MEDDELELSER OM GRØNLAND
UDGIVNE AF
KOMMISSIONEN FOR VIDENSKABELIGE UNDERSØGELSER I GRØNLAND
BD. 126 · NR. 1

DANSK NORDØSTGRØNLANDS EKSPEDITION 1938–39
UDSENDT AF: ALF TROLLE, EBBE MUNCK OG EIGIL KNUTH TIL MINDE OM DANMARK-EKSPEDITIONEN
LEADERS: EBBE MUNCK AND EIGIL KNUTH

REPORT ON THE EXPEDITION
AND ON SUBSEQUENT WORK AT THE MØRKEFJORD STATION

BY

EIGIL KNUTH

WITH 1 PHOTO OF H.R.H. PRINCE KNUD,
48 FIGURES IN THE TEXT AND 1 PLATE

KØBENHAVN
C. A. REITZELS FORLAG
BIANCO LUNOS BOGTRYKKERI A/S
1942

UDGIVET MED STØTTE AF CARLSBERGFONDET

The Patron of the Expedition
His Royal Highness Prince KNUD

Knud
Prins til Danmark
1941.

The consent of His Royal Highness Prince KNUD to be the patron of the expedition was an invaluable asset to us. Whatever doubts might have arisen as to the justice of our cause vanished now that we had obtained official recognition, and our courage and will to carry out our task were greatly strengthened. Prince KNUD came among us to remedy the disadvantage arising from the fact that the expedition had two leaders, and during our work we had the feeling of being a united body with a common responsibility towards our patron. This feeling drew natural nourishment from the many direct proofs of vivid interest and warm understanding, which repeatedly during the whole expedition came to us from our patron, as a result of the first-hand experience and intimate knowledge of conditions in Greenland which Prince KNUD in his capacity of Danish naval officer had acquired in our northern colony. But in a practical way also Prince KNUD extended his patronage to us, wholeheartedly devoting his time and working power to us when, after our return, it proved necessary to take steps to re-establish the economy of the expedition.

For all this aid and the hearty and comradely spirit in which it was given we express our thanks to our patron, not forgetting Princess CAROLINE-MATHILDE, who on every occasion showed the same friendly interest as Prince KNUD towards the expedition.

EBBE MUNCK. EIGIL KNUTH.

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PREFACE

In the popular account of the progress of the expedition, entitled "Under det nordligste Dannebrog", published by EIGIL KNUTH in the autumn of 1940, acknowledgements were already expressed to the many people who helped us with money, with advice or by deed, thus rendering the realisation of our plans possible. In view of the more official character of the present report, these acknowledgements will be repeated here at somewhat greater length.

Our thanks are principally due to the many contributors to the expedition, in the first place the Carlsberg Foundation, the Tuborg Foundation, and Captain TROLLE, as well as the managing director of the Commercial Bank of Copenhagen, who showed his large-mindedness by granting a big loan for the purchase of our ship. We were greatly impressed with the confidence and courtesy shown to us by all to whom we applied, though we were unknown and untried people. As early as the spring of 1938 the impending world crisis was, however, traceable in many ways within Danish business life; it is therefore all the more to the credit of its leading personalities and of Danish generosity in a national question that we obtained so much help. We saw glimpses of many great self-made concerns, and were admitted to the offices of their chiefs, where, like spiders in the middle of their webs, sat the men who, even more than the Government and the Rigsdag, govern the Denmark which will survive. And it turned out that amid the rattling of their typewriters and their dry accounts they nourished idealistic dreams and feelings of responsibility extending far beyond the limits of their concerns. It is impossible to thank everyone as they deserve to be thanked; their names will appear in the lists given on pages 17 and 21.

We are likewise indebted to the Administration of Greenland (the "Grønlands Styrelse"), whose late director, J. DAUGAARD-JENSEN, and present director, KNUD OLDENDOW, gave us eager support and promoted our plans. Mr. OLDENDOW, in addition, repeatedly paved the way for considerable contributions from various institutions. Dr. LAUGE KOCH not only assisted us with good advice, but kindly lent us the sketch maps and air photographs from northernmost Greenland which he had

brought home from his Peary Land flights immediately before our departure. Furthermore, he gave us much good counsel and told us of his experiences concerning Northeast Greenland in a letter, which is reprinted in his report on the Peary Land Expedition (Medd. om Grønl. Bd. 130, Nr. 1, pp. 293—299) and hence will not be quoted here. We are very grateful to Dr. KOCH for all this help. We also wish to thank Mr. ELMAR DRASTRUP, who after our return, when we were sketching the cartographic alterations in the interior of Kronprins Christians Land, allowed us to use his observations, so that a more satisfactory correction could be made.

Our special thanks are due to three more persons, who with unique self-sacrifice placed all their working power at the service of the expedition: They are Mrs. JYTTE KNIPSCHILDT, who wrote our letters and kept our accounts at the office of the expedition, Graabrødretorv 5; Mr. POUL CHRISTIANSEN, solicitor, who undertook all our financial arrangements and advised us in the difficult situations that might arise; and finally Civil Engineer POUL WINTHER, who alone took charge of the immense and complicated wireless equipment and made it not only the best-planned part of our equipment, and of the choicest material, but also comparatively the cheapest. Thus, although Mr. WINTHER was unable to join the expedition himself, he devoted as much care and zeal to it as if it had been his own.

To the members of the "Norsk-Fransk Polarekspedisjon 1938", who wintered barely 100 kilometres from us, and with whom a valuable scientific cooperation was established, we express our warmest acknowledgements—especially to the leaders, Mr. WILLIE KNUTSEN and Comte GASTON MICARD, and to the physicist Mr. KRISTEN HATLEVIK, who conducted the photography of the northern lights, in which we took part. We are likewise greatly indebted to our Danish neighbours in Dove Bugt, the trappers of the Nanok Company CHRISTIAN JENSEN, HENNING ØRNLEF, CARLOS ZIEBELL from the station at Hvalrosodden, and FRANTS DALSKOV and JENS MARIUS JENSEN from the station at Gefionshavn. Like good comrades they helped us if we wanted anything at our station; hospitably they allowed us to stay in their huts, they often accompanied us on our sledge journeys, and they invited us to join them in their large motorboat if they knew we had something to do in places where we could hardly go in our own light boat.

And last but not least we express our thanks to the members of the expedition, notably the five Danish wintering members, on whose careful contributions the whole undertaking came to be based, and the three Greenlanders, without whose patient work the scientists would not have accomplished what they did.

Personally I wish to thank Miss E. GLEERUP, the translator of this book, for good collaboration.

1. The name, financing, and accounts of the expedition.

The funds for the expedition were procured by applications, verbal and written, to our scientific foundations, to private people, and to the Danish State. One of the first private persons to whom we applied for financial aid was Captain ALF TROLLE, second in command on the Danmark-Expedition, and together with Mrs. TROLLE founder of a trust-fund which has for a great many years supported by grants the Danish exploration of East Greenland. Captain TROLLE helped us to overcome the first difficulties of starting as well as our hesitations by presenting us with a check for 2000 Kr.; furthermore he provided 4000 Kr. for ALWIN PEDERSEN's and twice 1000 Kr. for GITZ-JOHANSEN's participation in the expedition—a fact which does not appear from the subjoined accounts. Later on, when we were again hard up after our first wintering, he contributed an amount of 10,000 Kr. for the pay of the members of the expedition—a gesture not designed to benefit the expedition but the scientists. However, this is not all that Captain TROLLE has done for the expedition, for in addition to these contributions in cash he also placed an amount of 15,000 Kr. as a loan in the ship—a loan which has now been repaid, but without which our wish to obtain our own ship would hardly have been fulfilled.

As exactly thirty years had elapsed since the return of the Danmark-Expedition, and we set out for the same regions in which that expedition had carried out its unique pioneer work with the loss of three lives, even without Captain TROLLE's aid our expedition would have had the character of a memorial expedition. In view of Captain TROLLE's financial aid and moral support we thought it reasonable to establish this by the name of the expedition, calling it: "Dansk Nordøstgrønlands Ekspedition 1938—39, udsendt af Alf Trolle, Ebbe Munck og Eigil Knuth til Minde om Danmark-Ekspeditionen" (Danish Northeast Greenland Expedition 1938—39, sent out by Alf Trolle, Ebbe Munck, and Eigil Knuth in memory of the Danmark-Expedition).

Previous to Captain TROLLE's loan, 40,000 Kr. had been advanced by the Commercial Bank of Copenhagen, which loan, too, has now been

repaid, while the remaining lenders—Director POVL MUNCK and Mr. H. HOLLESEN, manufacturer—have allowed the sums lent by them, each amounting to 5000 Kr., to be used for covering the deficit of the expedition.

The starting of a large expedition in less than six months involves certain difficulties, and these made themselves strongly felt i. a. in the financing of the undertaking. Orders for many foreign articles had to be given in good time, and the payment often had to be made before the money required was at our disposal. However, gradually as the amount of the contributions increased, the extent of the desirable equipment increased, too, so that new estimates had constantly to be made to replace the old ones. On negotiation with the various firms we succeeded in most cases in getting the prices reduced as much as possible, but still the final, exact figures in the accounts generally showed a tendency to exceed the round figures of the estimates. And new, unforeseen items constantly cropped up, gradually as time went on and the actual facts disclosed many pitfalls. Thus, when at last we sailed, a number of new, round items for the return journey and extra work on the ship had been added to the original estimate, and thus it must even now appear with a number of uncertain items due to the extra winterings and return journey problems which followed in the wake of the war. Hence I still call the accounts an "estimate", though, as will appear from the statement below, by far the greater part of the expenses have been paid and balance with the income.

The income of the expedition.

Direct contributions in cash:	Kr.	Kr.
KNUTH (41,000 Kr. in cash + 10,000 Kr. deposed at the Grønlands Styrelse)	51,000.00	
THE CARLSBERG FOUNDATION	25,000.00	
THE TUBORG FOUNDATION	20,000.00	
ANONYMOUS	15,000.00	
THE TRUST-FUND OF CAPTAIN ALF TROLLE AND WIFE	13,000.00	
STATE GRANT	12,000.00	
Mr. GUNNAR LARSEN, civil engineer, F. L. Smidth & Co.	10,000.00	
Mr. A. P. MØLLER, shipowner	6,000.00	
ANONYMOUS	5,000.00	
The "BIKUBEN", providents and savings institution	5,000.00	
Mr. H. HOLLESEN, factory owner, Golf Radiator	5,000.00	
Mr. POVL MUNCK, managing director	5,000.00	
EBBE MUNCK	4,000.00	
S.	4,000.00	
JULIUS SKRIKE'S TRUST-FUND	4,000.00	
A DANISH LADY IN SWEDEN	3,000.00	
Mr. KAI MYGIND, civil engineer, London	2,500.00	
Mr. JØRGEN SAXILD, civil engineer	2,000.00	
		191,500.00

	Kr.	Kr.
	191,500.00	
Mr. Holger Hirschsprung, managing director, Hirschsprung & Sons	2,000.00	
Consul Georg Jorck	2,000.00	
Messrs. Kongsbak & Cohn, photographers	2,000.00	
Tuxham, Engine Works, Ltd.	2,000.00	
Mr. Claus Sørensen, managing director, Sea-fishery, Esbjerg	1,500.00	
Mrs. Thiele	1,000.00	
Miss Elly Grøn	1,000.00	
Mr. C. Kraemer, shipowner	1,000.00	
The Scoresby Sund Committee	1,000.00	
Mr. Johan Hansen, consul general, merchant	1,000.00	
Mr. Per Kampmann, civil engineer, Engineering Firm "Kampsax", Ltd.	1,000.00	
C. Schous Factories, Ltd.	1,000.00	
Mr. Steen Christensen, managing director, The United Coal Importers	1,000.00	
Mr. Adler Svanholm, managing director, The Danish Coal Company, Ltd.	1,000.00	
Mr. Thomas Juncker, managing director, Aarhus Oil Factory, Ltd.	1,000.00	
Mr. Th. Pedersen, manufacturer, The Insulin Factory "Novo"	1,000.00	
Mr. N.J. Haustrup, manufacturer, Haustrups Factories, Odense	500.00	
Mr. O. P. Christensen, managing director "Kymeia", Ltd.	200.00	
		212,700.00
Other sources of income:		
Sale of M/S "Gamma"	120,000.00	
"Gamma" in carrying trade for Mr. Østermann, shipowner, Marstal	18,568.84	
"Gamma" in carrying trade for Mr. A. E. Sørensen, shipowner, Svendborg	35,059.83	
Sale of postcards bearing the stamp of the expedition	5,000.00	
Sale of emergency provisions after return of "Gamma" in 1938	4,152.53	
Sale of the "Gamma"s former motor to the "Tuxham"	2,500.00	
Meteorological Institute for observations, financial year 1938—39	2,645.00	
Meteorological Institute for observations, financial year 1939—40, provisionally	836.34	
The Grønlands Styrelse remission of its part of our telegram account 1938—39	1,791.59	
Sale of the floats of the aircraft	1,000.00	
Knuth, bought outfit of expedition (tent, wireless, etc.)	754.46	
Damages for the "Gamma"s average in 1938	434.63	
Dr. Gelting, earned by lecturing	25.00	
		192,768.22
Loan:		
Mr. Claus Sørensen, managing director, contributed to Hvidberg's journey		2,000.00
		407,468.22

Estimate of the expedition.

Various expenses:	Kr.	Kr.
Office expenses at Copenhagen	3,552.66	
Expenses at sale of postcards	534.45	
Forwarding and clearance of foreign goods	490.18	
Preparation of photographic material	3,158.26	
Drawing of maps	489.50	
Solicitor's fee for three years	2,500.00	
		10,725.05
The ship and its outfit: (A)		
Purchase of M/S "Gamma"	57,004.00	
A new motor installed by Tuxham	19,803.50	
Re-building for ice navigation	19,367.30	
Extra work at ship-yard exceeding offer	13,550.38	
Sails, stove, tools, and implements	3,104.24	
		112,829.42
Sailings in 1938: (B)		
Installation and working of the ship's radio	2,510.90	
Insurance and accidents insurance	7,226.53	
Provisions for eighty days at sea for 20 men on outward and 12 men on homeward journey	5,457.18	
Extra provisions for all members for one year	8,172.15	
Harbour fees, medicine, furniture	6,326.35	
Pay of captain and crew	9,473.15	
		39,166.26
Journey of Greenlanders and dogs: (C)		
Journey of three West-Greenlanders from West Greenland to Copenhagen and their stay at the "Greenlanders' Home"	611.10	
Transport of dogs West Greenland—Copenhagen	534.28	
Internment of dogs at the "Mellemfortet"	1,952.67	
Food for the dogs on outward journey in the "Gamma"	377.84	
		3,475.89
The Mørkefjord Station and its equipment: (D)		
The station house according to offer	4,827.00	
Provision house and dogs' run	3,451.54	
Household articles and furniture	3,925.65	
Wireless instalment	10,441.95	
Motorboat	2,275.04	
74 West Greenland dogs	2,220.00	
		27,141.18
Aircraft and pilot:		
Insurance, purchase and fixing of floats	7,469.85	
Pilot's fee	1,222.75	
		8,692.60
		202,030.40

	Kr.	Kr.
Wintering 1938—39: (F)		202,030.40
Pay of three Greenlanders	5,700.00	
Pay of four wintering members + a "summer man"	23,204.00	
Alwin Pedersen's participation in the expedition	4,742.46	
Provisions for eight men for two years	10,677.87	
Outfit for eight men for two years	12,237.26	
Scientific outfit	5,869.51	
Photographic outfit	6,459.50	
Fuel (kerosene, oil, petrol, etc.)	3,394.80	
Camping and sledge journeys	5,096.42	
Pemmican for men, meatpowder chocolate	1,076.30	
Dog-pemmican	7,983.36	
Sledge wireless	600.00	
Shooting and fishing gear	2,605.97	
Telegram account for Mørkefjord	4,665.72	
		94,313.17
Sailings in 1939:		
Voyage in "Gustav Holm", stay at Isafjord, voyage in "Dronning Alexandrine"		3,815.28
Wintering 1939—40:		
Pay of four members of the expedition (4,505.50 Kr. of which were not paid out on May 1st, 1942)	13,067.00	
Provisions	1,124.49	
Equipment	1,414.46	
Scientific outfit	1,919.36	
Various articles ordered	4,663.60	
		22,188.91
Sailings in 1940:		
Haarløv's return journey (so far)	1,519.41	
Three new men sent up with the sealer "Vesle Kari" (Norwegian Kr. 7,500.00)	8,832.75	
		10,352.16
Wintering 1940—41:		
Pay of six members (10,558.50 Kr. of which were not paid out on May 1st, 1942)	17,600.00	
Various articles ordered	3,435.54	
Telegram account for Mørkefjord	175.21	
		21,210.75
M/S "Gamma" in carrying trade:		
Expenses of the office in Copenhagen	4,044.06	
Expenses of Mr. Østermann, shipowner, Marstal, during carrying trade June 6, 1939—October 10, 1940	17,856.26	
Expenses of Mr. A. E. Sørensen, shipowner, Svendborg, during carrying trade August 1, 1940—March 2, 1942	36,140.01	
		58,040.33
		411,951.00

	Kr.	Kr.
		411,951.00
Interest on loan from the Commercial Bank	7,171.50	
Interest on loan granted by Mrs. O. MUNCK	765.77	
One-fourth of the expenses due to the average of the "Gamma"	1,433.27	
Extra expenses for repairs and new articles bought besides the classification,	1,136.02	
		10,506.56
Sale of M/S "Gamma":		
Commission + stamps and fees		3,124.00
		425,581.56

Statement on May 1st, 1942.

