been washed out of it. As mentioned above (p. 165), *Heterolaophonte strömi* is known from several brackish- and salt-water localities along the Greenland coasts, while *Heterolaophonte* sp., as far as I can see, is new to science.

The three entomostraca previously known from this faunal element are all known from the palaearctic as well as the nearctic. *Heterolaophonte strömi*, however, has previously been collected only from fresh water in North America. Still, there is reason to point out the fact that one of the species, *Limnocalanus grimaldi*, besides belonging to the brackish-water element in the Greenland freshwater fauna, undoubtedly also must be referred to the northwestern fauna element, as its occurrence in Greenland constitutes a continuation of the North Canadian localities to the species.

VI. SUMMARY

During a stay in West Greenland from 1954 to 1957 and on travels in East Greenland in the summer of 1958, Upernavik and Thule in the summer of 1959 and Thule in the spring of 1960 investigations have been made in a total of 207 freshwater localities.

64 of these localities are lakes, i.e. permanent, stagnant freshwater localities which never freeze solid, 107 are ponds, i.e. permanent, stagnant freshwater localities which may freeze solid, and 36 are temporary waters. The map fig. 2 shows the situation of the localities investigated.

Analyses of the water have been made in most of the localities. The results of these analyses are shown in three tables, Lakes on p. 54–59 Ponds on p. 104–107 and Temporary waters on p. 126–127 In addition temperatures and contents of oxygen have been measured down through the water masses in some of the lakes. The results appear in figs. 3–21.

Concerning the lakes the following main results may be recorded: The length of the ice-free period decreases evenly from north to south. On the west coast in about lat. 64° N. it is about four months, in about lat. 67° N. it is well over three months, in about lat. 69° N. just under three months, in about lat. 71° N. about two months and a half, in about lat. 74° N. about one month and a half, and about lat. 77° N. about one month. In the northernmost area, however, it may happen that the ice on rather large lakes does not disappear completely before the freezing up sets in again. From East Greenland few observations are available, but they seem to show that the ice-free period in about lat. 73° N. is just under three months and in lat. 77° N. about one month and a half.

Shallow lakes thaw and freeze earlier than deep lakes in the same latitude, but the length of the ice-free period is the same.

The maximum thickness of ice found in Greenland during the present investigations was 2.1 m at Umanak. Normally the greatest thickness of the ice is between 1.5 and 2 m. The quantity of winter precipitation is decisive of the thickness obtained by the ice.

It has been shown that the ice influences the shaping of the banks in different ways (1) By pressure of ice during the winter concentric banks are shaped round the lakes or in shallow water along the shores.

(2) In the spring large ice-floes, moved by wind pressure, plane off the shores. (3) In the spring, too, the supply of melt water will cause tearing-up of the bottom in shallow water when the ice is raised.

It is shown that the maximum summer temperature in the lakes decreases from the south towards the north and that the temperature is higher off flat banks than off steep banks; furthermore, that the temperature in the surface of the middle of the lakes is lower than near the banks.

An attempt has been made to fit all the Greenland lakes investigated into three main types: A. Lakes with large quantities of material suspended in the water. B. Lakes with clear water. C. Lagoons. The first two types are subdivided into two and three groups, respectively.

A. 1. Ice-dammed lakes. These are characterized by the fact that part of the bank is formed by inland ice or glaciers. The water is always cold; hence these lakes have a shorter ice-free period than others in the same latitude.

A. 2. Lakes through which glacial rivers flow. The water is somewhat less pronouncedly cold than the water in the preceding group. As to the length of the ice-free period, these lakes hold an intermediate position between the ice-dammed lakes and the following group.

B. 1. Lakes with clear water and with low contents of salts. This is the commonest type of Greenland lakes by far. Within this group there is a distinct difference between deep lakes and shallow lakes. In the former the fluctuations in temperature throughout the year are restricted to including the uppermost layers of water. There is never any loss of oxygen towards the bottom, and the freezing-up in winter does not cause any distinct increase of the amount of dissolved salts in the water. In the shallow lakes the total of the water masses is affected by the fluctuations in temperature, even if these are somewhat slighter near the bottom. In summer as well as winter there may be loss of oxygen near the bottom, and the contents of the dissolved salts in the water increase highly in winter with the increase in thickness of the ice. During the ice-free period all the lakes in this group have a constant outflow.

B. 2. Lakes with clear water and with high contents of salts. These lakes are characterized by the fact that the contents of dissolved salts in the water are rather high and constant. The

conductivity in these lakes is between 200 and 700 μ mho. They have outlets, but these only function for a very short time after the spring thaw. Such lakes in Greenland are only found in continental areas poor in precipitation: in the Thule District and about the heads of the Umanak Fjord, the Søndre Strømfjord, Kejser Franz Josephs Fjord, and the Nordvestfjord.

B. 3. Salt lakes. These lakes have extraordinarily high contents of dissolved salts in the water and have no outlets at all. Lakes of this type have only been found at the heads of the Umanak Fjord and the Søndre Strømfjord.

C. Lagoons. Only one lacustrine locality has been investigated which is so close to the sea that its water was characterized by a high chloride content.

The following main results can be adduced concerning the investigations of the ponds: The duration of the ice-free period is a little longer than in the case of the lakes in the same latitude. The thawing takes place considerably earlier, while the freezing sets in a week or two earlier than in the case of the lakes. As in the lakes there is a decrease in the maximum summer temperature from the south towards the north.

An attempt has been made at fitting all the ponds investigated into three main types, two of which have been subdivided into two subtypes:

A. Ponds with low contents of dissolved salts in the water.

1. The bottom is firm rock or stones. These ponds are characterized by the fact that a sessile vegetation is missing or at any rate only developed in the form of filamentous algae or mosses. The contents of salts are very low and the water is colourless or only very slightly coloured.

2. With a soft bottom. This is the very commonest type of freshwater locality in Greenland. The bottom of these ponds has a luxuriant vegetation. The salt content of the water is on the whole somewhat higher than in the preceding type, and the water is more or less coloured.

B. Ponds with high contents of salts.

1. Polluted ponds. The ponds of this type which have been investigated are all situated in or near settlements. They are very characteristic, as the water during the summer are of an intense green colour due to phytoplankton.

2. Ponds naturally rich in salts. These ponds, with the exception of two, are all situated in continental areas poor in precipitation, where also the lakes rich in salts are found. The content of dissolved salt of the water is considerable, the conductivity is between 90 and 810 μ mho, and in all localities there are huge growths of mosses and other vegetation.

C. Ponds influenced by the sea. A minor number of the ponds investigated are situated so that they are highly influenced by the sea. Some of these ponds must, if anything, be considered as small lagoons, while others are situated at so high a level that they only receive contributions of sea water through spray.

The temporary waters do not differ from the ponds as regards conditions of ice and temperature. The temporary localities which are dry at the beginning of the freezing, have open water a little earlier than other localities, as the snow blown together by the wind thaws faster than the ice.

There are three fundamentally different types of temporary localities: 1) water bearing in the early summer, 2) water bearing in the early summer as well as in the autumn, with an intervening dry period, 3) water bearing during the whole summer; but a locality can differ in this respect from year to year. Several temporary waters only dry up at intervals of several years.

All temporary waters in Greenland can be fitted into one of the following two types:

1. Localities with a vegetationless bottom. The absence of a vegetation in these localities may be due to two causes. The bottom consists of bare rock where nothing can grow, or at the drying-up a hard crust of dead algae develops on the bottom. This is the commonest Greenland type of temporary localities.

2. Localities with a vigorous vegetation on the bottom. Such localities occur where there is a possibility of a little moisture being preserved at the bottom of the locality after the water has evaporated. The character of the vegetation is conditioned by the environment, but mostly it consists of grasses, sedges, or mosses.

The Greenland fauna of freshwater entomostraca has been worked up on the basis of material from the localities the author has examined himself, and from 118 localities from which samples have been collected by others and which were found partly in various institutions, and partly have been left to the present writer by the collectors for working up.

Previously a total of 55 freshwater entomostraca have been described from Greenland. 44 of these were found again at the present investigations. Five species, *Polyartemia forcipata*, *Daphnia magna*, *D. atkinsoni* var. *bolivari*, *Paracyclops fimbriatus*, and *Bryocamptus vandouwei*, must be considered to have been included in the Greenland fauna by mistakes. One name of a species, *Eucypris fuscata affinis*, is a nomen nudum. Another species, *Ophryoxus gracilis*, is of uncertain occurrence in Greenland, while four Greenland species, *Cypridopsis vidua*, *Limnocalanus grimaldi*, *Epactophanes richardi*, and *Nannopus palustris*, have not been found in the material worked up.

In the material available, a total of 52 species of freshwater entomostraca have been found, 8 of them, viz. *Daphnia catawba*, *Candona falcata*, *C. subgibba*, *Limnocythere sanctipatrici*, *Eucyclops serrulatus*, *Cyclops* (*Megacyclops*) *magnus*, *Heterolaophonte strömi*, and *Heterolaophonte* sp. are new to the fauna of Greenland. Thus a total of 56 species of freshwater entomostraca are known with certainty from Greenland.

In the systematic part, pp. 137–167, the species found have been listed. In two cases, *Cyclops* (*Cyclops*) *scutifer* and *Bryocamptus* (*Arcticocamptus*) *tikchikensis*, it has proved necessary to change the names previously used for the Greenland finds of the species. Likewise, taxonomic questions have been discussed in the case of a number of species.

On the basis of tables of the occurrence of the species in the various types of localities, lakes, ponds, and temporary waters, the frequency of the species in these types has been calculated. If all the localities investigated are taken together, it appears that *Chydorus sphaericus* is the commonest and most constant Greenland species by far, while *Daphnia pulex* is similar, though without being quite so common. Especially important in the lakes are furthermore the species *Cyclops scutifer* and *Diaptomus minutus*, in the ponds *Acroperus harpae*, *Polyphemus pediculus*, and *Simocephalus vetulus*, and in the temporary waters *Cyclops* (*Acanthocyclops*) *vernalis* and *Branchinecta paludosa*. In 64 lakes a total of 45 species have been found, on an average 5.7 species per locality; in 107 ponds 46 species, on an average 6.5 species per locality, and in 36 temporary waters 30 species with 4.4 species per locality.

25 species have been found in all types of locality, 15 species only in localities that do not dry up, 4 species only in ponds and temporary waters, 4 species exclusively in lakes, 2 in ponds only, and finally, one species has been found in lakes and temporary waters only.

Of plankton organisms proper only 8 species have been found, viz. *Holopedium gibberum*, *Daphnia catawba*, *D. longispina*, *Ceriodaphnia quadrangula*, *Bosmina longirostris*, *B. coregoni obtusirostris*, *Diaptomus minutus*, and *Cyclops* (*Cyclops*) *scutifer*. All the other species investigated

are more or less pronounced littoral or bottom forms, or they only occur in shallow localities.

An attempt has been made to find relations between the occurrence of the species investigated and a number of chemical factors measured in the localities, viz. hydrogen ion concentration (pH), the actual as well as the theoretically highest and lowest value, the electrical conductivity of the water, and the contents of calcium, magnesium, and chloride. The results have been compared with what is known of the occurrence of the same species in other areas. Summarily it may be said that the species which are common in Greenland, especially such as are common in all types of locality, as regards the factors examined seem to have a very high tolerance.

In Table 5 all the Greenland species established with certainty are set up with indication of their occurrence within the holarctic area. 43 of the species found are holarctic species proper, 6 are nearctic, of which however, *Candona subgibba* has been found in Japan and *Diaptomus minutus* in Iceland. 6 species have been found only in the palaearctic area. Of the last six species, however, presumably only *Diaptomus castor* can be characterized as a purely palaearctic species, as it will probably be possible to find the other five species, which all are ostracods, in the arctic and subarctic regions of North America. One species, *Heterolaophonte* sp., has not been found out of Greenland, but there is no reason to suppose that it should be an endemic Greenland species. It is probably a saltwater or brackish-water species which has got into fresh water.

Climatically the species can be divided into three groups. One group, which includes 34 species, is widely distributed in arctic-alpine as well as temperate regions, a few are even found in the tropics. A group which includes 17 species, has a purely arctic-alpine distribution, and a group which includes 4 species only, has outside Greenland been found only in temperate regions.

