DET KONGELIGE DEPARTEMENT
FOR HANDEL, SJØFART, INDUSTRI, HÅNDVERK OG FISKERI

NORGES SVALBARD- OG ISHAVS-UNDERSØKELSER
LEDER: ADOLF HOEL

# SKRIFTER OM SVALBARD OG ISHAVET

Nr. 70

EILIF DAHL, B. LYNGE, AND P. F. SCHOLANDER

# LICHENS FROM SOUTHEAST GREENLAND

COLLECTED CHIEFLY BY
DR. P. F. SCHOLANDER IN 1932
DURING THE NORWEGIAN EXPEDITION
IN THE S/S "POLARIS"

WITH 2 MAPS

OSLO
I KOMMISJON HOS JACOB DYBWAD
1937

# RESULTS OF THE NORWEGIAN EXPEDITIONS TO SVALBARD 1906—1926 PUBLISHED IN OTHER SERIES

(See Nr. 1 of this series.)

The results of the Prince of Monaco's expeditions (Mission Isachsen) in 1906 and 1907 were published under the title of 'Exploration du Nord-Ouest du Spitsberg entreprise sous les auspices de S. A. S. le Prince de Monaco par la Mission Isachsen', in Résultats des Campagnes scientifiques, Albert Ier, Prince de Monaco, Fasc. XL—XLIV. Monaco.

ISACHSEN, GUNNAR, Première Partie. Récit de voyage. Fasc. XL. 1912. Fr. 120.00.

With map: Spitsberg (Côte Nord-Ouest). Scale 1 : 100 000. (2 sheets.) Charts: De la Partie Nord du Foreland à la Baie Magdalena, and Mouillages de la Côte Ouest du Spitsberg.

ISACHSEN, GUNNAR et ADOLF HOEL, Deuxième Partie. Description du champ d'opération. Fasc. XLI. 1913. Fr. 80.00.

HOEL, ADOLF, Troisième Partie. Géologie. Fasc. XLII. 1914. Fr. 100.00.

SCHETELIG, JAKOB, Quatrième Partie. Les formations primitives. Fasc. XLIII. 1912. Fr. 16.00.

RESVOLL HOLMSEN, HANNA, Cinquième Partie. Observations botaniques. Fasc. XLIV, 1913. Fr. 40.00.

A considerable part of the results of the ISACHSEN expeditions in 1909 and 1910 has been published in Videnskapsselskapets Skrifter. I. Mat.-Naturv. Klasse. Kristiania (Oslo).

ISACHSEN, GUNNAR, Rapport sur l'Expédition Isachsen au Spitsberg. 1912, No. 15. Kr. 5,40.

ALEXANDER, ANTON, Observations astronomiques. 1911, No. 19. Kr. 0,40.

GRAARUD, AAGE, Observations météorologiques. 1913, No. 1. Kr. 2,40.

HELLAND-HANSEN, BJØRN and FRIDTJOF NANSEN, The sea west of Spitsbergen. 1912, No. 12. Kr. 3,60.

ISACHSEN, GUNNAR, The hydrographic observations. 1912, No. 14. Kr. 4,20.

With chart: Waters and anchorages on the west and north coast. Publ. by the Norw. Geogr. Survey, No. 198.

HOEL, A. et O. HOLTEDAHL, Les nappes de lave, les volcans et les sources thermales dans les environs de la Baie Wood au Spitsberg. 1911, No. 8. Kr. 4,00.

GOLDSCHMIDT, V. M., Petrographische Untersuchung einiger Eruptivgesteine von Nordwestspitzbergen. 1911, No. 9. Kr. 0,80.

BACKLUND, H., Über einige Olivinknollen aus der Lava von Wood-Bay, Spitzbergen. 1911, No. 16. Kr. 0,60.

HOLTEDAHL, OLAF, Zur Kenntnis der Karbonablagerungen des westlichen Spitzbergens. I. Eine Fauna der Moskauer Stufe. 1911, No. 10. Kr. 3,00. II. Allgemeine stratigraphische und tektonische Beobachtungen. 1912, No. 23. Kr. 5,00.

HOEL, ADOLF, Observations sur la vitesse d'écoulement et sur l'ablation du Glacier Lilliehöök au Spitsberg 1907—1912. 1916, No. 4. Kr. 2,20.

VEGARD, L., L'influence du sol sur la glaciation au Spitsberg. 1912, No. 3. Kr. 0,40.

ISACHSEN, GUNNAR, Travaux topographiques. 1915, No. 7. Kr. 10,00.

With map: Spitsberg (Partie Nord-Ouest). Scale 1 : 200 000 (2 sheets).

GUNNAR ISACHSEN has also published: Green Harbour, in *Norsk Geogr. Selsk. Aarb.*, Kristiania, 1912—13, Green Harbour, Spitsbergen, in *Scot. geogr. Mag.*, Edinburgh, 1915, and, Spitsbergen: Notes to accompany map, in *Geogr. Journ.*, London, 1915.

All the above publications have been collected into two volumes as Expédition Isachsen au Spitsberg 1909—1910. Résultats scientifiques. I, II. Christiania 1916.

As the result of the expeditions of ADOLF HOEL and ARVE STAXRUD 1911—1914 the following memoir has been published in Videnskapsselskapets Skrifter. I. Mat.-Naturv. Klasse.

HOEL, ADOLF, Nouvelles observations sur le district volcanique du Spitsberg du Nord. 1914, No. 9. Kr. 2,50.

---

Expeditions of TH. VOGT 1925 and 1928:

STØRMER, LEIF, Downtonian Merostomata from Spitsbergen. — Skr. Norske Vid.-Akad. I. Mat.-Nat. Kl. 1934. No. 3. Kr. 3,00.

The following topographical maps and charts have been published separately:

Maps:

Bear Island. 1 : 25 000. 1925. Kr. 10,00.

Bear Island. 1 : 10 000. (In six sheets). 1925. Kr. 30,00.

East Greenland. Eirik Raudes Land from Sofiasund to Youngsund. 1 : 200 000. 1932. Kr. 5,00.

DET KONGELIGE DEPARTEMENT
FOR HANDEL, SJØFART, INDUSTRI, HÅNDVERK OG FISKERI

NORGES SVALBARD- OG ISHAVS-UNDERSØKELSER
LEDER: ADOLF HOEL

# SKRIFTER OM SVALBARD OG ISHAVET

Nr. 70

EILIF DAHL, B. LYNGE, AND P. F. SCHOLANDER

# LICHENS FROM SOUTHEAST GREENLAND

COLLECTED CHIEFLY BY
DR. P. F. SCHOLANDER IN 1932
DURING THE NORWEGIAN EXPEDITION
IN THE S/S "POLARIS"

WITH 2 MAPS

OSLO
I KOMMISJON HOS JACOB DYBWAD
1937

A. W. BRØGGERS BOKTRYKKERI A/S

*In Memory of my Mother*

*Mrs. Julie Lynge*

# Preface.

In the summer of 1932 a Norwegian scientific expedition worked along the coast of Southeast Greenland. Its botanist, Dr. P. F. Scholander, devoted the greater part of his time to the study of the Vascular Plants, and after his return he published a valuable paper on these collections, into which he also included the results of some collections of minor importance from other Norwegians who worked on the same coasts in 1931 and 1932 (J. Devold and P. F. Scholander: Flowering Plants and Ferns of Southeast Greenland, *Skrifter om Svalbard og Ishavet,* No. 56, p. 1—209, Oslo 1933).

During the expedition Dr. Scholander, who is a trained lichenologist, eagerly collected lichens. The forced work under such conditions obliged him to restrict his efforts to the Vascular Plants and the larger lichens, Microlichenes were only incidentally collected. His paper on the former group speaks for itself, but also his collection of Macrolichenes is very considerable. In reality it is so great that it is the first fully representative collection from this long coast.

Scholander collected lichens in the following localities:

**Kangerdlugsuak** (about 63° 15′ N).

Skardet, Aug. 29th.
Spekkpynten (called "Første bistasjon", i. e. First sub-station of the hunters, on the labels), Aug. 19th.
Storfjord Radio (called "Brandal" on the labels), Aug. 25th—27th.
Brandalsfjell, Aug. 23rd.
Polarisbreen, Aug. 23rd.
Amdrupneset, Aug. 28th.

**Akorninarmiut** (about 63° 30′).

Finnsbu, July 24th and Aug. 10th, 11th, and 14th.
Eskimoneset, Aug. 12th, (only diary).
Dronning Maria's dal (often called Trollbotn on the labels), July 24th, and Aug. 12th.

**Tingmiarmiut** (about 62° 40′).

Brattneset, Aug. 8th.

**Kangerdlugsuatsiak** (about 60° 30′ and a little farther north.)

Mortensberg (often called Olabu on the labels), July 26th.
Fossheim, July 31st (only diary).
Persvatnet, July 31st.
Møretind, July 28th.
Møretun, July 31st, and Aug. 3rd.
Narsak, July 27th and 29th.

Kangerdlugsuatsiak corresponds to the Lindenow fjord district. All these localities will be found on the two maps which Dr. Scholander prepared for his paper of 1933, and which will be reproduced also for the present paper.

Unfortunately, the collection of Crustaceous lichens was very small; it is far from representative, and can only be regarded as a contribution to our knowledge. It is not much greater than that of former botanists from these regions.

We were therefore glad to receive a small collection of Crustaceous lichens from the Danish geologist, Mr. R. Bøgvad, M. A., which he had brought together in 1933 in the Isle of "Storøen", a gneissic island at the outlet of a fjord Kangerdlugsuatsiak, 66° 15′ N. On the southeast coast of Greenland there are several fjords of this name, and to avoid confusion with the southernmost Kangerdlugsuatsiak (Lindenow Fjord) this locality has simply been named Storøen.

Mr. Bøgvad collected his plants during a spare hour, a happy inspiration, for small though his collection was, it yet contained several interesting finds. It shows us how much research work there is still left to be done on the Crustaceous lichens on the southeast coast of Greenland. An hour's work in any place there would be sure to result in the finding of other interesting plants.

Dr. Scholander's plants belong to the Botanical Museum of Oslo (a good set of duplicates has been presented to the Botanical Museum of Copenhagen). Dr. Bøgvad's plants belong to the Copenhagen Museum, and the first set of duplicates has been presented to the Botanical Museum of Oslo.

It is unfortunate that Dr. Scholander's present vocation (he is working on physiology) has prevented him from determining this interesting collection himself. It was therefore resolved that his colleagues should do it for him. My young student friend, Mr. Eilif Dahl, has undertaken the mounting and labelling of the whole collection, a work which required much time and patience. After that he preliminarily determined all the Macrolichenes. Dr. Scholander has followed our work from the beginning to the end, and has given us many valuable suggestions and much information which can only be furnished by the man who did the field work. It fell to the present writer to

determine the Crustaceous lichens, to check the determinations of the others, and to pen the manuscript.

It was thought desirable to give a survey of the lichens which have formerly been collected in Southeast Greenland, i. e., the coast between Cape Brewster (the southern entrance to Scoresby Sound) in the north and Cape Farewell in the south. Lichens from Scoresby Sound, and from other parts of Greenland have occasionally been mentioned if they offered special interest.

The most important former collections of lichens from Southeast Greenland are due to:

I. It is impossible to touch on the Greenland lichen flora without meeting the name of Jens Vahl, the founder of our knowledge. He visited Southeast Greenland in 1829 and advanced as far north as Cape Rantzau, or more accurately to Karra Akunguak between Cape Rantzau and Cape Adelaer.

II. P. Eberlin, during the umiak-expedition in 1883—85 under the command of Lieutenant Gustav Holm. Eberlin reached Tingmiarmiut, but it is doubtful whether he collected lichens north of Inger Kajarfik, just north of 62° N.

Vahl's and Eberlin's collections belong to the Botanical Museum of Copenhagen. They were determined by the Danish clergyman, the Rev. J. S. Deichmann Branth, who made use of the determinations for his well-known "Grønlands Lichen-Flora", of 1888. Deichmann Branth's limitation of the species is much wider than that of the present time, and his determinations are much in need of verification. The present writer has seen these plants in Copenhagen, and has tried to check the determinations and bring the nomenclature into accord with the present rules, as far as the time at disposal made it possible. But it was not always possible to do so. Several of the plants belong to critical sections, others were not inviting to work upon, being old now, and collected, as they were, by non-lichenologists.

III. G. Amdrup, then lieutenant in the Royal Danish Navy, collected lichens in the northern part of Southeast Greenland (and also in Scoresby Sound, and on the Liverpool Coast). His collection was determined by the Finnish lichenologist Edv. A. Vainio (*Lichenes expeditionis G. Amdrup (1898—1902), Meddelelser om Grønland, vol. XXX, p. 123—141, København 1905,* here quoted as Vainio 1905, p. X).

IV. The Norwegian research work began in 1931. In that year Bjørn Bjørlykke, student at the Oslo University, and Mr. J. Kr. Tornøe, collected lichens in Kangerdlugsuak, Umivik, Akorninarmiut, Umanak, Tingmiarmiut and Kangerdlugsuatsiak or the Lindenow Fjord. Their lichens, which belong to the Botanical Museum of Oslo, were determined by the present writer (B. Lynge: *Lichens from South East Greenland,*

*collected in 1931 on Norwegian Expeditions, Skrifter om Svalbard og Ishavet,* No. 45, p. 1—15, Oslo 1932, here quoted as Lynge 1932, p. X).

V. During the Danish "Scoresby Sound Committee's 2nd East Greenland Expedition in 1932 to King Christian IX' Land", Mr. Tyge Wittrock Böcher collected lichens between Angmagsalik (65° 37′ N) and Cape Dalton (69° 25′ N), just south of Cape Brewster. His lichens, which belong to the Botanical Museum of Copenhagen, were determined by the present writer (B. Lynge *The Lichens etc., Meddelelser om Grønland,* vol. CIV, No. 5, p. 1—15, København 1933, here quoted as Lynge 1933, p. X).

The present writer begs to express his profound gratitude to many institutions which have facilitated the work in many ways, especially to the Botanical Museums of Copenhagen, Uppsala, and Stockholm, and to their staffs.

He is also much indebted to Mr. Adolf Hoel, the Leader of *Norges Svalbard- og Ishavs-undersøkelser,* who has followed this work, as he has followed so many of my former studies on arctic lichens, with a much appreciated interest. A grant from his institution enabled the present writer to visit Copenhagen in November 1936 in order to see its great Greenland herbarium once more.

I am also glad to express my gratitude to my Swedish lichenological friends, especially to Dr. A. H. Magnusson of Göteborg, who have so often placed their knowledge at my disposal, with wonted courtesy, and promoted my work in many ways.

A manuscript on the much larger West Greenland material, brought home by the Swedish Professor Th. M. Fries in 1871, was finished last autumn (1936), but financial difficulties delayed the printing of the great paper. The two works will presumably be printed almost at the same time. This necessitated the double printing of remarks on a few interesting species, found in both collections.

Oslo 23rd January 1937.

*B. Lynge.*

## *Verrucariaceae.*

### *Verrucaria* (Wigg.) Th. Fr.

#### 1. *Verrucaria margacea* Wbg.

*Kangerdlugsuatsiak*: Narsak.

The plant has a fairly thick, rimulose crusta and large perithecia, 0,4—0,5 mm in diam. It certainly belongs to the *Verrucaria aethiobola* section, and it has been named *V. margacea* on account of its large perithecia.

*Verrucaria aethiobola* was collected at Cape Dalton by Böcher (Lynge 1933, p. 13).

#### 2. *Verrucaria maura* Wbg.

*Kangerdlugsuatsiak*: Møretun.

Only one plant was collected, spores 12—15 $\mu$, broadly ellipsoidical. Formerly not recorded from East Greenland.

### *Staurothele* Norm.

#### 1. *Staurothele fuscocuprea* (Nyl.) Zschacke.

Zschacke Verrucariaceae etc., in Rabenhorst Kryptogamenflora, 1933, p. 519.
Storøen (Bøgvad).

Thallus tenuis vel tenuisculus, limitatus, ambitu non radiatus, fusco-cupreus, verrucosus, verrucae interdum (si thallus tenuis) subdiscretae, sed vulgo magis contiguae, vel (si thallus optime evolutus) thallus fere rimoso-areolatus, areolae tum irregulares, saepe angulosae. Areolae steriles parvae vel minutae, diam. 0,2 mm raro superantes, verrucae fertiles multo majores, diam. 0,35—0,45 mm, concolores, subglobosae et basi constrictae vel obtuse conicae, semper supra thallum bene elevatae.

Perithecia plus minusve alte parte thallina superne tenui obducta, apice anguste prominenti. Sporae binae, mox vel demum nigricantes, murales, magnitudine variantes, 30—50 $\times$ 15—20 $\mu$. Gonidia hymenialia vulgo oblonga, 7—8 (—10) $\times$ 3—4 $\mu$, sed etiam subcylindrica, apice rotundata, subrecta vel leviter arcuata, saepe 10—15 $\mu$ longa, rarius vidimus usque ad 20 $\mu$ longa.

The present species was also found in Th. Fries's collection from West Greenland (1871) and in Lynge's collection from Northeast Greenland (1929). It is extremely abundant there; there are hundreds of plants, found in almost every brooklet where is was looked for. It is there really one of the commonest Pyrenocarpous lichens. It is very characteristic of rocks and stones in depressions which are constantly or at least often irrigated by very cold water from melting snow and ice.

It must be admitted that the thickness of the thallus is very variable; in some plants it is so thin that we should hardly be able to detatch a fragment from the stone for sectioning, in others fairly thick, in some plants so thick that it is irregularly rimose rather than verrucose. In Lynge's very large material it would hardly be possible to distinguish between the present species and *Staurothele clopima* after the thickness of the thallus alone; a distinction can only be based on the much larger and very elevated fertile verrucae of *Staurothele fuscocuprea.* The structure of the perithecia, the size of the spores and the gonidia hymenialia are very much the same in the two species.

The proportion between the rather short, oblong gonidia hymenialia and the longer, more cylindrical ones is very variable. In some plants the latter are very scarce, and we have to search after them; in others they are more abundant, but hardly ever so numerous as the oblong gonidia.

*Staurothele fuscocuprea* has a hard time during the great inundations in the early summer. Fine detritus may then entirely cover the fissures between the sterile verrucae, and even these verrucae themselves, leaving only the fertile verrucae free.

*Staurothele fuscocuprea* is an addition to the lichen flora of Greenland. But Deichmann Branth recorded *Staurothele clopima* from West Greenland: Holstensborg and Arsuk, and Vainio from Fleming Inlet and Turner Sound in East Greenland. (Deichmann Branth, Grønlands Lichen-Flora, 1888, p. 510, Vainio 1905, p. 140). We have not studied these plants, some of the records may stand for *Staurothele fuscocuprea.*

Scholander's collection was very poor in Crustaceous Pyrenocarpous lichens. There was no *Polyblastia,* no *Thelidium* and no *Staurothele.* Amdrup collected *Polyblastia terrestris* at Cape Dalton and *Polyblastia pseudomyces* in Turner Sound.

## *Dermatocarpaceae.*

### *Dermatocarpon* Eschw.

1. *Dermatocarpon miniatum* (L.) Mann.
var. *complicatum* (Lightf.) Hellb.

*Kangerdlugsuak*: Storfjord Radio.

There was only one plant in the collection. It is perhaps rare, anyhow there is no other record of it from Southeast Greenland.

2. *Dermatocarpon rivulorum* (Arn.)
DT. et Sarnth.

Degelius, Gunnar: Über Dermatocarpon rivulorum (Arn.) DT. et Sarnth. und D. Arnoldianum Degel. n. sp., Nyt Magazin f. Naturv., LXXV, p. 151—161, tab. I, Oslo 1934.
*Kangerdlugsuak*: Amdrupneset.
*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.

The plants are entirely typical, and the determination was checked and approved by Degelius. *Dermatocarpon rivulorum* was better represented in the collection than many other lichens; at Amdrupneset in particular, Scholander collected a lot of plants.

It is one of the most interesting lichens in the collection, an addition not only to the lichen flora of Greenland, but even to the whole arctic lichen flora.

3. *Dermatocarpon lachneum* (Ach.) A. L. Sm.

*Kangerdlugsuak*: Storfjord Radio.

Very scarce in the collection, and to our knowledge not formerly collected in Southeast Greenland.

Amdrup collected *Dermatocarpon cinereum* and *Endocarpon pulvinatum* in Turner Sound (Vainio 1905, p. 140).

*Coniocybe furfuracea* was not found in the present collection, but Bjørlykke found it in Tingmiarmiut (Lynge 1932, p. 9). — At Møretun in Kangerdlugsuatsiak an Eskimo hut was dug out, and Scholander found a yellow "needle-lichen" on a beam. Unfortunately the plant was lost. It may have been *Coniocybe furfuracea,* or perhaps *Calicium viride.*

## *Sphaerophoraceae.*

### *Sphaerophorus* Pers.

1. *Sphaerophorus globosus* (Huds.) Vain.

*Kangerdlugsuak*: Skardet.
*Akorninarmiut*: Finnsbu.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Møretun and Narsak.

There was a large number of fine plants from many localities; the f. *congesta* is also common. Formerly collected in Angmagsalik by Böcher (Lynge 1933, p. 12). Said to be fairly common in Scoresby Sound (Deichmann Branth 1894, p. 101), which is probable. Farther north the Norwegian expeditions to Eirik Raude's Land in 1929 and 1930 found it only once; we have possibly overlooked it. Collected near Danmark's Havn by Lundager (Galløe 1910, p. 191).

2. *Sphaerophorus fragilis* Pers.

*Akorninarmiut*: Dronning Marie's dal.
*Tingmiarmiut*: Brattneset, c. fr.
*Kangerdlugsuatsiak*: Møretind, 1200 m above sea-level, and Møretun.

A lot of fine, even fertile plants. The number of localities is, however, not great. On the whole rather rare in Greenland (see Lynge-Scholander 1932, p. 16). In Southeast Greenland it has formerly been recorded from Umanak, collected by Bjørlykke (Lynge 1932, p. 14).

## *Ephebaceae.*

### *Ephebe* E. Fr.

1. *Ephebe lanata* (L.) Vain.

*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

Supposed to be rare, there are no other finds from East Greenland. But there are several finds on the west coast up to Disko Island.