Expenditure (paid):		
Various expenses	10,725.05	
The ship and its outfit	112,829.42	
Sailings in 1938	39,166.26	
Journey of Greenlanders and dogs	3,475.89	
The Mørkefjord station and its outfit	27,141.18	
Aircraft and Aviator	8,692.60	
Wintering 1938—39	91,439.04	
Sailings in 1939	3,815.28	
Wintering 1939—40	17,683.41	
Sailings in 1940	10,352.16	
Wintering 1940—41	10,477,04	
The "Gamma" in carrying trade	68,546.89	
Expenses connected with the sale of the "Gamma"	3,124.00	
		407,468.22
Income:		
Direct contributions in cash	212,700.00	
Other sources of income	192,768.22	
Loans	2,000.00	
		407,468.22

Long date estimate.

Total estimated expenditure	425,581.56
Total income	407,468.22
Deficit...	18,113.34

The deficit arose from the following items not yet due.

Debt to the Grønlands Styrelse for telegram account paid to the State	2,874.13	
Arrears of pay for wintering 1939—40	2,505.50	
Mr. CLAUS SØRENSEN's contribution to HVIDBERG's journey	2,000.00	
Arrears of pay for wintering 1940—41	10,558.50	
Telegram account 1940—41	175.21	
		18,113.34

In addition to the aforementioned contributions in cash, the expedition has received the following contributions in kind of a total value of c. 7000 Kr.:

Mr. Søren Jensen, merchant: A large Dannebrog flag for the station.
The Danmarkssamfundet: Ten smaller flags.
Søfartens Bibliotek (library of the shipping trade): 180 books, comprising light literature as well as scientific works and handbooks.
Gyldendalske Boghandel Nordisk Forlag A/S: Books of our own choice.
Frederik E. Pedersen, publishers: Various books.
The Commission for the Scientific Investigation of Greenland: All the volumes of the "Meddelelser om Grønland" dealing with Northeast Greenland.
The Geodetic Institute: Maps of Northeast Greenland.
Alfred Benzon's Chemical factories: Medicine-case for eight men for two years.
The Krone-Apotheket: Medicine chest for use on the ship.
Ferrosan, Ltd., Copenhagen: Vitamin tablets for five men for 200 days.
Dr. A. Wander, Ltd., Copenhagen: 100 tins of Ovomaltine.
The "Danmark", fishing-net factory, Helsingør: Two salmon nets.
Mr. P. O. Bacher, Torvegade, Copenhagen: Four pairs of anoraks and fabric gloves.
J. C. Hempel's ships' paint factory: Paints for the ship and the house.
Plesner Davidsen & Co., Ltd.: 174 pieces of Insulite building plates for the house.
Rockwool, Ltd.: Insolation mats for the house.
The "Lyac", accumulator factory, Ltd.: One battery DF 13a with handle.
Hellesens Enke & V. Ludvigsen: Electric torches, elements, and batteries.
Alfred Olsen & Co., Ltd.: 20 tons Solar oil for the ship.
Association of Coal Importers in Copenhagen: 20 tons of household coal, 5 tons briquets, and 2 cubic meters of fire-wood for the station.
Det Danske Petroleums Aktieselskab: 8 barrels of lubricating oil for the ship.
The United Oil Company, Ltd.: 25 barrels of kerosene and 4 barrels of petrol.
The Carlsberg Breweries: Six cases of beer.
The Tuborg Breweries: Six cases of beer.
Messrs. Martin Dyrbye: 75 kg of Java Coffee.
The newspaper Berlingske Tidende: Twenty packets of newspapers.

Finally the expedition received the following things on loan:

The War Ministry: A Tiger-Moth airplane.
The Naval Ministry: A 5.5 m life-boat.
Mr. M. P. Pedersen, civil engineer: Long-wave transmitters with accessories and spare parts, both for the ship and the station on land.
The Geodetic Institute: Observation instruments, mounts, levelling rods, etc.
The Meteorological Institute: Observation instruments.
Messrs. Iver C. Weilbach & Co.: Aircraft sextant, sounding apparatus, and other instruments.
The "Silva", Ltd., Stockholm: Compasses for use on journeys.
Messrs. Kongsbak & Cohn: A film apparatus, Siemens B. 16923.

2. The members of the expedition.

A. Summer members:

EBBE MUNCK, in conjunction with KNUTH starter and leader of the expedition. Born Jan. 14, 1905, at Copenhagen, matriculated from Ordrup Secondary School 1922, cand. polit. from the University of Copenhagen 1928. Member of Captain Einar Mikkelsen's Scoresby Sund Expedition 1924, of Charcot's expedition in "Pourquoi-pas?" 1926, of Augustine Courtauld's East Greenland Expedition 1935 (during which he ascended Gunnbjörns Fjæld, the highest mountain of Greenland). On the staff of the Copenhagen newspaper "Berlingske Tidende" from 1929, where he took charge of the foreign correspondence from Berlin and London. War correspondent during the Spanish Civil War.

MICHAEL HANSEN, aviator. Born Jan. 14, 1903, at Copenhagen. Preliminary Exam. 1920, radio certificate 1st class 1921, Army Flying School 1927—29, Military College 1932—34, first lieutenant 1934. Competed with a Desoutter-airplane in the international aviation race to Melbourne and back 1934, and in the autumn of 1937 flew from Copenhagen to Capetown and back. (Book: "Paa danske Vinger i Syd og Nord", Fred. E. Pedersen, publishers, 1941).

AAGE GITZ-JOHANSEN, painter. Born Aug. 20, 1897, at Odense, matric. from Odense Grammar School 1916, cand. phil. 1917, studied zoology at the University of Copenhagen for four years. Visited Greenland for the first time in the summer of 1933, returned to Greenland in November of the same year and spent the winter 1933—34 at Sukkertoppen; subsequently wintered at Angmagssalik 1935—36 and visited Thule in the summer of 1937. (Books: "Skitzebogsblade fra Angmagssalik 1935—36", and "Tasiusaq, tolv Original-Træsnit", both in "Publikationer om Østgrønland Nr. 7", and illustrations for numerous books on Greenland).

FLEMMING ANDERSEN, zoologist. Born June 2, 1918, at Copenhagen. Matric. Birkerød State School 1937, cand. phil. 1937, stud. mag.

B. Wintering Party:

EIGIL KNUTH, leader. Born Aug. 8, 1903, at Ordrup near Copenhagen. Matric. Østre Borgerdydsskole 1921. Assistant to Mr. Roussell, of the National Museum, during excavations of the Norse ruins in the district of Godthaab in the summers of 1932 and 1934. Assisted Mr. Helge Larsen, of the National Museum, in excavations of Eskimo ruins in the Kangerdlugssuaq district, East Greenland, summer 1935 (Courtauld Expedition). In the summer of 1936, as a member of the "Expedition Française Transgroenland", traversed the inland ice from west to east, and spent the winter alone working as a sculptor at Angmagssalik 1936—37. (Book: "Fire Mand og Solen", publishers: Gyldendal 1937).

PAUL GELTING, botanist. Born March 30, 1905, at Aakirkeby, Bornholm. Matric. Rønne State School 1923, cand. mag. 1931, Ph. D. University of Copenhagen 1937. Wintered at the station Eskimonæs, Clavering Ø, East Greenland 1931—32 as a member of Dr. Lauge Koch's Three-Year Expedition, and in 1933 as a member of the same expedition travelled along the east coast from

Scoresby Sund to Wollaston Forland. (Papers: "Studies on the Vascular Plants of East Greenland between Franz Joseph Fjord and Dove Bay" (Medd. om Grønl. Bd. 101, Nr. 2) and "Studies on the Food of the East Greenland Ptarmigan" (thesis for the doctorate) 1937 (Medd. om Grønl. Bd. 116, Nr. 3)).

Eigil Hans Aage Nielsen, zoopalæontologist. Born at Copenhagen Aug. 16, 1910, matric. Sorø Academy 1929, mag. scient. 1935. First visit to Greenland in the summer of 1931 as a member of the Danish Three-Year Expedition 1931—34, travelled along the stretch from Eskimonæs to Scoresby Sund. Wintered on the same expedition at Eskimonæs 1932—33 and further at Eskimonæs 1936—37 and at Scoresby Sund (as leader of the party) 1937—38. Main working-field: Cape Hold with Hope. (Papers: "Ophiurans from Panama, California and the Strait of Georgia" 1932 (Papers from Dr. Mortensen's Pacific Expedition 1914—16), "Permo-Carboniferous Fishes from East Greenland" 1932 (Medd. om Grønl. Bd. 86, Nr. 3), "The Permian and Eotriassic Vertebrate-bearing Beds at Godthaab Gulf" 1935 (Medd. om Grønl. Bd. 98, Nr. 1), "Some few preliminary remarks on Triassic fishes from East Greenland" 1936 (Medd. om Grønl. Bd. 112, Nr. 3)).

Svend Valdemar Sølver, meteorologist, geologist (primary rocks), cartographer. Born Aug. 1, 1911, in Germany. Matric. Gammel Hellerup Gymnasium 1929. Graduated from the Royal Technical College of Denmark January 1936. Later studies at the Kungliga Tekniska Högskolans Avdelning för Bergsvetenskap, Stockholm. Wintered in Greenland 1933—34 at the magnetic observatory of Godhavn. In 1936 member of Dr. Lauge Koch's expedition, working at Julianehaab. (Papers: "Minedrift paa Grønland" (Det Grønlandske Selskabs Aarsskrift 1940)).

Kurt Henry Bæk, wireless operator and aircraft mechanician. Born Oct. 22, 1909, at Copenhagen. Wireless certificate 1936. Wireless operator of the Royal Danish Army Flying Corps.

Alwin Joseph Hermann Pedersen, zoologist. Born Aug. 20, 1899, at Osnabrück (Danish subject), cand. rer. nat. at University of Münster 1924. Wintered at Scoresby Sund 1924—25 on Captain Einar Mikkelsen's expedition, 1927—29 two consecutive winterings at Scoresby Sund on independent expedition, 1931—33 two consecutive winterings on Clavering Ø and Hochstetter Forland on the Danish Three-Year Expedition, 1935 summer journey alone in West Greenland. (Papers: "Beiträge zur Kenntnis der Säugetier- und Vogelfauna der Ostküste Grönlands" 1930 (Medd. om Grønl. Bd. 77, Nr. 5), "Der grönländische Moschusochse" 1936 (Medd. om Grønl. Bd. 93, Nr. 7), "Die Ornis des mittleren Teiles der Nordostküste Grönlands" 1934 (Medd. om Grønl. Bd. 100, Nr. 11). Further the following books: "Der Scoresbysund" 1930, Aug. Scherl, Berlin, "Polardyr" 1934, Gyldendal, Copenhagen, and "Arktiska Fåglar" (Prof. Hjalmar Rendahl and Alwin Pedersen, Åhlen & Söner, Stockholm).

Ove Rossbach, Greenlandish assistant. Born Nov. 27, 1912, hunter from Rodebay, Disko Bugt, West Greenland.

Sakæus Sandgreen, Greenlandish assistant. Born Jan. 17, 1913, hunter from Akunak, Disko Bugt, West Greenland.

Eli Kristiansen, Greenlandish assistant. Born June 13, 1913, hunter from Jacobshavn, Disko Bugt, West Greenland.

3. How the expedition was started.

The thought of undertaking an expedition to Greenland together had for several years been cherished by cand. polit. EBBE MUNCK and myself, and was seriously considered in 1935 while we were both onboard the "Quest" in the East Greenland waters as members of the English expedition led by AUGUSTINE COURTAULD. We were induced partly by our love of the nature of Greenland and our interest in its problems, partly by a sense of what was due to our nation, which told us that now was the time if our generation, too, was to add its quota to the Danish exploration work in Greenland. Generation after generation had made their contributions to the long chain of this work and honourably maintained Denmark's right to the country. Systematically and thoroughly the investigations had dealt with area after area of the immense stretch of coast of the largest island of the world. Hardly had the men of one generation concluded their work before a fresh party was ready to step in, and this tradition must be continued. It is true that the men whom we were to succeed were investigators of great merit, thus KNUD RASMUSSEN, who died in 1933, LAUGE KOCH, whose large Three-Year Expedition had recently ended, and EJNAR MIKKELSEN, who had entered the service of the Administration of Greenland as Superintendent for East Greenland. We were aware that neither our scientific nor our administrative qualifications made us worthy successors to the work of such men, but if our generation was to contribute anything, who was to take the initiative, if we did not? It was not that we claimed to be more than we were, but our generation must at any rate show to the best of its ability that it had the same good will and the same understanding of the traditional duties of the nation as its predecessors. With the courage of youth, its love of adventure, and probably also some of its audacity, we jumped at the chance and started an expedition to the northernmost parts of East Greenland in the summer of 1938.

The actual cause which made us take action was a cablegram from the Russian PAPANIN group ("Station Northpole") arriving shortly before Christmas 1937, announcing that on their drift on the ice-floe from the Polar basin down towards the east coast of Greenland they thought they had sighted land between Spitsbergen and Nordostrundingen. Thus for the third time in the course of thirty years an expedition reported the existence of the "Fata Morgana Land" in these waters. Whence the message came, was never cleared up, nor was the statement ever confirmed—PAPANIN's diary from the ice-drift published later does not say one word about the Fata Morgana Islands, and there is every reason to believe that the whole thing is due to a misunder-

standing on the part of the receiver[1]). However, even if the message itself was merely a Fata Morgana, it was sufficient to revive the old theories and provide fresh food for the imagination.

Hence it came to pass that the seeds of two new Danish Greenland expeditions could grow up independently of each other about the New Year of 1937—38: LAUGE KOCH's "Seaplane Expedition to Peary Land 1938" and "The Danish Northeast Greenland Expedition 1938—39", on the latter of which an account will be given here. To begin with both were speeded up by the realisation that in the general search for the Fata Morgana Islands which might be anticipated to be the consequence of the Russian cablegram, Denmark must necessarily assume a kind of leadership because the new land was situated in the immediate vicinity of Greenland. In his account of his Peary Land Expedition Dr. LAUGE KOCH expresses this thought as follows (L. K.: "Survey of North Greenland", Medd. om Grønl. Bd.130, Nr.1, p. 304): ". . . since, according to the few and vague observations, it must be assumed to be situated nearer to Greenland than to Spitsbergen, it was natural for Denmark to take up the task". And in the first circular applying for financial support which EBBE MUNCK and I composed we said: "The latest observations have rendered the question as to the final discovery and exploration of the islands burning, and it is probable that attempts will be made from foreign quarters to reach the unknown land. It is obvious that Denmark should not be lacking in this race, among other things because the land is situated nearest Greenland and, geographically, belongs to our northern colony" (translated from the Danish).

Only a little more than a month of the year 1938 had elapsed when EBBE MUNCK and I discovered that others in this country besides ourselves entertained the idea of starting an expedition to the Fata Morgana Islands. We instantly communicated with Dr. KOCH, and there was a mutual candid revelation of our various plans, after which EBBE MUNCK and myself had in private to make a thorough revision of our hitherto somewhat vague project in favour of the more extended programme which subsequently became the aim of the "Danish Northeast Greenland Expedition".

From the outset we had been aware that to base a large and costly expedition exclusively on the discovery of some doubtful islands would be an irresponsible undertaking. A real object on the east coast of Greenland must be aimed at in order to justify the expedition and ensure a result, if the Fata Morgana Land should not exist. That land could only be the possible extra prize. Dr. KOCH, too, had such an object, in itself great and important: he meant to fly over Peary Land, the northern-

[1]) For this, as for the Fata Morgana Islands altogether, see below.

most land area not only in Greenland but on the whole globe, and to photograph it from the air. At the instance of Dr. KOCH, who allowed us to profit by his experiences from East Greenland, MUNCK and I now directed our attention towards the vast stretches of the Northeast Greenland coast situated between 76° and 82° N. lat., the former working field of the Danmark-Expedition, never explored since the days of MYLIUS-ERICHSEN and his men, but still presenting many features which required to be explored. As a vain hope, which would only be fulfilled in the most favourable circumstances, we extended our working area northward to Peary Land, where our scientists in the field could supplement Dr. KOCH's observations from the air. A necessary consequence of this extension of our programme was that the expedition changed its character, aiming now at wintering in Northeast Greenland instead of making a mere summer journey.