On the map Pl. 8 all the places are indicated from which information about freshwater entomostraca is available. Furthermore, the 11 areas into which I have divided Greenland in order to show the variation of the fauna of entomostraca are shown on the map. These areas are on the west coast: I. The Thule District with 29 localities, II. The Upernavik District with 40 localities, III. The Umanak District with 7 localities, IV. The Disko Bugt area with 66 localities, V. The Holsteinsborg area with 31 localities, VI. The Godthåb area with 29 localities, and VII. Southwest Greenland with 20 localities. On the east coast: VIII. The Northeast coast area with 11 localities, IX. The Kejser Franz Josephs Fjord area with 33 localities, X. The Scoresby Sund area with 53 localities, and XI. The Southeast coast area with 6 localities.

Table 6 shows the occurrence of the Greenland species in the various areas in percentages of all localities in the area.

If this table is compared with the maps of distribution of the individual species, figs 38–84, and with the ecological conditions, it is possible to demonstrate four faunal elements in the Greenland freshwater entomostraca. These four elements each have their distinctive characters as regards distribution and presumably also their origin in Greenland.

(1) Species Found in the Whole of Greenland.

This element includes four certain species: *Macrothrix hirsuticornis*, *Chydorus sphaericus*, *Cyprinotus incongruens*, and *Candona candida*. All these species are widely distributed and very tolerant to the environmental conditions.

Furthermore, another three species should probably be included in this element, viz. *Bosmina longirostris*, *Maraenobiotus brucei*, and *Moraria mrazeki*.

The fact that this faunal element can manage in the high arctic area in North Greenland and has a distribution including the whole of Greenland, might suggest that it is a very old faunal element, which has been capable of surviving the greatest glaciation in Greenland and which no doubt is the last remnant of the preglacial Greenland fauna of freshwater entomostraca. It is not possible to decide today where and under what conditions the species have survived, but 5 of the 7 species are found in the half-nunatak area Charcots Land in the inmost part of the Scoresby Sund Fjord under conditions which probably are not appreciably different from the conditions which prevailed on the nunataks which existed during the greatest glaciation.

(2) The Northwestern Faunal Element.

10 species can with certainty be included in this element, viz. *Branchinecta paludosa*, *Artemiopsis stefanssoni* var. *groenlandicus*, *Lepidurus arcticus*, *Daphnia pulex*, *Prionocypris glacialis*, *Candona groenlandica*, *C. subgibba*, *Eucyclops serrulatus*, *Cyclops* (*Megacyclops*) *magnus*, and *Bryocamptus* (*Arcticocamptus*) *tikchikensis*. Of these species four are nearctic and four are holarctic. None of these eight species occur outside the arctic-alpine area. The two species *Daphnia pulex* and *Eucyclops serrulatus* are widely distributed ubiquists. In Greenland all these species have a more or less pronounced northwestern distribution.

With this faunal element two further species are connected, viz *Daphnia catawba* and *Epactophanes richardi*, which have both been

found only a few times in Greenland. *Daphnia catawba* is a nearctic species, while *Epactophanes richardi* is holarctic.

It applies to the 10 certain species that if they are distributed over a large part of Greenland, their occurrence decreases towards the south, even in such cases in which there are excellent ecological conditions for the species in southern Greenland. This might suggest that they belong to a faunal element immigrated into Greenland from the North American continent by way of the North Canadian islands.

(3) The Southern Faunal Element.

This faunal element includes such species as have a distinct northern limit in Greenland. It is however, necessary to distinguish between two main types of distribution, viz. species found only on the west coast, and species found both on the west coast and the east coast. Within these two main types it is possible to find groups of species which have approximately the same northern limit.

Species found only on the west coast:

(a) Pronounced southern forms. Here we find only one certain species, *Latona setifera*, and perhaps the species *Cypris pubera* and *Cypridopsis vidua*, which have been found only a few times.

(b) Species the northern limit of which is in about lat. 70° N. These are *Ceriodaphnia quadrangula*, *Graptoleberis testudinaria*, *Diaptomus castor*, *Cyclops* (*Acanthocyclops*) *vernalis*, and *Maraenobiotus insignipes*, besides probably *Streblocerus serricaudatus*.

(c) Species the northern limit of which is in about lat. 73° N. They are *Daphnia longispina*, *Alonella nana*, *Diaptomus minutus*, and *Bryocamptus* (*Arcticocamptus*) *arcticus*.

Species found both on the west coast and on the east coast:

(a) Species the northern limit of which is between lat. 70° and 73° N. To this group belong *Holopedium gibberum*, *Scapholeberis mucronata*, *Simocephalus vetulus*, *Bosmina coregoni obtusirostris*, *Eurycercus glacialis*, *Acroperus harpae*, *Alona intermedia*, *A. quadrangularis*, *A. affinis*, *Alonella excisa*, *Polyphemus pediculus*, *Eucypris affinis hirsuta*, *E. virens*, *Candona rectangula*, *C. lapponica*, *C. falcata*, and *Limnocythere sanctipatrici*.

(b) Species the northern limit of which is in about lat. 77° N. Here belong the species *Alona guttata*, *A. rectangula*, and *Cyclops* (*Cyclops*) *scutifer*.

It is impossible on the basis of the available material to decide whether the division of this faunal element into two groups, viz. species found only on the west coast and species found on both the west and the east coast, is natural. Of the species of the southern faunal element which are now known from both coastal areas, eight were only known from the west coast before the present investigations were started. It does not seem improbable that some of the 13 species so far known only from the west coast may also be found on the east coast, especially in the southern part of the east coast, which has been very poorly investigated.

The factor which causes the species of the southern faunal element to have a northern limit in Greenland, must be the length of the ice-free period of the localities. The limitation probably is due to the fact that the species are unable to carry through their life cycle in a shorter ice-free period than the one prevalent at their northern limit.

The fact that the percentages of occurrence in the case of some species are higher in the north than in the south would seem to indicate that these species under more favourable climatic conditions than those now prevalent in Greenland have been able to immigrate to Greenland from the north, but in the case of the majority of the species of this faunal element it must be considered that they must have been introduced to South Greenland by the migration of birds and that the species from there have spread towards the north. As all the species — with the exception of *Diaptomus minutus*, which is nearctic, and *D. castor*, which is palaearctic—have a holarctic distribution, it is not possible to decide whether the southern faunal element is mainly of a nearctic or a palaearctic origin.

(4) The Faunal Element of Brackish-Water.

In the Greenland fauna of freshwater entomostraca this faunal element includes four species which actually belong to salt or brackish water. They are the species *Limnocalanus grimaldi*, *Nannopus palustris*, *Heterolaophonte strömi*, and *Heterolaophonte* sp.

It is uncertain whether *Nannopus palustris* has been found in any actual freshwater locality in Greenland at all, but the three other species have been found in freshwater localities which a fairly short time ago were directly connected with the sea.

As to *Limnocalanus grimaldi* the special condition applies that besides belonging to the brackish water element, it must also somehow be included in the northwestern faunal element, as the occurrence of the species in Greenland forms a natural continuation of its North Canadian distribution.

VII. DANSK RESUMÉ

Under ophold i Vestgrønland 1954–1957 og på rejser i Østgrønland sommeren 1958, Upernavik og Thule sommeren 1959 og Thule foråret 1960, er der foretaget undersøgelser i ialt 207 ferskvandslokaliteter.

Af disse lokaliteter er 64 søer, d.v.s. permanente, stillestående ferskvandslokaliteter, der aldrig bundfryser, 107 er damme, d.v.s. permanente, stillestående ferskvandslokaliteter, der kan bundfryse og 36 er temporære vande. Pa kortet Pl. 1 ses beliggenheden af de undersøgte lokaliteter.

Analyser af vandet er blevet foretaget på de fleste af lokaliteterne. Resultaterne af disse analyser findes i tre tabeller, søer p. 54–59, damme p. 104–107 og temporære vande p. 126–127. Herudover er der i en del af søerne målt temperaturer og iltindhold ned gennem vandmasserne. Resultaterne ses på figs. 2–20.

Om søerne kan følgende hovedresultater anføres: Den isfrie periodes længde aftager jævnt fra syd mod nord. På vestkysten er den på ca. 64° N.B. omkring 4 måneder, på ca. 67°N.B. godt tre måneder, på ca. 69° N.B. knap tre måneder, på ca. 71° N.B. ca. $2^1/_2$ måned, på ca. 74° N.B. ca. $1^1/_2$ måned og på ca. 77° N.B. omkring een måned. I det nordligste område kan det dog ske, at isen på større søer ikke når at forsvinde helt før islæget sætter ind igen. Fra Østgrønland haves kun nogle få observationer, der synes at vise, at den isfrie periode på ca. 73° N.B. er på knap tre måneder og på 77° N.B. på ca. $1^1/_2$ måned.

Lavvandede søer tør tidligere op og fryser tidligere til end dybe søer på samme breddegrad, men den isfrie periodes længde er den samme.

Den maksimale istykkelse, der er fundet på Grønland under denne undersøgelse er 2.1 m i Umanak. Normalt ligger den største istykkelse mellem 1.5 og 2 m. Vinternedbørens mængde er afgørende for, hvor stor en tykkelse isen får. Et stort snefald forårsager ringere istykkelse.

Det er påvist, at isen på forskellig vis indvirker på søbreddernes udformning. 1. Ved ispresning i løbet af vinteren dannes koncentriske istryksvolde rundt om søerne eller på ganske lavt vand ved bredderne. 2. Om foråret vil store isflager ved vindpres foretage afhøvlinger af bredderne. 3. Ligeledes om foråret vil tilførsel af smeltevand forårsage oprivning af bunden på lavere vand, når isen løftes.

Vedrørende temperaturerne i søerne er det vist, at den maksimale sommertemperatur aftager fra syd mod nord, og at temperaturen bliver højere ved flade bredder end ved stejle, samt at temperaturen i overfladen i søernes midte er lavere end ved bredderne.

Der er foretaget et forsøg på at indpasse alle de undersøgte grønlandske søer i et samlet system, idet der er opstillet tre hovedtyper: A. Søer med store mængder opslæmmet materiale i vandet. B. Klarvandede søer. C. Strandlaguner. De to første af disse typer er inddelt i henholdsvis to og tre grupper.

A. 1. Isdæmmede søer. Karakteriserede ved, at en del af bredden dannes af indlandsis eller gletsjere. Vandet er altid koldt, derfor har disse søer en kortere isfri periode end andre på samme bredde.

A. 2. Søer, der gennemstrømmes af afsmeltningselve fra gletsjere. Vandet er noget mindre udpræget koldt end i foregående gruppe. Med hensyn til længden af den isfrie periode indtager disse søer en mellemstilling mellem de isdæmmede søer og den følgende gruppe.

B. 1. Klarvandede søer med ringe indhold af salte. Langt den almindeligste type af grønlandske søer. Der er indenfor denne gruppe tydelig forskel på dybe søer og lavvandede søer. I de dybe søer er temperatursvingningerne året igennem indskrænkede til at omfatte de øverste vandlag, der er på intet tidspunkt noget iltsvind mod bunden og tilfrysningen om vinteren forårsager ikke nogen tydelig forøgelse af mængden af opløste salte i vandet. I de lavvandede søer omfattes hele vandmassen af temperatursvingningerne, selv om disse er noget svagere nede over bunden. Der kan såvel sommer som vinter findes iltsvind over bunden, og indholdet af opløste salte i vandet om vinteren stiger kraftigt samtidigt med isens tykkelsesvækst. Alle søerne i denne gruppe har i den isfrie periode et konstant afløb.

B. 2. Klarvandede søer med stort indhold af salte. Karakteriserede ved, at vandets indhold af opløste salte er ret højt og konstant. Ledningsevnen i disse søer ligger mellem 200 og 700 μmho. De har afløb, men dette fungerer kun en ganske kort tid efter tøbrud. Disse søer er kun fundet i nedbørsfattige, kontinentale områder af Grønland: i Thule distrikt og omkring bunden af Umanakfjord, Søndre Strømfjord, Frantz Josephs Fjord og Nordvestfjord.

B. 3. Saltsøer. Disse søer har et overordentligt højt indhold af opløste salte i vandet og er ganske uden afløb. Der er kun fundet søer af denne type ved bunden af Umanakfjord og Søndre Strømfjord.