## *Pyrenopsidaceae.*

### *Pyrenopsis* Nyl.

1. *Pyrenopsis pulvinata* (Schaer.) Th. Fr.

*Kangerdlugsuak*: Storfjord Radio.

The single, saxicolous plant was well fertile, but the apothecia examined contained no spores. The thick membranes of the gonidia stain violet with KOH. If this substance does not readily penetrate the

mucilagineous cover, this may be removed or loosened by heating with water before staining.

No *Collemaceae* was detected in the present collection. But Amdrup found *Leptogium lacerum* f. *majus* (= *L. lichenoides* (L.) Zahlbr.) at Cape Dalton (Vainio 1905, p. 135).

## *Pannariaceae.*

### *Massalongia* Koerb.

#### 1. *Massalongia carnosa* (Dicks.) Koerb.

*Kangerdlugsuatsiak*: Mortensberg and Narsak.

There were only these two finds, and few plants. — There are no other finds from East Greenland, it was not found during the two Norwegian expeditions to Northeast Greenland in 1929 and 1930. I have no notes on it from the Danish arctic herbarium. Can it be an addition to the lichen flora of Greenland?

### *Pannaria* Del.

#### 1. *Pannaria elaeina* (Wbg.) Nyl.

*Akorninarmiut*: Finnsbu.
*Kangerdlugsuatsiak*: Narsak.

The two plants are the only plants that have been collected in East Greenland. Th. Fries collected it in Disko Island, West Greenland (Lynge, manuscript), the only finds from West Greenland.

#### 2. *Pannaria Hookeri* (Borr.) Nyl.

*Kangerdlugsuak*: Storfjord Radio.

Very scarce, the only find from East Greenland.

#### 3. *Pannaria pezizoides* (Web.) Lightf.

*Kangerdlugsuak*: Storfjord Radio.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

Scattered all over the region, and perhaps more common than these few finds might suggest. Collected in Scoresby Sound by Hartz (herb. Copenh.) and fairly common in Eirik Raude's Land (Lynge 1929).

### *Psoroma* (Ach.) Nyl.

1. *Psoroma hypnorum* (Dicks.) Hoffm.

*Kangerdlugsuak*: Skardet, Storfjord Radio, several places, up to 1000 m above sea-level, and Amdrupneset.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Møretun and Narsak.

The only *Pannariacé* that is really common in Southeast Greenland. It has been found by Amdrup at Cape Dalton and in Turner Sound (Vainio 1905, p. 135), by Bjørlykke in Akorninarmiut and Tingmiarmiut (Lynge 1932, p. 13) and by Böcher in Angmagsalik and at Cape Ewart (Lynge 1933, p. 12). All records agree that it is common all over the east coast of Greenland.

*Parmeliella lepidiota* was found in Turner Sound by Amdrup (Vainio 1905, p. 135), the only record from East Greenland.

No *Placynthium* was found in the present collection, and no *Lobaria,* neither did we find a *Lobaria* in Eirik Raude's Land in 1929 and 1930. But *Placynthium* — most probably *Pl. asperellum* — is common enough there.

## *Peltigeraceae.*

### *Peltigera* Willd.

1. *Peltigera aphthosa* (L.) Willd., sensu angustiore.

*Kangerdlugsuak*: Storfjord Radio.
*Akorninarmiut*: Finnsbu, c. fr., Dronning Maria's dal, c. fr.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun, c. fr., and Narsak, c. fr.

There were large numbers of plants from many localities; it must be common. It is of special interest that there were so many fertile plants. Formerly collected by Tornøe just north of 60° 30′ in the Kangerdluarak Fjord (Lynge 1932, p. 13).

2. *Peltigera leucophlebia* (Nyl.) Gyeln.

*Kangerdlugsuak*: Storfjord Radio.
*Akorninarmiut*: Dronning Maria's dal, c. fr. and Finnsbu, c. fr.
*Tingmiarmiut*: Brattneset, c. fr.
*Kangerdlugsuatsiak*: Møretun and Mortensberg.

It is common and widely distributed in Southeast Greenland. There were several fertile plants in the collection. I can only confirm the statement by several authors that there is no continuous cortex on the under side of the apothecia. This, in connection with the prominent

veins of its under side, justifies a specific distinction from *Peltigera aphthosa* (L.) Willd., s. ang.

This conspicuous and common species could not escape the attention of former collectors. It has been collected in Kangerdlugsuak by Böcher (Lynge 1933, with bibliography).

### 3. *Peltigera venosa* (L.) Hoffm.

*Kangerdlugsuak*: Storfjord Radio.
*Tingmiarmiut*: Brattneset.
*Akorninarmiut*: Dronning Maria's dal.

It is not supposed to be common; it was quite scarce in the present collection. It has formerly not been collected in Southeast Greenland, but there were many finds in the Norwegian collections from Eirik Raude's Land (Lynge-Scholander 1932, p. 29), and it has also been collected in Scoresby Sound by Hartz (Deichmann Branth 1894, p. 88).

### 4. *Peltigera canina* (L.) Willd.

*Kangerdlugsuak*: Skardet.
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

The number of plants is quite considerable, and some of them are well fertile. — The typical var. *membranacea* is found in the collection, but several plants are more crisp along the margins, as is so often the case with arctic *Peltigerae*.

*Peltigera canina* has formerly been collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 13) and at Cape Dalton by Böcher (Lynge 1933, p. 11). Recorded by Vainio from several places in the Scoresby Sound district (leg. Amdrup), but it is not certain whether Vainio separated it from *Pelt. rufescens*. *Pelt. canina* was not found by the Norwegian expeditions to Eirik Raude's Land in 1929 and 1930.

### 5. *Peltigera rufescens* (Weis) Humb.

*Kangerdlugsuak*: Skardet, Storfjord Radio and Amdrupneset, c. fr.
*Akorninarmiut*: Finnsbu, c. fr., Dronning Maria's dal, c. fr.
*Tingmiarmiut*: Brattneset, c. fr.
*Kangerdlugsuatsiak*: Møretun.

Very plentiful in the northern fjords. It has been collected by Böcher at several localities between Kangerdlugsuak and Scoresby Sound (Lynge 1933, p. 11). Farther north it is still more common, see Lynge—Scholander 1932, p. 30. Its northernmost known locality is Hvalrossodden (leg. Lundager), but a great share of the plants from the Danmark expedition which Galløe referred to *Pelt. rufescens* belong to *Pelt. aphthosa,* s. lat.

### 6. *Peltigera lepidophora* (Nyl.) Vain.

*Kangerdlugsuak*: Storfjord Radio and Brandalsfjell (1200 m above sea-level) and Amdrupneset.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.

Scattered, but far from common. Formerly there were no records from Southeast Greenland, but the Norwegian expeditions found it at several localities in Eirik Raude's Land farther north. So far, there are no finds from West Greenland.

### 7. *Peltigera erumpens* (Tayl.) Vain.

Typus:
*Kangerdlugsuak*: Storfjord Radio.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.

f. *leptoderma* (Nyl.) Schol.

*Kangerdlugsuak*: Storfjord Radio, pluribi, and Brandalsfjell, 1000 m above sea-level (diary).
*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

*Peltigera erumpens* is quite common, but hardly plentiful. The two formae, the type and the glabrous *leptoderma,* have the same distribution and are supposed to be almost equally common. Formerly not collected in Southeast Greenland, but there are lots of plants in the Norwegian collections from Eirik Raude's Land (Lynge—Scholander 1932, p. 32 and 33). It has also been collected in the Scoresby Sound district by Hartz (Lynge 1928, p. 9).

### 8. *Peltigera scabrosa* Th. Fr.

*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset, c. fr.
*Kangerdlugsuatsiak*: Mortensberg, Møretun and Narsak, c. fr.

There were many plants, it being evidently quite common, at least in the southernmost fjords. It has formerly been collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 13), and in Scoresby Sound by Hartz (Lynge 1928, p. 11). But it was not found by the Norwegian expeditions to Eirik Raude's Land in 1929 and 1930.

### 9. *Peltigera malacea* (Ach.) Funck.

*Kangerdlugsuak*: Skardet, Storfjord Radio and Amdrupneset.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun and Narsak.

It must be fairly common, for there are many plants, they are of the usual arctic type with "complicata" thalli. Apothecia are not lacking, but they are very rare.

*Peltigera malacea* has formerly been collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 13) and at D'Aunay Bay just south of Scoresby Sound by Böcher (Lynge 1933, p. 11), in Scoresby Sound by Hartz (Lynge 1928, p. 10) and in Eirik Raude's Land at several localities by the Norwegian expeditions 1929—30 (Lynge—Scholander 1928, p. 32).

### 10. *Peltigera polydactyla* (Neck.) Hoffm.

*Kangerdlugsuak*: Storfjord Radio.
*Tingmiarmiut*: Brattneset.

It cannot be common. The plants are of the usual arctic "complicata"-type. The only find from Southeast Greenland was Eberlin's at Kangerdluarak, just north of 60° 30′ (Lynge 1928, p. 11). It is very rare farther north; the Norwegian expeditions of 1929—30 only detected it once, at Husbukta in the Vega Sound (Lynge—Scholander 1932, p. 32). Underside with nerves.

## *Solorina* Ach.

### 1. *Solorina crocea* (L.) Ach.

*Kangerdlugsuak*: Skardet, Spekkpynten, and several places near Storfjord Radio, e. g., Brandalsfjell at 1000 m above sea-level.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Møretun, Møretind at 1200 m above sea-level, and at Narsak.

*Solorina crocea* is very common in Southeast Greenland. There were large numbers of plants in the present collection, the greater part of them of the "complicata" type. — Found in abundance also by other collectors, by Bjørlykke and Tornøe in Kangerdlugsuak, Umivik, Akorninarmiut, and Tingmiarmiut (Lynge 1932, p. 14), at Angmagsalik and two places just south of Scoresby Sound by Böcher (Lynge 1933, p. 12). Many finds have been enumerated from the east coast in my paper on the Peltigeraceae in the Copenh. arctic herb. 1928, p. 3. North of Scoresby Sound it is evidently rare (Lynge—Scholander 1932, p. 27).

### 2. *Solorina bispora* Nyl.

*Akorninarmiut*: Dronning Maria's dal.

It is the first find in Southeast Greenland, where it is supposed to be rare. But there are many finds from Scoresby Sound and farther north, it is there, perhaps, the commonest of all *Solorinae* (Lynge 1928, p. 2, Lynge-Scholander 1932, p. 24).

3. *Solorina spongiosa* (Sm.) Anzi.

*Kangerdlugsuak*: Storfjord Radio.
*Akorninarmiut*: Dronning Maria's dal.

Evidently a rare plant in Southeast Greenland, this being the first record south of Scoresby Sound. There are a few localities farther north, up to Cape Herschel (Lynge 1928, p. 4 and Lynge—Scholander 1932, p. 27).

Scholander detected only these 3 species of *Solorina* in Southeast Greenland. Farther north *Solorina octospora* has been collected at many localities in Scoresby Sound and in Eirik Raude's Land (see Lynge 1928, p. 3 and Lynge—Scholander 1932, p. 26). — *Solorina saccata* (L.) Ach. has been collected at several localities in Eirik Raude's Land by the Norwegian expeditions in 1929 and 1930 (Lynge—Scholander 1932, p. 25). There are also a few records from Scoresby Sound, one of which stands for *Solorina octospora*.

## *Nephroma* Ach.

1. *Nephroma arcticum* (L.) Torss.

*Kangerdlugsuatsiak*: Mortensberg, Møretun, and Narsak.

It was found in abundance in this southern fjord. It is a southern plant on the east coast of Greenland, recorded from a few scattered localities as far north as Simiutat (63° 45′, leg. Hartz). The Norwegian expeditions in 1929 and 1930 did not find a single *Nephroma* in Eirik Raude's Land.

2. *Nephroma laevigatum* (Huds.) Ach.

*Akorninarmiut*: Dronning Maria's dal, c. fr.

It is an interesting addition to the lichen flora of East Greenland. There are 3 finds from West Greenland, in the Julianehaab district.

3. *Nephroma parile* Ach.

*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Kangerdlugsuatsiak*: Mortensberg and Møretun.

Like the former species, it is an addition to the lichen flora of East Greenland. Dr. Scholander collected many plants, all of them sterile. On the west coast there are some scattered finds as far north as the Ameralik Fjord, 64° 3′ (Lynge 1928, p. 6).

## *Lecideaceae.*

### *Lecidea* (Ach.) Zahlbr.

1. *Lecidea vernalis* (L.) Ach.

*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.

Formerly collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 11).

2. *Lecidea cuprea* Somrft.

*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

The thallus stains distinctly red with paraphenylendiamin, in *Lecidea vernalis* I was unable to obtain any staining. — *Lecidea cuprea* has been collected at Aluk immediately south of 60° N (Vahl 1829) and at Nuk (not located, Eberlin), according to the Copenh. herb.

3. *Lecidea rufofusca* (Anzi) Nyl.

*Kangerdlugsuatsiak*: Møretun.

The plant agrees well with Anzi Lich. Lang. No. 178. It is a rare species in the Arctic. I have formerly identified it in collections from Novaya Zemlya: Gribovii fjord (Lynge) and from Greenland: Disko Island (Th. Fr.) and Ameralik in the Godthaab district (Vahl). There are also two (unpublished) finds from Spitsbergen: a muscicolous plant from Isfjorden: Russekeila (Hagen) and an ossicolous plant from Bellsund: Calypso Bay (Lynge). — *Lecidea rufofusca* has not formerly been found in East Greenland.

4. *Lecidea alpestris* Somrft.

*Kangerdlugsuak*: Skardet, very scarce.

It has not previously been found in Southeast Greenland.

5. *Lecidea Berengeriana* (Mass.) Th. Fr.

*Kangerdlugsuatsiak*: Narsak.

It has not previously been found in East Greenland.

Sect. *Aspicilioideae* Lynge nov. sect.

Apothecia in thallo subimmersa vel — si elevata — margine tumidulo persistenti circumdata et eam ob causam aspicilioidea videntur. Paraphyses apicem versus constricte articulatae, plus minusve cohaerentes, sed KOH si addito facilius discretae. Sporae majusculae, late ellipsoideae.

Huc pertinent: *Lecidea aspicilioidea* Th. Fr., *L. superlata* Vain. et *L. elevata* Lynge, n. sp.

### 6. *Lecidea elevata* Lynge, n. sp.

*Kangerdlugsuatsiak*: Storfjord Radio, supra saxa granitoidea.

Thallus ut videtur late expansus, crassitudine mediocri vel crassiusculus, areolato-verrucosus, areolae parvae, 0,1—0,18 mm latae, rotundatae vel subrotundatae, albido-cinerascentes, superne rugulosae, epruinosae, sorediis isidiisque destitutae. Hypothallus ater hinc inde satis distinctus.

Apothecia numerosa — numerosissima, saepe congesta, sessilia, sed basi constricta et supra thallum distincte elevata, magnitudine mediocri, diam. 0,5—1,2 mm. Discus ater, epruinosus, concavus vel subplanus et margine concolori, crasso, elevato, nitido persistenter circumdatus, apothecia eam ob causam aspicilioidea videntur. Excipulum plus minusve obscure fuscescens, usque carbonaceum, plectenchymaticum. Hypothecium incoloratum, circ. 25 $\mu$ altum. Hymenium altum (90—100 $\mu$), superne olivaceo-fuligineum, praeterea incoloratum. Paraphyses coharentes, in KOH facilius discretae, indivisae vel superne ramosae, clavatae et constricte septatae. Asci pyriformes, octosporae, sed saepe steriles. Sporae distichae, late ellipsoideae, 15—18 $\times$ 10—12 $\mu$.

Pycnides frustra quaesitae.

Medulla J et KOH non colorata, hymenium J e fugaciter caeruleo mox vinosum, etiam cum hypothecio, KOH decolorantur. Epithecium $HNO_3$ leviter in caerulescentem vergens.

If this species is determined after the clavis in Vainio Lich. Fenn. IV, we are led to *Lecidea superlata* Vain. If determined after Th. Fries Lich. Scand., we find it closely related to *Lecidea aspicilioidea* Th. Fr. It differs from the former species in its larger and more elevated apothecia, and from the latter also in its more elevated apothecia, and further in its more coherent paraphyses and smaller spores.

In Lich. Fenn. IV, p. 210, Vainio wrote of his *Lecidea superlata:* "Facie externa fere similis est *Lecan. gibbosae* v. *subdepressae*". The present species is also very aspicilioid on account of its thick persistent margin. In some sections a few gonidia were actually found near the margin of the apothecia, in others not. Some apothecia had quite a "margo thallinus", at least on one side. We got the impression that this thalline party did not belong to the apothecia, but that it had been attached to them, and followed them upwards when the young apothecia penetrated the areolae and were raised above their surface during their development.

Th. Fries placed *Lecidea aspicilioidea* in his *Tenebrosa* section. This is, perhaps, not a happy constellation, *Lecidea aspicilioidea* differs very considerably from *L. tenebrosa* in its broad asci, and its paraphyses are not at all so easily discrete as in that species. It might be better to unite

these three species (*Lecidea aspicilioidea* Th. Fr., *L. superlata* Vain. and *L. elevata* Lynge) into a new section, distinguished by their aspicilioid apothecia, articulated paraphyses and rather large, broad spores.

### 7. *Lecidea cinereoatra* Ach.

*Kangerdlugsuatsiak*: Narsak.

Areolae dispersae, plus minusve rotundatae, diam. 1 mm haud superantes, distincte convexae, albido-cinerascentes, supra hypothallum atrum distinctum sitae.

Apothecia dispersa vel interdum approximata, arcte adpressa vel subinnata, rotundata, diam. 0,5—0,7 (—1,0) mm, discus depresse convexus, pruinosus, margine integro, crassiusculo, persistenti circumdatus. Excipulum carbonaceum, etiam cum hypothecio, hymenium circ. 90 $\mu$ altum, superne olivaceo-nigricans, paraphyses conglutinatae, apice haud incrassatae, sporae raro evolutae, parvulae, 12—14 $\mu$.

Medulla J—, KOH—, P. intense flavescens.

After its habitus, as well as the structure of its apothecia, it undoubtedly belongs to the *Macrocarpa* section. It spores were very scarce, but well developed when seen. Their small size must exclude *Lecidea steriza* (Ach.) Vain. and *L. albocaerulescens* (Wulf.) Schaer., it agrees better with *L. cinereoatra* and *L. crustulata,* as does also the height of its hymenium. In *Lecidea crustulata* the apothecia are much smaller and the thallus much thinner than in the present Greenland plant. The substratum is a very siliceous rock.

The intensely yellow reaction with Paraphenylendiamin is against the determination. In well identified plants of *Lecidea cinereoatra,* such as Malme Lich. Suec. No. 925, and Havås Lich. Norv. No. 137, I was unable to obtain any distinct reaction with P. This was also the case with *Lecidea crustulata* in Malme Lich. Suec. No. 249. It is possible that the present plant is an undescribed, "chemical" species, distinguished from *Lecidea cinereoatra* by the different reaction with paraphenylendiamin.

### 8. *Lecidea plana* Lahm.
### f. *perfectior* (Nyl.) Vain.

*Kangerdlugsuatsiak*: Narsak.

Thallus modice incrassatus, rimoso-areolatus, areolis depresse verrucosis, albido-cinerascens, hypothallus haud visus.

Apothecia numerosissima, saepe approximata, arcte adpressa, diam. 1—1,5 (—2) mm, epruinosa, opaca, in juventute plana et margine tenui cincta, deinde saepe umbonata, interdum radiatim rupta et eam ob causam spurie composita, in aetate margine minus distincto cincta. Hypothecium omnino incoloratum, hymenium superne fuligineum vel (in KOH) caerule-

scenti-fuligineum. Paraphyses in aqua concretae, in KOH vel in HCl facilius discretae, satis validae et superne plus minusve distincte clavatae et usque ad 3—5 $\mu$ crassae. Asci, si fertiles, inflati, sporis vulgo destituti. Sporae octonae, anguste ellipsoideae, 8—10 $\mu$ longae.

Medulla J—, KOH—, P—.

In Lich. Fenn. IV, 1934, p. 138, Vainio introduced the specific name *Lecidea enteromorpha,* based on *Lecidea atroalba* var. *enteromorpha* Flot. 1829. But as a specific name *plana* is older (*Lecidella plana* Lahm 1861).

*Lecidea plana* has not formerly been found in Greenland.

### 9. *Lecidea Dicksonii* Ach.

*Kangerdlugsuak*: Spekkpynten and Storfjord Radio.
Storøen, in abundance (Bøgvad).
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

This species which is almost inevitable in Arctic collections, has previously been collected in Turner Sound by Amdrup (Vainio 1905, p. 138), Cape Dalton and Kangerdlugsuak by Böcher (Lynge 1933, p. 8), and in Akorninarmiut by Bjørlykke (Lynge 1932, p. 11). Collected also by Eberlin at Kekertatsiak (60° 9′), Serketnoa (just south of 61° N) and Karra Akunguak (61° 42′), herb. Copenh.

### 10. *Lecidea lapicida* Ach.

*Kangerdlugsuak*: Spekkpynten.
*Akorninarmiut*: Dronning Maria's dal.

Collected by Eberlin at Inger Kajarfik, in Ikermiut (a little north of 62° N). Curiously enough there are no detailed literary records of this common species from Southeast Greenland.

### 11. *Lecidea pantherina* (Ach.) Th. Fr.

Storøen, f. *athallina* (Bøgvad).
*Akorninarmiut*: Finnsbu.

This species, which is otherwise so common in the Arctic, has not previously been collected in Southeast Greenland.

### 12. *Lecidea subsorediza* Lynge n. sp.

Storøen (Bøgvad).

Thallus crustaceus, uniformis, limitatus, sed ambitu non radiatus, albissimus, pruinosus, crassitudine mediocri, rimis profundis in areolis angulatis, 0,2—0,4 mm latis divisus, areolae, praecipue earum margines, sed etiam in lamina, sorediis rotundatis, diam. 0,15—0,18 mm, concoloribus, granulato-crateriformibus dense instructae. Prothallus haud visus.

Apothecia et pycnides desunt.

Medulla J caerulescens, KOH mox rubescens, crystalla fasciculata praecipituntur.