During the thirty years that had elapsed since the stay of the Danmark-Expedition in Northeast Greenland numerous Danish scientists had been at work in other parts of the enormous coast stretches of Greenland, and through their results had created new problems of a topical character in the area which had in the interval remained unexplored partly on account of its inaccessibility. The constant development within all branches of science with consequent alterations of views and methods will make itself largely felt in the course of thirty years. Among the questions which thus obtruded themselves in Northeast Greenland there were in the first place geological (zoo-palæontological), botanical, and archæological problems, and naturally these questions did not exist merely theoretically, but within the younger generation of scientists were incarnated in people who had themselves contributed to their creation by their investigations in Greenland. By the burning desire of these people to go to the area it was contemplated to visit, and to set to work on certain tasks within their branch of science, the expedition acquired its solid foundation.

KOCH called our attention to some of these people and the work they might be expected to do in Northeast Greenland: the zoopalæontologist m. sc. EIGIL NIELSEN and the botanist Dr. PAUL GELTING had both been members of his Three-Year Expedition, and without hesitation immediately pronounced themselves willing to winter with our expedition in Northeast Greenland; thus Mr. NIELSEN, who at that time was staying in East Greenland for his second year in succession, was not alarmed by the idea of having his isolated life prolonged by another year—or perhaps for an unknown space of time. Dr. GELTING was staying in Copenhagen, and with his enthusiasm for our plans he became a great moral support for the expedition during the start, which is always so difficult.

The engagement of an archæologist did not proceed quite so smoothly, not from any lack of inclination or of scientists for this post, but because the various archæologists of the National Museum who could come into consideration were each of them engaged in work that could not be postponed. The Museum then requested me to undertake the archæological investigations on the expedition. This request placed me in a difficult position, because I had not contemplated wintering myself, whereas I had been looking forward with great pleasure to a resumption of my activities as a sculptor at Angmagssalik, where a house, plaster, and clay awaited me. However, the Museum could suggest no one else, and since the special conditions in Northeast Greenland made it quite unjustifiable to strike archæology off the programme, and I was keenly aware of the fact, as this science is particularly near to my heart, I accepted the confidence that was bestowed on me, agreed to be the archæologist of the expedition, and made up my mind to pass the winter in Greenland in company with the other members.

4. The aims on which the expedition was based from the beginning.

An expression of how the whole project of the expedition now took shape will best be gained from the letter which Ebbe Munck and I on the 1st of May sent to the Carlsberg Foundation, applying for financial aid. After an introduction the application runs as follows:

"The expedition is planned to leave Copenhagen in its own ship about July 1st, bound for the northeast coast of Greenland, the stretch from Danmarks Havn to and including Peary Land having been chosen for its field of operation. The ship is meant to enter the drift ice belt between 74° and 76° N. lat., and an attempt will be made to reach the land water off Store Koldewey. From this point it is intended to push as far northwards as the ice conditions permit, our aim being to build a house in Ingolfs Fjord in 80°30′ N. lat. In addition to this house, a botanist, a geologist, an archæologist, and a wireless operator will be disembarked to pass the winter there, besides four Greenlanders, who with their dogs and sledges will be at the disposal of the scientists during their journeys in the terrain.

As these journeys will be long and will take place in tracts poor in game, they must be backed up by the establishment of large depots and small houses as substations. At the main station in Ingolfs Fjord the wireless operator will establish a regular communication with the surrounding world by the aid of a small transmitter, which is able to communicate with the larger Danish stations farther south at Eskimonæs and Ella Ø. At the same time he will undertake the meteorological observations recommended to be made by the Meteorological Institute at Copenhagen, and for which the latter will supply the apparatus.

The ship will return to Denmark and will fetch the expedition in the summer of 1939 either at Ingolfs Fjord or, if this is hindered by the ice, at Danmarks Havn,

to which place the wintering members will in that case go by sledge, drawing support from a depot laid out in 1938.

EIGIL KNUTH, who is to be the leader of the wintering party, traversed the inland ice in 1936 and stayed one year at Angmagssalik, thus gaining experience in travelling with dog sledges and a knowledge of conditions in East Greenland. He has been chosen by the National Museum to undertake the archæological field work, with which he is familiar after three summers' excavation work on the west and east coasts of Greenland. It is known that several summer and winter settlements (left by the Eskimos) occur within the area, and the questions it will be possible to solve on this expedition are, partly the establishment of the northern limit of the southern Eskimo cultures, partly the immigration road of the northwestern cultures. From the material so far available from Northeast Greenland it has been impossible to separate with certainty the elements coming from the north from those coming from the south. The winter houses found by the Danmark-Expedition at Sophus Müllers Næs and Eskimonæsset, however, may render it possible to find the culture coming from the north entirely unmixed, and the same applies to an even greater extent to the settlements at Danmarks Fjord and Independence Fjord, whence tent rings, meat caches, and fox traps are known, and where there is every reason to believe that the Eskimos have wintered, too. The comparative frequency of relics of this culture along the coasts of these fjords viewed in connection with the scarcity of finds from the northeast coast of Peary Land would seem to suggest that the Eskimo immigration from Arctic Canada into Northeast Greenland mainly took place by way of Wandels Dal and Brønlunds Fjord west of Peary Land. However, the question as to the road of immigration still awaits its solution, which, in the most favourable case, may be secured on this expedition. By comparing the finds with the excavated material recently brought home from Thule by Mr. ERIK HOLTVED, m. sc., there is, moreover, a basis for determining the time of the immigration.

The geologist, m. sc. EIGIL NIELSEN, is at present staying at Scoresby Sund, but will be fetched by the "Gertrud Rask" when she calls at the colony, and will join the expedition in Iceland. He has passed three winters on the east coast of Greenland, exploring the geology of the fjord complexes, and has published several papers on these investigations in the "Meddelelser om Grønland". He has long desired to add as a link in his work an investigation of the Permo-Carboniferous sections of Mallemukfjældet near Ingolfs Fjord. This wish may now be fulfilled, and in addition there will be an opportunity of investigating analogous sections on Herlufsholms Strand north of the mouth of Independence Fjord. On his journeys he will further be able to explore the intermediate areas of Nordostrundingen and near Danmarks Fjord, which will mean an investigation of the northern parts of the East Greenland geosyncline. He will be able to determine its boundary towards the North Greenland geosyncline, notably the eastern limit of the Thule Formation, of which the land around Danmarks Fjord is reported to consist.

The botanist PAUL GELTING, Ph.D., who has previously wintered in East Greenland and worked there for three summers, and has published several papers on his investigations in the "Meddelelser om Grønland", intends to continue his study of the botanical problems, pushing these problems to their extreme limits in the north. He will have his base at the winter station in Ingolfs Fjord, where he will place self-registering thermographs in the different vegetation types in order to gain an insight into the annual course of the temperature in the vegetation layer proper and at the level of the roots about 10 cm below the crust of the soil. After some instruction it may be left to the wireless operator living constantly at the

station to attend to the self-registering apparatus, so that Dr. GELTING may be free partly to carry on a floristic investigation of the country, partly to make statistical analyses of the vegetation and study the biology and ecology of the plants on journeys and during stays in suitable places. In addition he will measure the snow-covering in the vegetation types and note its duration, study the hydrogen-ion concentration, and collect mosses and lichens.

At the suggestion of Mr. R. SPÄRCK, Ph.D., it is contemplated to induce a zoologist to join the expedition; he has, however, not yet been chosen. The zoologist is either to winter or to return with the ship in the autumn, so that the expedition will have at any rate zoological and especially entomological investigations on its programme for the summer months.

The main objects of the expedition outlined here may, as a result of certain external circumstances, undergo some modifications, which will be mentioned here in view of two different possibilities. If the existence of the new, so-called Fata Morgana Land between Nordostrundingen and Spitsbergen is ascertained on Dr. LAUGE KOCH'S flights, and if the ice conditions in its immediate neighbourhood prove favourable, our expedition will consider it a secondary object to try to go ashore there for the purpose of scientific investigations. Should the land exist, and a landing in the present summer prove to be risky or impossible, there will be another opportunity of making the attempt when the expedition is fetched in 1939. Finally, the ice conditions may be so unfavourable this summer that the expedition is prevented from reaching its goal, Ingolfs Fjord; that, however, will cause no change except in the place for the wintering station, for the house may be erected farther south, on Lamberts Land or in Skærfjorden, whence the above-mentioned working fields may be reached by boat in the summer and by sledge in the winter."

The importance of climatological work had been confirmed by the chief of the Danish Meteorological Office, Director D. LA COUR, in a letter dated April 29th, 1938, which we had enclosed in our application to the Carlsberg Foundation:

"In connection with the plans of establishing a base for various scientific investigations in Northeast Greenland in the coming summer I should like to state that it must be warmly recommended to utilise this opportunity of securing, also, systematic meteorological observations from these regions. If it would be possible to carry through regular meteorological observations for a year at a fixed station in Northeast Greenland, this material will mean an exceedingly valuable addition to our knowledge of the weather conditions in this part of Greenland.

(Signed) D. LA COUR."

In connection with our application to the Carlsberg Foundation quoted above, an extract of the letter to EBBE MUNCK and myself in which the zoologist ALWIN PEDERSEN asked for permission to join the expedition may be given here. Like the scientists already mentioned, ALWIN PEDERSEN not only had preconceived plans for an exploration journey to Northeast Greenland, but his realisation of them was in active progress in order that he might set out and solve his special tasks, which were described as follows:

"My main object will be a continuation of previous studies on the biology and occurrence of the musk-ox, but in addition collections of mammals and birds for the Zoological Museum of the University will be made. Finally my work is to comprise such investigations and collections as may contribute to clearing up the causes of the periods of decline which have prevailed among the land mammals of Northeast Greenland in recent years."

These three letters indicate the main objects on which the expedition was originally based. As regards their accomplishment it will be seen that natural reservations were made in the presentation of the project. Arctic expeditions must necessarily have a greater element of uncertainty about them than most other undertakings, and it will indeed appear from the following account that while some objects were attained, others were not. The alterations were chiefly due to the change we were compelled to make in the placing of the wintering station; however, the optimism of our project must be viewed from the angle that, naturally, a plan must express positivities, and that too vague and uncertain a project would hardly have inspired sufficient confidence in quarters whence we hoped for financial aid. And for ourselves, too, it was necessary, in the further development of our plans, to have a fixed framework with distinct lines to guide us.

The final results will not be evident till the publications of all the members of the expedition within all fields will one day be available. It may be stated here, however, that the main objects, as set out in the project, in spite of the aforementioned modifications, were solved in all essentials, as will appear from the report. Some objects had to be abandoned, but this was made up for by the extension of the programme which was a consequence of the further practical development of the expedition.

5. Extension and further development of the scientific programme.

The admission of Civil Engineer SVEND SØLVER as a member of the wintering party made it possible to carry out geological investigations of the bed-rock and extended geological activities altogether. In the place of the geodetists we had been hoping would join us, SØLVER further thought he could undertake mapping work within minor areas, i. a. as a support for the work of the botanist in the environs of the station. Finally, it was possible by SØLVER's help considerably to increase and stabilise the meteorological work, which he hoped he would be able to supervise and devote his time to during the greater part of the year, so that the climatological observations at the station could be sup-

plemented by observations from a substation at a greater altitude, by observations and photographing of northern lights, measurements of the thicknesses of the ice, careful adjustment of instruments, etc. Thus an independent meteorologist was added to the expedition, and as such SØLVER received instructions from, and took over the negotiations with, the Meteorological Institute.

This further allowed the wireless operator, at any rate while SØLVER was staying at the station, to be partially relieved of the work entrusted to him, so that he could devote more of his strength to his own branch of work. A modern expedition under primitive conditions makes great claims on its wireless operator; hence it was of great importance for us to find the right man, not least if our plans of a collaboration with an aircraft were to be realised. In Mr. KURT BÆK, field mechanician, who was recommended to us by the Royal Danish Flying Corps, we found precisely the man we wanted, a man who, besides holding certificate as a wireless operator, was both a radio and an aircraft mechanician. By his thoroughness, care, and mechanical genius BÆK raised his part of the work of the expedition from a mere technical job to scientific work in itself; as will be mentioned below, he very soon obtained astonishing results by the aid of his apparatus, and carefully collected his observations on the reactions registered under the extraordinary conditions caused by the time of darkness, the northern lights, and the climate. Since his experiences will be of value for the wireless technique as a whole, as well as for future expeditions, they will be published by him in a separate paper coordinate with the other publications, in which way an unexpected addition will be made to the contributions of the expedition.

Thanks to the liberality of the War Ministry and his chiefs in the Flying Corps, BÆK was granted one year's permission and allowed to retain his post and minimum pay.

In the zoological field also the programme was extended, the expedition being joined by a young student at the Zoological Museum, stud. mag. FLEMMING ANDERSEN, who, as a summer member, was to make collections chiefly of skeleton material and birds. Finally, the expedition found an experienced zoological observer and collector of insects in the painter GITZ-JOHANSEN. With private aid from the trust-fund of Alf Trolle and Wife he made it his main object to make sketches and water-colour studies during the summer months, returning to Copenhagen in the "Gamma" with the other summer members.

6. The ship, its re-building and outfit.

(Estimate: A).

Our endeavours to acquire a ship of our own for the expedition were dictated by the consideration that in this way we should be more independent and have a greater chance of penetrating through the drift ice and pushing as far northward as was our aim. With chartered ships one will in most cases be restricted in one's dispositions by the regard of their owners, who dare not expose their ships to excessive risks; thus, for instance, one of the ships of the Greenland Administration, for the loan of which we had first thought of asking, always sailed under certain clauses: it was not to be exposed to too heavy ice, and on its homeward journey it was to be out of the ice before a stipulated date.

The Greenland Administration kindly placed at our disposal Captain PEDER MARCUS PEDERSEN, KNUD RASMUSSEN's well-known skipper i. a. from the Fifth Thule Expedition; he was to sail our vessel northward and altogether assist us in the purchase and re-building of our ship. For a great number of years he had been in charge of the sailings to and from KNUD RASMUSSEN's station Thule in the Kap York district, West Greenland, and after KNUD RASMUSSEN's death, when the State had taken over the station, he had passed into the service of the State.

Many and long negotiations with ship-brokers took place before we could make up our minds to choose one of the ships available. We should have preferred a real Norwegian sealing vessel, built for ice navigation, and felt much inclined to buy a small vessel named "Isfjæld", but unfortunately it was too expensive, and it would also have involved too great expense to have it brought to Denmark. The result was, therefore, that we decided to buy the "Gamma", a three-mast Danish motor schooner, of Svendborg, at a price of 57,000 Kr.—it had this name already, and we saw no reason to alter it. It was of oak wood, built in 1919 by CHR. J. JENSEN, Thorseng (Troense), and was stated to be of the following dimensions: length 93′5″, width 23′1″, draught 9′6″—English measures, and tonnage: 136 gross and 103 net register tons, dead weight tonnage 200 tons.

When the purchase was made on June 1st, the "Gamma" was in Finland to fetch a cargo of timber; however, the order was transferred to another party, and the ship arrived at Copenhagen on June 8th, where MUNCK and I surveyed it in company with Captain PEDERSEN; extensive re-building and strengthening were required before it would be safe to use the ship in the Greenland ice, and as there was no time to waste, it was immediately sent to a ship-yard. Here it was provided with an outward ice-sheathing, first of oak timber and then of iron plates, internal strengthening in the shape of extra frames and trans-

verse stays in the hold. The bulkhead of the forecastle was shifted slightly astern, so that additional berths could be fitted in the space; a large deckhouse was built on top of the whole front hatch, containing a common mess room, four berths, and a wireless room; a crow's nest

Fig. 1. The "Gamma" being provided with an ice-sheathing at the dockyard.

was placed on the foremast, strong brackets were arranged on the deck astern to carry the aircraft, and finally the old Vølund motor was replaced by a new Tuxham auxiliary motor of 1938, which would be better fitted to struggle with heavy ice blocks and push them aside. After all this had been done, the tonnage of the "Gamma" had been slightly altered, viz. to 146 gross register tons and 80 net register tons, with 124/144 H.P. The dimensions of the remaining part of the hatch were 13.5′ × 11′ Danish measures.

In addition to the aforementioned extensive repairs of the ship, numerous minor pieces of work were done, so that this item of the

estimated expenditure of the expedition rose in an alarming degree: a new water tank, jolly-boats, stoves, aerials, sail, cordage, tools, berths, etc., etc. Altogether the "Gamma" became a handsome and worthy expedition ship, which stood its test in the ice, even though owing to some unforeseen defects it could not be termed an ideal ice vessel. The drawbacks were as follows:

1) The wheel house was placed too low, hidden behind the deck house astern so that the steersman had no view of the ice and could only with difficulty see and hear the look-out in the crow's nest. There ought to have been a steering device on a bridge elevated above the deck house.
2) When the motor of the ship was exchanged, it was neglected to fit in oil tanks wherever a non-utilised space was found, and the consequence was that oil barrels had to be stowed in a double layer on the deck, which was already full of goods.
3) The exhaust pipe of the motor ran perpendicularly up through the roof of the deck house, so that everything onboard was blackened by a thick layer of soot, and you could hardly move for dirt. This might have been avoided by carrying the pipe through the ship's side.

The wireless installation of the ship, like our other wireless equipment supplied by the firm M. P. PEDERSEN and installed by Mr. WINTHER, consisted of a 150 Watt short-wave transmitter with a wave range of from 16 to 56 m and a long-wave transmitter with a wave range of from 600 to 800 m. Together with the wireless installation in the wintering house, this station onboard the "Gamma" and its functions will be described in more detail by the wireless mechanician and operator of the expedition KURT BÆK (Medd. om Grønl. Bd. 127, Nr. 3). Its call signal became OUTJ.