C. Strandlaguner. Der er kun undersøgt een søagtig lokalitet, der lå så nær havet, at vandet af denne grund var tydeligt præget af klorid.

Følgende hovedresultater kan anføres om undersøgelserne af dammene: Den isfrie periodes varighed er lidt længere end for søers vedkommende på samme bredde. Optøningen falder betydeligt tidligere, mens islæget foregår 1–2 uger tidligere end søerne. Ligesom tilfældet var med søerne er der en aftagen af den maksimale sommertemperatur fra syd mod nord.

Samtlige undersøgte damme er søgt passet ind i tre hovedtyper, hvoraf de to er delt i hver to undertyper:

A. Damme med ringe indhold af opløste salte i vandet.
   1. Bunden fast klippe eller sten. Disse damme er karakteristiske ved, at fastsiddende vegetation mangler eller i hvert fald kun er udviklet i form af trådalger eller mosser. Saltindholdet er meget ringe og vandet er farveløst eller kun ganske svagt farvet.
   2. Med blød bund. Denne type er den aller almindeligste type af ferskvandlokaliteter på Grønland. Bunden i disse damme har en frodig vegetation, indholdet af salte i vandet ligger gennemgående noget højere end i den foregående type og vandet er mere eller mindre farvet.

B. Damme med stort indhold af salte.
   1. Forurenede damme. De damme, der er undersøgt af denne type ligger alle i eller nær bebyggelser. Dammene er meget karakteristiske idet vandet sommeren igennem er farvet kraftigt grønt af phytoplankton.

2. Naturligt saltrige damme. Disse damme ligger, med undtagelse af to, alle i de nedbørsfattige, kontinentale områder, hvor også de saltrige søer findes. Indholdet af opløste salte i vandet er betydeligt, ledningsevnen ligger mellem 90 og 810 μmho, og der er i alle lokaliteterne mægtige bevoksninger af mosser og anden vegetation.

C. Marint influerede damme. Et mindre antal af de undersøgte damme er således beliggende, at de er stærkt påvirkede af havet. Nogle af disse damme må nærmest betragtes som små strandlaguner, mens andre er beliggende i så højt niveau, at de kun modtager tilskud af havvand gennem sprøjt.

De temporære vande adskiller sig med hensyn til isforhold og temperaturforhold ikke fra dammene. Kun er de temporære lokaliteter, der ved tilfrysningens indtræden er tørre, lidt tidligere fri for is end andre lokaliteter, idet den i løbet af vinteren sammenblæste sne tør hurtigere end is.

Der er principielt tre forskellige typer af vandføring i de temporære lokaliteter. Lokaliteten er kun vandførende først på sommeren, lokaliteten er såvel vandførende først på sommeren som om efteråret med en mellemliggende tør periode eller lokaliteten kan være vandførende hele sommeren. Men vandføringen i lokaliteterne kan være forskellig fra år til år i samme lokalitet. Flere temporære vande tørrer kun ud med års mellemrum.

Alle grønlandske temporære vande kan indpasses i een af de to følgende typer:

1. Lokaliteter med vegetationsløs bund. Manglen på vegetation i disse lokaliteter kan skyldes to årsager. Enten består bunden af nøgen klippe, hvor intet kan vokse, eller også dannes der ved indtørringen over bunden en hård skorpe af døde alger. Det er den almindeligste grønlandske type af temporære lokaliteter.
2. Lokaliteter med kraftig vegetation i bunden. Sådanne lokaliteter findes, hvor der er mulighed for bevarelse af lidt fugtighed i bunden af lokaliteten efter at vandet er fordampet. Vegetationens art er betinget af omgivelserne, men består oftest af græsser, starer eller mosser.

Den grønlandske ferskvandsentomostracfauna er bearbejdet på grundlag af materiale fra de lokaliteter, forfatteren selv har undersøgt, samt fra 118 lokaliteter, hvorfra prøver er indsamlede af andre, og som dels fandtes på forskellige institutioner, dels er overladt forfatteren til behandling af indsamlerne.

Tidligere var der fra Grønland beskrevet ialt 55 ferskvandsentomostraca. Af disse er 44 genfundet ved nærværende undersøgelse. 5 arter: *Polyartemia forcipata*, *Daphnia magna*, *Daphnia atkinsoni* var. *bolivari*, *Paracyclops fimbriatus* og *Bryocamptus vandouwei* må anses for at være medregnet til den grønlandske fauna ved fejltagelser; een art: *Eucypris fuscata affinis* er et nomen nudum; een art: *Ophryoxus gracilis* er usikker på Grønland, mens fire grønlandske arter: *Cypridopsis vidua*, *Limnocalanus grimaldi*, *Epactophanes richardi* og *Nannopus palustris* ikke er fundet i det bearbejdede materiale.

Ialt er der i det materiale, der har stået til rådighed, fundet 52 arter af ferskvandsentomostraca, hvoraf de 8, nemlig *Daphnia catawba*, *Candona falcata*, *Candona subgibba*, *Limnocythere sanctipatrici*, *Eucyclops serrulatus*, *Cyclops* (*Megacyclops*) *magnus*, *Heterolaophonte strömi* og *Heterolaophonte* sp. er nye for den grønlandske fauna. Ialt kendes der således med sikkerhed nu 56 arter af ferskvandsentomostraca fra Grønland.

I den systematiske del, p. 137–167, er de fundne arter gennemgået. I enkelte tilfælde, *Cyclops* (*Cyclops*) *scutifer* og *Bryocamptus* (*Arcticocamptus*) *tikchikensis*, har

det været nødvendigt at andre de tidligere benyttede navne for de grønlandske fund af arten, ligesom taxonomiske spørgsmål er blevet behandlet for en række arters vedkommende.

På grundlag af tabeller over arternes forekomst i de forskellige lokalitets typer, søer, damme og temporære vande, er arternes frekvens på disse typer beregnet. Tages alle undersøgte lokaliteter undet eet viser det sig, at *Chydorus sphaericus* er langt den almindeligste og mest konstante grønlandske art, mens *Daphnia pulex* forholder sig på lignende måde uden dog at være helt så almindelig. Særligt betydningsfulde i søerne er desuden arterne *Cyclops* (*Cyclops*) *scutifer* og *Diaptomus minutus*, i dammene *Acroperus harpae*, *Polyphemus pediculus* og *Simocephalus vetulus* og i de temporære vande *Cyclops* (*Acanthocyclops*) *vernalis* og *Branchinecta paludosa*. I alt er der i 64 søer fundet 45 arter, gennemsnitligt 5.7 arter pr. lokalitet; i 107 damme 46 arter, gennemsnitligt 6.5 arter pr. lokalitet, og i 36 temporære vande 30 arter med 4.4 arter pr. lokalitet.

25 arter er fundet på alle lokalitetstyper, 15 arter kun i ikke-udtørrende lokaliteter, 4 arter kun i damme og temporære vande, 4 arter udelukkende i søer, 2 i damme og endeligt er een art kun fundet i søer og temporære vande.

Af egentlige planktonorganismer er der kun påvist 8 arter, nemlig *Holopedium gibberum*, *Daphnia catawba*, *Daphnia longispina*, *Ceriodaphnia quadrangula*, *Bosmina longirostris*, *Bosmina coregoni obtusirostris*, *Diaptomus minutus* og *Cyclops* (*Cyclops*) *scutifer*. Alle de øvrige undersøgte arter er mere eller mindre udprægede bred- eller bundformer, eller forekommer kun i lavvandede lokaliteter.

Der er søgt relationer mellem de undersøgte arters forekomst og en række af de målte faktorer i lokaliteterne, nemlig brintionkoncentrationen (pH), såvel den aktuelle som den teoretisk højeste og laveste værdi, vandets elektriske ledningsevne, samt indhold af kalcium, magnium og klorid. Resultaterne er vist i en række skemaer, pl. 2–7. Resultaterne er søgt sammenholdt med, hvad man kender til de samme arters forekomst i andre områder. Sammenfattende kan det siges, at de arter, der er almindelige på Grønland, og især sådanne, der er almindelige i alle lokalitetstyper, overfor alle de undersøgte faktorer synes at have en meget stor tolerans.

I tabel 5 er alle de med sikkerhed konstaterede grønlandske arter opstillede med angivelse af deres forekomst indenfor det holarktiske område iøvrigt. 43 af de fundne arter er egentligt holarktiske, 6 er nearktiske, af disse er dog *Candona subgibba* fundet i Japan og *Diaptomus minutus* i Island; 6 arter er kun fundet i det palaearktiske område. Af de sidste seks kan imidlertid formodentlig kun *Diaptomus castor* betegnes som en ren palaearktisk art, idet de øvrige fem arter, der alle er ostracoder, sandsynligvis vil kunne findes i de arktiske og subarktiske områder af Nordamerika. Een art, *Heterolaophonte* sp. er ikke fundet udenfor Grønland, men der er ingen grund til at antage, at det er en endemisk, grønlandsk art, idet det sandsynligvis drejer sig om en salt- eller brakvandsart, der er kommet ind i ferskvand.

Klimatisk fordeler arterne sig i tre grupper. En gruppe, der omfatter 34 arter, er vidt udbredt i såvel arktisk–alpine som tempererede områder, enkelte findes endog i troperne, en gruppe, der omfatter 17 arter, har en ren arktisk–alpin udbredelse, og en gruppe, der kun omfatter 4 arter er udenfor Grønland kun fundet i tempererede områder.

På kortet Pl. 8 er vist alle de steder, hvorfra der haves oplysninger om ferskvandsentomostraca. Desuden er på kortet vist de 11 områder, hvori jeg har delt Grønland, for at vise ferskvandsentomostracfaunaens variation. Disse områder er på vestkysten: I Thule distrikt med 29 lokaliteter, II Upernavik distrikt med 40 lokaliteter, III Umanak distrikt med 7 lokaliteter, IV Diskobugtområdet med 66 lokaliteter, V Holsteinsborgområdet med 31 lokaliteter, VI Godthåbområdet med

29 lokaliteter og VII Sydvestgrønland med 20 lokaliteter. Og på østkysten: VIII Nordøstkystområdet med 11 lokaliteter, IX Franz Joseph Fjord området med 33 lokaliteter, X Scoresbysund området med 53 lokaliteter og XI Sydøstkystområdet med 6 lokaliteter.

I tabel 6 er vist de grønlandske arters forekomst i de forskellige områder i procent af samtlige lokaliteter i området.

Sammenholdes denne tabel med udbredelseskortene over de enkelte arter, figs. 38–84 og med de økologiske forhold, er det muligt at påvise fire faunaelementer i den grønlandske ferskvandsentomostracfauna. Disse fire elementer har hvert sit særpræg med hensyn til udbredelse og formodentlig også sin oprindelse på Grønland.

1. Et element, der forefindes på hele Grønland.

Dette element omfatter fire sikre arter: *Macrothrix hirsuticornis*, *Chydorus sphaericus*, *Cyprinotus incongruens* og *Candona candida*. Alle disse arter er vidt udbredte og meget tolerante overfor milieuforhold.

Desuden må til dette element sandsynligvis medregnes endnu tre arter, nemlig *Bosmina longirostris*, *Maraenobiotus brucei* og *Moraria mrazeki*.

Det forhold, at dette faunaelement kan klare sig i det højarktiske område i Nordgrønland og har en udbredelse, der omfatter hele Grønland, kunne tyde på, at man her har at gøre med et meget gammelt faunaelement, der har været i stand til at overleve den største nedisning på Grønland og som er de sidste rester af Grønlands præglaciale ferskvandsentomostracfauna. Hvor, og under hvilke forhold arterne har overlevet, er det ikke muligt at afgøre i dag, men 5 af de 7 arter er fundet på halvnunatakområdet Charcots Land inderst i Scoresbysundfjorden under forhold, der sikkert ikke er væsentligt forskellige fra de forhold, der har hersket på de nunatakker, der har eksisteret under den største nedisning.