There were two plants, growing together with *Rhizocarpon geographicum, Rhiz. badioatrum, Lecanora cinereorufescens, Lecidea paupercula,* a. o. Habitually, the species agrees well with *Lecidea sorediza* Nyl., but it is distinguished from that species by its reaction with KOH, *Lecidea sorediza* is J—, KOH—, or yellowish. We have tested several good plants of the latter species, such as Arnold Lich. Monac. No. 242, Suza Lich. Bohemoslov. No. 130, and Swedish and German plants (leg. Magnusson and Hillmann), and in all of them we found the above reaction (sometimes the stratum gonidiale stained yellowish with KOH). Like so many other *Lecidiae, L. sorediza* often contains brownish maculae in its thallus. They are stained brownish-red by KOH, but red crystals are never precipitated in such plants.

The reaction is the same in *Lecidea pantherina* (Ach.) Th. Fr., and in *L. theiodes* Somrft. as in *L. subsorediza,* but neither of these species has soredia. The former species varies much in colour, the latter is yellowish-grey, with very irregular, plicated areolae. — Typical *Lecidea sorediza,* as well as *L. theiodes,* are found in Jan Mayen (unpublished).

### 13. *Lecidea paupercula* Th. Fr.

*Kangerdlugsuak*: Skardet and Storfjord Radio.
Storøen, in abundance (Bøgvad).
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.

It is evidently quite common in Southeast Greenland where it has not previously been collected.

### 14. *Lecidea atrobrunnea* (Ram.) Schaer.

*Kangerdlugsuak*: Storfjord Radio.
*Akorninarmiut*: Dronning Maria's dal.

It is a very ornithocoprophilous species which is perhaps not so common in Southeast Greenland as in other Arctic regions. The reason is evidently that birds are so scarce there. Formerly collected at Cape Dalton by Böcher (Lynge 1933, p. 8, s. n. *Lecidea fuscoatra,* its necrotized amorphous upper part of the thallus gave no reaction with J), and also in Umanak by Eberlin (herb. Copenh.).

### 15. *Lecidea arctogena* Th. Fr.

*Kangerdlugsuatsiak:* Møretoppen, 1000 m above sea-level.

It was very scarce. This species has not previously been collected in East Greenland.

### 16. *Lecidea*, cfr. *atromarginata* Magn.

*Kangerdlugsuak*: Spekkpynten.

The structure of the apothecia agrees, but the thallus is too thick for the species. The specimen might possibly be an abnormal *Lecidea atromarginata*.

### 17. *Lecidea leucophaea* (Flk.) Nyl.

Storøen (Bøgvad).

Thallus crassus, pure cinereus, areolatus, areolae subdiscretae. — Apothecia adpressa, plana, indistincte marginata, hypothecium incoloratum vel deinde (morbose?) fusco-rubescens. Paraphyses cohaerentes, epithecium olivaceo- vel fusco-fuligineum, sporae (parce visae) oblongae, (8—) 12—15 × 5,5 $\mu$. — Pycnoconidia arcuata, 25—30 $\mu$ longa.

Medulla J—, KOH—, hymenium J e caeruleo leviter vinosum.

Its thallus is thicker than in Scandinabian plants. Hultén collected just the same form in the Aleutic Islands (Degelius in littere). The thallus is not dark enough for us to venture to refer it to the more northern var. *griseoatra* (sensu Th. Fries). At Cape Dalton Böcher collected a *Lecidea* which was referred to that forma (Lynge 1933, p. 9, s. n. var. *obscurescens*).

### 18. *Lecidea lulensis* (Hellb.) Stiz.

*Kangerdlugsuak*: Storfjord Radio.
*Kangerdlugsuatsiak*: Møretoppen, 1200 m above sea-level.

It has not previously been recorded from East Greenland.

### 19. *Lecidea granulosa* (Ehrh.) Ach.

*Kangerdlugsuatsiak*: Møretun.

It is certainly a southern species. Eberlin found it at Kekertatsiak, just south of the above-mentioned locality. To our knowledge there are no other finds from Greenland.

### 20. *Lecidea demissa* (Rutstr.) Ach.

*Kangerdlugsuak*: Skardet, Storfjord Radio, and Brandalsfjell, 1000 m above sea-level.
*Kangerdlugsuatsiak*: Møretun and Møretind, 1200 m above sea-level.

Formerly collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 11). It was not altogether scarce in the present collection, and on the whole it is supposed to be fairly common in Southeast Greenland. In the Copenh. herb. there are also some plants from this region, viz. Aluk and Nanusek (Vahl) and Nuk (Eberlin). North of Scoresby Sound it is rare (Lynge's collection of 1929, unpublished).

### 21. *Lecidea rubiformis* Wbg.

*Kangerdlugsuak*: Storfjord Radio, in abundance.

Formerly collected in Turner Sound (with the parasite *Pharcidia lichenum* Arn.) by Amdrup (Vainio 1905, p. 137). Supposed to be a rather northerly plant, most plentiful in Scoresby Sound and farther northwards, but so far we have no finds south of Kangerdlugsuak.

### 22. *Lecidea decipiens* (Ehrh.) Ach.

*Kangerdlugsuak*: Storfjord Radio, pluribi.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.

All authors agree that this species is restricted to calcareous ground. It is perhaps common on such ground all over Greenland; it should however be remembered that calcareous rocks are not found everywhere in Greenland.

The *Microlichenes* have not been intensively collected in Southeast Greenland, by any means! It is therefore only to be expected that each collector would find some species which has escaped the attention of other collectors. The above-mentioned species, even with the addition of the species of other botanists, are not at all representative of the *Lecidea* flora of Southeast Greenland. It may be mentioned that there were about 70 species of *Lecidea* in Th. Fries' collection from more northerly regions in West Greenland.

The following Southeast Greenland *Lecideae,* not found in the present collections, are known to us:

1. *Lecidea assimilata* Nyl. f. *irrubata* Th. Fr.: Cape Dalton, leg. Amdrup (Vain. 1905, p. 138). *F. infuscata* Th. Fr.: Akorninarmiut, leg. Bjørlykke (Lynge 1932, p. 10). *"Lecidea assimilata":* Ikerasarsuak (Vahl) and Kangerdluluk (Hartz).

2. *Lecidea auriculata* Th. Fr.: Umanak, leg. Eberlin (herb.Copenh.).

3. *Lecidea caesioatra* Schaer. (syn. *L. arctica* Somrft.): Akorninarmiut and Umanak, leg. Bjørlykke (Lynge 1932, p. 10).

4. *Lecidea cfr. confluens* Fr.: Akorninarmiut, leg. Bjørlykke (Lynge 1932, p. 10, a poor plant which did not allow of an unobjectionable determination).

5. *Lecidea goniophila* Flk. **L. latypiza* Nyl.: Cape Dalton, leg. Amdrup (Vain. 1905, p. 137, cum diagn.).

6. *Lecidea hilarescens* Nyl.: Nanusek, leg. Vahl (herb. Copenh., a very miserable specimen, hardly to be determined).

7. *Lecidea limosa* Ach.: Cape Dalton, leg. Amdrup (Vainio 1905, p. 138), and Kekertatsiak, just north of 60° N, leg. Eberlin (herb. Copenh.).

8. *Lecidea pallida* Th. Fr.: Kangerdluarak, just north of 60° 30′ N, leg. Eberlin (herb. Copenh.).

9. *Lecidea pelobotrya* (Wbg.) Leight.: Ikerasarsuak, leg. Vahl (herb. Copenh.).

10. *Lecidea soredizodes* (Anzi) Vain. var. *ochracea* Lynge: Fjord north of Cape Ravn, leg. Böcher (Lynge 1933, p. 10).

11. *Lecidea subcongrua* Nyl.: Turner Sound, leg. Amdrup (Vainio 1905, p. 138).

12. *Lecidea* cfr. *vorticosa* (Flk.) Koerb.: Kangerdlugsuak, leg. Böcher (Lynge 1933, p. 10, a small and not well developed plant which did not allow of an unobjectionable determination).

13. *Lecidea Wulfenii* (Hepp) Arn. (syn. *Lecidea glomerulosa* (DC.) Steud. var. *muscorum* (Wulf.) Vain.): Kangerdlugsuak, leg. Tornøe (Lynge 1932, p. 11).

If these 13 species are added to the before enumerated 22, we find that at present 35 species of *Lecidea* are known from Southeast Greenland. If *Lecideae* were collected a few hours in any place along this long coast we should be sure to find additional species.

### *Bacidia* (DNot.) Zahlbr.

1. *Bacidia alpina* (Schaer.) Vain.

*Akorninarmiut*: Finnsbu, only one sterile plant.

### *Lopadium* Kbr.

1. *Lopadium coralloideum* (Nyl.)

*Akorninarmiut*: Finnsbu, very scarce.

Amdrup collected *Lopadium pezizoideum* var. *muscicola* in Turner Sound (Vainio 1905, p. 137).

### *Rhizocarpon* (Ram.) Th. Fr.

Vide Lynge: A Revision of the Genus Rhizocarpon in Greenland, Skrifter om Svalbard og Ishavet, No. 47, p. 1—30, Oslo 1932.

1. *Rhizocarpon geographicum* (L.) DC.

*Kangerdlugsuak*: Skardet and Storfjord Radio.
Storøen (Blegvad).
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretind, 1200 m above sea-level, and Narsak.

Ubiquitous in Southeast Greenland as in other arctic regions. — It has formerly been collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 14), and in Kangerdlugsuak and at Cape Dalton by Böcher (Lynge

1933, p. 12). — In Lynge Greenl. Rhiz., 1932, the other known East Greenland localities have been enumerated.

Galløe's *Rhiz. geographicum* in Lich. from the "Danmark Exp.", 1910, p. 191, is not that species, but *Rhiz. occidentale* Lynge.

### 2. *Rhizocarpon disporum* (Naeg.) Müll. Arg.

Storøen (Blegvad).

Curiously enough this otherwise almost ubiquitous species was lacking in Scholander's collection, but there is no reason to suppose that it should be rare in Southeast Greenland. — It has formerly been collected in Turner Sound and Cape Dalton by Amdrup (Vainio 1905, p. 137), and in Kangerdlugsuak by Böcher (Lynge 1933, p. 12).

### 3. *Rhizocarpon chionophilum* Th. Fr.

*Kangerdlugsuak*: Storfjord Radio, pluribi.
*Kangerdlugsuatsiak*: Møretoppen, 1200 m above sea-level.

Formerly collected in Umanak by Eberlin (Lynge Greenl. Rhiz., 1932, p. 18).

### 4. *Rhizocarpon crystalligenum* Lynge.

Lynge Greenl. Rhizoc., 1932, p. 19.

*Kangerdlugsuak*: North side of Brandal Glacier.

Thallus ochroleucus, sporae dyblastae, obscuratae, 14—16 $\mu$ longae. Epithecium aeruginosum, medulla J—, KOH rubescens.

It is an addition to the lichen flora of Southeast Greenland, and an interesting extension of its known range. So far it has been found only on the east coast of Greenland.

### 5. *Rhizocarpon occidentale* Lynge.

Lynge Greenl. Rhizoc., 1932, p. 20.

*Kangerdlugsuak*: Brandalfjell, 1000 m above sea-level.

This is also an addition to the lichen flora of Southeast Greenland. But the species has a wider known range than *Rhiz. crystalligenum:* West Greenland: Disko (leg. Lagerkrantz, Lynge in manuscr.). East Greenland: From Danmarks havn in the north (leg. Lundager, Galløe 1910, p. 191, s. n. *Rhiz. geographicum*), continuously distributed through Eirik Raude's Land down to Kangerdlugsuak, although at present unknown from Scoresby Sound. Svalbard: North coast of Nordostlandet (leg. Schol., Lynge Rhizoc. of Spitsbergen etc., 1936, p. 310). It is, like the former *Rhizocarpon,* a species of western arctic distribution.

### 6. *Rhizocarpon badioatrum* (Flk.) Th. Fr.

*Kangerdlugsuak*: Storfjord Radio.
Storøen (Blegvad).
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.

A southern species which is supposed to be quite common in Southeast Greenland. It has formerly been collected in Akorninarmiut by Bjørlykke. It was entirely lacking in the great Norwegian collections from Northeast Greenland in 1929 and 1930. In West Greenland it is found as far north as Disko Island, but so far we have only a few finds.

### 7. *Rhizocarpon rittokense* (Hellb.) Th. Fr.

*Kangerdlugsuak*: Storfjord Radio.
*Tingmiarmiut*: Brattneset.

Unfortunately the few plants were sterile. We were unable to obtain any blue staining of the medulla with J—, which would exclude *Lecidea paupercula*. But it is most undesirable to determine such crustaceous lichens without a microscopical examination of their apothecia, and we do not regard this determination as unobjectionable. It has formerly not been detected on the east coast of Greenland.

### 8. *Rhizocarpon jemtlandicum* Malme.

Lynge Greenl. Rhizoc., 1932, p. 24, ubi syn.

*Kangerdlugsuak*: Amdrupneset.

Sporae dyblastae, obscuratae, 23—25 $\mu$ longae (saepe male evolutae), hymenium roseum, sed KOH si addito deinde superne fuligineum, solutione flavescenti effundenti.

Its reaction with KOH prevents a confusion with *Rhiz. Copelandii,* and its spores are much too small for *Rhiz. badioatrum,* its habitus is also different from that species. — In his first diagnosis Malme wrote that *Rhiz. jemtlandicum* is KOH— (Jemtl. Rhizoc. 1914, p. 283). But if the reaction is studied under the microscope, as it always should be, a yellow colour is diffused from the thallus. This was seen in Magnusson Lich. sel. Scand. No. 45, as well as in Malme's type plant (Lich. Suec. No. 349). This yellow colour is, in reality, one of its best characters. I was much astonished to find violet as well as bluish epithecia in Malme's said plant; in Magnusson, l. c. they were distinctly violet, as also in the present Greenland plant. — The violet colour of the lower part of the hymenium was observed also in my Novaya Zemlya plants (Lynge Lich. Nov. Zemlya, 1928, p. 134). — The paraphyses are much branched; they are thinner in the Greenland plants than in Magnusson, l. c.

One species of *Rhizocarpon,* not found in the present collections, has been found in Southeast Greenland, viz. *Rhizocarpon Copelandii* (Kbr.) Th. Fr. in Umanak (Eberlin, Bjørlykke).

Seven other species of *Rhizocarpon* have been found in Northeast Greenland, viz. *Rhiz. grande* (Flk.) Arn., *Rhiz. distinctum* Th. Fr., *Rhiz. obscuratum* (Ach.) Mass., *Rhiz. superficiale* (Schaer.) Malme, *Rhiz. groenlandicum* Lynge, *Rhiz. polycarpum* (Hepp) Th. Fr. and *Rhiz. Hochstetteri* (Kbr.) Vain. — For references see Lynge: A Revision of the Genus Rhizocarpon in Greenland, 1932.

## *Cladoniaceae.*

### *Cladonia* (Hill) Vain.

This genus was perhaps the best part of Dr. Scholander's collection. It has repeatedly been stated that the *Cladoniae* are more influenced by the severe Arctic conditions of life than are most other lichens. Such plants with damaged podetia are often very difficult of determination.

The reaction with paraphenylendiamin has been in constant use and has rendered us excellent service. A survey of our results is found in Lynge's paper on the West Greenland lichens at present in print in Meddelelser om Grønland, Copenhagen. — Some plants, the determination of which was still doubtful, were submitted to our German friend, the eminent expert on the genus *Cladonia*, Dr. H. Sandstede, who promptly settled our difficulties. We are glad to express our profound gratitude to him for this much appreciated help.

#### 1. *Cladonia rangiferina* (L.) Web.

*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Møretun, and Narsak.

In the southern fjords it is found everywhere, but it becomes rarer northwards. It was not found in Kangerdlugsuak.

Formerly collected in Angmagsalik by Böcher (Lynge 1933, p. 7), so far its northern limit on the east coast, and by Bjørlykke and Tornøe in Kangerdlugsuatsiak at Nagtoralik, Mortensberg, and Kutekfjorden, and in Umanak at Vogtsbu.

#### 2. *Cladonia mitis* Sandst.

*Kangerdlugsuak*: Skardet, Spekkpynten, Storfjord Radio, and Amdrupneset.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Møretind (620 m above sea-level), and Narsak.

*Cladonia mitis* is widespread and plentiful all over the region; fine plants were collected in great abundance. Fertile at Narsak.

It has formerly been collected by Bjørlykke and Tornøe in 1931, and by Böcher in 1932 from so many East Greenland localities that it is unnecessary to enumerate them again (Lynge 1932, p. 8, and 1933, p. 6).

### 3. *Cladonia coccifera* (L.) Willd.
### var. *stemmatina* Ach.

*Kangerdlugsuak*: Skardet, Storfjord Radio, pluribi, Brandalsfjell (1000 m above sea-level), and Amdrupneset.
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak and Møretoppen (1200 m above sea-level).

Var. *stemmatina* is plentiful and abundant all over the region.

### var. *pleurota* (Flk.) Schaer.

*Kangerdlugsuak*: Skardet, Spekkpynten (diary), and Amdrupneset.
*Akorninarmiut*: Dronning Marias's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Møretun, and Narsak.

Supposed to be equally common as var. *stemmatina* in these southern fjords. This is distinctly a southern feature, for in the fjord-district north of the Scoresby Sound it was neither found by Lynge in 1929, nor by Scholander in 1930, although var. *stemmatina* was one of the commonest of all *Cladoniae* there (Lynge and Scholander 1932, p. 36).

South of Scoresby Sound either var. has been collected very often by all the expeditions which have worked there (Vainio 1905, p. 135—136, Lynge 1932, p. 7, and 1933, p. 6).

### 4. *Cladonia deformis* (L.) Hoffm.

*Kangerdlugsuak*: Skardet, Storfjord Radio, and Amdrupneset.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun and Narsak.

There was a large number of plants, many of them fine and well developed, but no fertile plant was detected. It is evidently quite common in these southern fjords, for it was collected in Akorninarmiut, Umanak, and Tingmiarmiut by Bjørlykke in 1931 (Lynge 1932, p. 7) and in Angmagsalik by Böcher 1932 (Lynge 1933, p. 6). This is its northern known limit on the east coast, for it was not detected in the fjord-districts north of Scoresby Sound, visited by Lynge in 1929 and by Scholander in 1930. In West Greenland it is found as far north as Disko Island, about 70° n. l.

### 5. *Cladonia bellidiflora* (Ach.) Schaer.

*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Torgilsbu (Aaseth 1936), Mortensberg, Fossheim (diary), Møretun, and Narsak.

Many plants, several of them fine and well fertile. It is, perhaps, a still more southern plant than is *Clad. deformis*. On the east coast it has been found at Ikerasarsuak: Kekertatsiak, just south of 60° (Eberlin), Iluilek: Serketnoua, just south of 61° (Eberlin), Kangerdlugsuatsiak (Tornøe), and Tingmiarmiut, Akorninarmiut, and Umivik (Bjørlykke) and farthest north in Angmagsalik (see Lynge 1932, p. 6, and 1933, p. 6).

### 6. *Cladonia amaurocraea* (Flk.) Schaer.

*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset, also a few fertile plants.

The f. *Tominii* Sandst. was found at Mortensberg in Kangerdlugsuatsiak.

*Clad. amaurocraea* is a rare species in East Greenland. We are only aware of one well identified plant from that coast, viz. Hartz's plant from "Karssissagdlik" (not located). It was not detected by Lynge (1929) and Scholander (1930) in Northeast Greenland.

### 7. *Cladonia uncialis* (L.) Web.

*Kangerdlugsuak*: Skardet and Dronning Maria's dal.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal (also f. *obtusata*).
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Møretun (also f. *obtusata*), and Narsak (also f. *obtusata*).

There were a great number of fine plants. They are not so arctic in their habitus as in more northerly regions, with their often short and stunted podetia. The present plants do not differ much from common Norwegian ones; they vary from long, slender plants to the coarse, inflated f. *obtusata*. At Narsak Scholander collected fertile plants.

It must be common in the southern fjords, it having been collected in Tingmiarmiut by Bjørlykke (Lynge 1932, p. 8) and in Angmagssalik and Kangerdlugsuak by Böcher (Lynge 1933, p. 7). According to Deichm. Branth 1894, p. 94, it is common in Scoresby Sound (leg. Hartz), farther north found only at a few localities by Lynge in 1929 and Scholander in 1930.

### 8. *Cladonia crispata* (Ach.) Flot.

F. *infundibulifera* (Schaer.) Vain.: Møretun in *Kangerdlugsuatsiak*.
F. *dilacerata* (Schaer.) Malbr.: Møretun and Narsak in *Kangerdlugsuatsiak* at the former locality also f. *divulsa*.

F. *virgata* (Ach.) Vain.: Dronning Maria's dal in *Akorninarmiut*, Brattneset in *Tingmiarmiut*, and Fossheim (diary), Møretun, and Narsak in *Kangerdlugsuatsiak*.

*Clad. crispata* is a southern species, supposed to be rather rare, even in the southern fjords. The present records are the first from East Greenland. In good agreement with its distribution in Northern Norway f. *virgata* is the commonest forma.

It is much influenced by the arctic conditions of life, as is also *Clad. Delessertii*. We are much indebted to Dr. Sandstede for his valuable help in the determination of these difficult plants.

### 9. *Cladonia Delessertii* (Nyl.) Vain.

*Kangerdlugsuak*: Skardet.
*Akorninarmiut*: Finnsbu (f. *trichotera*) and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun and Narsak.

*Cladonia Delessertii* cannot be rare in these southern fjords. After its distribution in Scandinavia this was, perhaps, not unexpected. But it is an addition to the lichen flora of Greenland.

### 10. *Cladonia squamosa* (Scop.) Hoffm.

*Kangerdlugsuatsiak*: Mortensberg.

A very rare species in this collection, as it generally is in collections from Arctic regions. — Formerly we only had one find from East Greenland, Scott Keltie Islands (Lynge—Scholander 1932, p. 36).

In the present plant the podetia are squamose though not intensely so; in the upper part they are almost ecorticated and brownish, in the lower part corticated and more greyish in colour. No distinct scyphi are developed. It is difficult to identify the plant with any of the many formae described, but it seems nearest related to f. *muricella*.

### 11. *Cladonia turgida* (Ehrh.) Hoffm.

*Kangerdlugsuatsiak*: Mortensberg.