7. The ship's company.

(Estimate: E).

PEDER MARCUS PEDERSEN, Captain.
K. NIELSEN VOGN, mate.
THORVALD PEDERSEN, motorman.
ANDREAS HVIDBERG, steward.
AAGE SØRENSEN, best hand.
EGON JØRGEN LUND PETERSEN, A.B.
OLFERT KAABER ERIKSEN, ordinary seaman.

Poul Dyrbye Grumsen, ordinary seaman.
Mogens Barfoed, deck hand.

After Aage Sørensen, best hand, had been paid off at Akureyri owing to illness, the Icelander Bragi Svanefag was engaged as sailor.

8. The aircraft.

(Estimate: C).

From the outset an aircraft was included in our programme to enable us to reach the Fata Morgana Islands. At first I thought of a plane of the autogyro type, which could ascend vertically from an ice-floe by the aid of an extra horizontal propeller and likewise descend vertically and land on the supposed islands. My proposal did not meet with the approval of Ebbe Munck or other experts in flying whom we consulted; they placed more confidence in an ordinary airplane, where the elements of risk were known, and as to which experience from Greenland was available. Gradually as the search for the islands came to occupy a place in the background, the question of an air-plaine, too, was set aside, and at one time it was almost entirely given up on account of economic problems.—In spite of the statements of the experts I am still of opinion that an airplane on the autogyro principle must be the most suitable machine under conditions such as those of Northeast Greenland, where landings are to be made on rough ice, islands, small coastal areas, or in narrow fjords, and I believe it will one day be used up there.

Shortly before the departure of the expedition, when our economic prospects brightened a little, the question of an airplane was again considered on the ground that as a means of reconnaissance in the ice it would very considerably increase our chances of reaching the coast and in a given situation might even save the prestige of the whole expedition. From this point of view, therefore, it was no extra thing, no article of luxury, but on the contrary a kind of insurance premium for all that was otherwise invested in the expedition both of time, work, and money. To have one became a necessity—a duty.

And thanks to the good will shown to us from many quarters, not least from the chief of the War Ministry, Major General von Stemann, and the chief of the Royal Danish Army Flying Corps, Colonel Førslev, our wish to carry an airplane with us was realised. However, an airplane, complete and suitable for the purpose was not available, but, like the ship, had to be pieced together. That this was possible technically in the course of the very limited time at our disposal, was due not least to the fact that the very clever Australia-pilot, First Lieute-

Fig. 2. Captain MICHAEL HANSEN in our de Havilland Moth plane. Photograph by SVEND SØLVER.

nant MICHAEL HANSEN, was placed at our service, leave being granted him so that he could assist both in mounting the airplane and in flying it on the expedition.

The Royal Danish Army Flying Corps lent us a De Havilland Tiger-Moth school-plane, model 1937, on the condition that we ourselves insured it for its transport with the ship and for the flights. The policies were taken out in England and amounted to a total of 2900 Kr. The wheel-carriage of the airplane was exchanged for a set of floats bought by us at Stockholm for 2000 Swedish crowns equal to 2200 Danish crowns, and after this change our aircraft became unique of its kind: the smallest seaplane found in Scandinavia. An extra petrol tank was bought in order to increase the plane's range of action; it was thus enabled to carry petrol for $3^3/_4$ hours' flight, which at a rate of 135 km per hour would suffice for a flight of well over 500 km; further, a Marconi A D 63/64 B short-wave set was installed, which will be described in BÆK's report mentioned above on p. 34. Finally, the seaplane was painted in the traditional reddish-yellow Greenland-colour, which by

experience has proved to be easily visible against the snow in case a forced landing necessitates a search. Below, the planes bore red and white cockades as marks of identification. Altogether the seaplane and its operation came to cost us the fairly modest sum of 7,692.60 Kroner, after deduction of the proceeds from the sale of the floats on our return.

MICHAEL HANSEN had never before flown a seaplane, and during the last few days before our departure he had to learn the technique of starting and landing on water, the pilots of the Danish Navy in a very comradely manner volunteering to teach him. About this as well as the details concerning the re-building of the Tiger-Moth plane and MICHAEL HANSEN's experiences with it in Greenland information may be gained from his book, "Paa danske Vinger i Syd og Nord" (Fred. E. Pedersen, publishers, Copenhagen, 1941) pp. 122—152.

9. Greenlanders and dogs.

(Estimate: C).

For various reasons Greenlanders and dogs were only obtainable from northern West Greenland, and since the "Hans Egede", the ship of the Greenland Administration, was approaching Disko Bugt at the beginning of May, we hastened to make the first arrangements for the expedition, asking the Administration of Greenland on May 7th to telegraph to the superintendent of North Greenland our request that three able, unmarried hunters and nine dog-teams each of eight dogs should immediately be sent in the ship to Copenhagen.

As we were bound for tracts in the far north, it would have been best to obtain Greenlanders and dogs from as northern parts of the west coast as possible, where they are accustomed to severe cold, dark periods, long journeys, and seal-hunting on the ice. Polar Eskimos and dogs from the Kap York district would have been ideal, but they could not be procured in time; not even from Umanaq could sledges reach the "Hans Egede" before it left on its homeward journey. When on June 3rd the ship arrived at Copenhagen, it carried the required number of dogs from the Disko Bugt area and three hunters: OVE ROSBACK of Rodebay, 25 years, ZACKÆUS SANDGREEN of Akunak, 25 years, and ELI KRISTIANSEN of Jacobshavn, 24 years of age.

The stay and feeding of the dogs in Copenhagen was a difficult problem, for according to the Board of Health provisions it was not permitted to land them. However, the authorities approved the placing of them on an uninhabited island, and on application to the Naval Ministry we obtained permission to set the dogs ashore on the abolished fort "Mellemfortet" opposite the Seaplane Station. Here ANDREAS HVIDBERG arranged a dogs' run for them and undertook to feed them during

the one and a half months of their stay in Copenhagen; HVIDBERG had become familiar with the tending of Greenland dogs during his stay as a trapper in Northeast Greenland. Their food consisted partly of gruel prepared in a large pot with the following ingredients: barley soaked in water and mixed with greaves and broken bone cakes from the meat-feeding-stuff-factory "Sjælland" at Ortved, partly fresh fish as for instance garfish and herring. In spite of much rain and a temperature to which they were not accustomed, the dogs throve well at the Mellemfortet under HVIDBERG's care, and several of the bitches had pups.

10. Start and outward journey.

The departure of the expedition took place in the afternoon of Tuesday the 19th of June, 1938, from Grønlands Handels Plads. Their Royal Highnesses Princess CAROLINE-MATHILDE and Prince KNUD, the patron of the expedition, were present, besides a large number of people, among whom may be mentioned: Viceadmiral AMDRUP and Commodore BISTRUP, who as representatives of the committee and the members of the Danmark-Expedition respectively brought wreaths which they asked us to place at Danmarks Havn and on BRØNLUND's grave. Further, from the Administration of Greenland, the managing director Mr. J. DAUGAARD-JENSEN and the head of the office Mr. KNUD OLDENDOW, the painter Mr. ERNST HANSEN, and the authoress Baroness KAREN BLIXEN.

Owing to various circumstances the start was delayed, among other things, because the dockers went home before the loading had been completed, and the members of the expedition assisted by relations and friends had to carry the timber for the wintering house onboard, where the goods were gradually piled up in heaps on the deck in the greatest disorder. Barrels containing oil for our voyages and for the wintering were found in two layers both on the starboard and the port side, and the doors leading to the mess-room were therefore divided into halves, so that it was possible to descend through the upper halves. Not till 6.30 p.m. did the ship leave the quay. Passing MYLIUS-ERICHSEN's monument, the ship lowered its flag, and after the dogs had been taken onboard at the "Mellemfortet", the course was laid northward through the Sound; however, off Skodsborg the anchor had to be dropped in order that the deck cargo could be better stowed and lashed before we reached the open sea.

Next morning KNUTH, who had remained at Copenhagen, left for Iceland in the M/S "Dronning Alexandrine" of the United Steamship Company, in order to procure various concessions from the Icelandic harbour authorities before the arrival of the "Gamma". Thanks to

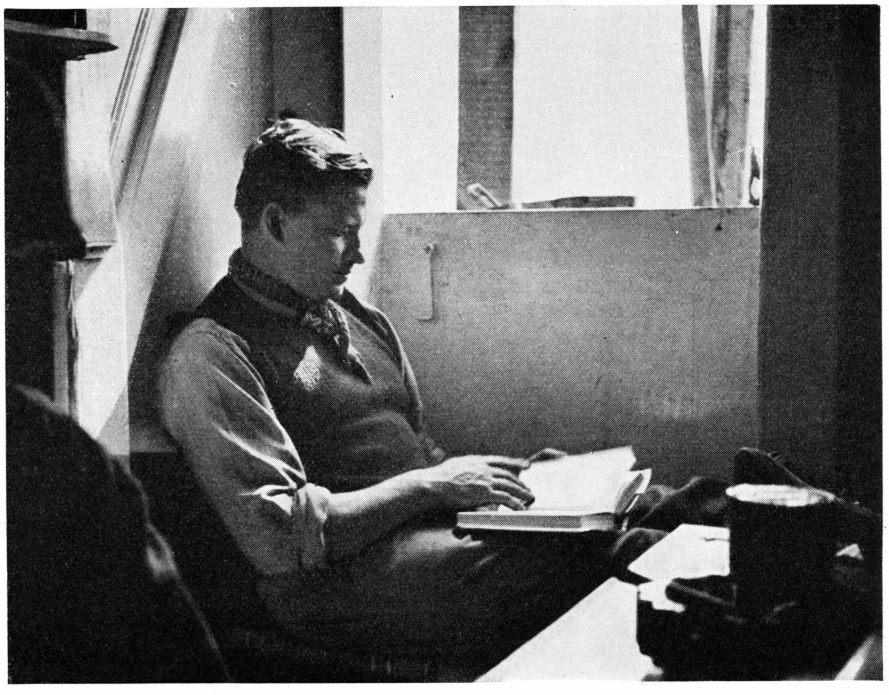


Fig. 3. EBBE MUNCK in the mess room of the "Gamma". Photograph by FLEMMING ANDERSEN.

extraordinarily favourable conditions of the sea the expedition ship reached Akureyri in Øfjord, northern Iceland, as early as the evening of July 28th after eight days' voyage. Unfortunately a man of the crew had been taken ill during the voyage and had to be sent home immediately after the arrival of the ship at Akureyri, where an Icelander was engaged in his place (cf. p. 35). Furthermore, the stock of dogs had been reduced by five, four of which had died from cramp, while one had jumped overboard. In Iceland the ship took in some more oil, carried up by the "Dronning Alexandrine", and fresh provisions and food for the dogs. Some excursions were made in the neighbourhood.

In those days their Royal Highnesses Crownprince FREDERIK and Crownprincess INGRID were visiting northern Iceland, and before we continued northward towards the unknown, they did us the great honour and pleasure of paying a visit onboard the "Gamma" to wish us good luck on our journey. Later on it was always a pleasant memory to us that our last farewell from our own world was given us by the crown-prince and crownprincess of Denmark and Iceland.

Our next problem was how our leading geologist, Mr. EIGIL NIELSEN, who was staying at Scoresby Sund, was to join the expedition. We dared not go with the "Gamma" to the colony to fetch him, for it meant two

extra voyages through the drift-ice, and we preferred to save our strength and not expose the ship to risk till we had got farther north. Fortunately, however, in 1938 the "Gertrud Rask", the ship of the Greenland Administration, called at the east coast at an earlier date than usual, and at our request the ship had been allowed to fetch Mr. NIELSEN and to call at Akureyri, where he was to join us, on its return journey from Scoresby Sund to Copenhagen.

However, the "Gertrud Rask" was somewhat delayed and did not arrive at Scoresby Sund while we were staying at Akureyri. Since a delay of only some few days might spoil our chances of reaching the northern coast, we decided not to waste time waiting in the Øfjord, but headed northward, keeping a look-out for the "Gertrud Rask" outside the ice belt off Scoresby Sund. The experiment was crowned with success in spite of a dense fog. By the aid of our wireless we took each other's bearings, and at 1.30 in the morning of August 3rd, just as the sun peeped up above the horizon, dispersing the fogs, we met in a small cove in the ice edge, where the sea was so calm that EIGIL NIELSEN could go from one ship to another in a rowboat. Immediately afterwards the two ships headed each in its own direction, the "Gertrud Rask" towards Denmark, and the expedition—which now at last, for the first time, had all its members assembled in the same spot—northward bound.

We remained in the open sea off the ice edge till we reached 75°30′ N. lat. 9°40′ W. long., where on August 6th we decided to turn the stem of the ship landwards and try to penetrate the ice belt, trusting to the traditions which say that the best possibilities for reaching land are found in about that latitude. Here MICHAEL HANSEN with his seaplane was of great use to us, and on August 12th we could cast anchor in Danmarks Havn in 76°46′ N. lat., 18°37′ W. long., opposite the former wintering house of the Danmark-Expedition, which was still standing in its place. We had been lured by a column of smoke, which we sighted from a great distance, to go inside Kap Bismarck; we thought that it was a signal to us from a trapper there. It turned out, however, that the smoke originated from two ships, both Norwegian sealers, viz. the "Vesle Kari", with the expedition of the American photographer Miss BOYD onboard, and the "Ringsælen"—renamed "En avant"—with a Norwegian-French expedition financed by Comte GASTON MICARD and led by Mr. WILLY KNUTSEN, architect. The first-named expedition was to return the same summer, while the last-named expedition (including Count MICARD), and even the ship, were to pass the winter in Northeast Greenland. We were later to become neighbours, and scientific cooperation was established between the Norwegians and ourselves.

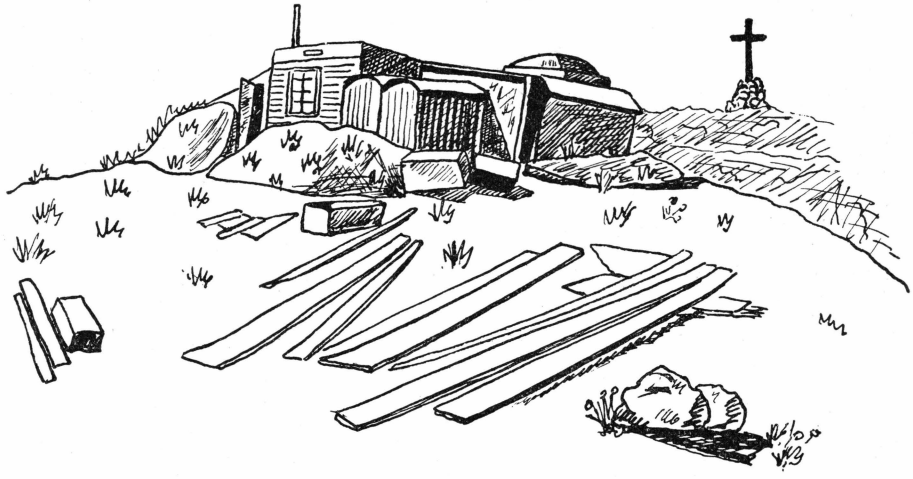


Fig. 4. The wintering house of the Danmark-Ekspedition at Danmarks Havn 1938

11. The ice conditions and the flights.

The ice conditions when the "Gamma" sailed through the ice belt at the beginning of August cannot be characterised as especially difficult —as was generally the case along the whole east coast of Greenland in 1935—but on the other hand they were not particularly good either. Apparently freshly broken floes, some of which were several kilometres in size, were drifting rapidly southwards and were often so heavy and close-packed that the ship had to work long in order to make its way through them. Frequent fogs increased the difficulties of navigation. Numerous little auks were seen everywhere on the ice floes, indicating the presence of a little-auk-cliff in the neighbourhood.