2. Det nordvestlige faunaelement.

10 arter kan med sikkerhed henregnes til dette element, nemlig: *Branchinecta paludosa*, *Artemiopsis stefanssoni* var. *groenlandicus*, *Lepidurus arcticus*, *Daphnia pulex*, *Prionocypris glacialis*, *Candona groenlandica*, *Candona subgibba*, *Eucyclops serrulatus*, *Cyclops* (*Megacyclops*) *magnus* og *Bryocamptus* (*Arcticocamptus*) *tikchikensis*. Af disse arter er de fire nearktiske og de fire holarktiske arter. Ingen af disse arter forekommer udenfor det arktisk-alpine område. De to sidste arter, *Daphnia pulex* og *Eucyclops serrulatus*, er vidt udbredte ubiquister. I Grønland har alle disse arter en mere eller mindre udpræget nordvestlig udbredelse.

Til dette faunaelement slutter sig endvider to arter, *Daphnia catawba* og *Epactophanes richardi*, der begge kun er fundet enkelte gange på Grønland. *Daphnia catawba* er en nearktisk art, mens *Epactophanes richardi* er holarktisk.

For de 10 sikre arters vedkommende gælder det, at såfremt de er udbredt over en større del af Grønland, er deres forekomst aftagende mod syd, selv i sådanne tilfælde, hvor der findes udmærkede økologiske forhold for arterne i det sydlige Grønland. Dette kunne tyde på, at vi her har at gøre med et faunaelement, der er indvandret til Grønland fra det nordamerikanske fastland via de nordcanadiske øer.

3. Det sydlige faunaelement.

Dette faunaelement omfatter sådanne arter, der har en tydelig nordgrænse i Grønland. Imidlertid er det nødvendigt at skelne mellem to hovedtyper af udbredelser, arter, der kun findes på vestkysten og arter, der både findes på vestkysten og på østkysten, og indenfor disse to hovedtyper kan der findes grupper, hvori arterne har omtrent den samme nordgrænse.

Arter, der kun findes på vestkysten:

a. Udpræget sydlige former. Hertil hører kun een sikker art *Latona setifera*, samt eventuelt arterne *Cypris pubera* og *Cypridopsis vidua*, der begge kun er fundet enkelte gange.

b. Arter, hvis nordgrænse ligger på ca. 70° N.B. Hertil hører arterne *Ceriodaphnia quadrangula*, *Graptoleberis testudinaria*, *Diaptomus castor*, *Cyclops* (*Acanthocyclops*) *vernalis* og *Maraenobiotus insignipes* samt sandsynligvis *Streblocerus serricaudatus*.

c. Arter, hvis nordgrænse ligger på ca. 73° N.B. Hertil hører arterne *Daphnia longispina*, *Alonella nana*, *Diaptomus minutus* og *Bryocamptus* (*Arcticocamptus*) *arcticus*.

Arter, der både findes på vestkysten og på østkysten.

a. Arter, hvis nordgrænse ligger mellem 70° og 73° N.B. Hertil må henføres arterne *Holopedium gibberum*, *Scapholeberis mucronata*, *Simocephalus vetulus*, *Bosmina coregoni obtusirostris*, *Eurycercus glacialis*, *Acroperus harpae*, *Alona intermedia*, *Alona quadrangularis*, *Alona affinis*, *Alonella excisa*, *Polyphemus pediculus*, *Eucypris affinis hirsuta*, *Eucypris virens*, *Candona rectangula*, *Candona lapponica*, *Candona falcata* og *Limnocythere sanctipatrici*.

b. Arter, hvis nordgrænse ligger på ca. 77° N.B. Hertil hører arterne *Alona guttata*, *Alona rectangula* og *Cyclops* (*Cyclops*) *scutifer*.

Hvorvidt opdelingen af dette faunaelement i to grupper, arter, der kun findes på vestkysten og arter, der findes på såvel vest- som østkysten, er naturlig, er umuligt at bedømme på grundlag af det foreliggende materiale. Af de arter af det sydlige faunaelement, der nu kendes fra begge kyststrækninger, var de 8 før nærværende undersøgelse kun kendt fra vestkysten. Det er vel ikke usandsynligt, at en del af de 13 arter, der endnu kun kendes fra vestkysten, også vil kunne findes på østkysten, især på dennes sydlige del, der er meget dårligt undersøgt.

Den faktor, der forårsager, at arterne i det sydlige faunaelement har en nordgrænse på Grønland, må være længden af lokaliteternes isfrie periode. Begrænsningen finder sandsynligvis sted på den måde, at arterne ikke er i stand til at gennemføre deres livscyclus ved en kortere isfri periode end den, der hersker ved deres nordgrænse.

Det forhold, at forekomstprocenterne for en del arters vedkommende er højere mod nord end mod syd, synes at tyde på, at disse arter under gunstigere klimaforhold, end dem der nu hersker i Grønland, har været i stand til at indvandre til Grønland nordfra, men for størstedelen af dette faunaelements arters vedkommende må man regne med, at der er foregået en indslæbning til Sydgrønland med fugletrækket, og at arterne herfra har spredt sig mod nord. Da alle arterne – med undtagelse af *Diaptomus minutus*, der er nearktisk og *Diaptomus castor*, der er palaearktisk – er holarktisk udbredte, er det ikke muligt at afgøre, hvorvidt det sydlige faunaelement fortrinsvis er af nearktisk eller palaearktisk oprindelse.

4. Brakvandsfaunaelementet.

Til dette faunaelement hører i den grønlandske ferskvandsentomostracfauna fire arter, der egentligt er hjemmehørende i salt- eller brakvand. Det er arterne

Limnocalanus grimaldi, *Nannopus palustris*, *Heterolaophonte strömi* og *Heterolaophonte* sp.

Det er usikkert, hvorvidt *Nannopus palustris* overhovedet er fundet i en egentlig ferskvandslokalitet i Grønland, men for de tre andre arters vedkommende gælder det, at de er fundet på ferskvandslokaliteter, som for ret kort tid siden har stået i direkte forbindelse med havet.

For *Limnocalanus grimaldi*'s vedkommende gælder det særlige forhold, at den foruden at høre til brakvandselementet, også på en måde må henregnes til det nordvestlige faunaelement, idet artens forekomst i Grønland danner en naturlig fortsættelse af dens nordcanadiske udbredelse.

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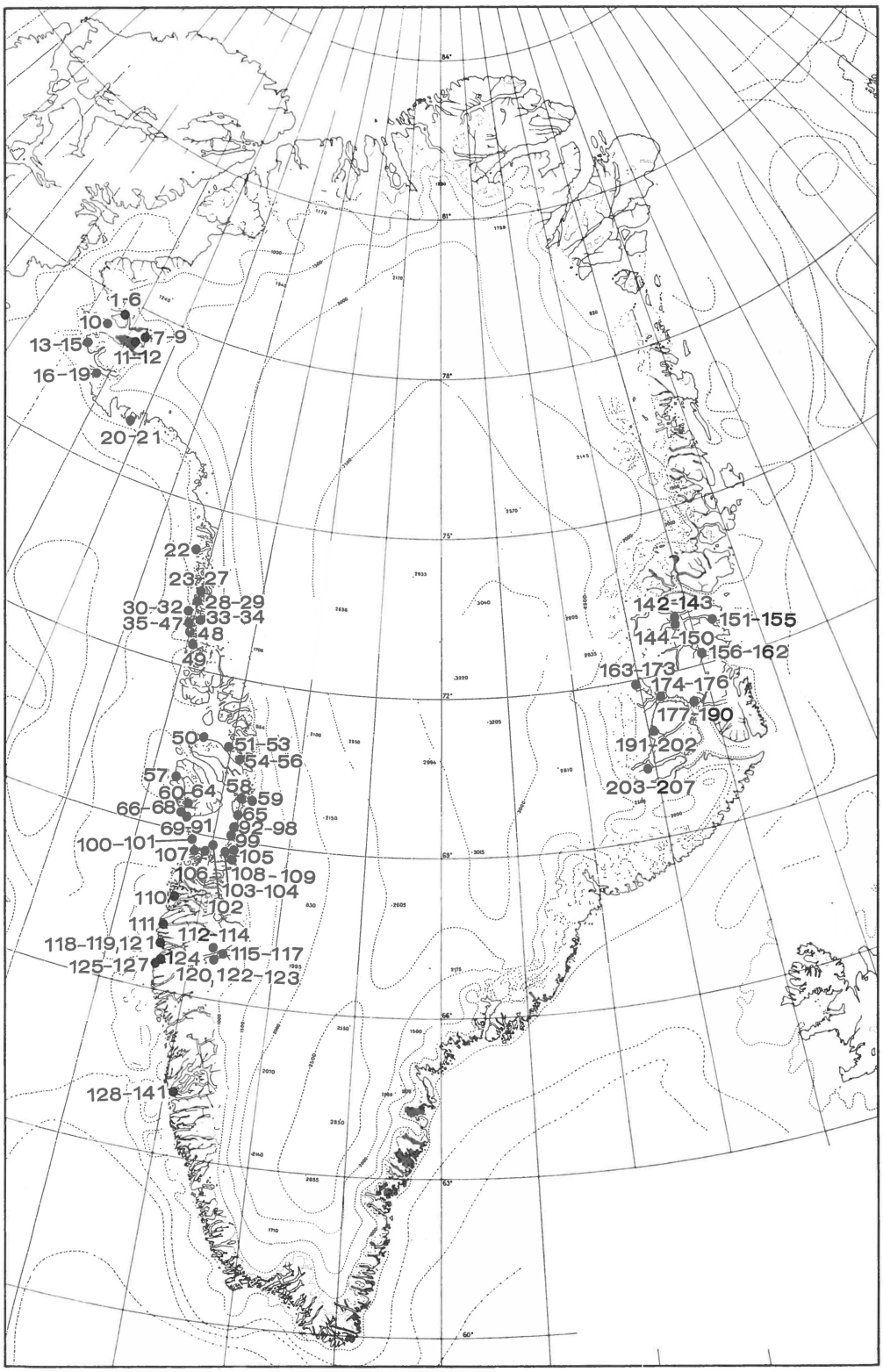
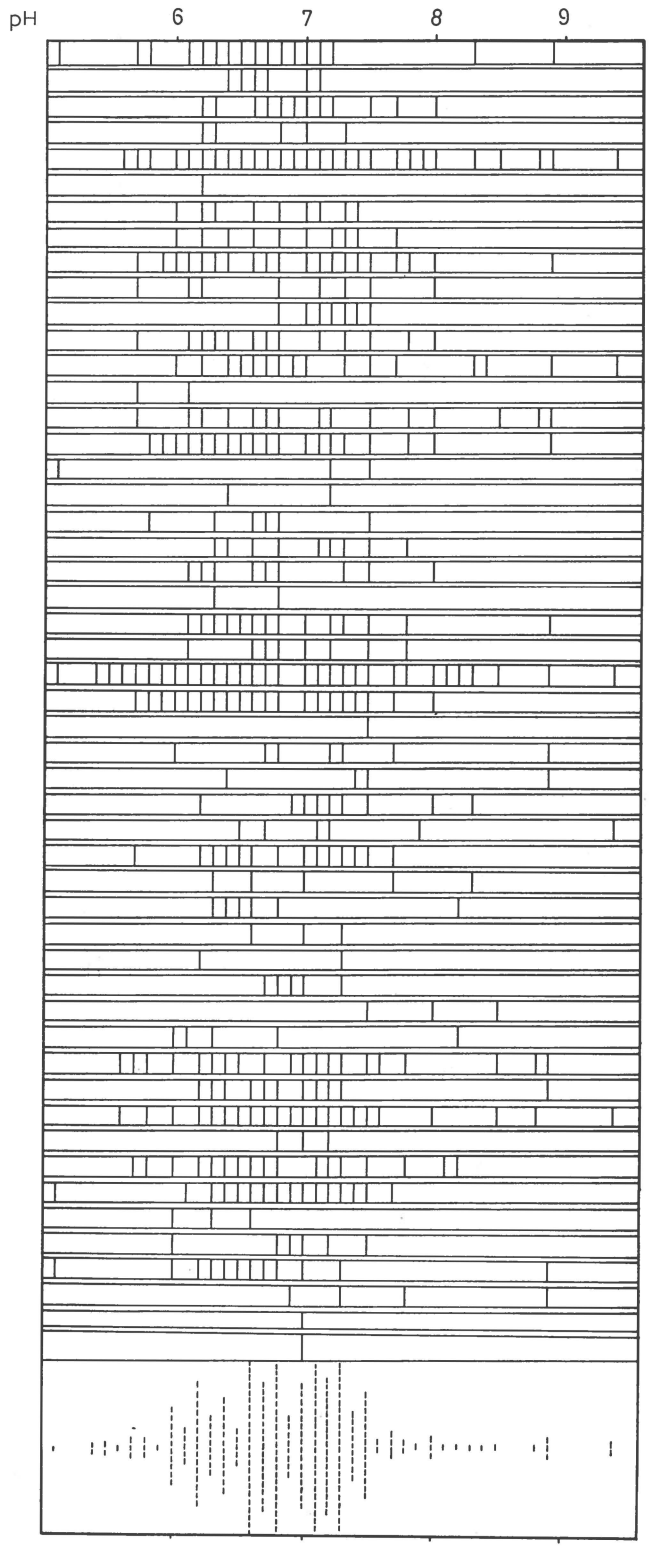