It is an addition to the lichen flora of Greenland, and certainly a most unexpected one. It was also very scarce, and only found in this southern fjord.

The plant is not typical. The upper side of the phyllocladia has a greenish colour instead of the normal greyish-green or somewhat yellowish colour. It was determined by Sandstede.

In Norway it is "a lowland plant, frequent in the forests of South-Eastern Norway . . . in Western Norway it ascends to 800 m . . . less common northwards, only a few stations recorded north of Lofoten"

(Lynge Studies on the Lichen Flora of Norway 1921, p. 56). Magnusson also writes: "Not rare in the forest zone, less common northwards" (Skand. Busk- och Bladl. 1929, p. 56).

It is of much interest that Høeg collected a *Clad. turgida* at Virgo Harbour in Northwest Spitsbergen. This plant which is more typical was also determined by Sandstede. It is one of the many southern plants found on the north coast of Svalbard.

### 12. *Cladonia cariosa* (Ach.) Spreng.

*Kangerdlugsuak*: Brandalen.
*Akorninarmiut*: Dronning Maria's dal.

The former plant is of the usual Arctic development, with whitish phyllocladia and no podetia, the latter is a fine plant of the common Scandinavian type, with typical podetia.

*Clad. cariosa* is not supposed to be rare along the east coast, but it was scarce in the present collection. — Formerly collected by Tornøe in Kangerdlugsuak (Lynge 1932, p. 7), and in Turner Sound where Amdrup collected its var. *pruniformis* (Vain. 1905, p. 136). Farther north Lynge and Scholander collected many plants between Davy Sound and Cape Herschell (Lynge-Scholander 1932, p. 37).

### 13. *Cladonia alpicola* (Flot.) Vain.

*Kangerdlugsuak*: Skardet and Amdrupneset.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun.

It cannot be quite rare in the southern fjords, but it was not found by Lynge and Scholander in Northwest Greenland in 1929 and 1930. Collected in West Greenland at Godhavn by Smith (Lynge-Scholander 1932, p. 46) and at Sinigfik by Grøntved (unpublished), also in Disko Island. The present localities are therefore interesting additions to its known distribution in Greenland.

### 14. *Cladonia acuminata* (Ach.) Arn. var. *Norrlinii* (Vain.) Lynge.

*Akorninarmiut*: Finnsbu.

*Clad. acuminata* is a rare species in Greenland. It has been collected by Lynge and Scholander at several places in Northeast Greenland (Lynge—Scholander 1932, p. 38) and in Disko Island by Th. Fries (unpublished), that is all.

### 15. *Cladonia gracilis* (L.) Willd. var. *chordalis* (Flk.) Schaer.

*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Møretind, 1200 m, Møretun and Narsak.

Many finds, especially in the southernmost fjords, but not many plants; it is perhaps rather scarce. — It was not found by Lynge and Scholander in Northeast Greenland, but there are a few finds from the west coast, as far north as Disko Island.

### 16. *Cladonia elongata* (Jacq.) Hoffm.

*Kangerdlugsuak*: Skardet, Brandalen, and Amdrupneset (diary).
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary) Møretun, and Narsak.

There are great numbers of magnificent plants, it is ubiquitous and plentiful all over the region investigated. This is also proved by numerous finds by former botanists, such as Bjørlykke, Tornøe, and Böcher (Lynge 1932, p. 7, and 1933, p. 6). Most records of "*Clad. gracilis*" from Greenland stand for the present species.

At Skardet Scholander collected a *Cladonia* with very maculated, apiculated podetia. A distinctly yellow reaction with KOH excludes *Clad. degenerans*. It might be a forma of *Clad. lepidota* var. *stricta*, but Sandstede preferred the determination *Clad. elongata* on account of the apiculated podetia.

### 17. *Cladonia degenerans* (Flk.) Spreng.

F. *euphorea* (Ach.) Flk.: Finnsbu (in f. *phyllophoram* transiens) and Dronning Maria's dal in *Akorninarmiut*. — Brattneset in *Tingmiarmiut*. — Narsak in *Kangerdlugsuatsiak*.
F. *phyllophora* (Ehrh.) Flot.: Dronning Maria's dal in *Akorninarmiut*.
F. *gracilescens* Flk.: Finnsbu and Dronning Maria's dal in *Akorninarmiut*.

*Clad. degenerans* is supposed to be a rare species in Southeast Greenland, and to be lacking in Northeast Greenland, at least it was not detected there by Lynge and Scholander in 1929—1930. Bjørlykke collected it in Umanak and Tingmiarmiut in 1931 (Lynge 1932, p. 7). There are also a few finds from West Greenland, but the greater part of the records stands for other species.

### 18. *Cladonia lepidota* Nyl. var. *gracilescens* (Flk.) DR.

*Tingmiarmiut*: Dronning Maria's dal.
*Akorninarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun.

Rare and scarce, on the whole a much more southern plant than var. *stricta*.

var. *stricta* (Nyl.) DR.

*Kangerdlugsuak*: Skardet, Storfjord Radio, Brandalen, and Amdrupneset.
*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Møretun, and Narsak.

Very common and plentiful, as was to be expected. Almost the entire material is f. *pterophora*, the more northern *f. hypophylla* was collected at Brandal and at Skardet. Var. *stricta* has repeatedly been collected in Southeast Greenland, by Bjørlykke in Akorninarmiut (Lynge 1932, p. 8) and by Böcher at Angmagsalik and at Cape Ewart (Lynge 1933, p. 6). See also Lynge—Scholander 1932, p. 41.

19. *Cladonia macrophyllodes* Nyl.

*Kangerdlugsuak*: Amdrupneset.
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.

Some plants from Bratneset were submitted to Dr. Sandstede, who acknowledged the determination which is suspected to be unobjectionable, for the plants are very fine and typical. The other plants were referred to this species, and not to *Clad. subcervicornis,* on account of their coarse phyllocladia, with a purely white underside. In the latter species the underside is blackish at the base, and this colour spreads more or less towards the tips of the phyllocladia. The plants from Brattneset had well developed podetia.

A plant which Bjørlykke collected at Heimen in Akorninarmiut, 1931, most probably belongs to *Clad. macrophyllodes,* but the plant is not well enough developed to allow of an unobjectionable determination.

20. *Cladonia subcervicornis* (Vain.) DR.

Du Rietz Flechtensystematische Studien, Bot. Not., 1922, p. 218. — H. Magnusson, New or interesting Swedish Lichens, Bot. Not., 1929, p. 110, Skand. Busk- och Bladlavar, 1929, p. 60. — Anders Strauch- und Laubflechten Mitteleur., 1929, p. 89 and 104, tab. XVI, fig. 1. — Sandstede, Die Gattung Cladonia, Rabenh. Krypt. Flora, 1931, p. 24 and 396, tab. XXVIII, fig. 1—5.

*Cladonia macrophyllodes* Nyl., Lynge, Studies on the Lichen Flora of Norway, 1921, p. 73, map III, 3.

*Cladonia verticillata * Krempelhuberi* var. *subcervicornis* Vain., Lynge, Lich. Nov. Zemlya, 1928, p. 159, p. p. The material was determined by Sandstede. I have looked over it again and found that the greater part of it must be referred to the formerly overlooked species *Clad. macrophyllodes,* as already suggested by Magnusson, 1929, p. 115, viz., from the following localities: Matotchkin Shar: Belushii Bay, and Mashigin

Bay: Blomsterbugten, and Mt. Tveten. — But it seems to me that two other plants from Mashigin Bay: Fram Bay, and Mt. Tveten, really are *Clad. subcervicornis.* Their phyllocladia (KOH yellow) are too small and too darkly grey for *Clad. macrophyllodes. Clad. macrophyllodes* is an addition to the lichen flora of Novaya Zemlya.

*Kangerdlugsuak*: Skardet, Spekkpynten, Storfjord Radio and Amdrupneset.
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Møretind at an elevation of 1200 m above sea-level, Møretun, and Narsak.

Common and widespread, certainly more so than *Clad. cervicornis,* especially in the southernmost fjords a great number of fine plants were collected. Some of them are quite as fine as plants from the southern and western Norwegian fjords.

It has not formerly been recorded from Greenland. I cannot now say whether it is found in the Copenhagen Greenland herb. under the head of *Clad. verticallata.* Grøntved collected it in Disko Island, West Grenland (Lynge 1937, not yet printed).

*Clad. subcervicornis* has attracted the attention of Scandinavian lichenologists for a long time, but it has been confused with *Clad. macrophyllodes,* until Du Rietz cleared up the question in his paper of 1922, l. c. A critical synonymy is found there, p. 218. Du Rietz calls attention to the plumbeous-grey colour of the primary squamules where no trace of a pale brownish tinge is seen, such as in *Clad. cervicornis.* The margin of the podetia is much incised. The dark colour near the base of the underside of the phyllocladia and their rugosa upperside, due to minute reticulated cracks of the upper cortex, are excellent characters; the latter character is, however, more distinct in Scandinavian plants than in the Arctic ones. *Clad. subcervicornis* is very fragile.

The very distinct, yellow reaction of th phyllocladia (underside) readily distinguishes it from *Clad. cervicornis.* -- It is often more difficult of distinction from the genuine *Clad. macrophyllodes,* which is also KOH yellow, and possibly a few of the present plants should be referred to the latter species, which see.

Magnusson studied its variability and distinguished several formae (1929, p. 110—115, Lich. Scand. Nos. 32—35). At Møretun Scholander collected fine plants of f. *contraria* Magn. with very elongated phyllocladia. Here he also found plants with well developed podetia and small phyllocladia, f. *subregularis* Magn. The greater part of the material should be referred to f. *sterilis* Magn., caespitose plants with large phyllocladia, without podetia.

### 21. *Cladonia cervicornis* (Ach.) Fw.

*Kangerdlugsuak*: Spekkpynten, Storfjord Radio, and Brandalen.
*Kangerdlugsuatsiak*: Møretun and Narsak.

The phyllocladia vary much in size. In some plants they are quite small, not larger than in *Clad. pyxidata*. The finest plants were collected at Møretun, podetia and phyllocladia equally well developed. — Several of the determinations were acknowledged by Sandstede.

*Clad. cervicornis* is supposed to be distributed throughout the region, and to be fairly common.

### 22. *Cladonia pyxidata* (L.) Fr.
### var. *neglecta* (Flk.) Mass.

*Kangerdlugsuak*: Skardet, Storfjord Radio, Brandalsfjell, 1000 m above sea-level, and Brandalen.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Kangerdlugsuatsiak*: Narsak.

In places it is supposed to be common. Its phyllocladia are very coarse, as they usually are in Arctic plants; occasionally the podetia are poorly developed, and the phyllocladia large, suggestive of *Clad. subcervicornis*. Also this variation is quite common in Arctic *Cladoniae*.

### var. *pocillum* (Ach.) Flot.

*Kangerdlugsuak*: Storfjord Radio.

I was much astonished to find var. *pocillum* so rare in this collection. Is the soil unfavourable to its requirements, or is it a more northern type?

### var. *chlorophaea* (Flk.) Spreng.

*Kangerdlugsuak*: Skardet and Storfjord Radio.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Møretun, and Narsak.

It was well represented in the collection, suggesting a common plant. A few very sorediated plants should be distinguished from *Clad. fimbriata* var. *simplex* with some care; the latter species was lacking in the collection. — *Clad. fimbriata* var. *minor* was collected in Turner Sound by Amdrup (Vain. 1905, p. 136). The Norwegian expeditions detected a few plants farther north (Lynge—Scholander, 1932, p. 42), and it has been recorded from Scoresby Sound (Deichm. Branth 1894, p. 94).

After some chewing var. *chlorophaea* is very bitter. Its red colour with paraphenylendiamin gives a good distinction from *Clad. coccifera* var. *pleurota*, which it may occasionally resemble, at least in arctic plants.

*Clad. pyxidata* has been collected in Akorninarmiut and Tingmiarmiut by Bjørlykke (Lynge 1932, p. 8) and in Kangerdlugsuak by Böcher (Lynge, 1933, p. 7). These plants were referred to var. *pachyphyllina*. Var. *chlorophaea* was collected in Akorninarmiut by Böcher (Lynge, 1932, p. 8), and in Fleming Inlet by Amdrup (Vain. 1905, p. 136). It is also fairly common north of Scoresby Sound, as is also var. *neglecta* (Lynge—Scholander 1932, p. 42).

### 23. *Cladonia carneola* Fr.

*Akorninarmiut*: Dronning Maria's dal.
*Kangerdlugsuatsiak*: Møretun.

Supposed to be rare, as was to be expected. In Norway it is a forest lichen which ascendes a little higher than the tree line (Lynge, Studies on the Lich. Flora of Norway, 1921, p. 76—77). This is the case also in Sweden (Magnusson, Skand. Busk- och Bladlavar, 1929, p. 63—64). *Clad. carneola* is found in Svalbard, but like so many otherwise southern species only along the north coast: between Amsterdamøya and Brennevinsbukta (unpublished).

The Greenland plants are sterile, but the habitus agrees well, and there are a few pale pycnides. Sandstede agreed to the determination.

## *Stereocaulon* Schreb.

### 1. *Stereocaulon fastigiatum* Anzi.

*Kangerdlugsuak*: Brandalsfjell, 1000 m above sea-level.
*Kangerdlugsuatsiak*: Mortensberg.

#### var. *dissolutum* Magn.

*Kanderdlugsuak*: Spekkpynten, Storfjord Radio, Brandalsfjell 1000 m above sea-level, and Amdrupneset.
*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun.

The former two plants agree well with Malme Lich. Suec. 979, A, var. *dissolutum* with Malme Lich. Suec. No. 979, B. It is a question whether the two should not be regarded as distinct species.

In Southeast Greenland *Ster. fastigiatum* is supposed to be quite common, as is the case in so many arctic and subarctic regions. It has not formerly been collected in Southeast Greenland. It is often well fertile, but in the present material only the first-mentioned plant had a few apothecia.

### 2. *Stereocaulon paschale* (L.) Hoffm.

*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun and Narsak.

Scholander only collected it in the southernmost fjords, it is here supposed to be fairly common, and always in abundance when found.

*Ster. paschale* is easily distinguished from *Ster. alpinum* by its slightly stalked, coralloid phyllocladia, as explained by Magnusson. In the present material there were no apothecia, but cephalodia are very common.

It is a more southern species than the other *Stereocaulons*. It has been found by Bjørlykke and Tornøe in Kangerdlugsuatsiak and Akorninarmiut (Lynge 1932, p. 15), and by Böcher in Angmagsalik (Lynge 1933, p. 13). The last-mentioned find is its northern limit in East Greenland. (Galløe's records from the Danmark expedition stand for other species.)

### 3. *Stereocalon alpinum* Laur.

*Kangerdlugsuatsiak*: Skardet, Spekkpynten, Storfjord Radio, Brandalsfjell, 1000 m above sea-level, with fine apothecia, Brandalen, and Amdrupneset.
*Akorninarmiut*: Dronning Maria's dal and Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun, Møretind 1200 m above sea-level, and Narsak.

By far the commonest *Stereocaulon* in the collection, especially in the northern fjords.

The rather small (1—1,5 mm), immarginate apothecia which are very common in this collection, the flattened and larger, more granuliform phyllocladia, and the less fragile podetia, distinguish this species from *Ster. rivulorum*. But if the plants are sterile and poorly developed, as they often are in the Arctic, the distinction may be very difficult.

Almost the whole material must be referred to f. *erectum* Frey. I was glad to find var. *Janii* Lynge, (Jan Mayen, yet unpublished) in one plant from Tingmiarmiut and one from Møretind, 1200 m above sea-level. It is distinguished from the ordinary *Ster. alpinum* by its phyllocladia which are flattened, with a greenish centre and a whitish margin, much as in *Ster. denudatum,* at least in young phyllocladia. But the podetia are tomentose, often intensely so, and the cephalodia contain a *Nostoc*, not a *Stigonema*.

This almost ubiquitous species has been collected by former botanists in many places (Lynge 1932, p. 14, 1933, p. 12, and — farther north — Vainio 1905, p. 128).

### 4. *Stereocaulon rivulorum* Magn.

*Kangerdlugsuak*: Brandalsfjell 1000 m above sea-level.
*Akorninarmiut*: Finnsbu.

It is not at all common in the present material. Formerly recorded from Kangerdlugsuak, Akorninarmiut and Umanak, collected by Bjør-

lykke and Tornøe (Lynge 1932, p. 15). Its finds suggest rather a northern species, it was common enough in the Norwegian collections north of Scoresby Sound (Lynge—Scholander 1932, p. 49).

### 5. *Stereocaulon denudatum* Flk.

*Kangerdlugsuak*: Skardet (a great material and several formae), Spekkpynten, Storfjord Radio (several localities), Brandalsfjell, 1000 m above sea-level.
*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Møretind 1200 m above sea-level, Møretun, and Narsak.

Many localities and many plants prove it to be a very common species. — At Brandal, Scholander collected a plant of an almost fasciated habitus; the phyllocladia are enlarged, covering the podetia in an unusual manner.

This species has been collected in many localities in Southeast Greenland by Bjørlykke and Tornøe (Lynge 1932, p. 14), and by Böcher (Lynge 1933, p. 13). But it is perhaps a rather southerly species in East Greenland, for it was only collected once by the Norwegian expeditions to Northeast Greenland in 1929—30, at Cape Simpson, the southernmost place visited by us.

Vainio has recorded *Stereocaulon evolutum* at Cape Dalton. It is a southerly species, even in Norway. A revision might be desirable.

## *Umbilicariaceae.*

This family has been subdivided in agreement with Scholander's paper on the Apothecia in the Lichen Family Umbilicariaceae, Nyt Magazin for Naturvidenskaberne, vol. LXXV, p. 1—32, tab. I—V, Oslo 1934. — To judge from Frey's paper on the *Umbilicariaceae* in Rabenhorst Kryptogamenflora, 1933, this family name is to be preferred to the name *Gyrophoraceae*.

### *Umbilicaria* (Hoffm.) emend. Schol.

Scholander On the Lichen Family Umbilicariaceae, 1934, p. 19.

*Gyrophora rigida* Du Rietz Die europ. Arten d. Gyrophora "Anthracina"-Gruppe, Arkiv f. Bot. Vol. XIX, No. 12, 1925, p. 3, Gyrophora rigida DR. in North America, Svensk Bot. Tidskr., vol. XXII, p. 278—281, Lynge—Scholander 1932, p. 66.

1. *Umbilicaria rigida* (Du Rietz) Frey.

*Kangerdlugsuatsiak*: Fossheim (diary), Persvatnet (diary), Møretun, and Møretind, 1200 m above sea-level.

In the greatest abundance from the last mentioned two localities, but not found elsewhere. — It has previously been found in Umanak by Bjørlykke (Lynge 1932, p. 10). There are no other finds from East Greenland, to our knowledge, but there are many finds from West Greenland.

*Umbilicaria rigida* has never been found in Svalbard, nor in Novaya Zemlya. As stated by Du Rietz, l. c., it is a western species in the flora of Scandinavia, where it is common in the Southern highlands above the tree line (cfr. Lynge, Stud. Lich. Flora of Norway, 1921, p. 87, and Magnusson, Skand. Busk- och Bladlavar 1929,p.72).

2. *Umbilicaria Lyngei* Schol.

Scholander, 1934, p. 19, ubi syn. et tab. I, fig. 1, IV, fig. 1.

*Kangerdlugsuak*: Skardet, Storfjord Radio, and Brandalsfjell, 1000 m above sea-level.

At Brandal, Scholander collected a large number of plants, also some fertile ones. In East Greenland it is distinctly a northern species, not found south of Kangerdlugsuak. The present finds are an addition to the flora of Southeast Greenland.

*Omphalodiscus* Schol.

Scholander, 1934, p. 23.

1. *Omphalodiscus decussatus* (Vill.) Schol.

*Kangerdlugsuatsiak*: Brandalsfjell, 1000 m above sea-level, and Brandalen (diary).

In Southeast Greenland this coprophilous species is decidedly northern. Scholander only detected one plant, at a considerable elevation. It has not previously been found in Southeast Greenland, but it is common in Northeast Greenland from Scoresby Sound and northwards, further in West and North Greenland, in Svalbard, Franz Josef Land and in Novaya Zemlya.

2. *Omphalodiscus polaris* Schol.

Lynge—Scholander 1932, p. 57, tab. IV, figs. 1—4. — An syn. *Omphalodiscus Krascheninnikovii* (Sav.) Schol.?

*Kangerdlugsuak*: Brandalen, sparingly fertile.

Like *Omphalodiscus decussatus* a northern species which was detected only once, the first find in Southeast Greenland. The plant was fertile, which ensures the determination.

In his paper of 1934, p. 24, Scholander suggests that is has been repeatedly described, and that *Krascheninnikovii* is the first and valid species name. He is possibly right, but a better material of the latter species might be desirable to settle the question definitely.

### 3. *Omphalodiscus virginis* (Schaer.) Schol.

Scholander, 1934, p. 25, tab. I, fig. 6.

*Kangerdlugsuak*: Skardet, Brandalsfjell, 1000 m above sea-level, Brandalen, and Storfjord Radio.

Like the other members of this genus, a northern species. The present finds move its southern known limit from Turner Land (leg. Amdrup—Vain., 1905, p. 125) to Kangerdlugsuak. There are no other finds from Southeast Greenland, but in Northeast Greenland it is very common (Lynge—Scholander, 1932, p. 51).

## *Gyrophora* (Ach.) emend. Schol.

Scholander, 1934, p. 26.

### 1. *Gyrophora torrefacta* (Lightf.) Cromb.

This species is much better known by the name *Gyrophora erosa* (Web.) Ach. In a paper by Lynge, which will be printed in 1937 in Medd. om Grønl. (Lich. Groen. occid. a Th. M. Fries collecti), he has tried to prove that the above combination is the valid one. He has arrived at the result that there is no specific distinction between a *Gyrophora erosa* and a *G. torrefacta*.

*Kangerdlugsuak*: Skardet, Spekkpynten, Storfjord Radio pluribi, Brandalsfjell, 1000 m above sea-level, and Amdrupneset.
Storøen (Bøgvad).
*Akorninarmiut*: Finnsbu and Dronning Maria's dal (diary).
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Persvatnet (diary), Møretind, 1200 m above sea-level, Møretun, and Narsak.