The first reconnaissance flight took place in the pack ice shortly after midnight of August 8th, when the position of the "Gamma" was about 75°20′ N. lat., 12°00′ W. long. Sounding showed 75 fathoms of water. After scattered fogs on August 6th, there was a constant fog accompanied by small rains on August 7th. A boundless ice field teazed us all day and prevented further progress. Towards eleven in the evening of August 7th the fog began to lift, and since we reached a fairly large space of open water at the same time, the pilot was called, and the seaplane was lowered on to the water. The start took place on August 8th at 3.05 a.m. with Ebbe Munck as passenger, and five minutes later Bæk, the wireless operator, was in telephonic connection with the sea-plane, and Michael Hansen's voice was heard in the loud-speaker. It was observed from the air that the ice field consisted merely of two

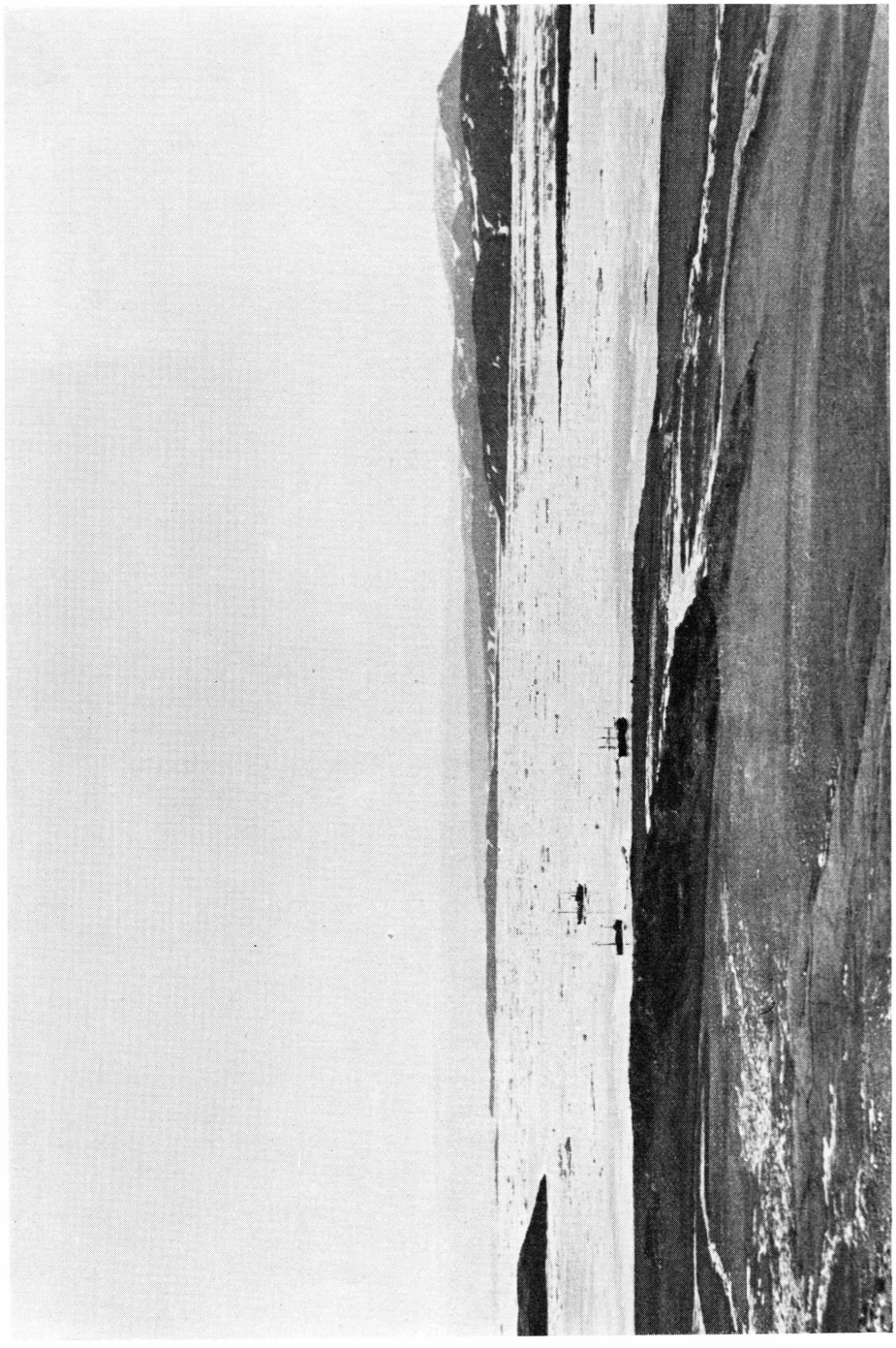


Fig. 5. The three ships in Danmarks Havn. Photographed by FLEMMING ANDERSEN. August 13th, 1938.

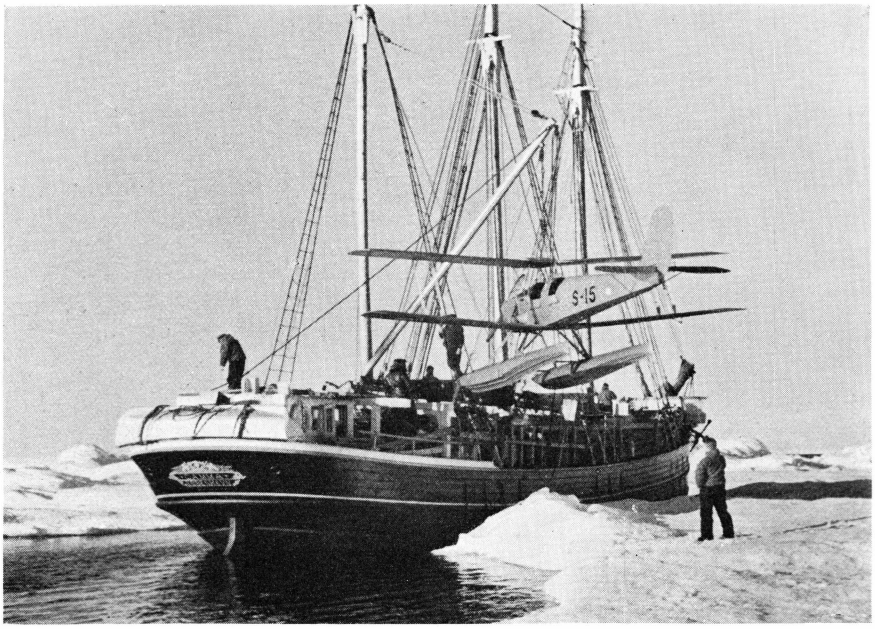


Fig. 6. The S-15 is launched for ice reconnaissance. Photographed by Flemming Andersen. August 8th, 1938.

enormous floes, and a sketch of the position was drawn, showing the channels leading towards the land. Before landing, Michael Hansen flew across the ship, heading towards those points on the shore of which he thought he would be able to give the name, and these courses were then read on the compass of the ship. Shortly after the landing of the seaplane it grew foggy again; however, on the basis of the sketch and the information obtained the "Gamma" was now able to proceed on its voyage.

The second reconnaissance flight took place on August 10th hardly 15 km from the coast of Hochstetter Forland in the bay between Store Koldewey and Shannon. After twenty-four hours' voyage in almost open water we had been locked up and exposed to serious pressure during our attempt to push into Dove Bugt from the south. We succeeded in slipping into an opening in the ice, whence Michael Hansen started at 2 p.m., flying northward towards Store Koldewey with Ebbe Munck as passenger. Unfortunately the receiver of the seaplane failed to work, but the pilot reported a large open sea west and southwest of Store Koldewey, so that the "Gamma" could soon sail at full speed. On this trip Michael Hansen experienced how extremely difficult it is to find a ship again from the air, and learned that careful bearings of it have to be taken before moving far away from it.

The third reconnaissance flight was started from the bay near Danmarks Havn in the afternoon of August 13th. The trip, which lasted for two hours, went northward along the outer coast of Germania Land (Storlandet), across Skærfjorden to Kap Amélie, and back to the ship. It became of decisive importance for our wintering, for it was established that the ice lay unbroken in a northward direction from the southernmost point of Ile de France as far as the eye could reach.

This was in accord with the information obtained from the "Vesle Kari" and the "Ringsælen" about their attempts to push northward, and the result was that next day we sailed westward in the "Gamma" into Dove Bugt in order to look for walrusses and wait some time in the hope that conditions might improve. Although the ice in here was scattered, unfortunately our propeller was slightly bent, and the captain thought it best to have the goods unloaded and the ship run ashore at high-water, in order that the damage might be repaired at ebb-tide. After a council had been held, it was decided that in view of this conjuncture of circumstances it would be best to carry the goods ashore and build the wintering station in the interior of Dove Bugt in a place which would be favourable for GELTING's botanical investigations and serve as a base for our sledge journeys northward.

The fourth reconnaissance flight was started from the water immediately off the station of the hunting company "Nanok" on Hvalrosodden on August 15th with EIGIL NIELSEN as passenger. Its purpose was to choose a place for the wintering house and to examine the sledge route across Storlandet to Skærfjorden. This proved to be practicable, and a place on Winges Kyst east of Hvalrosodden was proposed as a building site.

A trip in a motorboat to the place taught us, however, that the water outside this place was too shallow to allow the ship to approach the shore. At the suggestion of Dr. GELTING, we went westward from Hvalrosodden in the motorboat next day (August 16th) and **agreed to erect the station on a shore-terrace quite close to Gravelven at the foot of Rypefjeldet near the mouth of Mørkefjord (according to Sølver: 76°56′.1 N. lat., 20°18′.2 W. long.).** Various advantages seemed to be combined in this place: the building site was dry and level, the view magnificent, there was a rich vegetation, salmon were plentiful outside the mouth of the river, and ancient Eskimo sites were found in various places in the neighbourhood.

The fifth reconnaissance flight was made from the same place as the preceding one, on August 22nd, with KNUTH as passenger. In the course of five days and nights all our goods had been carried on

The outward journey of M/s „Gamma" August 1938, from Akureyri at the head of Öfjorden, Iceland, to Mörkefjord, lat. 76°56', long. 20°18', Northeast Greenland.

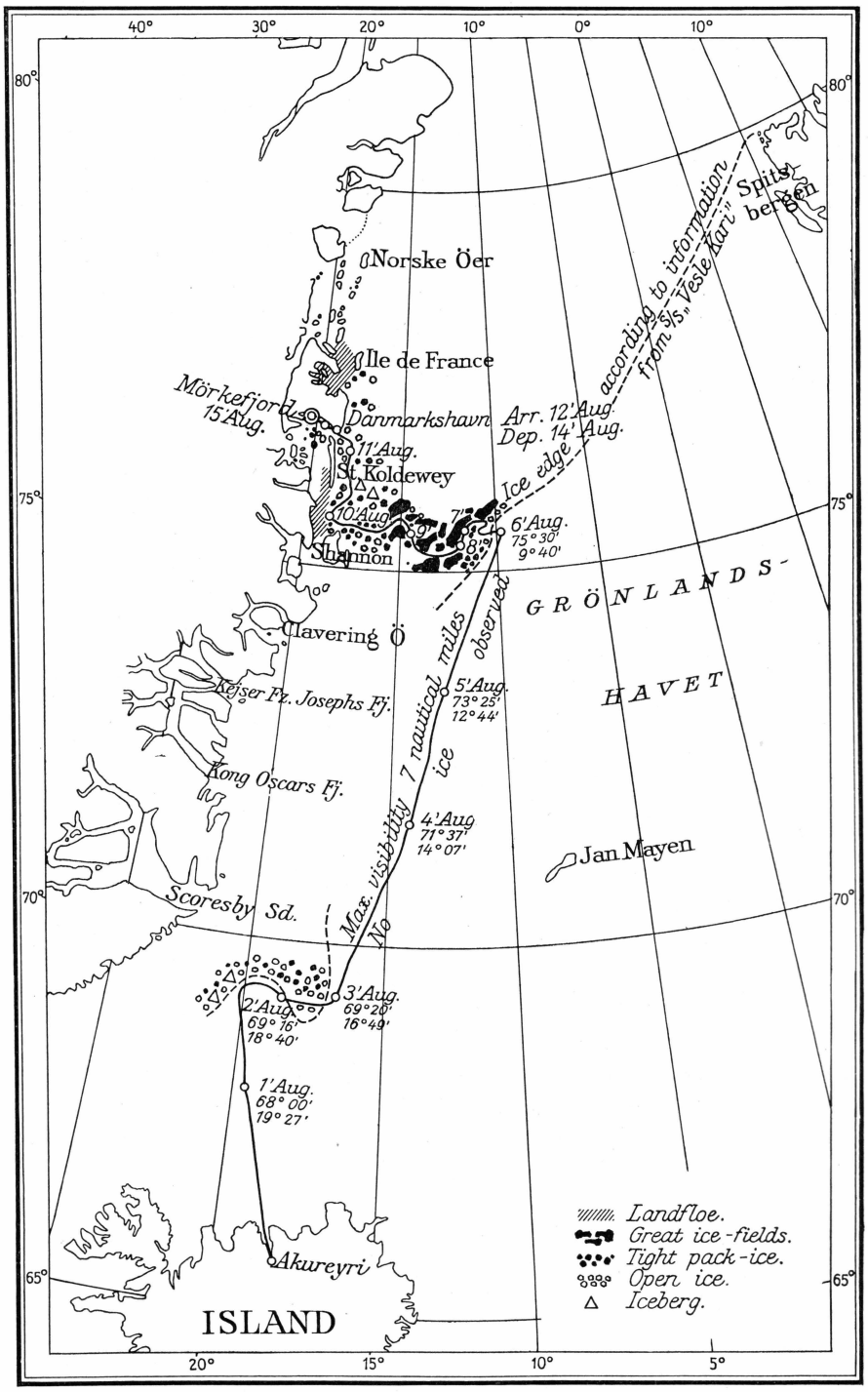


Fig. 7. Off Scoresby Sund, in 69°30′ N.lat., 18°00′ W.long.; a curve in the route is seen in the place where we met the "Gertrud Rask" on August 3rd, 1938, at 1.30 p.m. and took EIGIL NIELSEN on board.

to the shore, and the wintering party was now ready to leave the ship. But first it had to be found out whether the ice conditions off the coast had improved so much in the meantime that a depot of dog-pemmican and possibly a hut could be sailed northward before the "Gamma" left us. This would be of the greatest importance for the sledge journeys. Unfortunately, however, the ice conditions did not seem to have changed. The start took place at 9 a.m. and the flight lasted for one and a half hours. After flying over Germania Land to the head of Fladebugt, where some open water was observed outside the mouth of the rivers, the course was laid across the ice-covered Skærfjorden to the southern point of Joinvilles Ø and thence southward across Kap Récamier, Annekssøen, and Sælsøen to Mørkefjord and along this fjord back to the ship. On this circumflight the leader of the wintering party obtained a general view of the conditions prevailing in the vicinity of the station.

12. The return voyage of the "Gamma".

On August 22nd the wintering party sailed ashore in the motorboat ("Ebbe"), while the "Gamma" headed southward in Dove Bugt in order to run ashore at "Gefions Havn" at the south side of Godfred Hansens Ø. This place was recommended to us by the Mr. HARRY ROSFELDT, captain of the "Gustav Holm", which, while we were unloading at our wintering place, arrived at Hvalrosodden, where it exchanged the trappers of the company "Nanok" and set ashore our zoologist ALWIN PEDERSEN and his house.

The repairs of the "Gamma" were easily finished; it turned out that the damage was not very serious and it was rapidly repaired. On its route farther southward the ship was able to rescue two Norwegian trappers whose boat had drifted away while they were on a hunting journey far from their station. The "Gamma" continued its way southward through Shannon Sund, and off Kap Bror Ruys MICHAEL HANSEN and EBBE MUNCK made a last flight in order to investigate the possibilities of the ship making its way out through the ice belt. The ice was very scattered, packing in some few places only, and on August 31st the "Gamma" reached the open sea in 72°15′ N. lat., 18°45′ W. long.

The ship did not call at Iceland on its return journey. On September 5th the Norwegian coast was sighted in the distance. It proved necessary to go to Farsund for slight repairs of the engine, but apart from this the ship arrived at Copenhagen without mishap on September 10th, 1938. In order to earn money for its own upkeep, the ship was now to go into the carrying trade.

Fig. 8. The "Gamma" aground in Gefionshavn before the return voyage. The steep capes above are, left: "Bælgen", right: "Orgelpiberne". Phot. by Flemming Andersen. August 24th, 1938.

WINTERING 1938–39

13. The station at Mørkefjord and its equipment.

Before the "Gamma" left us on August 22nd, it was decided to call our new station "Mørkefjord"; this seemed to us a good name with a fine phonetic sound—three distinct, equally stressed syllables, easily understandable over the wireless. ALWIN PEDERSEN built his own house on Hvalrosodden near the "Nanok" hunting station, and we, the eight other members of the wintering party, began to build and lay out the Mørkefjord-station near Gravelven.

A. The station house had been made by Mr. VIGGO PEDERSEN, a carpenter at Gudhjem, from the design of Mr. E. DAUGAARD-JENSEN, architect. After the very strong timber skeleton of the house had been framed in Denmark, each piece of timber had been marked and numbered so as to correspond to an accurate description so that the erection of the house in Greenland would be easy. The ground-plan and elevation will be seen from the subjoined drawing; GELTING, BÆK, NIELSEN, SØLVER, and KNUTH each had their own cabin, whose width from the living room to the outer wall of the house corresponded to the length of a berth. The berth could then be fitted "athwartship" at such a height that below it there would be space for shelves for our clothes and a working table at right angles to the direction of the berth, parallel to the outer wall. The three Greenlanders slept in one room with two berths along one and one berth along the other wall. Only one large stove served to heat the house, besides the range in the kitchen, where a fire was kept burning all day. However, in the coldest periods we had kerosene stoves or lamps for use during sedentary work, for instance at the wireless station, but they were not used by all the members.

Construction: The wooden beams of the floor rested in a frame placed at a low height above the ground on corner blocks and stones. The external provision sheds were filled with gravel to the level of the floor of the house, so that a stationary layer of air was found below the inhabited part of the house. On the floor balks the perpendicular timber skeleton was erected like a "wood" of close-set posts connected with stays, cross-bars, and a pole plate above, on which the rafters rested.