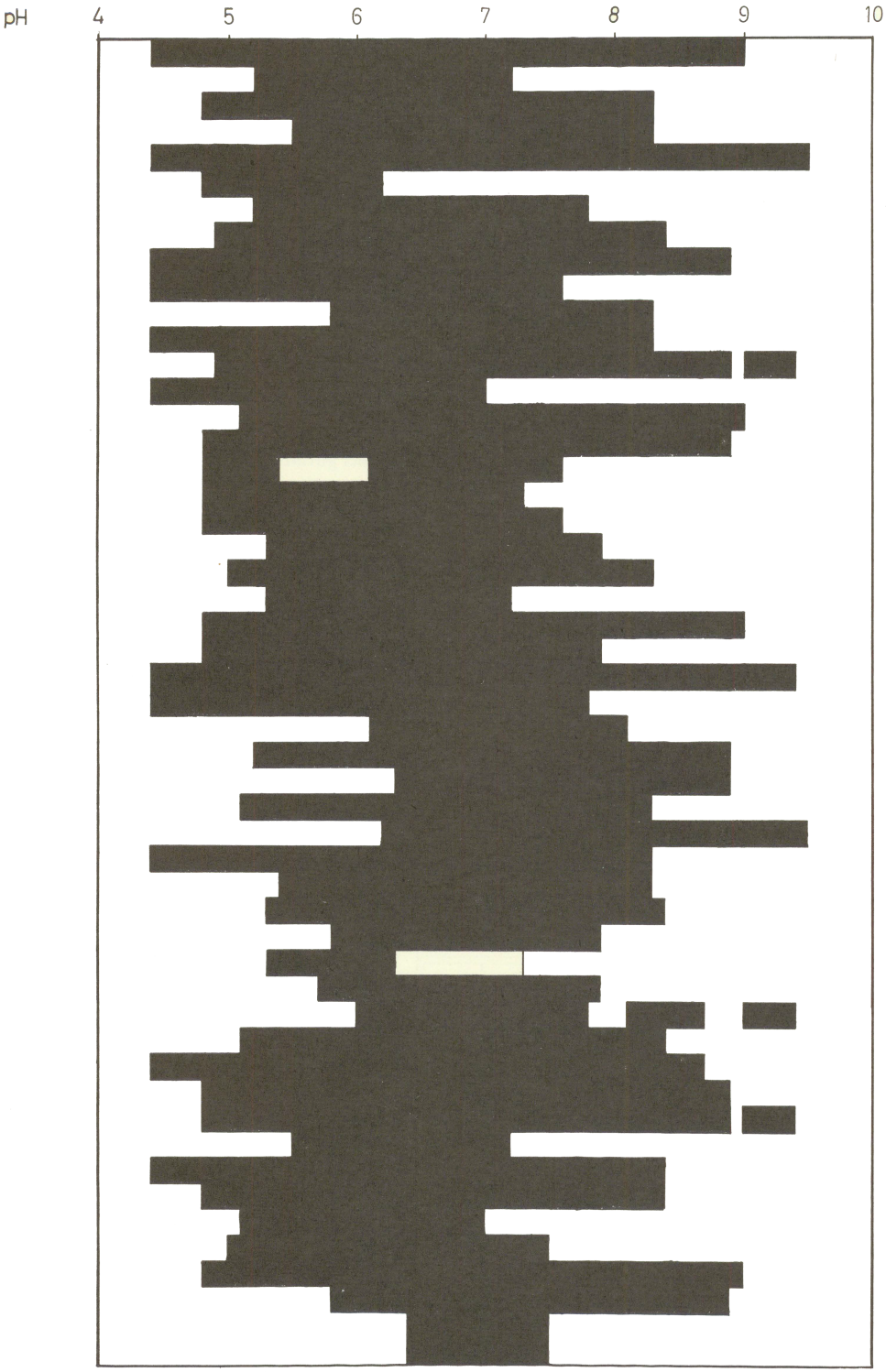
Map of Greenland showing the localities examined by the author.



Branchinecta paludosa
Artemiopsis stefanssoni var. groenlandicus
Lepidurus arcticus
Holopedium gibberum
Daphnia pulex
Daphnia catawba
Daphnia longispina
Scapholeberis mucronata
Simocephalus vetulus
Ceriodaphnia quadrangula
Bosmina longirostris
Bosmina coregoni obtusirostris
Macrothrix hirsuticornis
Streblocerus serricaudatus
Eurycercus glacialis
Acroperus harpae
Alona guttata
Alona intermedia
Alona rectangula
Alona quadrangularis
Alona affinis
Graptoleberis testudinaria
Alonella nana
Alonella excisa
Chydorus sphaericus
Polyphemus pediculus
Cypris pubera
Eucypris affinis hirsuta
Eucypris virens
Cyprinotus incongruens
Prionocypris glacialis
Candona candida
Candona lapponica
Candona groenlandica
Candona rectangula
Candona subgibba
Candona falcata
Limnocythere sanctipatrici
Diaptomus castor
Diaptomus minutus
Eucyclops serrulatus
Cyclops (Cyclops) scutifer
Cyclops (Megacyclops) magnus
Cyclops (Acanthocyclops) vernalis
Bryocamptus (Arcticocamptus) tikchikensis
Bryocamptus (Arcticocamptus) arcticus
Moraria mrazeki
Maraenobiotus brucei
Maraenobiotus insignipes
Heterolaophonte strömi
Heterolaophonte sp.

All observations in connection with collecting of entomostraca

Distribution of the species of freshwater entomostraca found in relation to the actual hydrogen ion concentration (pH).



Branchinecta paludosa
Artemiopsis stefanssoni var. groenlandicus
Lepidurus arcticus
Holopedium gibberum
Daphnia pulex
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Scapholeberis mucronata
Simocephalus vetulus
Ceriodaphnia quadrangula
Bosmina longirostris
Bosmina coregoni obtusirostris
Macrothrix hirsuticornis
Streblocerus serricaudatus
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Graptoleberis testudinaria
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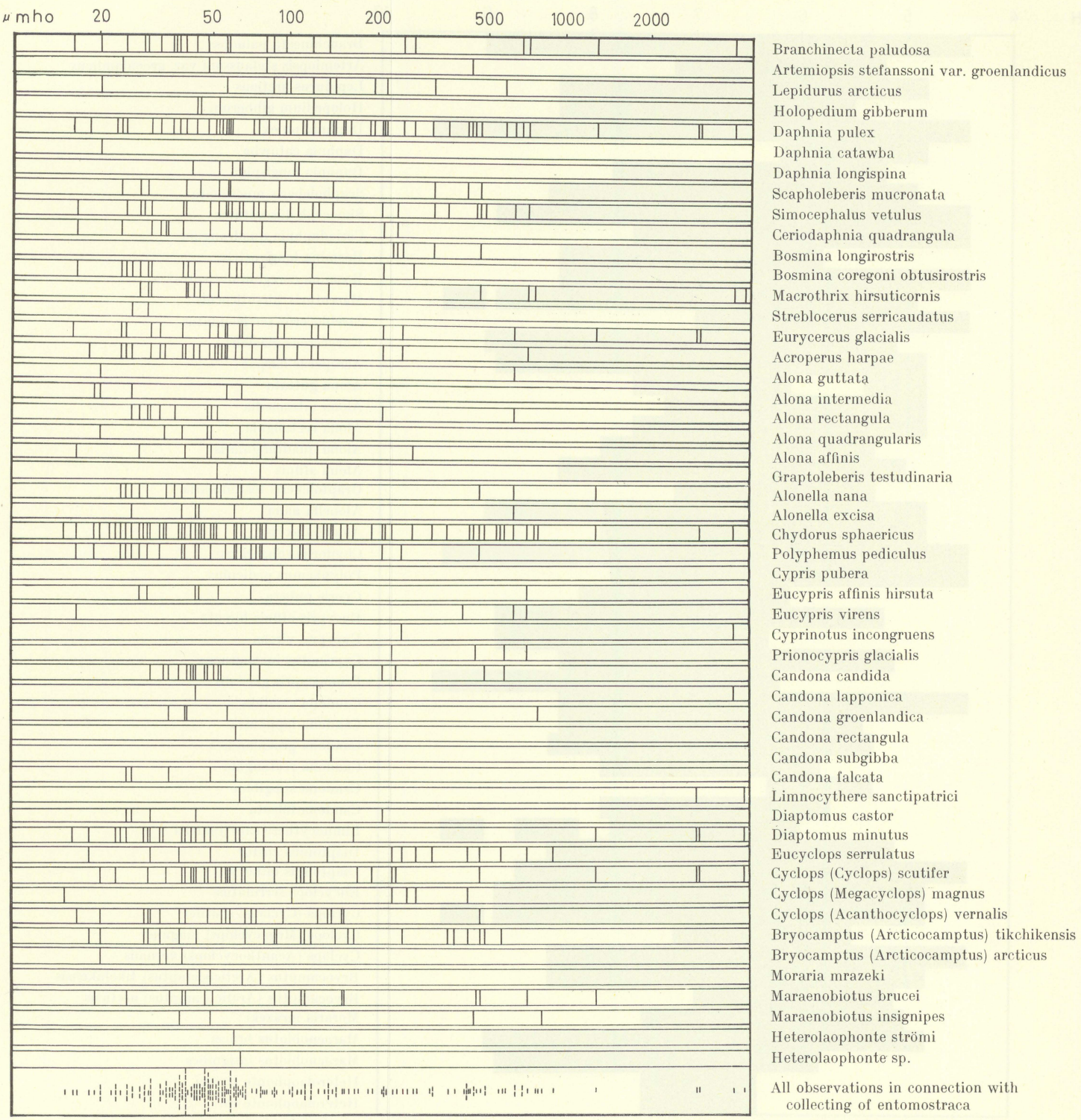
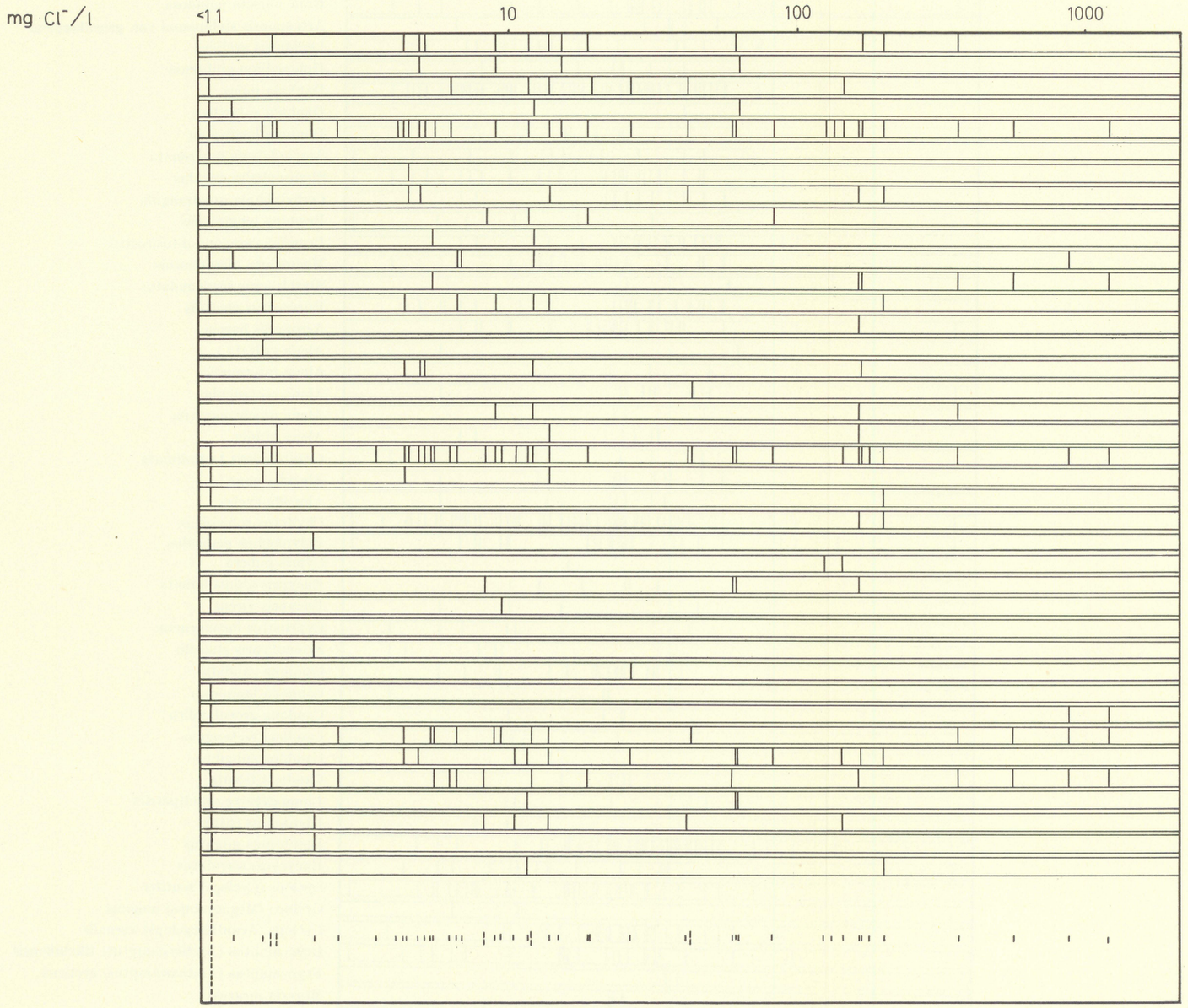
Bryocamptus (Arcticocamptus) arcticus
Moraria mrazeki
Maraenobiotus brucei
Maraenobiotus insignipes
Heterolaophonte strömi
Heterolaophonte sp.