*Gyrophora torrefacta* is one of the commonest and most widespread lichens in Southeast Greenland. It is also one of the most variable: from small, thin plants up to very large and coarse ones, the largest plant being 7 cm in diam., quite an analogon to *Gyrophora cylindrica* var. *Delisei*. — The chemical reaction is $CaCl_2O_2$ — in the preponderating number of the plants, a positive reaction was found in plants from Brandalsfjell, Skardet, Brattneset, Møretun and Narsak.

In one respect the material is fairly uniform: there is hardly one plant which is quite smooth on the underside. Generally the plants are (up to coarsely) trabeculate, in some plants we find small squamules instead of coherent trabeculae. There is no connexion between the

chemical reaction and the thalline development. — We should like to know the reason of the different chemical substances, but that can only be cleared up by the chemists.

This common species could not escape the attention of former collectors. It has been found by Bjørlykke and Tornøe in Kangerdlugsuak, Akorninarmiut and Umanak ($CaCl_2O_2$ — and +, Lynge 1932, p. 9 and 10), and in Kangerdlugsuak by Böcher (Lynge 1933, p. 7).

### 2. *Gyrophora hyperborea* Ach.

*Kangerdlugsuak*: Skardet, Spekkpynten, Storfjord Radio, pluribi, and Brandalsfjell, 1000 m above sea-level.
Storøen (Bøgvad).
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Møretun, Møretind, 1200 m above sea-level, and Narsak.

Very common and plentiful. — Formerly found by Bjørlykke and Tornøe in Kangerdlugsuak, Akorninarmiut and Umanak (Lynge 1932, p. 9). It is common also in Northeast Greenland, but perhaps not so plentiful (Lynge—Scholander 1932, p. 61).

### 3. *Gyrophora arctica* Ach.

*Kangerdlugsuak*: Skardet and Storfjord Radio, pluribi.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Persvatnet (diary), Møretun, and Narsak.

There were many plants in the collection. It has an excessive need of Nitrogen, and such plants cannot be ubiquitous in a region like the present one, where birds are so scarce. — Previously collected by Bjørlykke in Akorninarmiut and Umanak (Lynge 1932, p. 9).

*Gyrophora arctica* has much the same distribution in Northeast Greenland.

### 4. *Gyrophora proboscidea* (L.) Ach.

*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Persvatnet, Møretun, and Møretind, 1200 m above sea-level.

There were remarkably few plants in the collection. During his field work Scholander also found it to be rare. It has formerly not been found in Southeast Greenland, but there are some finds from Northeast Greenland. It is, on the whole, not supposed to be common on the coast of East Greenland.

### 5. *Gyrophora fuliginosa* Havås.

Havås, Lich. Norv. Exsic. 1904, No. 237, Beiträge zur Kenntnis der west-norwegischen Flechtenflora, I, Bergens Museums Årbog, 1909, No. 1, Bergen. — Lynge, Studies on the Lichen Flora of Norway 1921, p. 96, map XI, 3, Lynge—Scholander, Lichens from North East Greenland 1932, p. 64. — Kryptog. Exsic. Vindob. 1922, No. 2564. — Du Rietz, Die Europäischen Arten der Gyrophora "anthracina"-Gruppe, Arkiv för Botanik, XIX, No. 12, p. 12, 1925. — Häyrén, Gyrophora fuliginosa Havås aus Finnland, Mem. Soc. p. Fauna et Flora Fennica, VI, 1929—30, p. 180. — Magnusson, Skand. Busk- och Bladlavar 1929, p. 74. — Scholander, On the Lichen Family Umbilicariaceae, Nyt Magazin for Naturv., LXXV, p. 27, Oslo 1934. — Hasselrot, Några svenska fynd av Gyrophora fuliginosa Havås, Svensk Bot. Tidskr., XXIX, p. 306—318, tab. I—II, Stockholm 1935 (ubi syn.).

*Kangerdlugsuatsiak*: Persvatnet and Møretun (c. fr.).

Apothecia sparsa, dispersa, diam. circ. 1 mm, subelevata, basi constricta, alte convexa, valde composita, gyrosa, aterrima. Paraphyses fusco- vel nigrocapitatae, 5—6 $\mu$ crassae, sporae (saepe late) ellipsoideae, 12—15 $\times$ 6—7 $\mu$.

Only found twice, but the plants were not few in number. At Møretun, Scholander collected well fertile plants; also at the other locality a few apothecia were detected. These apothecia prove the species to be an *Eugyrophora*. — All the plants tested were $CaCl_2O_2$ red.

This is a most interesting find, one of the best in the whole collection. It is an addition to the lichen flora of East Greenland, but according to Du Rietz, 1925, p. 12, there are plants in the Uppsala herb. from Umanak (leg. Wenck), Labrador (Hebron, Mission Herrnhut) and from Hudson Bay: Cyges Island (leg. Macoun).

There is every reason to suppose that Umanak is a place on the Labrador coast where the German Herrnhutians had missionary stations, and not in Greenland. Anyhow the three above-mentioned localities are western arctic, and the present two finds fall excellently in line with them, proving *Gyrophora fuliginosa* to be what we call a western arctic species, as was already suggested by Du Rietz, 1925, p. 12. It is not found in our immense Svalbard collections (determined, but yet unpublished), and there is no find from Novaya Zemlya.

The last review of its distribution was given by Hasselrot, l. c. His map, p. 309, is very carefully done, but it clearly shows us the great shortcomings of such maps. A point stands for one locality, no matter whether the species in question is extremely scarce and rare there, or whether it is found in abundance within its present natural range of distribution.

Hasselrot has 21 points from the central Norwegian mountains (Langfjellene—Dovre) where 210 points would have been insufficient to show its real frequency: On the high mountains down to the tree line, and especially along the western side of the mountain chain.

Apart from this region it has been detected in Lycksele Lappmark by Magnusson, in Petsamo by Häyrén, and at 5 localities in Middle Sweden by Hasselrot and others. Hasselrot suggests these remarkable finds to be glacial survivors which "after the end of the Glacial Epoch had been able to extend the range of the species, not only along the mountain chain, but also far beyond it" (l. c. p. 311, Swedish), a view which is entirely in harmony with that of the present authors.

### 6. *Gyrophora polyphylla* (L.) Kbr.

*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Persvatnet, Møretun, and Narsak.

It is not altogether scarce in these southern fjords. It is an interesting addition to the lichen flora of East Greenland. Deichmann Branth records in from one locality in West Greenland, Kobbefjord, which we are unable to locate.

### 7. *Gyrophora deusta* (L.) Ach.

*Kangerdlugsuak*: Skardet and Amdrupneset.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Persvatnet (diary), Møretun, and Narsak.

The two plants from Kangerdlugsuak were not quite typical, they had a greyish, thin thallus. They were found together with *Dermatocarpon rivulorum,* and had evidently been damaged by irrigation with cold water.

It is one of the rarest species of its genus in Greenland (Lynge—Scholander, 1932, p. 63). — It is one of the southern species in the collection, an addition to the lichen flora of Southeast Greenland, but found once in Northeast Greenland, in Röhssfjorden (Scholander—Lynge, l. c.).

### 8. *Gyrophora cylindrica* (L.) Ach. var. *Delisei* (Nyl.) Syd.

*Kangerdlugsuak*: Skardet, Spekkpynten, Storfjord Radio, Brandalsfjell 1000 m above sea-level, and Amdrupneset.
Storøen (Bøgvad).
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Persvatnet, Møretind, 1200 m above sea-level, and Møretun.

There were many plants and many finds, it is perhaps the commonest *Gyrophora.* In addition to the above-mentioned finds there were

a lot of plants which could not directly be referred to var. *Delisei,* coarse plants, representing transitional stages to var. *fimbriata.* (The small, thin plants which are so common in Scandinavia were almost absent from the collection). Such plants were found at the following localities:

*Kangerdlugsuak*: Storfjord Radio and Brandalsfjell, up to 1000 m above sea-level.

It is hardly necessary to mention that *Gyrophora cylindrica* has been found by all the botanists who have worked in Southeast Greenland and collected lichens there, viz. Amdrup, Bjørlykke, Böcher, Eberlin, Hartz, Knutsen and Tornøe (Vainio 1905, p. 125, Lynge 1932, p. 9 and 1933, p. 7, and Herb. Copenh.).

It is perhaps less common in Northeast Greenland, but yet found at many localities (Lynge—Scholander 1932, p. 64). — Lundager's *Gyrophora cylindrica* from Danmark's Havn is *Omphalodiscus virginis* (Galløe 1910, p. 190).

### 9. *Gyrophora vellea* (L.) Ach.

*Kangerdlugsuak*: Skardet, Storfjord Radio, Brandalen, and Amdrupneset.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Persvatnet and Møretun.

There were quite a number of plants, suggesting a common and widespread species in the region. — Farther north it is rarer. There are many finds from Scoresby Sound, leg. Hartz, in the Copenh. herb. North of Scoresby Sound it has been found only once, in Röhssfjorden, by Scholander (Lynge—Scholander, 1932, p. 63).

## *Acarosporaceae.*

### *Sporastatia* Mass.

Magnusson Acarosporaceae, in Rabenhorst Kryptog.-Flora, 1935, p. 2.

### 1. *Sporastatia cinerea* (Schaer.) Koerb.

Magnusson, l. c. p. 4, ubi syn.

Storøen (Bøgvad).

Apothecia immersa, areolas aequantia, hypothallus satis crassus, KOH caerulescens Areolae non radiantes, subrimosae.

2. *Sporastatia tenuirimata* (Th. Fr.) Lynge comb. nov.

*Sporastatia Morio* (Ram.) **Sp. tenuirimata* Th. Fr. n. subsp., Lich. Spitsb., 1867, p. 42.

*Kangerdlugsuak*: Storfjord Radio.

Thallus late expansus, plus minusve orbicularis, ambitu bene radiatus, areolatus, areolae depresse verrucosae, subrotundatae, diam. 0,2—0,4 mm, subdiscretae, et ob rimas profundas, saepe obscuratas, rugosae. Areolae albido-cinerascentes, subnitidae, hypothallus tenuis, ater inter areolis distincte visus.

Thallus mollis strato necrali incolorato, rupto obductus. Cortex superior in parte exteriori plus minusve obscuratus. Gonidia glomerata, glomeruli dispersi, interdum fere usque ad superficiem progredientes. Hyphae medullares valde adspersae, $HNO_3$ si addito 3—4 $\mu$ crassae, constricte septatae.

Apothecia numerosa, sed dispersa, parva, diam. 0,3—0,5 mm, supra areolas distincte elevata, composita, disco subgyrose plicatulo, aterrimo, epruinoso, margine mox excluso. Excipulum in parte exteriori satis obscure, irregulariter fuscescens, parte interiori dilutius coloratum usque ad subincoloratum et sine limite distincto in hypothecio subincolorato transiens. Apothecia partibus excipularibus obscuratis in plura hymenia divisa, hymenia superne obscure fuscescentia, 60—65 $\mu$ alta, asci saccato-globosi, 20—25 $\mu$ crassi (si sporis repleti), paraphyses haud concretae, 1,8—2 $\mu$ crassae, superne leviter solum incrassatae (2—2,5 $\mu$). Sporae numerosissimae, globosae, parvae, diam. 2,5—3 $\mu$.

Omnes partes apothecii KOH immutatae, nisi leviter dilutius coloratae, etiam $HNO_3$ immutatae. Thallus J—, cortex $CaCl_2O_2$ dilutissime rubescens. Hyphae hypothallinae KOH violascentes.

The radiating marginal parts are divided into areolae by transverse fissures. These areolae are less divided into microareolae and therefore more "laevigate" than the central areolae. If studied under the microscope the hyphae of the hypothallus are very dark violet to black; if KOH is added they stain more distinctly into violet. — I am indebted to Mus. Upsal. for the loan of Th. Fries's type plants; they agree perfectly with the present plant.

Its colour does not differ much from that of *Sporastatia cinerea,* but it is sufficiently distinct in its more prominent, convex apothecia (*S. cinerea:* "innata, areolas aequantia", Th. Fr. Lich. Scand., p. 404), its lower hymenium, darker epithecium, the radiating lobes at the margin of its thallus, and in its almost discrete and very rimose areolae which suggested its name to Th. Fries. — If studied under a lens of high power the areolae of *Spor. cinerea* are not quite free from such rimae, and in arctic plants they may be more distinct than otherwise.

*Sporastatia tenuirimata* is an addition to the lichen flora of Greenland.

3. *Sporastatia testudinea* (Ach.) Mass.

Syn. *Biatorella coracina* (Somrft.) Lynge, pluribi.

*Kangerdlugsuak*: Brandalen.

This species which is almost ubiquitous in the Arctic, has formerly been collected in D'Aunay Bay by Böcher (Lynge 1933, p. 5).

### *Acarospora* Mass.

1. *Acarospora oxytona* (Ach.) Mass.

*Kangerdlugsuak*: Spekkpynten (sterile), and Brandalsfjell, 1000 m above sea-level (fertile).

It may be difficult to distinguish between *Acarospora oxytona* and *A. chlorophana*. The fertile plants in the present collection have plane apothecia with a thick margin, suggesting *A. oxytona* rather than *A. chlorophana*, after Magnusson's description. It is more difficult to grasp the thalline differences.

Böcher collected an *Acarospora* of this section in D'Aunay Bay; it was referred to *A. chlorophana* (Lynge 1933, p. 5). Unfortunately there was no plant for our herb., and I cannot now check the determination.

Another species of *Acarospora* has been collected in Southeast Greenland by Amdrup, viz. *Acarospora glaucocarpa* at Cape Dalton (Vain. 1905, p. 139).

## *Pertusariaceae.*

### *Pertusaria* DC.

1. *Pertusaria dactylina* (Ach.) Nyl.

*Tingmiarmiut*: Brattneset.

Not formerly collected in Southeast Greenland.

2. *Pertusaria oculata* (Dicks.) Th. Fr.

*Kangerdlugsuak*: Skardet.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg.

Supposed to be the commonest of its genus, here as elsewhere in the Arctic. It has repeatedly been collected in Southeast Greenland, by Bjørlykke in Akorninarmiut and Tingmiarmiut (Lynge 1932, p. 13), and by Böcher in Angmagsalik and at Cape Ewart (Lynge 1933, p. 12).

## *Lecanoraceae.*

### *Lecanora* (Ach.) Th. Fr.

Scholander did not give much attention to Crustaceous lichens, which were only collected here and there, several species quite unintentionally. Very common species, such as *Lecanora epibryon* and *L. verrucosa,* were not collected at all, and the following enumeration of the *Lecanorae* is far from representative of the lichen flora of Southeast Greenland. Yet the collection contained some very interesting species which were found also by Th. M. Fries in West Greenland in 1871. His lichens have been worked up by Lynge. The manuscript was ready early in the autumn of 1936, but printing difficulties have delayed the publication. The present paper will most probably be printed at an early date. It has therefore been found desirable to publish some diagnoses in both papers.

1. *Lecanora frustulosa* (Dicks.) Ach.
var. *occidentalis* Lynge.

Lichenes Groenl. Occid. (manuscr.), pl. VI, fig. 2.

*Akorninarmiut*: Finnsbu and Dronning Maria's dal, on mossy rocks.

Thallus apotheciis creberrime tectus. Discus ater, etiam madefactus leviter solum in fuscescentum vergens. Hymenium superne olivaceo-fuligineum, paraphyses minus arcte concretae, sporae 12—13 × 7 $\mu$. — Medulla J—, KOH flavescens, hymenium J persistenter caerulescens, KOH dilutius olivaceum.

The apothecia are so numerous that they entirely cover the thallus. The hymenium also differs from the type in the dark olive colour of the epithecium, as against a typically brown colour in *Lecanora frustulosa* var. *argopholis*.

2. *Lecanora maxima* Lynge.

Lichenes Groenl. Occid. (manuscr.), pl. IX, fig. 2.

*Tingmiarmiut*: Brattneset.

*Thallus plagas latas tegens,* a substrato facile separatus, *pulvinatus,* pulvinuli usque ad 4—5 cm lati, *thallus crassus, coriaceus, gleboso-verrucosus vel in centro subpapillatus,* lobi (vulgo) 1—1,5 mm lati, in thallis juvenilibus adpressi, crenati, deinde saepe plus minusve adscendentes et imbricati, superne *flavidi vel albido-flavescentes,* scabriusculi, inferne et ad latera mox obscurati usque nigricantes.

Hyphae medullares valde adspersae, etiam hyphae corticis superioris. Ad latera loborum hyphae fusco-nigricantes, densius contextae, papillaeformes, sed non corticatae, sensim vel mox necrotientes.

*Apothecia numerosa, approximata, magna,* diam. 2—3, interdum usque ad 4 mm, arcte adpressa, supra thallum haud elevata. Discus persistenter planus, lividus, interdum deinde fusco-nigricans, margine thallo subconcolori, elevato, valde crenato, persistenti circumdatus. Latera excipuli fusco-nigricantia, excipulum praeterea incoloratum, etiam cum hypothecio. Gonidia in margine excipuli inclusa. Hymenium circiter 100 $\mu$ altum, superne granulosum, fuscum, praeterea incoloratum. Paraphyses valde conglutinatae, satis validae, 2—2,5 $\mu$ (in HCl), apice vix vel leviter solum incrassatae. Asci male evoluti, sporae ellipsoideo-fusiformes, apice apiculatae (ut in *Lecanora badia*), 15—17 $\times$ 7—7,5 $\mu$.

Pycnides numerosissimae, perifulcrium circum ostiolum leviter obscuratum. Fulcra exobasidialia, pycnoconidia subrecta, 12—17 $\mu$ longa.

Medulla J non caerulescens, cortex KOH flavescens, thallus $CaCl_2O_2$—. Hymenium J primum caerulescens, gelatina deinde fere decoloratur, asci subpersistenter colorantur. Thallus P intense flavescens.

On account of the large, bullated lobes it quite resembles a *Thalloidima.*

### 3. *Lecanora polytropa* (Ehrh.) Rabh.

*Kangerdlugsuak*: Spekkpynten, Storfjord Radio, and Amdrupneset.
Storøen, in abundance (Bøgvad).
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

Certainly one of the commonest of all lichens in Southeast Greenland, as elsewhere in Arctic regions. How ubiquitous it is, is best seen from Mr. Bøgvad's collection. Dr. Bødvad who is a geologist, collected some licheniferous stones during a spare hour, and *Lecanora polytropa* was found on a great number of them. — All the plants had a well developed thallus, var. *leucococca.*

*Lecanora polytropa* has been found by all those who have collected lichens in Southeast Greenland. The literary records are, from the north: Turner Sound by Amdrup (Vain. 1905, p. 129), Kangerdlugsuak, D'Aunay Bay and Cape Dalton by Böcher (Lynge 1933, p. 8), and Akorninarmiut by Bjørlykke (Lynge 1932, p. 10). — In the Copenhagen herb. there are plants from Angmagsalik (leg. Knutsen) and from Puisortok: Karra Akunguak (leg. Eberlin).

### 4. *Lecanora badia* (Pers.) Ach.

*Kangerdlugsuak*: Storfjord Radio.
Storøen, in abundance (Bøgvad).
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun and Narsak.

To judge from the number of plants it must be very common. The greater part of the material belongs to var. *cinerascens*. — Curiously enough, there is no literary record of it from Southeast Greenland, but it was collected by Eberlin at Inger Kajarfik a little north of 62° N.

### 5. *Lecanora castanea* (Hepp) Th. Fr.

*Tingmiarmiut*: Brattneset.

It has formerly been collected in the same fjord by Bjørlykke (Lynge 1932, p. 10). In the Copenh. herb. there are plants from Cape Dalton (det. Vain.) and from Serketnua, 61° N (leg. Eberlin). Deichm. Branth records a find at Mt. Umanak (Grønl. Lich.-Flora, 1888, p. 496). It cannot be rare in Southeast Greenland.

### 6. *Lecanora alpina* Somrft.

*Kangerdlugsuak*: Skardet and Storfjord Radio.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.

There were so many plants that it quite suggests a common species. It is evidently an addition to the lichen flora of East Greenland.

### 7. *Lecanora cinereorufescens* (Ach.) Th. Fr.

Storøen, several plants (Bøgvad).
*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.

We cannot say much of its frequency from this scanty material. There are several plants in the Copenh. herb., but they also include *Lecanora alpina* (see Deichm. Branth Grønl. Lich-Flora, 1888, p. 485), and the determinations have not been checked. We are unaware of finds from East Greenland, but the collections from Northeast Greenland (the Norw. expeditions in 1929 and 1930) are as yet worked up only in part.

### 8. *Lecanora arctica* Lynge. var. *composita* Lynge.

*Akorninarmiut*: Dronning Maria's dal, scarce.

The species is proposed in Lynge's paper Lich. Groenl. Occid., as yet only in manuscript. It will be depicted on pl. VIII, fig. 2, of that paper. The considerations which led to the establishment of this species are too extensive to be repeated here. It belongs to the *L. gibbosa* section, an is closely related to *Lecanora subdepressa,* if specifically distinct.

The thallus of the present plant is very thick, considerably thicker than in the West Greenland plants. But a specific distinction does not seem justified.

### 9. *Lecanora sublapponica* Zahlbr.

Zahlbruckner, Die Gattung Lecanora (Novaya Zemlya), 1928, p. 17, pl. IV, fig. 2.

*Kangerdlugsuak*: Skardet.

Unfortunately, this only plant is sterile. The important pycnides were not detectable. Many of the verrucae contained apothecia, but for some reason the hymenia were destroyed in all of them.

The thallus is very soft, thinner and more membranaceous than in the Novaya Zemlya plants. Along the margin the protothallus is very distinct, and the radiating lobes are developed upon it. The cortical hyphae agree perfectly with the type plants. They are rather indistinct, after clearing they are seen to be perpendicular to the surface, 5—7 $\mu$ thick, leptodermatous, constrictedly septate, with rounded articuli. — Dr. A. H. Magnusson who has devoted much study to this intricate subgenus suggested the determination to me, and a comparison with the type plants confirmed his suggestion.

It is an addition to the lichen flora of Greenland.

### 10. *Lecanora straminea* (Whbg.) Ach.

*Kangerdlugsuatsiak*: Narsak, very scarce.