In this way there arose two almost square timber shells, inmost the periphery of the living room and outwardly the periphery of the house. These concentric timber buildings were covered everywhere on the inner and outer sides of the posts with a layer of soft, porous $^1/_2''$ insulite plates ($4' \times 8'$). In addition a layer of hard $^3/_{16}''$ insulite plates ($4' \times 8'$) was placed directly above the soft layer on the whole outer side of the house. All the partitions between the small rooms consisted of a single layer of boards. On the upper side the roof was covered with two layers of tarred roofing paper, the lower layer laid parallel to the inclination of the roof, the upper layer across it. Soft insulite plates were fitted below the rafters, and the cavity between the latter and the boards of the roof was filled with "Rockwool" insulating mats—a preparation of glasswool. All the insulating material, both the insulite plates and the rockwool mats, were gifts to the expedition from the firms dealing in those articles.

The small passage just beside the porch was originally intended for a lavatory, but we gave up this luxury and built instead a large provision room, to which

there was direct access through the passage from the interior of the house, so that we need not go out into the open to fetch provisions as when we went to the other provision sheds.

(Experience: The same advantage would have been attained, if the house had had a higher roof with room enough for a loft above the large room. I believe

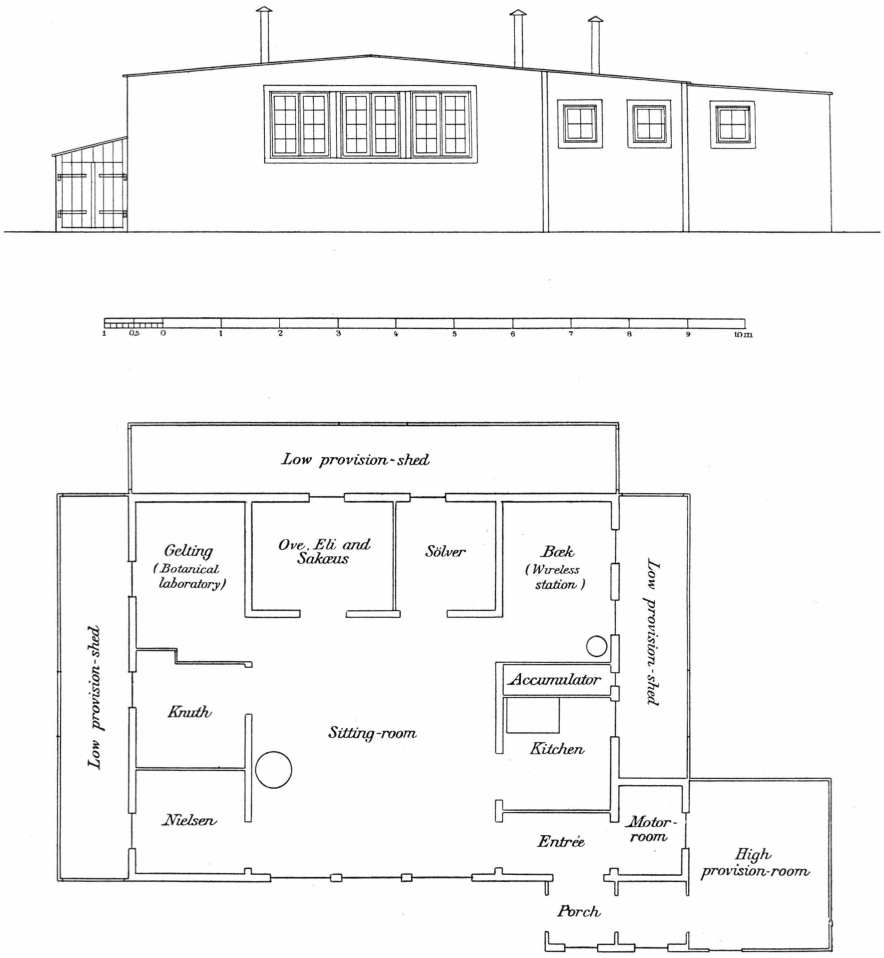


Fig. 9. Plan and elevation of the station house.

it was chiefly for economic reasons that the house was not made higher, but I am inclined to think that a steeper roof would have been preferable for other reasons also than for the sake of obtaining more space. For the flat roof made the snow, which swept over the house during the continuous gales, gather in a high drift immediately in front of the house, causing the windows and entrance to be almost constantly blocked. A steeper roof would have broken the force of the wind and would have allowed the driving snow to reach the ground at a greater distance from the house, so that the drift would not have blocked the entrance).

B. The wireless plant occupied three rooms: 1) The motor room (Placed outside the inhabited part of the house). Here the motor of the station was secured to a concreted foundation. It was a four-stroke one-cylinder kerosene motor, "Delcolight", model 850, with a capacity of 2 HP, coupled directly to a dynamo, 32 volt 850 Watt, which supplied current for charging the accumulator (Danish "Lyac") and for the light installation. In the dark period ten lamps were burning during the greater part of the twenty-four hours, four being of 40 Watt and six of 15 Watt. Besides the Delcolight dynamo, a hand-driven dynamo, from TH. B. THRIGE, was found at the station as a reserve.

2) The accumulator room contained the Lyac accumulator, a 32 volt battery with a capacity of 145 ampère-hours. The room was a cupboard with double doors opening towards the transmitter room and separated from the kitchen by a board partition only, the battery thus benefiting from the heat of the range. Two large valves in the outer wall of the room kept any acid smell away from the rest of the house.

3) The transmitter room was BÆK's residence and the actual wireless station with all the apparatus: a short-wave transmitter 16—56 metres, 150 Watt, a long wave transmitter 600—800 metres, 200 Watt, a medium-wave telephone transmitter 85—200 metres, 20 Watt, and a receiver 16—20,000 metres. The whole apparatus, of which the long-wave transmitter had kindly been lent us, was supplied by Mr. M. P. PEDERSEN, civil engineer. The call letters of the station became—and still remains—OYY.

The aerial plant was erected outside the house; it consisted of two masts 16 metres high, of fir stems, erected at intervals of 60 metres secured by two times three wires. For further information about the wireless the reader is referred to KURT BÆK's paper (Medd. om Grønl. Bd. 127, Nr. 3).

C. Household articles and furniture. Among the outfit of the station house mention may be made of the water containers, a large 80 l milk can for cold water and a special conical container with a cock below made to fit on the stove and intended for melting snow and ice on top of the stove. A large box, containing all kinds of medicines and dressings for eight men for two years, had been presented by ALFRED BENZON's Chemical Factories. All chairs were collapsible, in order that they could be easily removed, and in the summer some camp chairs gave us much pleasure in the open. For our entertainment during the dark time we had a gramophone and a billard table. In the spring cress and radishes were grown in boxes with mould from Denmark.

D. Provision house and dogs' enclosure. On the terrace, 75 metres west of the main house, an extra rectangular house of timber was erected. It was about 2.50×4.00 metres, and intended for the storage of all kind of spare provisions, outfit, and materials, in case the main station should burn down.

Between this house and the station a dogs' enclosure was built of posts and wire netting with six stalls, each 3×3 metres. In the course of the winter it was so often filled with drifting snow that it had to be abandoned, but later, in more favourable winters, it proved useful (see the plan on p. 61).

E. Our motorboat was a carvel-built boat of $^3/_4''$ American oak wood of the following dimensions (Danish feet and inches): length 18′4″, width 5′5″, and draught 2′5″ (corresponding to: length 5.75 m, width 1.26 m, draught 0.76 m). It was sharp in front, with a strong, raked stem with a view to the ice and covered on the outside with $^3/_4$ mm copper plate and provided with stem and keels rails. The motor was

Fig. 10. The motorboat (the "Ebbe") off the shore at the Mørkefjord station. Phot. by SVEND SØLVER. August 1st, 1939.

a one-cylinder two-stroke single acting petrol motor of the "Ideal" make, furnished with a spare ring.

(Experience: Unfortunately neither the boat nor the motor can be said to be suitable to the prevailing conditions—the boat was too small for the often rather exposed voyages in Dove Bugt, and the motor was too weak and unstable).

14. ALWIN PEDERSEN's house on Hvalrosodden.

The house was situated immediately north of the "Nanok" hunting station. It was built of two layers of boards, the innermost of which consisted of matched boards. Like all Danish hunting stations it was covered on the outside with tar roofing. It contained only one room of a floor area of $3 \times 3^1/_2$ m, and a porch was fitted in front of the entrance.

Fig. 11. ALWIN PEDERSEN's house at Hvalrosodden. Phot. by ALWIN PEDERSEN, beginning of September, 1938.

15. Equipment for wintering.

(Estimate: F.)

A. Provisions. The provisions consisted of tinned, salted, smoked, dried, and fresh goods. The last-named provisions included fruit, eggs, and potatoes; the fruit did not keep long in storage, while eggs and potatoes, having once for all frozen as hard as stones, sufficed for three-fourths of the wintering period. To replace them we had dried Danish yolk of egg and dried potatoes. Bread was baked of rye and barley meal with "Danisco" dry yeast added. The milk was partly unsweetened, partly whole milk powder in tins from "Dansk Mejeri Industris Eksport Kompagni". Our butter was in $^1/_4$ kg tins, but in addition we had two barrels each containing 50 kg, which kept well.

B. Members' outfit. For the reader's information a list of the outfit of each member of the wintering party will be given below:

Footwear:	1 pair of	polar boots	A/S Kolbjørn Knutsen & Co., Oslo.
	1 —	- ski boots	
	3 —	- gymnastic shoes with rubber soles	P. O. Bacher, Copenhagen.
	1 —	- turist shoes with leather soles	
	1 —	- cloth shoes	
	3 —	- felt soles	
	2 —	- insoles	
	1 —	- rubber boots, long	
	1 —	- "Træskostøvler" (leather boots with wooden soles)	

1 pair of "Filtkomakker", long, Kirvun Huopatehdas o/y, Viborg, Finland.
2 — - kamik boots with crepe rubber soles and lambskin stockings
2 — - kamik boots with Uskeid soles and lambskin stockings
1 — - extra lambskin stockings
} C. J. Thuesen's Eft., Copenhagen.

Stockings: 10 pair of woollen socks, P. O. Bacher, Copenhagen.
7 — - long Norwegian snow stockings
5 — - short Norwegian snow stockings
} Jagt- og Fiskerimagasinet, Copenhagen.

Underwear: 6 sets of thick underwear
2 — - thinner underwear
} P. O. Bacher, Copenhagen.

Anoraks: 1 reindeer-skin anorak, A/S Hannibal Sander, Copenhagen.
1 camel's wool anorak, Jaeger Co. Ltd., London.
1 weatherproof, anorak, "Dyhlén-Anorak", A/B Nordiska Kompagniet, Stockholm.
1 grey cloth anorak
1 Khaki anorak
3 linen anoraks
} P. O. Bacher, Copenhagen.

Sweaters: 2 Icelandic sweaters
1 blue sailor's jersey
} P. O. Bacher, Copenhagen.
1 down waistcoat ("vestes en duvet"), Pierre Allain, Paris.

Trousers: 1 pair bear-skin trousers, A/S Hannibal Sander, Copenhagen.
1 — camel's wool trousers, Jaeger Co. Ltd., London.
1 — weatherproof trousers, matching the Dyhlén anorak, A/B Nordiska Kompaniet, Stockholm.
2 — strong cloth trousers ("Holmens Blaa")
1 — ski trousers
} P. O. Bacher, Copenhagen.

Shirts: 3 working shirts of linen
3 woollen shirts
} P. O. Bacher, Copenhagen.

Out-door things: 1 oilskin coat, P. O. Bacher, Copenhagen.

Covering for the hands:
6 pair of woollen fingered mittens
5 — - muffetees
4 — - machine knitted mittens
4 — - cloth mittens
2 — - canvas shooting mittens
2 — - working gloves
} P. O. Bacher, Copenhagen.
2 — - bearskin mittens, A/S Hannibal Sander, Copenhagen.

Neck clothing: 3 woollen scarves, P. O. Bacher, Copenhagen.

Head gear: 2 camel's wool "helmets", "Balaclava Caps", Jaeger Co. Ltd., London.
1 skin cap
1 mason's cap
1 southwester
1 cap with a white cover for hunting purposes for Greenlanders
} P. O. Bacher, Copenhagen.

Sleeping bags: 1 reindeer-skin bag, A/S Hannibal Sander, Copenhagen.
1 down bag, double, A/S Crome & Goldschmidt, Copenhagen.

Divers articles: 1 pair of skis with metal edges } A/S Kolbjørn Knutsen & Co.,
1 pair of skis without metal edges } Oslo.

Spare parts for the skis, 1 rucksack with Meis, a wristlet compass, 3 pairs ordinary sun-glasses with changeable glasses, 1 face screen of celluloid, 2 Mora knives, 1 sheath knife with and 1 without a sheath, 1 folding knife with marline-spike, 1 pocket knife, 2 waist belts, 1 pair of braces, 2 berth sacks.

C. Photographic equipment. The expedition placed the following cameras at the disposal of the members:

1 Contax A. 49465 with a 13.5 cm "Sonnar" telephoto lens, "Contameter" portrait lenses and an "Albada" view-finder. For this camera both ordinary black and white films and colour films, size 24 × 36 mm. (For Mr. SØLVER).
1 Zeiss Ikon Ideal Kamera 25017 for glass plates and flat films, size 9 × 12 cm, with a 25 cm telephoto lens. (For Mr. SØLVER).
1 Reflex Corelle for roll films, 6 × 6 cm, with lens hood, yellow light filter, green light filter, portrait lens, tubus, stand, and globular head. (For Dr. GELTING).
1 Kodak Retina for roll films 24 × 36 mm. (For Mr. FLEMMING ANDERSEN).

In addition to these, the members of the expedition had the following private apparatus:

1 Reflex Corelle, roll films 6 × 6 cm. (SØLVER).
1 Standard camera for plates and flat films 9 × 12 cm. (GELTING).
1 Zeiss Ikon Super Ikonta for roll films 6 × 9 cm. (NIELSEN).
1 Exacta Camera for roll films 4.5 × 6 cm. (FLEMMING ANDERSEN).
1 Rolleiflex apparatus for roll films 6 × 6 cm. (KNUTH).
1 Zeiss Ikon Miroflex 9 × 12 cm with a 60 cm "Magnar" telephoto lens. (ALWIN PEDERSEN).
1 Zeiss Ikon Ideal Camera 9 × 12 cm. (ALWIN PEDERSEN).
1 Apem-Reflex, 6 × 9 cm. (ALWIN PEDERSEN).

Messrs. KONGSBAK & COHN had lent us a 16 mm Siemens B. 16923 apparatus for photographing moving pictures.

A trial development of films was made in a Correx box.

D. Shooting and fishing gear. For the general use of the wintering party the following equipment was at hand:

4 rifles model 1889, shortened, calibre 8 mm.
5 Remington, model 1867, shortened, calibre 11 mm.
1 shotgun, calibre 12, for semi-smokeless powder.
4 parlour guns, Mausser.

In addition the following private fire-arms were found:

1 Mausser rifle, Swedish (SØLVER).
1 Mausser rifle, German (KNUTH), calibre 8 mm.
1 Suler Drilling with smooth bored barrel, calibre 16 mm (KNUTH).
1 Mannlicher rifle with telescopic sight (NIELSEN).
1 carabine, model 1889, calibre 8 mm (GELTING).
1 parlour gun (BÆK).

Two large harpoons with movable barbs for walrus hunting, nets for salmon fishery, various hooks, lines, and jigging gear for fishing and for shark fishery. OVE shot a walrus with his 1889 rifle, using cartridges with pointed bullets.

E. Dog-food for use at the station. In addition to 4000 kg dog-pemmican for use on the sledge journeys, bone cakes and fish flour cakes were at hand for feeding during sojourns at the main station. The quantity amounted to about 1200 kg, it being planned to supplement it by seal and walrus secured before the winter set in.

F. Fuel. Nut-coal and briquettes were used for fuel at the station.

G. Equipment for sledge journeys.

1. Sledges. We carried with us from Denmark seven Greenland sledges of ash wood, four with runners c. 200 cm and three 235 cm long. However, in the opinion of Mr. NIELSEN even these were too small for sledging on sea ice with crevasses, and immediately after the building of the station we therefore commenced to build six long sledges to be used on the long sledge journeys northward. They had to be made up of the timber at hand, and thus could not, unfortunately, be furnished with runners of ash wood. The type was the same as that of the sledges brought up from Denmark, namely the West Greenland type as used in the Disko Bugt, and their dimensions were as follows, as far as I remember: length 275—290 cm, width 80 cm, height of runners behind 30—35 cm, in front somewhat less. Hoop-iron was fitted under the runners, and angular pieces of the same hoop-iron were used for perpendicular fortification of the runner, being sunk into it. For lashing the cross bars we used 6 mm lines, for front straps 12 mm hawsers were used, and for lashing the sledge loads 8 mm hawsers, all tarred in order that the dogs should feel less inclined to eat them. Experience: Sledges to be used in North-east Greenland may very well be even larger than ours, possibly of a runner length of 300 cm and a width of 100 cm.