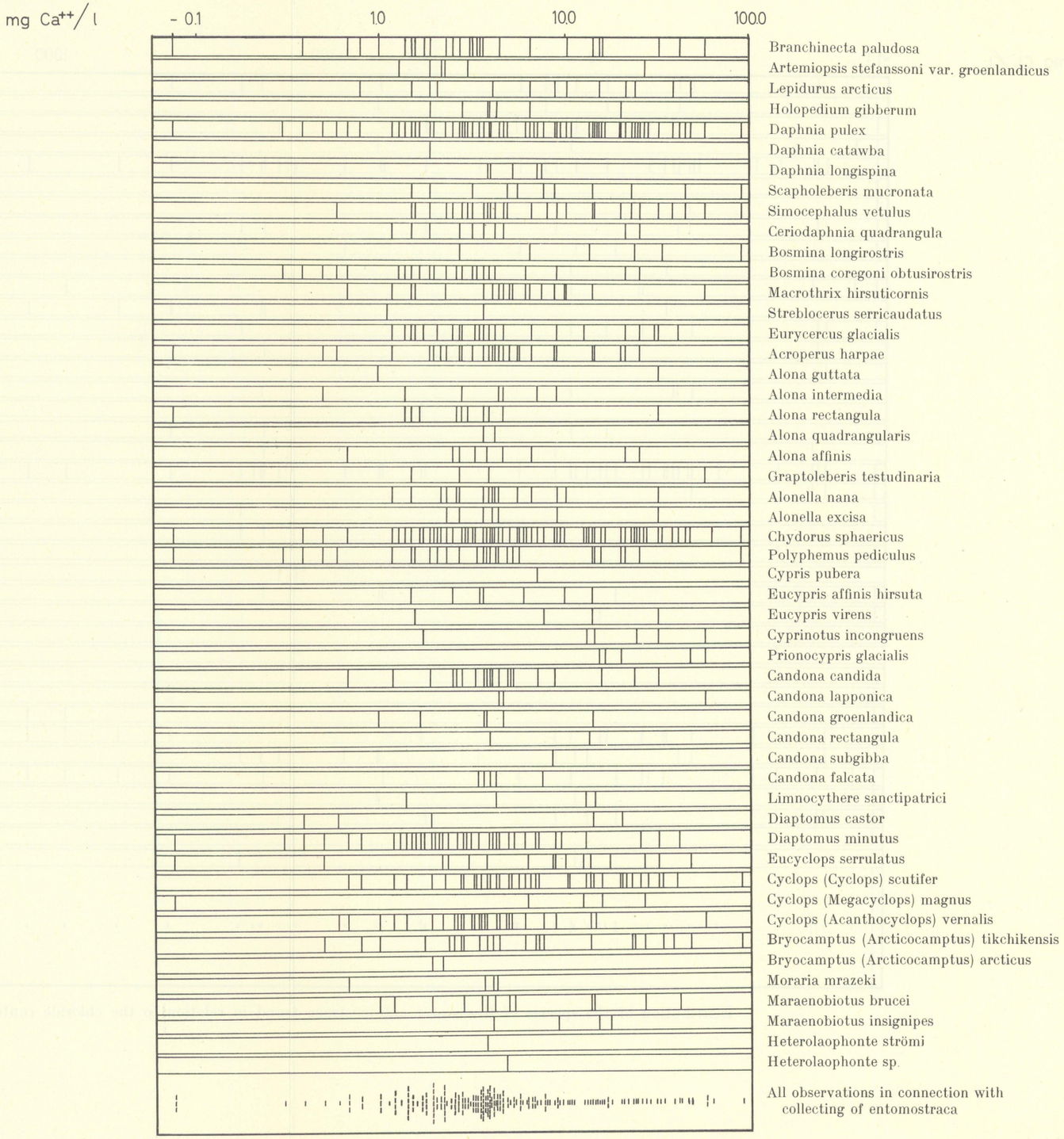
Distribution of the species of freshwater entomostraca found in relation to the theoretical range of the hydrogen ion concentration (pH).



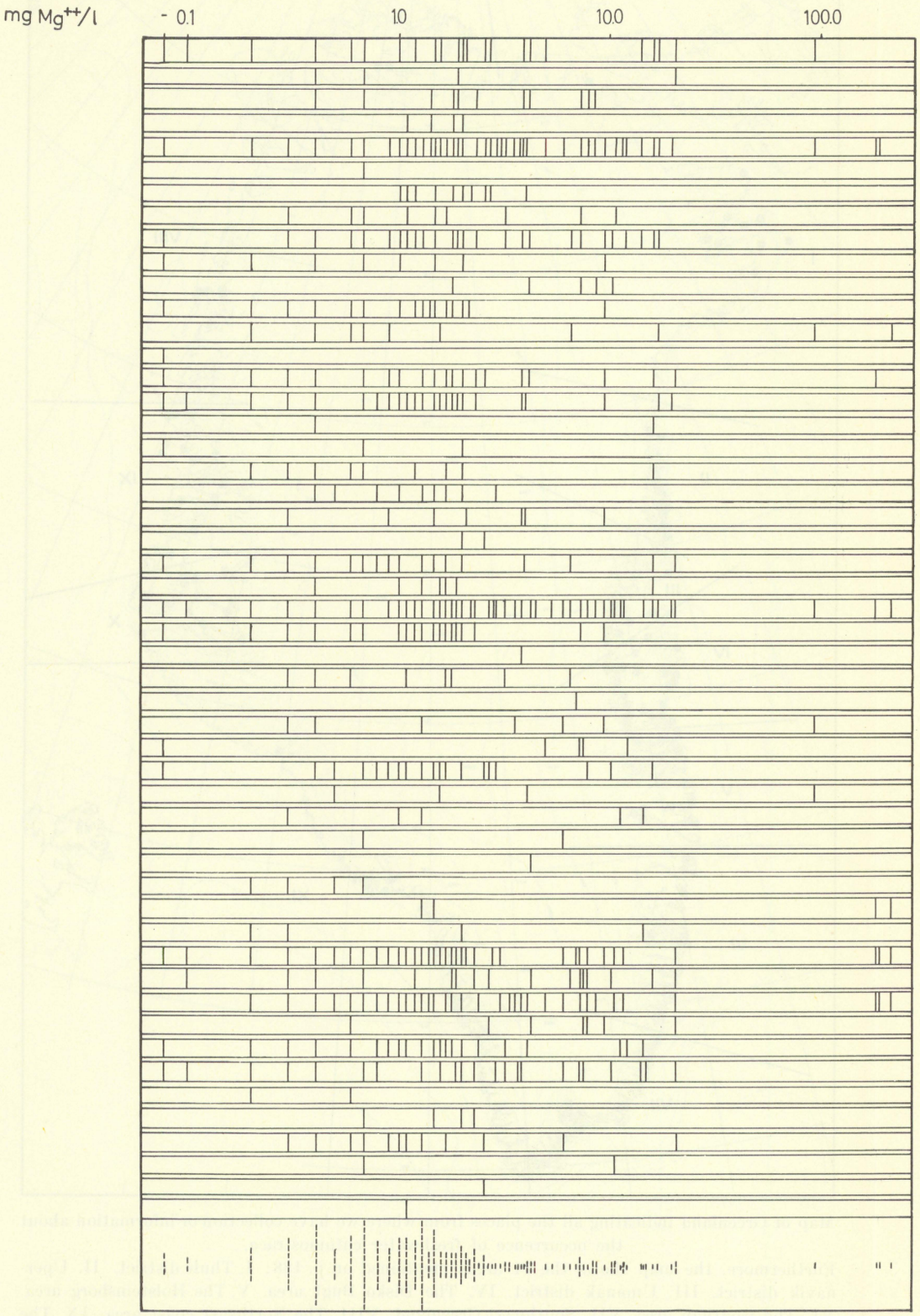
Distribution of the species of freshwater entomostraca found in relation to the electrical conductivity of the water.



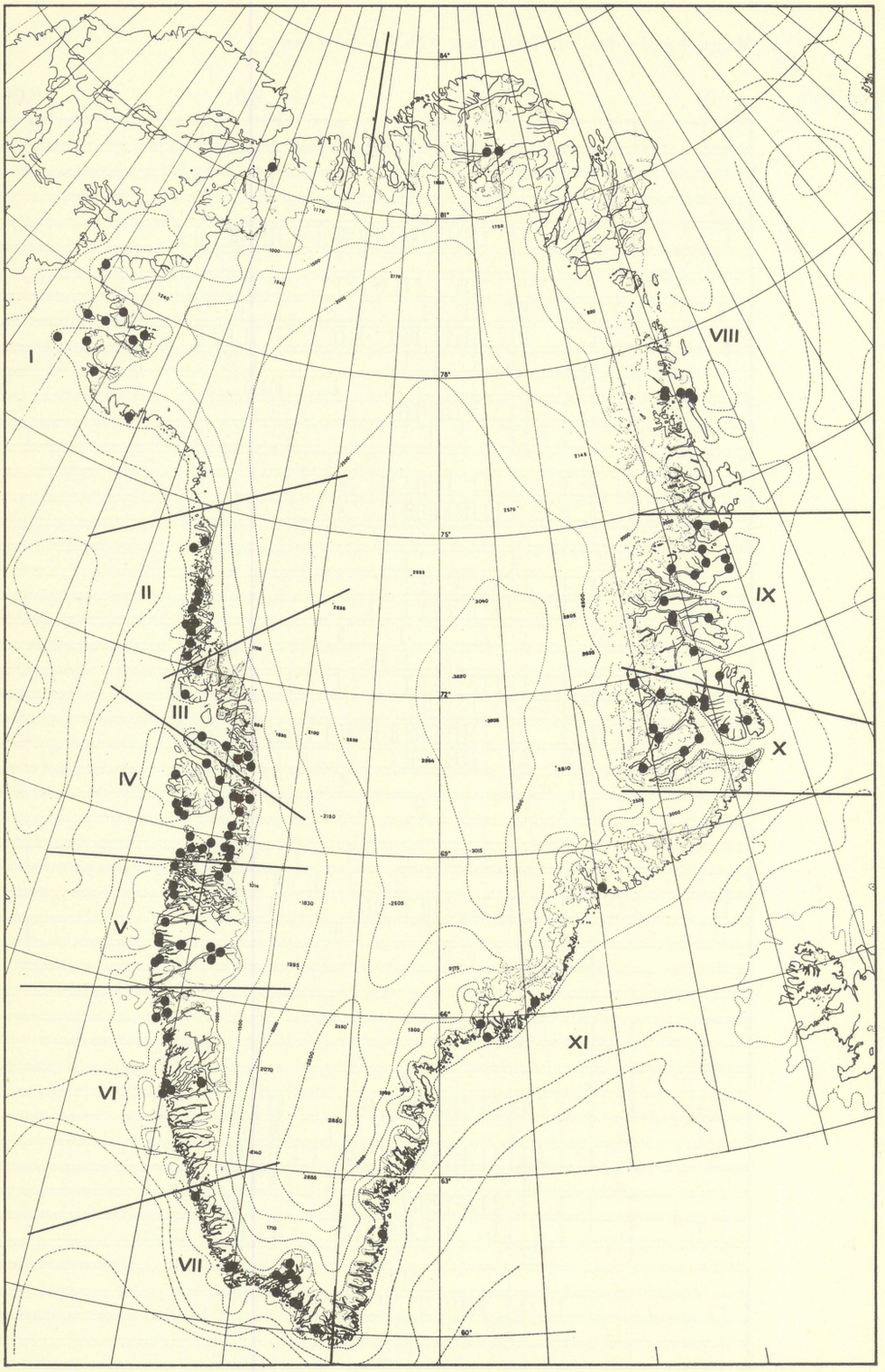
Distribution of the species of freshwater entomostraca found in relation to the chloride content (Cl^-) of the water.