We are unaware of literary records from East Greenland. But in the Copenh. herb. there are plants from Kangerajak, just south of the Lindenow fjord (leg. Sylow), and from Kaseingertok at the entrance of the Iluilek fjord (leg. Eberlin). We have (so far) not found it in the great Norwegian collections from Northeast Greenland in 1929 and 1930. On the west coast it is found as far north as Disko (leg. Th. Fries); there are many finds from South Greenland. The information, as yet available, suggests it to be a rather southern species in Greenland.

Recorded from Spitsbergen by Th. Fries, but his data are not precise: "Ad rupes litorales vix dubie perrara. Modo reportata e regionibus occidentalibus a Nordenskiöld. Amic. Malmgren (in litt.) affert, se illud semel modo vidisse" (Lich. Spitsb., 1867, p. 18). It has not been detected in the great Spitsbergen collections under determination by Lynge. It is perhaps one of the many more os less southern lichens which are found on the north and northwest coast of Svalbard, and not farther south.

It was not found in Lynge's Novaya Zemlya collection from 1921, but Almquist found it near the Bering Strait during the Vega Expedition (Nyl. Lich. Fret. Behr., 1888, p. 224, Konyam Bay, and p. 244, Lawrence Island, and Vainio Lich. Pitlek., 1909, p. 39, Jinretlen and Idlidlja).

It is very plentiful on the north coast of Norway along the beaches where fish is being dried.

On the whole it is found in rather southern Arctic regions with a face towards the west. It should be looked for on the Canadian coasts; it is not mentioned in Macoun's Cat. Canad. Plants, VII, 1902, and not in Fink Lich. Flora of the United States, 1935.

### 11. *Lecanora melanophthalma* Ram.

*Kangerdlugsuak*: Skardet, Amdrupneset, and several places near Storfjord Radio.
*Akorninarmiut*: Dronning Maria's dal.

Not supposed to be rare in the northern parts of Southeast Greenland.

*Lecanora melanophthalma* has been collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 10), and in D'Aunay Bay by Böcher (Lynge 1933, p. 8).

### 12. *Lecanora gelida* (L.) Ach.

*Kangerdlugsuatsiak*: Møretun, observed in a canyon, but not collected.

A few other species of *Lecanora* have been recorded from Southeast Greenland:

1. *Lecanora calcarea* var. *contorta* in Turner Sound, leg. Amdrup (Vain. 1905, p. 129).

2. *Lecanora intricata* in Akorninarmiut, leg. Bjørlykke (Lynge 1932, p. 10). The apothecia of *Lecanora polytropa* are often blackened, either on account of parasites, or from other causes. These plants were poorly developed, and the determination uncertain.

3. *Lecanora perradiata* in D'Aunay Bay by Böcher (Lynge 1933, p. 8).

4. *Lecanora verrucosa* at Cape Dalton by Amdrup (Vain. 1905, p. 129).

This raises the number of *Lecanorae* known from Southeast Greenland to 16, certainly less than ⅕ of the species found there. Zahlbruckner identified 52 species of *Lecanora* in Lynge's collection from Novaya Zemlya, brought together during two months of field work, and undoubtedly a considerable number of additional species will be found there.

## *Ochrolechia* Mass.

### 1. *Ochrolechia frigida* (Sw.) Lynge.

*Kangerdlugsuak*: Skardet (c. fr.) and Storfjord Radio.
*Tingmiarmiut*: Brattneset, ad f. *thelephoroidem*.
*Kangerdlugsuatsiak*: Møretind (1200 m above sea-level, c. fr., very compact plants), Møretun (on decayed wood, f. *thelephoroides*), and Narsak.

It was very plentiful, certainly just as common here as elsewhere in the Arctic. — This inevitable plant has been collected at several

places in Southeast Greenland: Kangerdlugsuak, Umivik, Akorninarmiut, Umanak and Tingmiarmiut, by Bjørlykke and Tornøe (Lynge 1932, p. 11), and Kangerdlugsuak and Cape Daussy, by Böcher (Lynge 1933, p. 11).

2. *Ochrolechia inaequatula* (Nyl.) A. Zahlbr.

*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun.

Formerly collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 11).

### *Haematomma* Mass.

1. *Haematomma ventosum* (L.) Mass.
var. *lapponica* (Räs.) Lynge.

*Kangerdlugsuak*: Skardet and Amdrupneset.
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.

There were several plants — it cannot be rare — but to our knowledge it has not formerly been recorded from Southeast Greenland. Hartz collected it in Scoresby Sound which is at present its known northern limit in East Greenland. It was not found by the Norwegian expeditions to Northeast Greenland in 1929 and 1930. — There are numerous finds from West Greenland, as far north as Disko and Umanak. Our present knowledge suggests it to be a plant of rather southern distribution in Greenland.

In Svalbard *Haematomma ventosum* is one of the many plants which are only found along the north coast, where it is fairly common. There is, however, one record of it from Bellsund (leg. Vahl), but as no-one else has been able to detect it there, nor in Isfjorden, it is not impossible that the label has been inaccurate (for Magdalena Bay?).

*Haematomma ventosum* has been recorded from Novaya Zemlya (Lynge 1928, p. 189), where it is a southern species, and from Lawrence Bay on the Asiatic side of Bering Strait (Vega Exped.). It is a circumpolar species.

### *Candelariella* Müll. Arg.

1. *Candelariella vitellina* (Ehrh.) Müll. Arg.

Storøen (Bøgvad).

Dr. Scholander concentrated his attention on the Macrolichenes, Crustaceous lichens were only occasionally collected, and this species was lacking in his collection. But there is every reason to suppose that it is very common on the east coast of Greenland. Dr. Bøgvad collected lots of plants, and it has formerly been collected in Turner Sound by Amdrup (Vain. 1905, p. 128), and in Umivik and Umanak by Bjørlykke (Lynge 1932, p. 5), and at Cape Dalton by Böcher (Lynge 1933, p. 5).

2. *Candelariella placodizans* (Nyl.) H. Magn.

Lynge, Lich. 5th Thule Exped., 1935, p. 23.

*Kangerdlugsuak*: Storfjord Radio and Amdrupneset.

It has not previously been recorded from Southeast Greenland, but it is a circumpolar species of a very wide distribution (see Lynge, l. c.).

*Icmadophila ericetorum* (L.) A. Zahlbr. was not found in the present collections, but Bjørlykke found it in Akorninarmiut (Lynge 1932, p. 10).

## *Parmeliaceae.*

### *Parmelia* Ach.

1. *Parmelia intestiniformis* (Vill.) Ach.

*Kangerdlugsuak*: Skardet, Storfjord Radio pluribi, and Amdrupneset.
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Møretun, and Narsak.

Widely distributed and common, there was a large number of plants. Apothecia are not frequent.

There is hardly any staining with paraphenylendiamin. In the so-called *Parmelia intestiniformis* var. *encausta* (Sm.) Vain. we get an intensely red colour of medulla as well as of cortex. If we also consider the well-known morphological differences, a specific difference seems safely established. *Parmelia encausta* has not been found in East Greenland, but *P. intestiniformis* is common all over East Greenland, as far as investigation goes.

2. *Parmelia alpicola* Th. Fr.

*Kangerdlugsuak*: Skardet, Amdrupneset (diary), and Storfjord Radio.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal (diary).
*Tingmiarmiut*: Brattneset (diary).
*Kangerdlugsuatsiak*: Fossheim (diary), Møretind, 1200 m above sea-level, and Narsak.

It is characteristic of *Parmelia alpicola* that its lobes are so "imbricatae et complicatae" (Th. Fr. Lich. Scand., p. 125) that they form an almost crustaceous, continuous cover over the substratum. In the present collection there were some plants where the branching was so divergent and open that the plants quite resembled *Parmelia intestiniformis,* but some scattered rhizinae on the under side excluded that species. The forma might perhaps deserve a name:

f. *aperta* n. f.: Thallus usque ad 5 cm latus, laciniae valde ramosae, sed aperte ramosae, substratum eam ob causam haud omnino tegentes. Cortex inferior 20—25 $\mu$ altus, cortex superior parum tenuior. Excipulum

secundum marginem apotheciorum subecorticatum. Hymenium circ. 45 $\mu$ altum, paraphyses apice clavatae, infuscatae. Episporium incrassatum, sporae 10—15 $\times$ 5—6,5 $\mu$. Pycnides frequentes, pycnoconidia 5—6,5 $\mu$ longa, altero apice ut videtur leviter incrassata. Medulla KOH—, cortex KOH flavescens et KOH + $CaCl_2O_2$ aurantiacus, medulla P flavescens.

It was detected at three localities, viz. Skardet in Kangerdlugsuak, and Møretoppen (1200 m s. m) and Narsak. — On the whole *Parmelia alpicola* is supposed to be fairly common, but not more so; there were several finds, but few plants. — It has formerly been collected in Umanak in Southeast Greenland by Bjørlykke (Lynge 1932, p. 12). In Northeast Greenland it must be rare; the Norwegian expeditions in 1929 and 1930 found it only once, at our southernmost locality, Cape Simpson at the outlet of Davy Sound. It is doubtful whether the other records from Northeast Greenland are based on this species.

If tested with paraphenylendiamin, *Parmelia alpicola* is at first unchanged, but after some time the medulla stains impurely yellow.

### 3. *Parmelia pubescens* (L.) Vain.

*Kangerdlugsuak*: Skardet, Spekkpynten, Storfjord Radio (pluribi), and Brandalsfjell 1000 m above sea-level (diary).
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Møretun, Møretind, 1200 m above sea-level, and Narsak.

There were many plants, *Parmelia pubescens* is supposed to be equally common all over the area investigated. It has formerly been collected in Southeast Greenland by several botanists: Cape Dalton by Amdrup (Vainio 1905, p. 128), Kangerdlugsuak by Böcher (Lynge 1933, p. 11), Umivik, Akorninarmiut and Umanak by Bjørlykke (Lynge 1932, p. 12). — Several records from Northeast Greenland suggest that it is common there, but during the Norwegian expeditions in 1929 and 1930 we found it to be quite rare. We have not been able to check all these records, but we know that some of them stand for *Parmelia minuscula,* e. g. Galløe's from Danmark's Havn (Galløe 1910, p. 187).

### 4. *Parmelia minuscula* Nyl.

*Kangerdlugsuak*: Skardet, Spekkpynten, Storfjord Radio (c. fr.), and Brandalsfjell, 1000 m above sea-level (diary).
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Møretoppen, 1200 m above sea-level, and Narsak.

One would, perhaps, not have expected to find *Parmelia minuscula* so well represented in a collection from rather southerly regions. The

plants are coarse, with applanated lobes (f. *applanata* Lynge); the plant from Trollbotn approaches f. *crustacea* Lynge.

Formerly collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 12), the plant was f. *applanata*.

### 5. *Parmelia centrifuga* (L.) Ach.

*Tingmiarmiut*: Brattneset.

One of the rarest lichens in East Greenland, this is the first and, so far, the only find there of this species, which is so common in West Greenland. It was evidently plentiful at Brattneset, but only seen sterile.

The plants differ somewhat from *Parmelia centrifuga,* as seen in Norway, by their yellowish colour, much as in *P. separata.* In Norway *P. centrifuga* is more ochroleucous, and the older parts towards the centre more grey. In the present Greenland plants the lobes are more divergently branched, and more convex than in Norwegian *P. centrifuga.* These characters are evidently arctic, we find the same in plants from Svalbard and from Novaya Zemlya, referred to *Parmelia centrifuga.*

The Greenland plants cannot be confused with *Parmelia separata,* which rather resembles *P. stenophylla* when well developed. The medulla of *Parmelia centrifuga* is J—. If stained with paraphenylendiamin nothing is seen at first, but after a few minutes a yellowish-orange or orange-red colour appears in *Parmelia centrifuga,* as well as in *P. separata* and in *P. groenlandica.*

### 6. *Parmelia groenlandica* Lynge.

Lynge and Scholander, Lichens from North East Greenland, 1932, p. 73.

*Kangerdlugsuak*: Spekkpynten.

Formerly collected by Bjørlykke in Umanak (Lynge 1932, p. 12), described from Röhssfjorden in North East Greenland.

### 7. *Parmelia prolixa* (Ach.) Röhl.

*Kangerdlugsuak*: Spekkpynten and Brandal.
*Kangerdlugsuatsiak*: Narsak.

We were not a little surprised to find this species, as well as *Parmelia isidiotyla,* in the collection. Either of them is an addition to the lichen flora of Greenland. *Parmelia prolixa* was very scarce.

There was no trace of isidia on the plants, and therefore we could not refer them to *Parmelia isidiotyla.* All the plants were tested with KOH + $CaCl_2O_2$, the result was entirely negative. They were also negative with paraphenylendiamin, but after some time (a month or

more) a reddish colour was observed on the plants, as is sometimes (often?) the case with plants where the reaction is at first P—.

It is difficult to say whether this species should be called *Parmelia prolixa* or *P. pulla*. The former name was given by Acharius, as *Parmelia olivacea* γ. *P. prolixa,* in Meth. Lich., 1803, p. 214, and raised to specific rank by Röhling, in Deutschl. Flora, III, 1813, part 2, p. 100. Its meaning is perfectly clear.

According to Zahlbruckner the name *Lichen pullus* dates from Necker Delic. Gallo-Belgic., vol. II, 1768, p. 510. But whether this really is our species seems uncertain. Acharius writes (l. c. p. 214): "ad hanc nostram varietatem — id est var. *P. prolixa* — saxatilem forte referendus est *Lichen pullus* Schreb. Spicil. p. 131. Neck. et Hag. in arborum cortice proveniens." If Necker's plant is found "in arborum cortice" it cannot be the present species. And if it is not, the combination *Parmelia pulla* is disposed of, and cannot be used again for another species, such as the plant mentioned in Schreb. Spicil., p. 131. This is probably our species, at least it is found "in lapidibus passim". — In order to avoid unnecessary confusion we have given preference to the combination *Parmelia prolixa.*

### 8. *Parmelia isidiotyla* Nyl. var. *glomellifera* Nyl.

*Akorninarmiut*: Trollbotn.

A southern species, and certainly rare, an addition to the lichen flora of Greenland.

We found that all the plants stained red by KOH + $CaCl_2O_2$. Nylander distinguished between two species, *Parmelia isidiotyla* "quarum medulla K(CaCl) non tingitur", and *Parmelia glomellifera* "quarum medulla K(CaCl) erythrinose tingitur" (Hue Addenda, p. p. 43 and 45); the present plants accordingly belong to the *glomellifera.* — We fully agree with Hillmann that this is not a specific distinction (Parmeliaceen, in Rabenh., Krypt. Flora, 1936, p. 156), nor is it possible to distinguish them after a supposed difference in the isidia which should be "viel zärter" in the *glomellifera,* and "dicker" in *isidiotyla.* The latter difference is, in our opinion, only expressions of a different age. If we should be wrong on that point the difference is supposed to be merely a common morphological variation without specific importance. But we are of opinion that the chemical difference should be expressed by the rank of a variety, or a forma. It is true enough that many botanists, even Nylander himself, have put a name to one of these plants, without testing their reaction with KOH + $CaCl_2O_2$, and that mistakes may thus arise. But that is another matter.

We do not understand why Hillmann has rejected the older species name *isidiotyla,* dating from 1875 (Addenda nova, Flora 1875, p. 8), and given preference to the younger name, *glomellifera* (Addenda nova, Flora, 1881, p. 453).

### 9. *Parmelia granulosa* Lynge.

Lynge and Scholander: Lich. North East Greenland, 1932, p. 74, tab. VI, fig. 4.

*Kangerdlugsuak*: Storfjord Radio, pluribi, and Brandalen (diary).
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

Few finds but many plants. Formerly collected in Umanak by Bjørlykke (Lynge 1932, p. 12). It is very common in Northeast Greenland (Lynge—Scholander l. c.).

### 10. *Parmelia sorediata* (Ach.) Th. Fr.

*Kanderdlugsuak*: Spekkpynten and Storfjord Radio.

Very rare, and very scarce, here as in Northeast Greenland. Formerly not recorded from Southeast Greenland. Vide Lynge—Scholander, 1932, p. 74—75.

### 11. *Parmelia infumata* Nyl.

Lynge—Scholander, Lich. North East Greenland, 1932, p. 75.

*Akorninarmiut*: Dronning Maria's dal.

There was but one specimen in this representative collection. It has not previously been collected in Southeast Greenland, and it is certainly rare there. It is hardly ever lacking on the arctic bird-stones, and the poor bird-life in Southeast Greenland is supposed to be the cause of its scarcity there. Farther north it is very common, cfr. Lynge—Scholander, l. c.

### 12. *Parmelia saxatilis* (L.) Ach.

*Kangerdlugsuak*: Skardet, of an almost blood-red colour.
*Akorninarmiut*: Dronning Maria's dal (blood-red) and Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretoppen, 1200 m above sea-level, very scarcely isidiated, Møretun, and Narsak where also a fertile plant was detected.

It has formerly been collected in Umanak by Bjørlykke (Lynge 1932, p. 12). *Parmelia saxatilis* is supposed to be common all over Southeast Greenland as far north as Scoresby Sound, but very rare north of that fjord, and so far only found in one of the adjacent fjords (Röhssfjorden, Lynge—Scholander 1932, p. 76).

### 13. *Parmelia omphalodes* (L.) Ach.

*Kangerdlugsuak*: Storfjord Radio.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun.

Formerly found in Umanak by Bjørlykke (Lynge 1932, p. 12); supposed to be rare in Southeast Greenland. The Norwegian expeditions to Eirik Raude's Land 1929 and 1930 found it to be very rare there. We have not seen the plant which Galløe recorded from Termometerfjeld near Danmarks havn (Galløe 1910, p. 186).

### 14. *Parmelia sulcata* Tayl.

*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.

This nitrophilous species is rare in Southeast Greenland, where there are so few birds. It has not previously been found there. There are only two finds from Northeast Greenland (Lynge—Scholander 1932, p. 77), and a few finds from Southwest Greenland.

*Parmelia fraudans* Nyl. has not been detected in Greenland, and not in the Svalbard region, but Lynge found a few plants in Novaya Zemlya (Lynge, Lich. from Novaya Zemlya, 1928, p. 202). It is common in Northern Scandinavia and in the eastern parts of Middle Scandinavia, in Norway as far south as the Oslo region. It evidently belongs to the eastern arctic element in the Scandinavian flora.

## *Cetraria* Ach.

### 1. *Cetraria islandica* (L.) Ach.

*Kangerdlugsuak*: Storfjord Radio pluribi, Brandalsfjell 1000 m above sea-level.
*Akorninarmiut*: Finnsbu (var. *platyna*), and Dronning Maria's dal (diary).
*Tingmiarmiut*: Brattneset (var. *platyna*).
*Kangerdlugsuatsiak*: Mortensberg (var. *platyna*), Fossheim (diary), Møretun (var. *platyna*, c. fr.), Møretind, up to 1200 m above sea-level, found fertile at 200 m above sea-level), and Narsak (diary).

It is very common in Southeast Greenland, where it has been found repeatedly: in Akorninarmiut by Bjørlykke and in Kangerdlugsuatsiak by Tornøe (Lynge 1932, p. 6), Kangerdlugsuak, Cape Dalton, Cape D'Aussay and Tasiussak and Angmagsalik by Böcher (Lynge 1933, p. 5—6). — North of Scoresby Sound the Norwegian expeditions in 1929 and 1930 found it to be a rare lowland species (Lynge—Scholander 1932, p. 81).

Habitually, it is not always easily distinguished from *Cetraria crispa*, and records by former authors should be checked if possible. Fortunately this is easily done, for *Cetraria islandica* stains intensely blood-red by paraphenylendiamin, whereas *C. crispa* is not stained.

### 2. *Cetraria crispa* (Ach.) Nyl.

*Kangerdlugsuak*: Storfjord Radio, Brandalen, Brandalsfjell, 1000 m above sea-level, and Skardet.
*Akorninarmiut*: Dronning Maria's dal and Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Møretind up to 1200 m above sea-level, and Narsak (diary).

Certainly one of the commonest lichens in the whole region. All the plants were tested with paraphenylendiamin. The plants are exceptionally fine, elongated, slender. — It has formerly been collected repeatedly, as was to be expected: by Bjørlykke and Tornøe in Kangerdlugsuak, Akorninarmiut, and Kangerdlugsuatsiak (Lynge 1932, p. 5), and at Cape D'Aunay by Böcher (Lynge 1933, p. 6) — after a revision with P.

### 3. *Cetraria Delisei* (Bory) Th. Fr.

*Kangerdlugsuak*: Skardet, Spekkpynten, Storfjord Radio c. fr., Polarisbreen, and Amdrupneset.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Møretun c. fr., Møretind up to 1200 m above sea-level, and Narsak.

A considerable number of plants suggests that it is as common in Southeast Greenland as elsewhere in the Arctic. It does not stain with paraphenylendiamin, a good distinction from *Cetraria islandica*.

Formerly collected by Amdrup at Cape Dalton (Vainio 1905, p. 127), by Bjørlykke and Tornøe in Kangerdlugsuak, Akorninarmiut, Tingmiarmiut, and Umanak (Lynge 1932, p. 6), and by Böcher at several localities between Kangerdlugsuak and Scoresby Sound (Lynge 1933, p. 5). — In Scoresby Sound and farther north it is very common (Deichmann Branth 1894, p. 87, Vainio 1905, p. 127, Lynge—Scholander 1932, p. 81, Galløe 1910, p. 185).

### 4. *Cetraria saepincola* (Ehrh.) Ach.

*Kangerdlugsuatsiak*: Møretun.

Collected but once, and supposed to be a rare species. In the Copenhagen herb. there are several plants from the *Betula* region of Southwest Greenland, there are also two plants from Sermiliarsuk and Sermersok "Groenlandiae orientalis", leg. Hartz 1889 (we have been unable to locate these places).

### 5. *Cetraria nivalis* (L.) Ach.

*Kangerdlugsuak*: Skardet, Storfjord Radio, and Brandalsfjell up to 1000 m above sea-level.
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg, Fossheim (diary), Møretun, and Møretind, 1200 m above sea-level.

The large number of plants indicates that it is as common here as elsewhere in the Arctic. — It has been collected all over the east coast of Greenland by all those who have here collected lichens. It cannot be necessary to give detailed references for this ubiquitous species.

### 6. *Cetraria cucullata* (Bell.) Ach.

*Kangerdlugsuatsiak*: Mortensberg and Møretun.