(In addition to the Greenland sledges we had two ski sledges, so-called Nansen sledges, from KOLBJØRN KNUTSEN, Oslo. The runner length was 230 cm, and at Copenhagen they were fitted with 1 mm semihard aluminium plates under the skis. Their slender structure is designed for soft snow, and on account of the stony ground and hard snow-drifts around Mørkefjord these sledges were not used.

For the same reason the two Segebadens Skipulke No. 3 from Sweden were unsuitable).

2. Sledge skis. In order to prevent the heavily loaded Greenland sledges from sinking on stretches covered with soft snow, the Greenlanders prepared long skis which could be fastened below the runners and easily removed.

They were kept in place on the runners by means of clamps, and in these clamps the lashes for fastening them were placed. Unfortunately, in this case also,

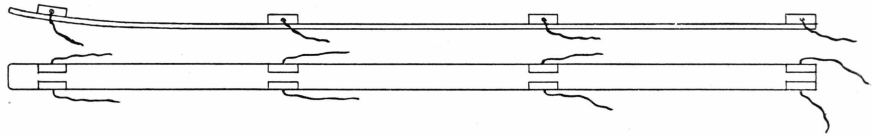


Fig. 12. A sledge ski viewed from the side and from above.

only pine wood was available, and both as a preventive and to be used for repairs in case of damage the skis were mounted with tin from the pemmican tins. The skis were absolutely indispensable, and other expeditions are advised to carry with them from home such skis made of ash wood or hickory.

3. Traces, harness, iron chains, dogs' kamiks. In view of the appetite of the dogs neither traces nor harness were of skin. For traces we used partly 5 mm tarred fishing line partly flag line; we made the harness ourselves of 2.6 mm light-brown girth-web of the kind used for carrying-braces in ruck-sacks and for horse reins. The same girth-web (from AUGUST MILLECH, Copenhagen) was used on the "Expédition Française Transgroenland 1936" and was excellent. It is true that hungry dogs would sometimes begin to eat of it, but kerosene was an effective means against this, and in order to prevent such and similar disorders iron chains with emergency links, swivels and swivel hooks were always carried on the sledge journeys, by means of which the dogs could be tethered at suitable intervals and suitable distances from the sledges during the night.

For sewing dogs' harness we used sailmaker gloves, triangular sailmaker needles and pitched sewing yarn No. 6. For the dogs' paws in case of wounds we had kamiks with skin soles and canvas legs.

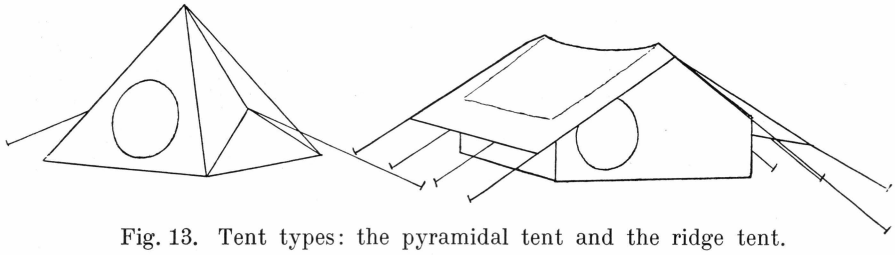


Fig. 13. Tent types: the pyramidal tent and the ridge tent.

4. Tents. The tents intended for long sledge journeys were all made of Khaki "Jaqua" cloth from Camp & Sports Co-operators, Ltd., London, and were of two types:

Two pyramidal tents of the Mount Everest type, square bottomed, with bamboo sticks fastened inside under the pyramid edges and converging at the top. The entrance was circular and with a serpent to lace up as a door. Height from floor to top 190 cm, ground area 240 × 240 cm. Length on the sledge when rolled up 250 cm. These tents are ideal during blizzards, since they cannot, so to speak, be blown down. On our journeys to lay out depots we slept four men in one tent; however, this size tent is not suitable for more than two men with sleeping bags, clothes, and kitchen utensils. They were delivered ready-made from London.

Our other travelling tents were ridged tents with triangular front and hind walls but without any ridge-pole. The lower part of the long sides were vertical, and the entrances were round serpents, as in the pyramid tents. They had been made in Copenhagen of "Jaqua" cloth. NIELSEN used this type of tent on all his winter journeys—the rest of us only in spring and summer, when it was extremely convenient and spacious. Both kinds of tents had two rims along the ground, an exterior one, which was covered with snow, and an interior one, on which the loose tent bottom of thin waterproof cloth was placed.

Two small very light double-walled tents, so-called Tentes isothermiques Super Himalaya, height 130 cm, width 120 cm, length 200 cm, had been ordered from France. They were intended to be carried in rucksacks, but they were not used. For use in the summer we also had various smaller linen tents.

5. Floor of tents. On the long journeys in the spring we used waterproof rubber mats, "Caoutchouc Mousse" from Paris (in addition to the impregnated layer), instead of reindeer skins. They were proportioned to fit the sledges, each

Fig. 14. One of the Norwegian "polar boots". (cf. next page).

mat probably weighed nearly 1 kg. They were soft to lie on, easy to keep clean, and if they got wet, they dried again in no time.

6. Cooking gear. Of the other camping outfit there remains to mention the cooking stoves, of which two types, in particular, were used: original Swedish 8 liter "Primus" stoves, high, round, and non-collapsible, and so-called "Svea-Komfurer", low, square stoves of the Primus system with containers at one side resting on the ground. The latter had the advantage that they were not easily upset, whereas the former were more spacious.

7. Sleeping bags. The sleeping bags of skin, each prepared of four Lappish reindeer skins, were too narrow; the occupant's breath, evaporation from the body during sleep, and steam from the cooking in the tent gradually made them damp so that they froze stiff and at times might be very difficult to get into. On account of their narrowness they were less warm than they would have been if there had been more room for air around the body. To this was added the drawback that the hair came off, so that everything in the tent, not least one's own person, was constantly covered with reindeer hairs. This might be remedied by putting a linen lining in the bag, but that would, of course, further diminish its heating capacity.

Being the tallest of the long-distance travellers, I myself therefore only used the skin bag in the coldest winter months (often with a bag of down inside), otherwise preferring the sleeping bags of down. These were made of the same dimensions as the English down-bags employed by the "Expédition Française Transgroenland 1936", and consisted of an inner and an outer bag. They were so large that one could easily disappear entirely in them, and no closing mechanism of any kind was found on the sides. Since eiderdown could not be had in Copenhagen at the time of our departure, they were filled with a double quantity of the choicest

ducks' down. On a bottom layer of reindeer skin you could keep splendidly warm in them in winter even at temperatures of nearly 40° C. below zero, and they had the great advantage, thanks to their porosity, that humidity and stiffness could easily be done away with by the heat of the sun or of the Primus stove in the tent.

8. Skis and boots have already been mentioned in the list of equipment; the skis were of hickory and the ties were of the "Greshoppa" type. One pair of skis with ties adapted for ordinary large unpegged boots with a skin lining was intended for use in the neighbourhood of the station. The other pair of metal-edged skis with extra large specially prepared ties fitted for the so-called "polar boots", obtained from KOLBJØRN KNUTSEN, Oslo, was to be used on long journeys in intense cold. These boots, shown in the figure, proved to be better suited to the conditions than any other European footgear known to me. They were of very large size, so that, though they were lined with lambskin, there was plenty of room for several pairs of snow-stockings and a layer of bladder sedge. Only the toe and the lower parts of the heel and sides consisted of leather, while the upper part of the boot and the leg consisted of russet, which gave way softly during the walk, and which was easily thawed at the Primus stove each morning when the boots were to be put on. The soles consisted of a thick double layer of felt between two layers of leather.

The kamik boots of canvas outside and lambskin inside, mentioned in the list, were used now and then on the sledge journeys, but were far less practical than the "polar boots". Their long legs became too hard and narrow in the cold so that the boots were difficult to put on and pinched the feet when in use. The protection yielded by the legs against intruding snow was ensured as regards the polar boots by supplementing them with loose linen leggings which covered the edges of the boots and could be easily put on and taken off.

In the cold period the Greenlanders made for themselves cover kamiks of musk-ox skin.

9. Clothes. Something similar as was the case with the sleeping bags applied to the clothing of the sledge travellers: the skin clothes—bear-skin trousers and reindeer-skin anoraks—proved inconvenient on long, trying marches in intense cold, when you perspire considerably. The clothes grew stiff and unwieldy. Personally I hardly used them, as I perspired very freely; even during the most intense cold I wore cloth trousers and a camel's wool anorak, over which I pulled weatherproofs when there was a wind. The Greenlanders, however, nearly always wore their bear-skin trousers, and NIELSEN wore his private bear-skin clothes on all his journeys; his anorak and kamiks, too, were of bear-skin.

10. Various articles. Besides general shooting gear, material for repairs, and medicine, the following things were indispensable on long sledge journeys: a long-handled stick with a strong, narrow, and sharp iron blade; it was used to test the thickness of the sea ice and to feel for hidden crevasses. Furthermore, a spade for digging up hard snow for cooking and cutting blocks to be placed around the outer edge of the tent to prevent it from being blown down; it turned out that only a really large foot spade with a steel blade was any good in the hard-blown snow. An ax was necessary for dividing the pemmican and frozen game for the dogs. The Greenlanders carried home-made shooting screens and shooting sledges for their guns. Of the kerosene barrels the 8 liter barrels, welded and galvanised, were preferable.

Fig. 15. The wintering station "Mørkefjord" when the building had been finished. Phot. by EIGIL NIELSEN, end of September, 1938.

16. Survey of the wintering year 1938—39.

September 1938.

The building of the house and the laying out of the Mørkefjord station as well as the arrangement of the hundreds of things that had to be brought under shelter were in some degree impeded by an early snowfall, which set in with a gale on September 1st, ten days after the "Gamma" had left. During these ten days it had been the finest weather imaginable: brilliant sunshine, clear and calm weather from morning till night. At last the immense Dove Bugt was entirely clear of ice, and we felt as if now, after all, the summer was commencing up there in real earnest. GELTING counted positively on being able to do botanical work in the field, and I myself on beginning excavations as soon as our work as carpenters and joiners had come to an end. A few motor-boat trips to secure some seal and walrus as dogs' food for the winter would be very desirable, too.

But the snow and frost changed everything. The landscape turned white and remained white, the soil froze and became so hard that SØLVER had great trouble in digging holes for fastening the backstays of the wireless masts; the ice again covered the fjord, and the boat had to remain in the place where it had been pulled ashore when we left the ship. Tools, nails, tar roofing, boards, and insulating plates were constantly being buried in snow and impossible to find when we were

to use them. In the same way cases with provisions and goods for the wintering disappeared entirely; some of these things—for instance colour pots and window glass— were not found again till the next summer. However, the snow meant one advantage: all the heavy goods could be transported on sledges from the depot on the shore up to the house.

The wireless room was first brought in order, and as early as August 28th BÆK could move in and begin to arrange the apparatus and accumulators. On September 6th his receiver functioned for the first time with the flagpole as an aerial mast. Next day our Dannebrog, three metres in size, was flying over the station, and towards evening the Delcolight motor came into action. Its energetic teuf-teuf rang out over the barren stony desert, and a column of smoke rose towards the sky, where the first two stars of the year twinkled faintly. Next day all the members of the expedition moved into the house, and the tents in the snow outside were taken down. ALWIN PEDERSEN, who with the help of the trappers soon completed his building work on Hvalrosodden, at the beginning of September managed to make two circum voyages in "Nanok"s motorboat in Dove Bugt, from Hvalrosodden via Gefionshavn to Danmarks Havn. The first trip lasted from the 4th to the 8th of September, the second from the 9th to the 12th, and after that he stayed alone in the house at Danmarks Havn from the 12th to the 28th September.

While we were building our house, the barnacle geese from the different goose-mountains in Sælsøen and Annekssøen (cf. the publications of the Danmark-Expedition, Medd. om Grønl. Bd. 45, Part I, p. 109, and GELTING's diary p. 139 and 140 of the present volume) practised flying over the house, but from September 10th they were seen no more. On the same day ptarmigans were migrating southwards, and the night frost increased; already on September 12th the temperature was 7—8° C. below zero. The different instruments for permanent scientific observations were installed in and near the station: the luxmeter, for registration of the variation in light intensity from hour to hour all the year round was installed in GELTING's laboratory, being connected by a conductive wire running through the ceiling to a sensitive photocell on the roof of the house. In three places in the terrain with different soils GELTING placed his soil thermographs, which drew curves on millimeter paper for the temperature fluctuations at the soil surface (beneath the snow) and at the depth of the roots of the plants.

On the terrace in front of the station SØLVER placed another instrument for measuring the light, a sunshine autograph, a glass ball which acted as a sun glass, burning a mark in a replaceable strip of paper as long as the sun was in the sky, so that the number of sunny hours all the year round could be controlled. Furthermore, precipi-

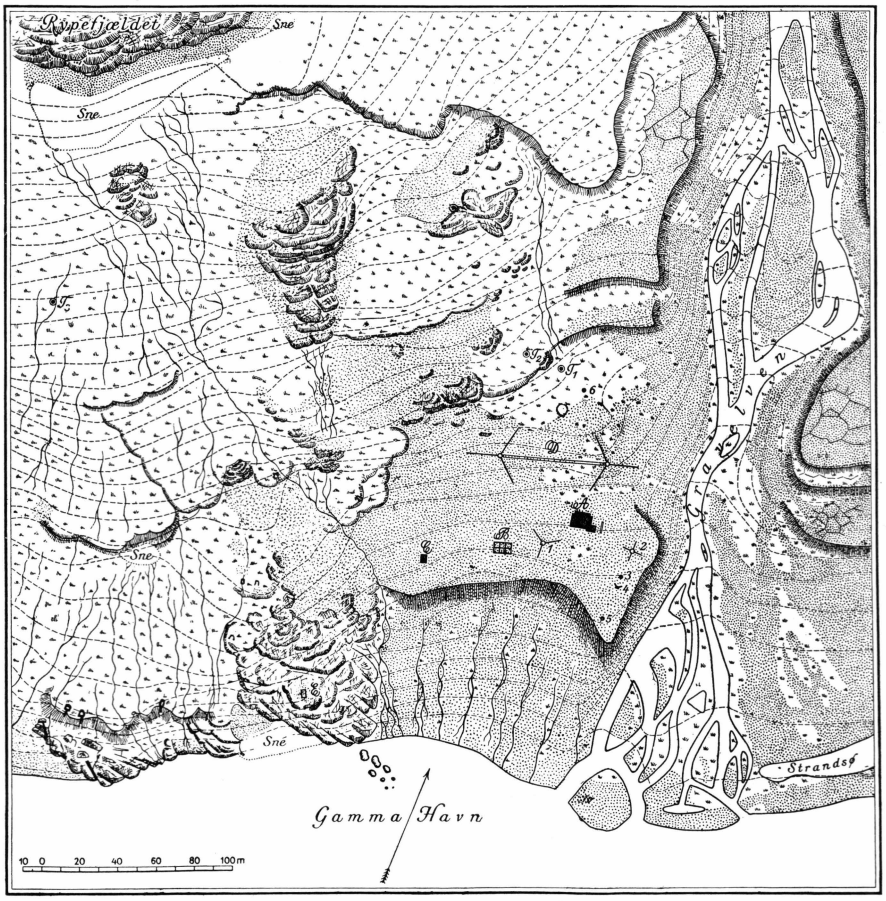


Fig. 16. Ground plan of the terrain around the station.

A. Wintering station, main house. *B*. Dogs' enclosure, *C*. Reserve provision shed. *D*. Mast of aerial. *E*. Kayak stand. T_1, T_2, T_3. Soil termographs. *1*. Flag pole. *2*. Wind mast. *3*. Precipitation gauge Nr. 1. *4*. Thermometer box. *5*. Sun autograph. *6*. Precipitation gauge Nr. 2.

Dotted areas indicate gravel and sand, the other symbols indicate vegetation and rocks. Below, left, the ruins of three Eskimo winter houses are seen on the tongues of solifluction soil above the shore rocks. A little higher up two other Eskimo house ruins are seen, as also a tent ring from the camp of the Danmark-Expedition in this place. The curves are given with one metre's interval. (Survey by Sølver, vegetation by Gelting, drawing by M. E. Knop and Knuth).

tation gauges and a thermometer box with maximum and minimum thermometers and a hygrometer were placed on posts in front of the house. The barometer obtained its place on the house itself, and the pudding vane, which indicated the direction of the wind, was hoisted on a special mast with arrows pointing north, south, east, and west.

From and including Saturday the 17th September SØLVER commenced his climatological observations according to the instructions of the Meteorological Institute and kept his journals. After a temporary computation of our position we determined the local time of the station to be one hour and twenty minutes after Greenwich, and in accordance with this reckoning the climatological observations were made three times a day, viz. at 8 a.m. and 2 and 9 p.m. To these were added observations of the northern lights, which from September 24th and onwards frequently appeared in the sky.

October 1938.