Distribution of the species of freshwater entomostraca found in relation to the calcium content (Ca^{++}) of the water.



Distribution of the species of freshwater entomostraca found in relation to the magnesium content (Mg^{++}) of the water.



Map of Greenland indicating all the places from where we have collection or information about the occurrence of freshwater entomostraca.

Furthermore, the map shows the 11 areas mentioned on p. 188: I. Thule district. II. Upernavik district. III. Umanak district. IV. The Disko Bugt area. V. The Holsteinsborg area. VI. The Godthåb area. VII. Southwest Greenland. VIII. The Northeast coast area. IX. The Kejser Franz Joseph area. X. The Scoresby Sund area. XI. The Southeast coast area.



Map of Greenland indicating the most important localities mentioned in this work.

Table 1. Survey of the occurrence of the species in the lakes.

Locality	1	7	9	11	12	16	19	20	22	23	31	34	39	44	48	50	51	54	55	56	58	59	60	61	62	64	67	69	85	99	103	105
Branchinecta paludosa	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	..	..	..	..	..	+	..	+	..
Lepidurus arcticus	..	..	..	..	..	+	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	..
Holopedium gibberum	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	+	..	..	..
Daphnia pulex	..	..	..	..	..	+	..	+	..	..	+	..	..	..	+	+	+	+	+	+	..	..	..	..	..	+	..	+	+	+	+	+
Daphnia catawba	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Daphnia longispina	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..
Scapholeberis mucronata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..
Simocephalus vetulus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	+	..	+	+	..	+	+	+	+	..
Ceriodaphnia quadrangula	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	+	..	+	..
Bosmina longirostris	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..
Bosmina coregoni obtusirostris	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	+	+	+	..
Macrothrix hirsuticornis	+	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	+	..	+	..	..	..	..	..	..	..	..	..
Eurycercus glacialis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	+	+	+	+	+	+	+	..
Acroperus harpae	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	+	..	+	..	+	+	..	+	+	+	+	+
Alona guttata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..
Alona intermedia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..
Alona rectangula	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	..	..	..	+	..	..	..
Alona quadrangularis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	+	+	..	..	..	..	+	..	..	..
Alona affinis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	+	+
Graptoleberis testudinaria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..
Alonella nana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	+	..	+	..	+	..	..	..	..	..	..	..
Alonella excisa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	+	..	..	..	..	..	..	..
Chydorus sphaericus	..	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	..	+	..	..	..	..	..	..	..	..	..	..	..
Polyphemus pediculus	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	+	+	+	+	..
Cypris pubera	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Eucypris affinis hirsuta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	..	..	..
Eucypris virens	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..
Cyprinotus incongruens	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Prionocypris glacialis	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Candona candida	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	+	+	+	..	..	..	+	+	..	..
Candona rectangula	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..
Candona subgibba	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Candona falcata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	+	..	..	..	..	..	..	..
Limnocythere sanctipatrici	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diaptomus minutus	..	..	..	..	..	..	..	..	..	+	+	+	+	..	+	..	..	+	..	+	+	+	+	+	..	+	..	..	+	..	+	+
Eucyclops serrulatus	..	..	+	..	+	+	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..
Cyclops (Cyclops) scutifer	..	..	..	..	..	..	..	..	+	+	+	..	+	..	+	..	..	+	..	+	+	..	+	+	+	+	+	+	+	..	+	+
Cyclops (Megacyclops) magnus	..	+	+	..	..	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cyclops (Acanthocyclops) vernalis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	+	+	+	+	..
Bryocamptus (Arcticocamptus) tikchikensis	..	+	..	..	+	+	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	..	..	..	..	..	..	..	..	..	..
Moraria mrazeki	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..
Maraenobiotus brucei	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..
Maraenobiotus insignipes	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..
Heterolaophonte strömi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..
Heterolaophonte sp.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..
Number of species per locality	1	6	3	1	3	8	2	2	2	3	4	6	5	1	3	2	2	7	9	7	13	3	11	7	16	8	3	8	15	8	13	5

Locality	107	108	110	111	112	113	114	115	116	119	120	122	123	125	130	143	147	148	150	152	154	163	170	171	173	175	176	177	185	192	203	205	
Branchinecta paludosa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7.8 %
Lepidurus arcticus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	+	..	..	+	..	+	..	..	..	..	..	..	14.0 -
Holopedium gibberum	+	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	9.4 -
Daphnia pulex	..	..	+	+	+	..	+	+	+	..	..	+	+	+	+	+	..	+	..	..	..	..	..	..	+	+	..	..	..	+	+	..	48.4 -
Daphnia catawba	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Daphnia longispina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3.1 -
Scapholeberis mucronata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	..	..	..	+	..	..	6.3 -
Simocephalus vetulus	+	..	..	+	..	..	..	..	..	..	..	+	+	+	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	+	..	..	23.4 -
Ceriodaphnia quadrangula	..	..	+	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7.8 -
Bosmina longirostris	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	..	+	..	+	..	..	..	..	..	..	..	..	9.4 -
Bosmina coregoni obtusirostris	+	+	+	+	..	..	..	..	..	..	..	+	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17.2 -
Macrothrix hirsuticornis	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	+	12.5 -
Eurycercus glacialis	..	..	..	..	+	..	+	+	+	..	..	+	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25.0 -
Acroperus harpae	+	+	..	+	+	..	..	..	..	+	+	+	+	+	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	+	..	..	32.8 -
Alona guttata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Alona intermedia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Alona rectangula	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6.3 -
Alona quadrangularis	+	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	12.5 -
Alona affinis	+	..	..	..	+	..	..	..	..	..	..	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10.9 -
Graptoleberis testudinaria	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3.1 -
Alonella nana	+	..	..	..	+	..	..	..	..	..	..	..	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14.0 -
Alonella excisa	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4.7 -
Chydorus sphaericus	..	..	..	..	..	..	+	+	..	..	..	+	+	+	+	+	+	+	+	..	..	+	+	..	+	+	+	..	+	+	..	..	51.6 -
Polyphemus pediculus	+	+	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	+	..	..	..	+	..	..	..	+	..	..	20.3 -
Cypris pubera	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Eucypris affinis hirsuta	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3.1 -
Eucypris virens	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Cyprinotus incongruens	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	3.1 -
Prionocypris glacialis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3.1 -
Candona candida	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	..	..	..	..	..	+	..	..	..	..	..	18.8 -
Candona rectangula	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	3.1 -
Candona subgibba	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Candona falcata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4.7 -
Limnocythere sanctipatrici	..	..	..	..	..	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3.1 -
Diaptomus minutus	+	+	+	+	+	..	+	..	+	+	+	..	+	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42.2 -
Eucyclops serrulatus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6.3 -
Cyclops (Cyclops) scutifer	+	+	+	+	+	+	+	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	+	+	+	70.3 -
Cyclops (Megacyclops) magnus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6.3 -
Cyclops (Acanthocyclops) vernalis	+	+	..	..	..	..	..	+	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14.0 -
Bryocamptus (Arcticocamptus) tikchikensis	+	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	+	..	..	..	..	+	..	+	+	..	..	..	+	..	..	..	18.8 -
Moraria mrazeki	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Maraenobiotus brucei	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	+	..	..	+	..	..	..	..	..	9.4 -
Maraenobiotus insignipes	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3.1 -
Heterolaophonte strömi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Heterolaophonte sp.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1.6 -
Number of species per locality	15	8	6	6	7	3	6	5	4	2	3	12	10	11	5	5	5	4	2	3	4	7	3	7	4	4	4	3	5	7	2	2	5.7

Table 2. Survey of the occurrence of the species in the ponds.

| Locality | 2 | 3 | 4 | 5 | 6 | 8 | 13 | 14 | 15 | 17 | 18 | 21 | 24 | 25 | 26 | 27 | 29 | 30 | 32 | 33 | 35 | 36 | 37 | 38 | 40 | 41 | 42 | 43 | 45 | 46 | 47 | 49 | 52 | 53 | 57 | 65 | 66 | 68 | 72 | 73 | 74 | 76 | 77 | 79 | 82 | 86 | 87 | 88 | 89 | 90 | 91 | 98 | 100 | 102 | 106 | 117 | 121 | 124 | 126 | 127 | 128 | 129 | 131 | 132 | 133 | 134 | 136 | 140 | 142 | 144 | 145 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 164 | 165 | 166 | 167 | 168 | 169 | 172 | 181 | 182 | 183 | 186 | 187 | 188 | 189 | 190 | 191 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 | 201 | 202 | 204 | 206 | 207 | |
|---|---|---

Table 3. Survey of the occurrence of the species in temporary waters.

Locality	10	38	63	70	71	75	78	80	81	83	84	92	93	94	95	96	97	101	104	109	118	135	137	138	139	141	146	149	151	153	165	174	178	179	180	184	
Branchinecta paludosa	+	..	..	..	..	..	+	..	+	+	+	..	..	..	+	+	..	+	..	..	..	..	..	..	+	+	..	..	..	..	..	..	..	..	..	..	..	27.8%
Lepidurus arcticus	+	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	8.3 -
Daphnia pulex	..	..	+	..	..	+	..	..	+	+	..	..	..	+	+	+	+	+	+	+	..	..	..	..	+	..	+	+	..	..	..	..	..	..	..	..	..	38.3 -
Scapholeberis mucronata	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	..	+	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	11.1 -
Simocephalus vetulus	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	+	..	+	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	13.9 -
Ceriodaphnia quadrangula	..	..	..	..	..	+	..	..	..	..	..	..	..	+	+	+	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13.9 -
Bosmina coregoni obtusirostris	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	+	+	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11.1 -
Macrothrix hirsuticornis	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5.6 -
Acroperus harpae	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	11.1 -
Alona rectangula	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5.6 -
Alona affinis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	2.8 -
Alonella nana	..	..	..	..	..	+	..	..	+	..	..	..	+	+	..	+	+	..	+	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22.2 -
Alonella excisa	..	..	..	..	..	+	..	..	+	..	..	..	..	..	..	+	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11.1 -
Chydorus sphaericus	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	..	+	+	+	+	..	..	+	..	..	..	+	..	75.0 -
Polyphemus pediculus	..	..	..	..	..	..	..	..	+	..	..	..	..	+	+	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13.9 -
Eucypris affinis hirsuta	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5.6 -
Cyprinotus incongruens	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	2.8 -
Prionocypris glacialis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	..	..	8.3 -
Candona candida	..	..	..	+	..	..	+	+	+	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	19.4 -
Candona lapponica	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2.8 -
Candona groenlandica	..	..	..	..	+	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5.6 -
Candona rectangula	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	2.8 -
Diaptomus castor	..	..	..	..	..	+	..	..	+	..	..	..	..	..	+	+	+	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16.7 -
Diaptomus minutus	..	..	..	..	..	..	..	..	+	..	..	..	..	+	+	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11.1 -
Cyclops (Cyclops) scutifer	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	+	+	8.3 -
Cyclops (Acanthocyclops) vernalis	..	..	..	+	+	+	..	+	+	..	..	..	..	+	+	+	+	..	+	..	+	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	33.3 -
Bryocamptus (Arcticocamptus) tikchikensis	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	..	..	..	..	+	+	..	..	+	+	+	+	..	25.0 -
Bryocamptus (Arcticocamptus) arcticus	..	..	..	..	..	..	..	..	+	..	..	..	..	..	+	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8.3 -
Moraria mrazeki	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5.6 -
Maraenobiotus brucei	..	..	..	..	+	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	+	..	+	..	..	..	..	13.9 -
Number of species per locality	2	1	2	3	4	9	4	4	12	6	2	1	3	11	9	12	10	3	9	7	7	2	2	2	3	1	4	7	1	2	1	2	3	1	5	2	4.4

Table 4. Survey of the occurrence of the species in the localities in which the collections were not made by the author. (see p. 131)



Table 5. The freshwater entomostraca found in Greenland and their occurrence outside Greenland.