We were much astonished to find it so rare in the collection. Scholander is of opinion that it is rare in this region. — It has been found in Scoresby Sound (Deichmann Branth 1894) and at Cape Gregg (leg. Amdrup, Vainio 1905, p. 127). North of Scoresby Sound it is common and widespread in Eirik Raude's Land (Lynge and Scholander 1932, p. 80).

### 7. *Cetraria fahlunensis* (L.) Vain.

*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg and Narsak.

Supposed to be scattered and rare in Southeast Greenland. The present plants are well fertile, and pycnoconidia were found in all the plants. The under side is pale, so the plants are quite typical. — It has formerly been collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 6), and its var. *groenlandica* Vain. at Cape Dalton by Amdrup (Vain. 1905, p. 127).

Deichmann Branth recorded "*Parmelia commixta*" from Danmarks ø (Denmark Is.) in Scoresby Sound, with the rather curious notice: "Spermatia ellipsoidea, unum alterumve apice incrassatulum". The latter half of his observation is most probably the correct one, suggesting *Cetraria hepatizon*. — Galløe's *Cetraria fahlunensis* from Danmark's Havn (Denmark Harbour) stands for *Cetraria hepatizon,* and not for the present species. I have examined its pycnoconidia and found them incrassated at either end.

### 8. *Cetraria hepatizon* (Ach.) Vain.

*Kangerdlugsuak*: Skardet, Storfjord Radio, Amdrupneset, and Brandalsfjell, 1000 m above sea-level.
*Akorninarmiut*: Finnsbu and Dronning Maria's dal.

*Tingmiarmiut*: Brattdalen.
*Kangerdlugsuatsiak*: Fossheim (diary), Møretun, Møretind, 1200 m above sea-level, and Narsak.

There were lots of plants, suggesting a very common and widespread species, perhaps almost ubiquitous. Formerly collected in Tingmiarmiut by Bjørlykke (Lynge 1932, p. 6). The Norwegian expeditions to Eirik Raude's Land in 1929 and 1930 found it common, in places almost plentiful, and there is every reason to suppose that this is the case all over the east coast of Greenland (vide Lynge—Scholander 1932, p. 79).

### *Cornicularia* (Schreb.) Ach.

1. *Cornicularia aculeata* (Schreb.) Ach.

*Kangerdlugsuak*: Storfjord Radio.
*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim, Møretun, and Narsak.

There are many plants, so that it must be common. Curiously enough, it has not formerly been found in Southeast Greenland, to our knowledge. There is every reason to suppose that it is common all over the coasts of Greenland (vide Lynge—Scholander 1932, p. 82).

*Cornicularia divergens* was not found, nor was it found in the large Norwegian collections from Eirik Raude's Land in 1929 and 1930. We regard with considerable distrust Deichmann Branth's record of its "formae minores" from Scoresby Sound; should it not stand for *Cornicularia aculeata?* (Deichmann Branth 1894, p. 87).

*Cornicularia odontella.* We regard with still greater distrust the Danish records of this species from East Greenland. Lynge has now seen two of the plants from the Danmark Expedition, viz., from Termometerfjell and Snenæs (Galløe1910, p.185) and found them to be *Cetraria Delisei.* — This is also the case with a plant from Iceland: Reykjavik, leg. Steenstrup. It is of a certainty only *Cetraria Delisei.* In Scandinavia *Cornicularia odontella* is so distinctly eastern that it is difficult to acknowledge records from the Western Arctic without a careful revision of the plants.

## *Usneaceae.*

### *Alectoria* Ach.

1. *Alectoria ochroleuca* (Ehrh.) Nyl.

*Kangerdlugsuatsiak*: Møretun and Møretind, 1200 m above sea-level.

It cannot be common in Southeast Greenland. The plants are of the common arctic and alpine type, with a slender thallus, much branched podetia, and very thin apical branches. We have never seen this forma fertile.

It is a rare species in East Greenland. It was found at Cape Humboldt by the Norwegian expedition in 1929 (Lynge—Scholander 1932, p. 87), and in Scoresby Sound by Hartz (Deichmann Branth 1894, p. 87), but we have seen no plants from Southeast Greenland except the present ones.

### 2. *Alectoria nigricans* (Ach.) Nyl.

*Akorninarmiut*: Finnsbu and Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Fossheim (diary), Møretun, and Møretind, at an elevation of 1200 m above sea-level.

In the present collection *Alectoria nigricans* was found in considerable abundance. It is supposed to be fairly common. Farther north, in Scoresby Sound and in Eirik Raude's Land, it is perhaps still more common, and in places abundant. But to my knowledge it has not previously been collected south of Scoresby Sound.

### 3. *Alectoria chalybeiformis* (L.) Röhl.

*Akorninarmiut*: Dronning Maria's dal (diary).
*Tingmiarmiut*: Brattneset.

Evidently rare, Scholander having collected it but once.— Previously collected in Tingmiarmiut and Umanak by Bjørlykke (Lynge 1932, p. 5), the only record from Southeast Greenland. But farther north it is quite common (Lynge—Scholander 1932, p. 88).

### 4. *Alectoria cincinnata* (Fr.) Lynge.

*Kangerdlugsuatsiak*: Møretind, 200 m above sea-level.

*Alectoria cincinnata* is well represented in the Copenhagen Greenland herb. from West Greenland. But to our knowledge this is the first find from East Greenland.

The *Usneaceae* are, on the whole, remarkably poorly represented in all collections from Southeast Greenland. We have no *Ramalina,* no *Dactylina,* no *Evernia,* and no *Letharia.* The southern known limit of the genus *Neuropogon* is Cape Dalton, just south of Scoresby Sound where Amdrup detected *Neuropogon sulphureus* (Vain. 1905, p. 126). It was found again by Böcher at the same locality (Lynge 1933, p. 13).

## *Caloplacaceae.*

### *Blastenia* Mass.

1. *Blastenia tetraspora* (Nyl.) Rehm.

*Tingmiarmiut*: Brattneset.

There are several finds from Northeast Greenland, but this is the first one from Southeast Greenland.

### *Caloplaca* Th. Fr.

1. *Caloplaca Jungermanniae* (Vahl) Th. Fr.

*Kangerdlugsuak*: Storfjord Radio.

Previously recorded from Turner Sound, leg. Amdrup (Vainio 1905, p. 131).

2. *Caloplaca subolivacea* (Th. Fr.) Lynge.

*Kangerdlugsuak*: Storfjord Radio.

Generally more common in the Arctic than the former species. It has been collected at Cape Dalton by Amdrup (Vainio 1905, p. 131), and in Tingmiarmiut by Bjørlykke (Lynge 1932, p. 5).

3. *Caloplaca stillicidiorum* (Vahl) Lynge.

*Kangerdlugsuak*: Brandalen.

Previously collected in Tingmiarmiut by Bjørlykke (Lynge 1932, p. 5).

4. *Caloplaca elegans* (Link) Th. Fr.

*Kangerdlugsuak*: Storfjord Radio, Brandalsfjell, 1000 m above sea-level (diary), and Brandalen (diary).
*Akorninarmiut*: Dronning Maria's dal (diary).
*Tingmiarmiut*: Brattneset.

It has formerly been collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 5). Scholander says that it is not common in Southeast Greenland, where the bird life is so scanty.

5. *Caloplaca sorediata* (Vain.) DR.

*Kangerdlugsuak*: Near Storfjord Radio, pluribi, Brandalsfjell, 1000 m above sea-level, and Amdrupneset, the latter locality after the diary.
*Akorninarmiut*: Dronning Maria's dal (diary).
*Tingmiarmiut*: Brattneset.

Collected in Turner Sound by Amdrup (Vainio 1905, p. 131).

Only these 5 species of *Caloplaca* were found in the collection. — Amdrup found "*Placodium ferrugineum* var. *bryacea*" at Cape Dalton (Vainio 1905, p. 131).

## *Theloschistaceae.*

### *Xanthoria* (Fr.) Th. Fr.

1. *Xanthoria candelaria* (Ach.) Arn.

*Akorninarmiut*: Dronning Maria's dal.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak and, after Scholander's diary, Mortensberg, and Møretun.

Scholander is of opinion that it is less common in Southeast Greenland than elsewhere in the Arctic, evidently on account of the poor bird-life. It has formerly been found at Cape Dalton by Amdrup (Vainio 1905, p. 130).

## *Buelliaceae.*

### *Buellia* De Notrs.

1. *Buellia atrata* (Sm.) Anzi.

*Kangerdlugsuak*: Storfjord Radio.
*Kangerdlugsuatsiak*: Møretind, 1200 m above sea-level.

There are large numbers of fine plants in the Copenh. Greenland herb. From Southeast Greenland we have seen plants from Kekertatsiak, Nuk and Umanak, leg. Eberlin.

2. *Buellia disciformis* (Fr.) Mudd.
var. *muscorum* (Schaer.) Vain.

*Kangerdlugsuak*: Storfjord Radio.

Collected in Akorninarmiut by Bjørlykke (Lynge 1932, p. 5).

1. *Buellia disciformis* (Fr.) Mudd var. *albocincta* Th. Fr. was collected in Turner Sound by Amdrup (Vainio 1905, p. 133).

2. *Buellia groenlandica* Vain. was collected in Turner Sound by Amdrup (Vainio 1905, p. 133).

3. *Buellia punctiformis* f. *stigmatea* was collected at Cape Dalton by Amdrup (Vainio 1905, p. 133).

### *Rinodina* (Ach.) S. Gray, p. p.

1. *Rinodina turfacea* (Wbg.) Kbr.

*Kangerdlugsuak*: Storfjord Radio, on mosses.

A very poorly developed plant with small apothecia, densely covering the substratum, and hardly any thallus.

Amdrup collected "*Rinodina archaea* var. *orbata* (Ach.) Vain." at Cape Dalton and in Turner Sound (Vainio 1905, p. 132).

*Rinodina mniaraea* (Ach.) Koerb. was lacking in the present collection, but Amdrup found it in Turner Sound (Vainio 1905, p. 132), and Böcher in D'Aunay Bay (Lynge 1905, p. 132).

The two genera *Buellia* and *Rinodina* were perhaps still more insufficiently represented than the other great genera of Crustaceous lichens. There is a considerable material in the Copenh. Greenland herb., also from East Greenland. But we have not ventured to quote it without checking the determinations.

## *Physciaceae.*

### *Physcia* (Ach.) Vain.

#### 1. *Physcia caesia* (Hoffm.) Nyl.

*Kangerdlugsuak*: Storfjord Radio, pluribi.
*Akorninarmiut*: Dronning Maria's dal, and Eskimoneset (diary).
*Tingmiarmiut*: Brattneset (diary).

We had expected more finds of this species, which is otherwise so common in the Arctic. It is rarely absent from bird-stones, which are, however, quite rare in Southeast Greenland. To our knowledge there are no literary records of *Physcia caesia* from Southeast Greenland.

#### 2. *Physcia dubia* (Hoffm.) Lettau.

Lynge, Physciaceae, in Rabenhorst Kryptogamenflora, 1935, p. 110, ubi syn. — *Physcia tribacia* in Scand. literature, also in Lynge—Scholander, Lich. from North East Greenland, 1932, p. 91. — Non *Lecanora tribacia* Ach. Lich. Univ. 1810, p. 415.

var. *cinerascens* Lynge.

Lynge—Scholander, l. c. 1932, p. 92.

*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Narsak.

var. *typica* Lynge, l. c.

*Kangerdlugsuak*: Skardet (diary), Storfjord Radio (diary), and Amdrupneset.
*Akorninarmiut*: Finnsbu (diary), Dronning Maria's dal, and Eskimoneset (diary).
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Mortensberg (diary), Fossheim (diary), and Narsak.

Hardly ever lacking in an Arctic collection, but rather scarce here. It is an ornithocoprophilous species, and there are few birds in Southeast Greenland.

Amdrup collected it in Turner Sound and at Cape Dalton (Vainio 1905, p. 132). In Northeast Greenland it is common enough (Lynge—Scholander 1932, p. 91).

3. *Physcia sciastra* (Ach.) Du Rietz.

*Kangerdlugsuak*: Storfjord Radio.

We do not know whether it is so scarce as this single find suggests. In Scholander's diary it was mentioned from Dronning Maria's dal in Akorninarmiut, and from Brattneset in Tingmiarmiut, but we cannot exclude the possibility of these notes standing for *Physcia lithotodes*.

4. *Physcia lithotodes* Nyl.

Lynge, Physciaceae, in Rabenhorst Kryptogamenflora, 1935, p. 132, ubi syn.

*Akorninarmiut*: Dronning Maria's dal, c. fr., and Finnsbu, c. fr.
*Tingmiarmiut*: Brattneset.

Scarce, but not so scarce in the collection as *Physcia sciastra*. There are sufficient localities in Southeast Greenland, for it is found on the shores of lakes, and the like; much less nitrophilous than several other *Physciae*. In the present plants there is no trace of isidia, the moistened thallus is distinctly greenish, and the lower part of the excipulum is plectenchymatous (hand sections, cleared with chlorale hydrate).

*Physcia lithotodes* has not previously been recorded from Greenland.

5. *Physcia muscigena* (Ach.) Nyl.

*Kangerdlugsuak*: Brandalen.

It is not very probable that this species should be so rare as this single find suggests. It was mentioned in Scholander's diary from Dronning Maria's dal in Akorninarmiut, and from Narsak in Kangerdlugsuatsiak. It has previously been collected at Cape Dalton by Amdrup (Vainio 1905, p. 132). In Northeast Greenland it is one of the commonest and most widespread of all lichens (see Lynge—Scholander 1932, p. 93).

## *Lichenes imperfecti.*

### *Thamnolia* Ach.

1. *Thamnolia vermicularis* (Sw.) Ach.

*Tingmiarmiut*: Brattneset (Schol.'s diary).
*Kangerdlugsuatsiak*: Møretind, 1200 m above sea-level.

This conspicuous plant was so scarce in the collections as to suggest a rare species. It has formerly been collected in Umanak by Bjørlykke (Lynge 1932, p. 15), to our knowledge the only find south of Scoresby Sound. In the Copenh. herb. there is no find south of Scoresby Sound. All available facts suggest that it is a northerly species on the east coast of Greenland. Farther north it is common enough (Lynge—Scholander 1932, p. 89).

### *Crocynia* Mass.

1. *Crocynia neglecta* (Nyl.) Hue.

*Kangerdlugsuak*: Skardet, Storfjord Radio, and Amdrupneset.
*Akorninarmiut*: Finnsbu.
*Tingmiarmiut*: Brattneset.
*Kangerdlugsuatsiak*: Møretun, Møretind, 1200 m above sea-level, and Narsak.

It is not plentiful, but yet one of the commonest and most widespread lichens in the collection. All the plants gave a yellow colour with paraphenylendiamin, an excellent distinction against *Ochrolechia frigida*.

It has formerly been collected in Umivik, Akorninarmiut and Umanak by Bjørlykke (Lynge 1932, p. 11).

## Enumeration of lichens from Southeast Greenland.

It might facilitate the work of future investigators on the lichen flora of this coast to have an enumeration of the lichens which are at the present day (1937) known from that region. After some hesitation we have resolved to give the enumeration in the same order as in the paper.

*Verrucaria.*

1. margacea Wbg.
2. aethiobola Wbg.
3. maura Wbg.

*Staurothele.*

4. fuscocuprea (Nyl.) Zschacke.
5. clopima (Wbg.) Th. Fr.

*Polyblastia.*

6. pseudomyces (Norm.) Th. Fr.
7. terrestris (Tuck.) Th. Fr.

*Dermatocarpon.*

8. miniatum (L.) Mann.
9. rivulorum (Arn.) DT. et Sarnth.
10. lachneum (Ach.) A. L. Sm.
11. cinereum (Pers.) Th. Fr.

*Endocarpon.*

12. pulvinatum (Kbr.) Th. Fr.

*Coniocybe.*

13. furfuracea Ach.

*Sphaerophorus.*

14. globosus (Huds.) Vain.
15. fragilis Pers.

*Ephebe.*

16. lanata (L.) Vain.

*Pyrenopsis.*

17. pulvinata (Schaer.) Th. Fr.

*Leptogium.*

18. lichenoides (L.) Zahlbr.

*Massalongia.*

19. carnosa (Dicks.) Kbr.

*Pannaria.*

20. elaeina (Wbg.) Nyl.
21. Hookeri (Borr.) Nyl.
22. pezizoides (Web.) Lightf.

*Psoroma.*

23. hypnorum (Dicks.) Hoffm.

*Parmeliella.*

24. lepidiota (Somrft.) Vain.

*Peltigera.*

25. aphthosa (L.) Willd.
26. leucophlebia (Nyl.) Gyeln.
27. venosa (L.) Hoffm.
28. canina (L.) Willd.
29. rufescens (Weis) Humb.
30. lepidophora (Nyl.) Vain.
31. erumpens (Tayl.) Vain.
32. scabrosa Th. Fr.
33. malacea (Ach.) Funck.
34. polydactyla (Neck.) Hoffm.

*Solorina.*

35. crocea (L.) Ach.
36. bispora Nyl.
37. spongiosa (Sm.) Anzi.

*Nephroma.*

38. arcticum (L.) Torss.
39. laevigatum (Huds.) Ach.
40. parile Ach.

*Lecidea.*

41. vernalis (L.) Ach.
42. cuprea Somrft.
43. rufofusca (Anzi) Nyl.
44. alpestris Somrft.
45. Berengeriana (Mass.) Th. Fr.
46. elevata Lynge.
47. cinereoatra Ach.
48. plana Lahm.
49. Dicksonii Ach.
50. lapicida Ach.
51. pantherina (Ach.) Th. Fr.
52. subsorediza Lynge.
53. paupercula Th. Fr.
54. atrobrunnea (Ram.) Schaer.
55. arctogena Th. Fr.
56. atromarginata H. Magn.
57. leucophaea (Flk.) Nyl.
58. lulensis (Hellb.) Stiz.
59. granulosa (Ehrh.) Ach.
60. demissa (Rutstr.) Ach.
61. rubiformis Wbg.
62. decipiens (Ehrh.) Ach.
63. assimilata Nyl.
64. auriculata Th. Fr.
65. caesioatra Schaer.
66. confluens Fr.
67. goniophila Flk.
68. hilarescens Nyl.
69. limosa Ach.
70. pallida Th. Fr.
71. pelobotrya (Wbg.) Leight.
72. soredizodes (Anzi) Vain.
73. subcongrua Nyl.
74. vorticosa (Flk.) Kbr.
75. Wulfenii (Hepp) Arn.

*Bacidia.*

76. alpina (Schaer.) Vain.

*Lopadium.*

77. coralloideum (Nyl.).

*Rhizocarpon.*

78. geographicum (L.) DC.
79. disporum (Naeg.) Müll. Arg.
80. chionophilum Th. Fr.
81. crystalligenum Lynge.
82. occidentale Lynge.
83. badioatrum (Flk.) Th. Fr.
84. rittokense (Hellb.) Th. Fr.
85. jemtlandicum Malme.
86. Copelandii (Kbr.) Vain.

*Cladonia.*

87. rangiferina (L.) Web.
88. mitis Sandst.
89. coccifera (L.) Willd.
90. deformis (L.) Hoffm.
91. bellidiflora (Ach.) Schaer.
92. amaurocraea (Flk.) Schaer.
93. uncialis (L.) Web.
94. crispata (Ach.) Flot.
95. Delessertii (Nyl.) Vain.
96. squamosa (Scop.) Hoffm.
97. turgida (Ehrh.) Hoffm.
98. cariosa (Ach.) Spreng.
99. alpicola (Flot.) Vain.
100. acuminata (Ach.) Arn.
101. gracilis (L.) Willd.
102. elongata (Jacq.) Hoffm.
103. degenerans (Flk.) Spreng.
104. lepidota Nyl.
105. macrophyllodes Nyl.
106. subcervicornis (Vain.) DR.
107. cervicornis (Ach.) Fw.
108. pyxidata (L.) Fr.
109. carneola Fr.

*Stereocaulon.*

110. fastigiatum Anzi.
111. paschale (L.) Hoffm.
112. alpinum Laur.
113. rivulorum H. Magn.
114. denudatum Flk.

*Umbilicaria.*

115. rigida (DR.) Frey.
116. Lyngei Schol.

*Omphalodiscus.*

117. decussatus (Vill.) Schol.
118. polaris Schol.
119. virginis (Schaer.) Schol.

*Gyrophora.*

120. torrefacta (Lightf.) Cromb.
121. hyperborea Ach.
122. arctica Ach.
123. proboscidea (L.) Ach.
124. fuliginosa Havås.
125. polyphylla (L.) Kbr.
126. deusta (L.) Ach.
127. cylindrica (L.) Ach.
128. vellea (L.) Ach.

*Sporastatia.*

129. cinerea (Schaer.) Kbr.
130. tenuirimata (Th. Fr.) Lynge
131. testudinea (Ach.) Mass.

*Acarospora.*

132. oxytona (Ach.) Mass. (chlorophana?)
133. glaucocarpa (Wbg.) Kbr.

*Pertusaria.*

134. dactylina (Ach.) Nyl.
135. oculata (Dicks.) Th. Fr.

*Lecanora.*

136. frustulosa (Dicks.) Ach.
137. maxima Lynge.
138. polytropa (Ehrh.) Rabh.
139. badia (Pers.) Ach.
140. castanea (Hepp) Th. Fr.
141. alpina Somrft.
142. cinereorufescens (Ach.) Th. Fr.
143. arctica Lynge.
144. sublapponica Zahlbr.
145. straminea (Wbg.) Ach.
146. melanophthalma Ram.
147. gelida (L.) Ach.
148. calcarea (L.) Somrft. (?).
149. intricata (Schrad.) Ach.
150. perradiata Nyl.
151. verrucosa (Ach.) Laur.

*Ochrolechia.*

152. frigida (Sw.) Lynge.
153. inaequatula (Nyl.) Zahlbr.

*Haematomma.*

154. ventosum (L.) Mass.

*Candelariella.*

155. vitellina (Ehrh.) Müll. Arg.
156. placodizans (Nyl.) H. Magn.

*Icmadophila.*

157. ericetorum (L.) Zahlbr.

*Parmelia.*

158. intestiniformis (Vill.) Ach.
159. alpicola Th. Fr.
160. pubescens (L.) Vain.
161. minuscula Nyl.
162. centrifuga (L.) Ach.
163. groenlandica Lynge.
164. prolixa (Ach.) Roehl.
165. isidiotyla Nyl.
166. granulosa Lynge.
167. sorediata (Ach.) Th. Fr.
168. infumata Nyl.
169. saxatilis (L.) Ach.
170. omphalodes (L.) Ach.
171. sulcata Tayl.

*Cetraria.*

172. islandica (L.) Ach.
173. crispa (Ach.) Nyl.
174. Delisei (Bory) Th. Fr.
175. saepincola (Ehrh.) Ach.
176. nivalis (L.) Ach.
177. cucullata (Bell) Ach.
178. fahlunensis (L.) Vain.
179. hepatizon (Ach.) Vain.

*Cornicularia.*

180. aculeata (Schreb.) Ach.

*Alectoria.*

181. ochroleuca (Ehrh.) Nyl.
182. nigricans (Ach.) Nyl.
183. chalybeiformis (L.) Roehl.
184. cincinnata (Fr.) Lynge.

*Neuropogon.*

185. sulphureus (König) Hellb.

*Blastenia.*

186. tetraspora (Nyl.) Rehm.

*Caloplaca.*

187. Jungermanniae (Vahl) Th. Fr.
188. subolivacea (Th. Fr.) Lynge.
189. stillicidiorum (Vahl) Lynge.
190. elegans (Link) Th. Fr.
191. sorediata (Vain.) DR.
192. "ferruginea (Huds.) Th. Fr."

*Xanthoria.*

193. candelaria (Ach.) Arn.

*Buellia.*

194. atrata (Sm.) Anzi.
195. disciformis (Fr.) Mudd.
196. groenlandica Vain.
197. punctiformis (Hoffm.) Mass. (stigmatea).

*Rinodina.*

198. turfacea (Wbg.) Kbr.
199. mniaraea (Ach.) Kbr.

*Physcia.*

200. caesia (Hoffm.) Nyl.
201. dubia (Hoffm.) Lettau.
202. sciastra (Ach.) DR.
203. lithotodes Nyl.
204. muscigena (Ach.) Nyl.

*Thamnolia.*

205. vermicularis (Sw.) Ach.

*Crocynia.*

206. neglecta (Nyl.) Hue.

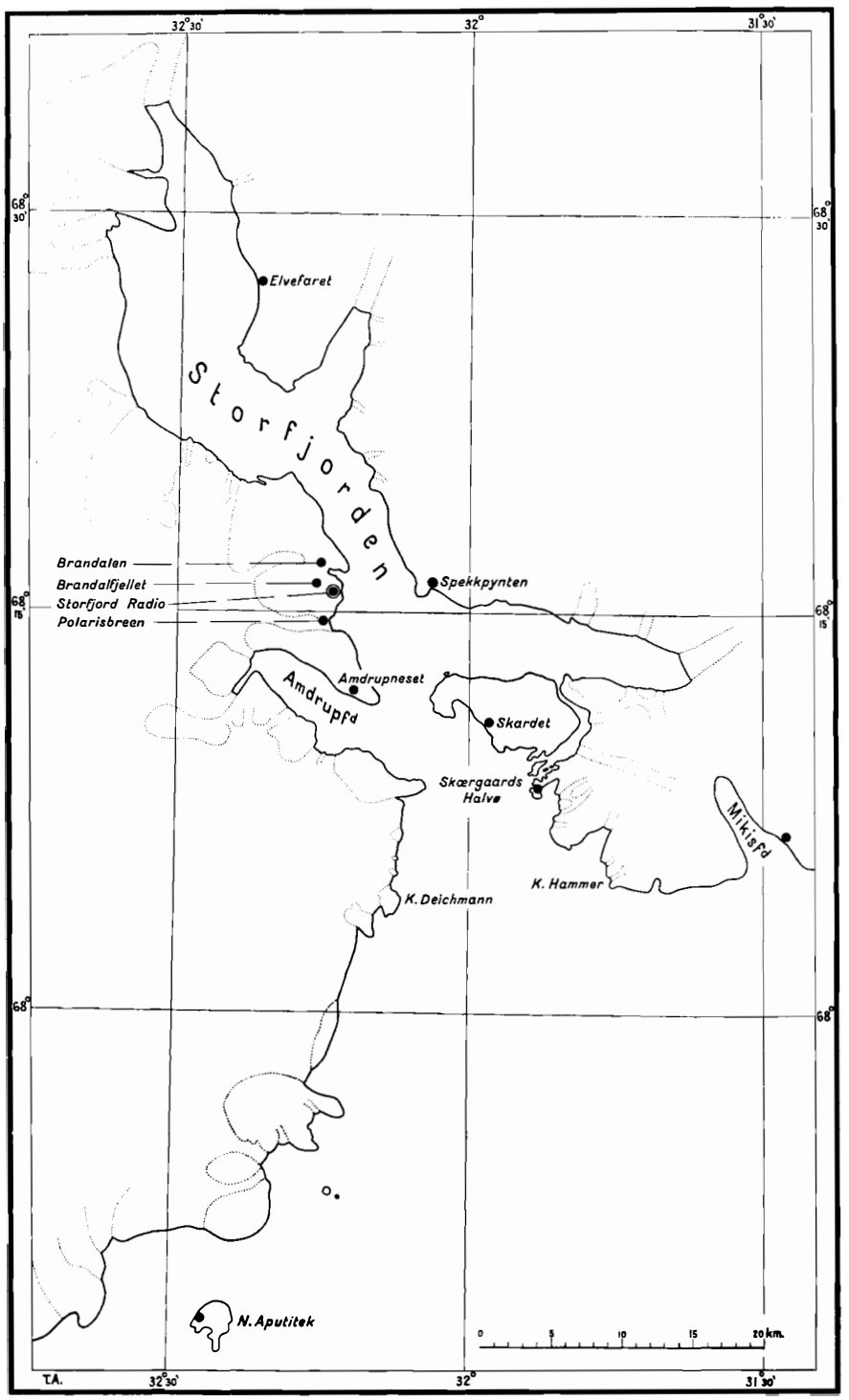
It is evident that these approximately 200 different species of lichens are only a part of the lichen flora of the region. It is not improbable that the number will mount to 600 species when exploration is more advanced.

Under these circumstances one is not tempted to compare this insufficiently known flora with that of other regions, the lichen flora of which is perhaps better known, perhaps not. Anyhow, the enumeration contains a considerable number of rather southerly lichens which are not known from Northeast Greenland, and which it is very unlikely that we should ever find there.

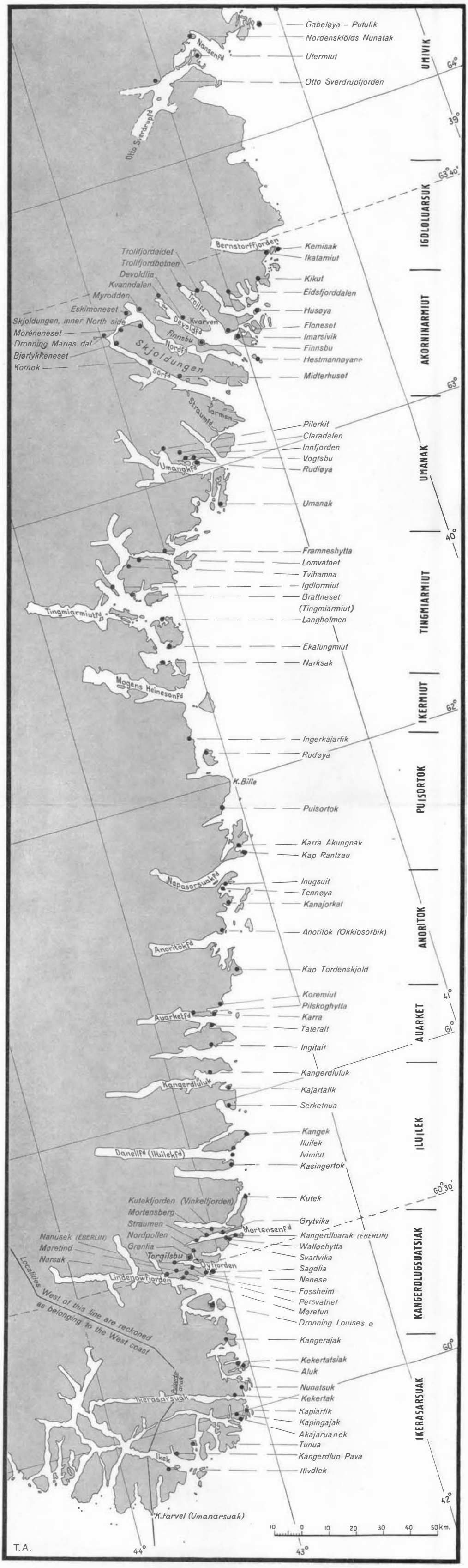
A comparison of that kind will be a natural part of the paper on the large Norwegian collections from Northeast Greenland from 1929—1930. The determination of the Crustaceous lichens of these collections is far advanced, and it is much to be hoped that it will be possible to finish the work within the next few years. A paper on their Macrolichenes has already been published (Lynge and Scholander, Lichens from North East Greenland collected on the Norwegian Scientific Expeditions in 1929 and 1930, I, Skrifter om Svalbard og Ishavet, No. 41, p. 1—116, pl. I—VII, Oslo 1932).

# Index.

Printed, April 17th, 1937.




Map of Botanical Localities in Kangerdlugsuak.




Map of Botanical Localities in Southeast Greenland.

Charts:

No. S. 1. Bear Island. 1 : 40 000. 1932. Kr. 4,00.
„ S. 2. Bear Island Waters. 1 : 350 000. 1931. New edition in preparation.
„ S. 3. From Bellsound to Foreland Reef with the Icefjord. 1 : 200 000. 1932. Kr. 5,00.
„ S. 5. Norway—Svalbard, Northern Sheet. 1 : 750 000. 1933. Kr. 4,00.
„ S. 6. Norway—Svalbard, Southern Sheet. 1 : 750 000. 1933. Kr. 4,00.
„ S. 7. Northern Svalbard. 1 : 600 000. 1934. Kr. 4,00.
„ S. 8. Kings Bay and Cross Bay. 1 : 100 000. 1934. Kr. 4,00.
„ S. 9. From South Cape to Hamburg Bay. 1 : 350 000. 1936. Kr. 4,00.
„ S.11. East Greenland. 1 : 600 000. 1937. Kr. 4,00.

A preliminary edition of topographical maps (1 : 50 000) covering the regions around Kings Bay, Ice Fjord, and Bell Sound, together with the map of Bear Island (1 : 25 000), is published in: Svalbard Commissioner [Kristian Sindballe], Report concerning the claims to land in Svalbard. Part I A, Text; I B, Maps; II A, Text; II B, Maps. Copenhagen and Oslo 1927. Kr. 150,00.

## SKRIFTER OM SVALBARD OG ISHAVET

Nr. 1. HOEL, A., *The Norwegian Svalbard Expeditions 1906—1926.* 1929. Kr. 10,00
„ 2. RAVN, J. P. J., *On the Mollusca of the Tertiary of Spitsbergen.* 1922. Kr. 1,60.
„ 3. WERENSKIOLD, W. and I. OFTEDAL, *A burning Coal Seam at Mt. Pyramide, Spitsbergen.* 1922. Kr. 1,20.
„ 4. WOLLEBÆK, A., *The Spitsbergen Reindeer.* 1926. Kr. 10,00.
„ 5. LYNGE, B., *Lichens from Spitsbergen.* 1924. Kr. 2,50.
„ 6. HOEL, A., *The Coal Deposits and Coal Mining of Svalbard.* 1925. Kr. 10,00.
„ 7. DAHL, K., *Contributions to the Biology of the Spitsbergen Char.* 1926. Kr. 1,00.
„ 8. HOLTEDAHL, O., *Notes on the Geology of Northwestern Spitsbergen.* 1926. Kr. 5,50.
„ 9. LYNGE, B., *Lichens from Bear Island (Bjørnøya).* 1926. Kr. 5,80.
„ 10. IVERSEN, T., *Hopen (Hope Island), Svalbard.* 1926. Kr. 7,50.
„ 11. QUENSTEDT, W., *Mollusken a. d. Redbay- u. Greyhookschichten Spitzb.* 1926. Kr. 8,50.

Nos. 1—11: Vol. I. From Nr. 12 the papers are only numbered consecutively.

Nr. 12. STENSIÖ, E. A:SON, *The Downtonian and Devonian Vertebrates of Spitsbergen.* Part I. *Cephalaspidae.* A. Text, and B. Plates. 1927. Kr. 60,00.
„ 13. LIND, J., *The Micromycetes of Svalbard.* 1928. Kr. 6,00.
„ 14. KJÆR, R. and J. E. FJELDSTAD, *Tidal Observations in the Arctic.* 1934. Kr. 6,00.
„ 15. HORN, G. and A. K. ORVIN, *Geology of Bear Island.* 1928. Kr. 15,00.
„ 16. JELSTRUP, H. S., *Déterminations astronomiques.* 1928. Kr. 2,00.
„ 17. HORN, G., *Beiträge zur Kenntnis der Kohle von Svalbard.* 1928. Kr. 5,50.
„ 18. HOEL, A. und A. K. ORVIN, *Das Festungsprofil auf Spitzbergen. Karbon-Kreide.* I. Vermessungsresultate. (In preparation.)
„ 19. FREBOLD, H., *Das Festungsprofil auf Spitzbergen. Jura und Kreide.* II. Die Stratigraphie. 1928. Kr. 3,00.
„ 20. FREBOLD, H., *Oberer Lias und unteres Callovien in Spitzbergen.* 1929. Kr. 2,50.
„ 21. FREBOLD, H., *Ammoniten aus dem Valanginien von Spitzbergen.* 1929. Kr. 4,00.
„ 22. HEINTZ, A., *Die Downtonischen und Devonischen Vertebraten von Spitzbergen.* II. *Acanthaspida.* 1929. Kr. 15,00.
„ 23. HEINTZ, A., *Die Downtonischen und Devonischen Vertebraten von Spitzbergen.* III. *Acanthaspida. — Nachtrag.* 1929. Kr. 3,00.
„ 24. HERITSCH, F., *Eine Caninia aus dem Karbon des De Geer-Berges im Eisfjordgebiet auf Spitzbergen.* 1929. Kr. 3,50.
„ 25. ABS, O., *Untersuchungen über die Ernährung der Bewohner von Barentsburg, Svalbard.* 1929. Kr. 5,00.
„ 26. FREBOLD, H., *Untersuchungen über die Fauna, die Stratigraphie und Paläogeographie der Trias Spitzbergens.* 1929. Kr. 6,00.
„ 27. THOR, S., *Beiträge zur Kenntnis der invertebraten Fauna von Svalbard.* 1930. Kr. 18,00.
„ 28. FREBOLD, H., *Die Altersstellung des Fischhorizontes, des Grippianiveaus und des unteren Saurierhorizontes in Spitzbergen.* 1930. kr. 4,00.
„ 29. HORN, G., *Franz Josef Land. Nat. Hist., Discovery, Expl., and Hunting.* 1930. Kr. 5,00.
„ 30. ORVIN, A. K., *Beiträge zur Kenntnis des Oberdevons Ost-Grönlands.* HEINTZ, A., *Oberdevonische Fischreste aus Ost-Grönland.* 1930. Kr. 4,00.
„ 31. FREBOLD, H., *Verbr. und Ausb. des Mesozoikums in Spitzbergen.* 1930. Kr. 17,00.
„ 32. ABS, O., *Über Epidemien von unspezifischen Katarrhen der Luftwege auf Svalbard.* 1930. Kr. 2,00.
„ 33. KIÆR, J., *Ctenaspis, a New Genus of Cyathaspidian Fishes.* 1930. Kr. 1,00.
„ 34. TOLMATCHEW, A., *Die Gattung Cerastium in der Flora von Spitzbergen.* 1930. Kr. 1,00.
„ 35. SOKOLOV, D. und W. BODYLEVSKY, *Jura- und Kreidefaunen von Spitzb.* 1931. Kr. 15,00.
„ 36. SMEDAL, G., *Acquisition of Sovereignty over Polar Areas.* 1931. Kr. 10,00.
„ 37. FREBOLD, H., *Fazielle Verh. des Mesozoikums im Eisfjordgebiet Spitzb.* 1931. Kr. 8,75.
„ 38. LYNGE, B., *Lichens from Franz Josef Land.* 1931. Kr. 3,00.
„ 39. HANSSEN, O. and J. LID, *Flowering Plants of Franz Josef Land collected on the Norwegian Scientific Expedition 1930.* 1932. Kr. 3.50.
„ 40. KIÆR, J.† and HEINTZ, A., *The Downtonian and Devonian Vertebrates of Spitsbergen.* V. Suborder *Cyathaspida.* 1935. Kr. 25,00.

Nr. 41. LYNGE, B. and P. F. SCHOLANDER, *Lichens from N. E. Greenland.* 1932. Kr. 9,50.
„ 42. HEINTZ, A., *Beitr. zur Kenntnis d. devonischen Fischfauna O.-Grönlands.* 1931. Kr. 4,00.
„ 43—46. BJØRLYKKE, B., *Some Vascular Plants from South East Greenland. Collected on the "Heimen" Expedition in 1931. Preliminary Report.* LID, J., *Vascular Plants from South East Greenland.* LYNGE, B., *Lichens from South East Greenland.* OMANG, S. O. F., *Beiträge zur Hieraciumflora Ost-Grönlands.* 1932. Kr. 4,00.
„ 47. LYNGE, B., *A Revision of the Genus Rhizocarpon in Greenland.* 1932. Kr. 2,00.
„ 48. VAAGE, J., *Vascular Plants from Eirik Raude's Land.* 1932 Kr. 7,00.
„ 49. SCHAANNING, H. THO. L., 1. *A Contribution to the Bird Fauna of East-Greenland.* 2. *A Contribution to the Bird Fauna of Jan Mayen. — Zool. Res. Norw. Sc. Exp. to East-Greenland. I.* 1933. Kr. 3,00.
„ 50. JELSTRUP, H. S., *Détermination astronomique de Mygg-Bukta au Groenland Oriental,* 1932. Kr. 3,75.
„ 51. BIRKELAND, B. J. et GEORG SCHOU, *Le climat de l'Eirik-Raudes-Land.* 1932. Kr. 2,00.
„ 52. KIÆR, J. †, *The Downtonian and Devonian Vertebrates of Spitsbergen.* IV. Suborder *Cyathaspida.* Preliminary Report. 1932. Kr. 5,50.
„ 53. 1. MALAISE, R., *Eine neue Blattwespe.* 2. A. ROMAN, *Schlupfwespen.* 3. O. RINGDAHL, *Tachiniden und Musciden.* 4. M. GOETGHEBUER, *Chironomides du Groenland oriental, du Svalbard et de la Terre de François Joseph. — Zool. Res. Norw. Sc. Exp. to East-Greenland. II.* 1933. Kr. 4,00.
„ 54. VARTDAL, H., *Bibliographie des ouvrages norvégiens relatifs au Grœnland (Y compris les ouvrages islandais antérieurs à l'an 1814).* 1935. Kr. 12,00.
„ 55. OMANG, S. O. F., *Übersicht über die Hieraciumflora Ost-Grönlands und Bemerkungen betreffend zwei Monstrositäten des Hieracium Alpinum (L)* Backh. 1933. Kr. 2,50.
„ 56. DEVOLD, J. and P. F. SCHOLANDER, *Flowering Plants and Ferns of Southeast Greenland.* 1933. Kr. 20,00.
„ 57. ORVIN, A. K., *Geology of The Kings Bay Region, Spitsbergen.* 1934. Kr. 20,00.
„ 58. JELSTRUP, H. S., *Détermination Astronomique à Sabine-Øya au Groenland Oriental.* 1933. Kr. 2,50.
„ 59. LYNGE, B., *On Dufourea and Dactylina. Three Arctic Lichens.* 1933. Kr. 5,00.
„ 60. VOGT, TH., *Late-Quaternary Oscillations of Level in Southeast-Greenland.* 1933. Kr. 5,00.
„ 61. 1. BURTON, M., M. Sc., *Report on the Sponges.* 2. ZIMMER, C., *Die Cumaceen. — Zool. Res. Norw. Sc. Exp. to East-Greenland. III.* 1934. Kr. 2,50.
„ 62. SCHOLANDER, P. F., *Vascular Plants from Northern Svalbard.* 1934. Kr. 15,00.
„ 63. RICHTER, S., *A Contr. to the Archæology of North-East Greenland.* 1934. Kr. 25,00.
„ 64. SOLLE, G., *Die devonischen Ostracoden Spitzbergens.* 1935. Kr. 5,50.
„ 65. 1. FRIESE, H., *Apiden.* 2. LINDBERG, H., *Hemiptera.* 3. LINNANIEMI, W.M., *Collembolen. Zool. Res. Norw. Sc. Exp. to East-Greenland. IV.* 1935. Kr. 2,50.
„ 66. 1. NORDENSTAM, Å., *The Isopoda.* 2. SCHELLENBERG, A., *Die Amphipoden.* 3. SIVERTSEN, E., *Crustacea Decapoda, Auphausidacea, and Mysidacea.* Zool. Res. Norw. Sc. Exp. to East-Greenland. *V.* 1935. Kr. 5,00.
„ 67. JAKHELLN, A., *Oceanographic Investigations in East Greenland Waters in the Summers of 1930—1932.* 1936. Kr. 7,00.
„ 68. FREBOLD, H. und E. STOLL, *Das Festungsprofil auf Spitzbergen.* III. Stratigraphie und Fauna des Jura und der Unterkreide 1937. Kr. 5,50.
„ 69. FREBOLD, HANS, *Das Festungsprofil auf Spitzbergen.* IV. Die Brachiopoden- und Lamellibranchiatenfauna und die Stratigraphie des Oberkarbons und Unterperms. Nebst Beschreibung anderer Vorkommen in Svalbard. 1937. Kr. 10,00.
„ 70. DAHL, EILIF, LYNGE, B., and SCHOLANDER, P. F., *Lichens from Southeast Greenland.* 1937. Kr. 4,50.

Norges Svalbard- og Ishavs-undersøkelser, Observatoriegaten 1, Oslo

A. W. BRØGGERS BOKTRYKKERI A/S, OSLO