Nearctic (-Greenland)		Greenland	Palaearctic				
						Other Palaearctic	
Non arctic	Arctic		Iceland	Spitzbergen	Northern Scandinavia	Arctic	Non arctic
+	+	*Branchinecta paludosa*	..	+	+	+	+
..	+	*Artemiopsis stefanssoni* var. *groenlandicus*	..	..	..	..	..
..	+	*Lepidurus arcticus*	+	+	+	+	+
+	..	*Latona setifera*	..	..	..	..	+
+	+	*Holopedium gibberum*	+	..	+	+	+
+	+	*Daphnia pulex*	+	+	+	+	+
+	..	*Daphnia catawba*	..	..	..	..	..
+	+	*Daphnia longispina*	+	..	+	+	+
+	+	*Scapholeberis mucronata*	+	..	+	+	+
+	..	*Simocephalus vetulus*	+	..	+	+	+
+	+	*Ceriodaphnia quadrangula*	+	..	+	+	+
+	+	*Bosmina longirostris*	..	..	..	+	+
+	+	*Bosmina coregoni obtusirostris*	+	..	+	+	+
+	+	*Macrothrix hirsuticornis*	+	+	..	+	+
+	..	*Streblocerus serricaudatus*	..	..	+	+	+
..	+	*Eurycercus glacialis*	+	..	..	..	+
+	+	*Acroperus harpae*	+	..	+	+	+
+	+	*Alona guttata*	+	+	+	+	+
+	..	*Alona intermedia*	+	..	+	..	+
+	+	*Alona rectangula*	+	+	..	+	+
+	+	*Alona quadrangularis*	+	..	+	+	+
+	+	*Alona affinis*	+	..	+	+	+
+	..	*Graptoleberis testudinaria*	+	..	..	..	+
+	+	*Alonella nana*	+	..	+	+	+
+	+	*Alonella excisa*	+	..	+	+	+
+	+	*Chydorus sphaericus*	+	+	+	+	+
+	+	*Polyphemus pediculus*	+	..	+	+	+
+	..	*Cypris pubera*	+	..	..	+	+
+	..	*Eucypris affinis hirsuta*	+	..	+	+	+
+	..	*Eucypris virens*	..	..	..	..	+
+	+	*Cyprinotus incongruens*	+	..	+	..	+
..	..	*Prionocypris glacialis*	+	+	+	..	..
+	..	*Candona candida*	+	+	+	+	+
..	..	*Candona rectangula*	..	+	..	+	..
..	..	*Candona lapponica*	..	..	+	+	..
..	..	*Candona groenlandica*	..	..	..	+	..
..	..	*Candona falcata*	..	..	..	+	..
..	+	*Candona subgibba*	..	..	..	..	..
+	+	*Cypridopsis vidua*	..	..	+	..	+
+	..	*Limnocythere sanctipatrici*	+	..	+	..	+
..	..	*Diaptomus castor*	..	..	..	..	+
+	+	*Diaptomus minutus*	+	..	..	..	..
+	+	*Limnocalanus grimaldi*	..	+	..	+	+
+	+	*Eucyclops serrulatus*	+	..	+	..	+
+	+	*Cyclops (Cyclops) scutifer*	+	+	+	+	+
..	+	*Cyclops (Megacyclops) magnus*	..	..	..	..	..
+	+	*Cyclops (Acanthocyclops) vernalis*	+	..	+	+	+
..	+	*Bryocamptus (Arcticocamptus) tikchikensis*	..	..	..	..	..
..	+	*Bryocamptus (Arcticocamptus) arcticus*	..	..	+	+	+
..	+	*Moraria mrazeki*	..	..	..	..	+
..	+	*Maraenobiotus brucei*	..	+	..	..	+
..	+	*Maraenobiotus insignipes*	..	..	+	+	+
+	+	*Epactophanes richardi*	+	..	+	..	+
+	+	*Nannopus palustris*	..	..	..	(+)	(+)
+	..	*Heterolaophonte strömi*	..	(+)	..	(+)	(+)
..	..	*Heterolaophonte* sp.	..	..	..	..	..

Table 6. The percentage occurrence of the Greenland freshwater entomostraca within the eleven areas.

	I. Thule District	II. Upernavik District	III. Umanak District	IV. The Disko Bugt Area	V. The Holsteinsborg Area	VI. The Godthåb Area	VII. Southwest Greenland	VIII. The Northeast Coast Area	IX. The Kejser Franz Joseph Fjord Area	X. The Scoresby Sund Area	XI. The Southeast Coast Area
Number of Localities in the Area.....	29	40	7	66	31	29	20	11	33	53	6
Branchinecta paludosa	41.4	60.0	42.9	41.9	16.1	27.6	..	18.2	..	..	..
Artemiopsis stefanssoni var. *groenlandicus*	3.5	15.0	+	1.5	..	..	..	..	..	..	..
Lepidurus arcticus.....	31.0	30.0	..	6.1	+	..	..	27.3	42.4	11.3	+
Latona setifera.....	..	..	..	..	+	17.2	55.0	..	..	..	..
Holopedium gibberum	..	..	+	10.6	3.2	3.5	..	..	..	3.8	..
Daphnia pulex.....	65.5	50.0	100.0	66.6	77.5	31.0	30.0	63.6	81.9	58.5	..
Daphnia catawba.....	..	..	..	..	..	..	..	..	3.0	..	..
Daphnia longispina.....	..	2.5	..	1.5	..	..	+	..	..	..	..
Scapholeberis mucronata.....	..	..	14.3	19.7	12.9	..	25.0	..	6.1	37.7	..
Simocephalus vetulus.....	..	17.5	28.6	38.0	48.5	17.3	15.0	..	15.2	32.0	33.3
Ceriodaphnia quadrangula	..	..	+	30.3	16.1	3.5	35.0	..	..	..	..
Bosmina longirostris	20.5	..	+	1.5	+	..	..	..	6.1	3.8	..
Bosmina coregoni obtusirostris.....	..	7.5	+	48.5	29.0	41.4	40.0	..	..	+	16.7
Macrothrix hirsuticornis.....	18.8	17.5	14.3	13.6	9.7	..	5.0	27.3	12.1	24.5	16.7
Streblocerus serricaudatus.....	..	..	..	3.0	..	..	..	..	..	..	..
Eurycercus glacialis.....	..	..	14.3	50.0	61.3	34.5	55.0	..	..	+	33.3
Acroperus harpae.....	..	40.0	14.3	44.0	32.3	27.6	40.0	..	..	54.7	50.0
Alona guttata	..	2.5	14.3	+	..	..	5.0	9.1	..	1.9	..
Alona intermedia.....	..	5.0	..	10.6	+	..	..	..	..	..	16.7
Alona rectangula	..	12.5	14.3	13.6	3.2	3.5	5.0	9.1	..	1.9	..
Alona quadrangularis	..	..	14.3	10.6	6.5	3.5	10.0	..	..	3.8	..
Alona affinis	..	2.5	..	18.2	22.6	27.6	20.0	..	+	1.9	16.7
Graptoleberis testudinaria	..	..	..	6.1	+	..	5.0	..	..	..	..
Alonella nana.....	..	10.0	42.9	33.3	12.9	10.3	10.0	..	..	..	..
Alonella excisa.....	..	2.5	14.3	12.2	6.5	6.9	15.0	..	..	3.8	33.3
Chydorus sphaericus	58.6	75.0	57.2	71.2	58.1	65.5	70.0	54.5	45.4	81.1	50.0
Polyphemus pediculus.....	..	12.5	..	53.0	25.8	38.0	45.0	..	+	50.9	33.3
Cypris pubera.....	..	..	..	..	3.2	3.5	..	..	..	..	..
Eucypris affinis hirsuta	..	..	14.3	13.6	6.5	6.9	25.0	..	3.0	11.3	..
Eucypris virens	..	..	42.9	1.5	3.2	..	..	..	..	1.9	..
Cyprinotus incongruens	6.9	..	..	4.9	9.7	..	5.0	9.1	12.1	11.3	50.0
Prionocypris glacialis	17.2	..	14.3	4.9	3.2	..	5.0	45.5	12.1	7.5	..
Candona candida.....	10.3	5.0	28.6	25.8	+	13.8	5.0	..	9.1	17.0	..
Candona lapponica	..	..	..	3.0	6.5	..	..	..	6.1	3.8	..
Candona groenlandica.....	3.5	2.5	..	7.6	3.2	..	..	18.2	..	..	..
Candona rectangula.....	..	..	..	1.5	+	..	..	..	3.0	3.8	..
Candona subgibba	10.3	..	..	..	..	..	..	9.1	..	..	..
Candona falcata.....	..	..	..	4.5	..	..	..	..	6.1	..	..
Cypridopsis vidua	..	..	..	..	+	..	..	..	..	..	..
Limnocythere sanctipatrici	..	..	..	1.5	6.5	..	..	..	..	1.9	..
Limnocalanus grimaldi.....	..	..	..	..	..	..	..	+	..	..	..
Diaptomus castor.....	..	..	..	18.2	6.5	..	20.0	..	..	..	..
Diaptomus minutus.....	..	37.5	28.6	47.0	51.6	44.8	65.0	?	..	..	..
Eucyclops serrulatus	58.6	30.0	28.6	..	..	..	..	9.1	..	..	..
Cyclops (*Cyclops*) *scutifer*.....	..	15.0	28.6	25.8	35.5	6.9	40.0	36.4	36.2	21.2	50.0
Cyclops (*Megacyclops*) *magnus*	34.6	..	..	..	..	..	..	..	..	..	..
Cyclops (*Acanthocyclops*) *vernalis*.....	..	..	..	57.6	48.5	44.8	15.0	..	..	..	..
Bryocamptus (*Arcticocamptus*) *tikchikensis*	27.6	12.5	14.3	13.6	9.7	..	5.0	27.3	24.1	26.4	..
Bryocamptus (*Arcticocamptus*) *arcticus* .	..	5.0	..	4.5	+	..	..	..	..	..	..
Moraria mrazeki	..	..	..	7.6	..	10.3	5.0	?	..	..	..
Maraenobiotus brucei	6.9	2.5	14.3	4.5	3.2	..	..	9.1	12.1	13.2	16.7
Maraenobiotus insignipes.....	..	..	28.6	1.5	3.2	..	5.0	..	..	..	..
Epactophanes richardi.....	..	..	..	+	..	..	..	+	..	..	..
Nannopus palustris.....	..	..	..	..	+	..	..	..	..	..	..
Heterolaophonte strömi	..	..	..	1.5	..	..	..	..	..	..	..
Heterolaophonte sp.....	..	..	..	1.5	..	..	..	..	..	..	..
Number of species found during the present investigations	16	25	28	47	42	23	30	17 (19)	20	28	14
Haberbosch (1920).....	..	3	18	37	38	9	19	..	..	..	..
Poulsen (1940a)	..	..	..	..	..	..	..	13 (15)	12	17	3