The erection of the wireless masts of wood, 16 m high, proceeded smoothly, on September 11th and 13th under the direction of SØLVER. BÆK commenced his callings, and finally, on October 4th, he received a reply from Lyngby Radio; we were again in communication with the surrounding world, and the establishment of the Mørkefjord station could be regarded as accomplished. Telegrams were transmitted to our patron, His Royal Highness Prince KNUD, the Administration of Greenland, Vice-Admiral AMDRUP, the staff of the Danmark-Expedition, our relatives and friends, and from all quarters we received hearty congratulations on the erection of the station.

However, now the more serious and less agreeable part of the work for the wintering had to be done: the depot journeys northward—the toilsome work of overcoming the handicap which was the result of our not having gone as far northward as we had hoped to do. But, just as we were about to prepare for a start northward in two parties—building of sledges, sewing of dogs' harness, calculating the sledge loads, etc.—a period of thaw set in quite unexpectedly on October 4th, which had unpleasant consequences not only for us but also for the animal stocks of the country. For several days the temperature remained above zero, to culminate with plus 3.5° C., the snow collapsed and thawed entirely over vast stretches owing to a heavy rain, the ice on Gravelven near the station broke up and the river rushed along entirely as in springtime. When after October 8th the frost set in again, the whole terrain was covered with a crust of ice, even the plants were encrusted in ice formed by the caved-in wet and slushy snow so that hares and musk-oxen had great difficulty in gathering their sparse food. Even if the plants were covered with ice, stones and coarse gravel, on the other hand, projected from the ice, causing great trouble to us, who had to drive with heavy loads long routes over land across the pass of Slædelandet, before we again reached on to the sea ice of Skærfjorden. It is true that there was a slight snowfall on October 10th, but it was next to nothing compared with the uniform layer that had gone, and the wind swept it

easily across the hard, smooth, and icy surface of the ground. On October 10th ALWIN PEDERSEN sledged to Danmarks Havn, remaining there till the 15th in order to photograph bears.

On October 13th, in fine weather and a temperature of 17° C. below zero, we made our first journey to lay out depots. Since it was at the same time to be a training trip for the dogs, it was only to go halfway across Slædelandet to the point where the ground began to slope down towards Skærfjorden. We carried only two boxes of pemmican for the dogs on each sledge, and were deluded by the ease with which the journey was accomplished into optimistic beliefs about the future. Unfortunately, however, it was the only one of the sledge journeys of the year which really proceeded at a good pace. Some days later, on October 16th, two parties started on the first depot journey northward: NIELSEN and OVE, who returned after thirteen days, and SØLVER, KNUTH, ELI, and ZACKÆUS, who were absent from the station for eighteen days. Large depots of provisions and food for the dogs were laid out on two small islands north and northeast of "Gamma Ø" in c. 77°53′ N. lat. (for this and subsequent sledge journeys, see a later chapter). While these journeys were made, the sun disappeared below the horizon, and we were then in the dark period, which at the Mørkefjord station was to last for 105 days and nights, from October 30th to February 13th. The sledge party which had been farthest off encountered thaw and rain on its return journey across Skærfjorden—another warm period, which continued during the first days of November with positive temperatures at the Mørkefjord station.

November 1938.

While we were away on the journeys northward, BÆK attended to the meteorological observations and otherwise occupied himself with the wireless apparatus, tuned in the aerials and the condensers, and examined their capacity. It turned out that the conditions for both transmitting and receiving were extraordinarily good; by the aid of our small 20 Watt telephone transmitter, of which nobody had had great expectations, BÆK established communication with several Danish North Sea cutters sailing near Iceland and the British Isles, and then it happened on November 3rd, the night after our return from our first depot journey, that he surprised both ourselves and the people at home by establishing a direct telephone connection between Mørkefjord and Copenhagen. The event aroused great interest in Danish wireless circles, and was later repeated, more or less effectively, several times in the course of the dark period; however, I will leave it to BÆK to give an account of this.

Since NIELSEN was not contemplating to set out on a depot journey

for the time being, GELTING could borrow his dogs, and accompanied by OVE he started southward into Dove Bugt on his first botanical reconnaissance journey, which lasted from the 5th to the 15th November. There seemed to be a period of settled and calm weather, the temperature kept steadily under 22° C. below zero, the going had improved, and the moon, which was on the increase, gave so much light that it was easy to find one's way in the terrain. SØLVER and I decided to take advantage of these favourable conditions and make one more depot journey northward before Christmas. It was planned to be shorter than our previous one, but it came to be of nearly the same duration, lasting from the 9th to the 24th November, partly on account of the capricious weather, partly because on our return journey we paid a visit to the Norwegian-French expedition on the outer coast of Storlandet.

It was a return visit for a visit which the Norwegians paid us as early as the end of September, when we learned where the Norwegian-French expedition had settled. A fairly large wintering house with a wireless station—very similar to ours—had been erected a little north of Fyrretyvekilometernæsset, and this was the residence of the main party consisting of the leaders, Count GASTON MICARD and the architect WILLIE KNUTSEN, the physician KRISTEN HATLEVIK, the wireless operator SIGBJØRN ÅMODT, the cook WILLIAM JACOBSEN, and the trapper NILS NILSEN. The station had been named Micardbu (77° 04′. 2 N. lat., 18° 12′ W. long.) after Count MICARD. A small depot hut had been built on Thomas Thomsens Næs 12—15 km farther northward, and a smaller house with aerial masts called "Centralen" had been erected at a similar distance to the south of Micardbu (cf. map on p. 159). The ship, the "Ringsælen" or the "En avant", had taken shelter for the winter in a cove at the north point of Store Koldewey (76° 43′. 2 N. lat., 19° 03′. 8 W. long.), and here the captain, KARL NICOLAISEN, the wireless operator JESS TILLIER, and the assistants LEIF OLSEN, INGVART INGEBRIGTSEN, SIGMUND SNARBY, and EDVARD WILHELMSEN, were staying.

With the Norwegians SØLVER and I arranged the details of a cooperation in photographing the northern lights, so that by directions over the wireless photographs of the same northern lights could be taken at the same second from Micardbu, the "En Avant", and Mørkefjord—three places situated at convenient distances and forming a triangle of a size suitable for our purpose: the computation of the height of the northern lights above the earth and their place in the sky. On our return journey from Micardbu we spent the night in the house at Danmarks Havn. Here we caught an ermine, which throve excellently in captivity during the remainder of the winter at the Mørkefjord station, and as early as about the middle of February it began to change to its summer phase.

Fig. 17. The shark arrives at the station on December 20th. Phot. by SVEND SØLVER.

After our return to Mørkefjord extra climatological observations were made at the top of the 200 m high Rypefjeldet, a mountain beside the station, every day at 2 p.m. from and including November 25th to and including March 9th, that is to say for 105 days. These observations were made alternately by SØLVER and myself, while SØLVER alone erected the substation and directed the work.

As the seal and walrus hunting of the autumn had been unsuccessful, and no other game was at hand, we were unfortunately compelled to shoot some musk-oxen in order to procure fresh food for the dogs. In the autumn musk-oxen had been numerous everywhere near the coast; thus the trappers from Hvalrosodden reported that they had observed several hundred during a trip across Slædelandet. On October 16th KNUTH and SØLVER counted 92 animals at one time in "Lumskebugten" (that is fourteen more than the total number of animals seen by the Danmark-Expedition in the course of two years), and late in October the oxen appeared in small flocks, totalling forty animals, scattered around the station, indeed so near it that GELTING had repeatedly to run outside to drive them away to prevent them from trampling on his soil thermographs. At that time we did not have the heart to kill them, but now that we needed them, they were nowhere to be seen, and we wondered where they were.

December 1938.

In the hope that we might be able to spare the musk-oxen, we tried other hunting possibilities, and on October 14th we set out a line

on the ice several kilometres in front of the station in order to catch sharks. In spite of great difficulty of finding the place again on the large ice-floe in blizzards and darkness, it was constantly watched by the Greenlanders during the rest of the year and now and then removed to other depths; finally, on December 20th, in the most intense darkness of the winter night, the Greenlanders returned to the house in the light of the storm lantern with a shark, 315 cm long, on their sledge, secured from a depth of 55 fathoms. It was the only shark we caught, a distressing result considering the need of food for the dogs, but still a proof that sharks did occur in the middle of the winter in Dove Bugt and that they might be caught.

The greatest event of the Christmas month was the transmission of greetings to Greenland over the wireless on December 13th, 15th, 16th, and 19th. On these occasions not only the three trappers CHRISTIAN JENSEN, HENNING ØRNLEF, and CARLOS ZIEBELL from Hvalrosodden, but also the Danish trappers FRANS DALSKOV and JENS MARIUS JENSEN from the "Nanok" station "Aalborghus" at "Gefionshavn" on Godfred Hansens Ø 80 km farther south in Dove Bugt, were present.

January 1939.

On New Year's Day the DRASTRUP-Expedition arrived. It consisted of two Danes, ELMAR DRASTRUP and FINN CHRISTOFFERSEN, who intended to drive around the north of Greenland to Thule. Since November 8th, when they informed us over the telephone from Eskimonæs in 74° N. lat. that they were now starting northward, we had been prepared for their arrival, but snowstorms, darkness, and unsuccessful hunting had impeded their progress. Several of their dogs had died along the route, so their original two teams had been reduced to one and the members of this team were so lean that they could hardly stand on their legs. As soon as food and rest had restored them a little, DRASTRUP and CHRISTOFFERSEN drove onwards to Hvalrosodden, where they settled down in one of the outbuildings and prepared for the next long stage of their northern journey.

BÆK continued his long-distance telephony to Denmark and at the beginning of the new year likewise repeatedly communicated with Angmagssalik. GELTING accompanied by ELI set out southward across Dove Bugt on his second botanical reconnaissance journey, January 4th to 8th, and SØLVER commenced photographing the northern lights in cooperation with the Norwegians, since, after some unsuccessful attempts, favourable conditions finally set in for the first time on January 9th. On that day it was so light at the observation time, 2 p.m., on Rypefjeldet that (with no moon) the figures of the thermometers were easily readable without the use of lanterns. A third warm period, when the temperature, however, only rose to near zero but not above that

Fig. 18. Drapery of northern lights in the southwest over the station. Phot. by SVEND SØLVER. January 18th, 1939.

point, set in about January 12th, when NIELSEN and OVE started on a five days' depot trip to Fladebugt in Skærfjorden. After that time the temperature fell rapidly again, reaching the first minimum of the winter, 40.5° C. below zero, on January 16th and 17th.

February 1939.

The ensuing period was characterised by violent snowstorms—especially before the return of the sun—and later on by renewed intense cold. From February 17th to 26th, with an interval of only a few days, the north wind swept roaring across the station from the mountains behind, heaping up enormous masses of snow over the landscape, and entirely changing its aspect. The dogs' yard was snowed under and could not be used, the houses were buried so deep that you had to dig your way down to them. The door was repeatedly blocked in the morning, so that SØLVER had to go out through a window in order to make his

observations. It was extremely difficult to find the way to the cairn at the top of Rypefjeldet on such days, and in some few cases it had to be given up.

As soon as it was at all possible and the weather seemed to have calmed down, the sledge journeys were resumed: SØLVER, ELI, and ZACHÆUS drove a depot to Rekvedøen, January 29th to February 3rd; KNUTH and the trapper ØRNLEF stayed at Sælsøen from February 1st to 7th to look for musk-oxen and to test the sledge wireless; and NIELSEN and OVE drove a depot to Skærfjorden, February 2nd to 9th. High, hard snow-drifts or deep, loose snow as a result of the stormy period rendered these journeys difficult, and to this was further added an extreme freakishness on the part of the weather, an extraordinarily intense cold, which compelled NIELSEN to interrupt his journey midway in Skærfjorden and return home. His temperature observations during the journey, given on p. 91, on February 7th and 8th showed 52° C. and 56° C. below zero respectively.

The observations were made with a spirit thermometer put out through a hole in the tent wall; it should be noted that the scale of the thermometer only reached —50°C., and temperatures below that point are therefore estimated on the basis of the remaining part of the spirit column, corresponding to a length of 10° below the 50°-line. At the station a temperature of —41.6° C. was registered on February 7th and —41.5° C. on February 8th, figures which, it is true, are not so high as those of NIELSEN; still they are below the cold record of the Danmark-Expedition for both its wintering years, viz. —40.9° C., which was registered on March 11th, 1907, at Danmarks Havn. On subsequent depot journeys intense cold on the fjord and sea ice farther northward was again ascertained, and NIELSEN's observations were thus confirmed. On KNUTH's depot journey (February 25th—March 28th) temperatures of 40°—47° C. below zero were often registered, and there is reason to believe that still lower temperatures might have been read if the minimum mechanism of the thermometer had not failed.

In the first days of February the Mørkefjord station was again visited by Norwegians, this time by WILLIE KNUTSEN and JESS TILLIER, and BÆK established some telephonic connections with Norway. Another stormy period set in about the time the sun returned, culminating on February 10th and 19th, when the observations at Rypefjeldet had to be given up; but a rather strong gale was blowing on the 12th, 20th, and 21st, too. It was during this stormy period, from the 19th to the 21st of February, that two Danish trappers, SVEND AAGE JESPERSEN and ANDERS KRISTIAN ØSTERLUND JOHANNESEN, as we learned later over the telephone, disappeared farther southward, north of Hochstetter Forland. They had started northward from the Hochstetter station on

Fig. 19. The whole wintering party in the daylight after the end of the dark period. From left to right: Sølver, Gelting, Knuth, Eli, Bæk, Nielsen, Ove and Zackæus. Photo by Eigil Nielsen, March 30th, 1939.

February 17th with Roseneath as their goal—with no tents on their sledge —and had not been seen since then. However, the wireless operator of the Eskimonæs station, IB POULSEN, who set out on a search trip, found indications in the Oswald Heer hut that they had been there; on his arrival both the doors of the hut were open, and JOHANNESEN's anorak was lying in the snow outside the hut. But no traces were seen of either the dogs or the sledges.

We got some idea of the large quantities of snow that had gradually accumulated when, before starting on the next long depot journeys, we had to provide for the kerosene supply of the station during our absence, and ordered the Greenlanders to dig down on the shore to fetch up the barrels. The snow was three metres deep where the barrels were standing, and a gigantic shaft had to be dug, which meant several days' work, in order to secure the right barrels. The return of the light had rendered it possible to trace the fate of the large herds of musk-oxen observed in the autumn; now musk-oxen were chiefly met with on the high plateaus, often at altitudes of 600—700 m. Up there the conditions for grazing had for various reasons been safer during the winter; owing to a lower precipiation in connection with more constant temperatures the warm autumnal period, which at lower levels caused everything to be encrusted with ice, had been of no effect; the soil was dry and fairly free from snow, a condition to which the strong gales had probably also contributed. Thus at any rate a certain proportion of the musk-ox stock seemed to have passed the dark period up there, but in the large mountainous areas farther inland the animals may of course have been found in many other kinds of places where, for good reasons, we were prevented from observing them. In the period from February 25th to March 3rd ALWIN PEDERSEN made a trip to the northern part of Slædelandet in the company of FINN CHRISTOFFERSEN, and subsequently he set out with ZIEBELL on his longest journey, from March 11th to April 8th, to Hellefjord, Port Arthur, and the islands in the southern Dove Bugt, where, as mentioned above, he noted that everything was covered with ice, even as far as the edge of the inland ice.

March 1939.

At last the long winter depot journeys northward could take place. There were two parties: NIELSEN and OVE, whose journey lasted from February 22nd to March 21st, and KNUTH, ELI, and ZACHÆUS, whose journey lasted from February 25th to March 28th. (The depots laid out in the autumn and earlier in the winter were gathered in one place and added to, with the result that two substantial depots were established farther northward in Jøkelbugten, at the southernmost point of the island of "Hammeren" (78°15′ N. lat.) and at "Mellemfortet" (78°25′ N. lat.) respectively.) KNUTH made his

Fig. 20. View from the terrain around the station towards the "Danmarks Monumentet" and Fuglenæbsfjeldet, in Mørkefjord. Phot. by EIGIL NIELSEN, about March 25th, 1939.

return journey via Micardbu, and here WILLIE KNUTSEN made him a present of two dogs to remedy the very critical situation that had arisen owing to a heavy reduction of the number of dogs of the expedition in the course of the winter. Five dogs had been lost onboard the "Gamma" even before its arrival at Iceland, some had died from cramp in the autumn, others could not tolerate the intense cold or the hardships of the sledge journeys, three had disappeared leaving no trace, and finally, in January, our stock of dogs suffered a most distressing and serious diminution, four dogs dying on the same day after breaking into our provision house and eating of a barrel of salt meat. All attempts to save their lives by lavage proved futile. Forty adult dogs were now left at the Mørkefjord station, and two of these were female dogs with almost new-born pups; this meant that for three of the seven sledges which now constituted the smallest number of necessary vehicles, only five dogs were available. The problem became still more difficult when after my return home SØLVER expressed a desire to travel alone with one Greenlander instead of travelling in company with ELI and myself, as was my plan. However, SØLVER thought that he could do more in his special field as a cartographer and geologist if he was entirely independent.

At last the problem was solved when the trapper CARLOS ZIEBELL from Hvalrosodden, at the end of the trapping season, entered the service of the expedition with his five dogs. The total number of dogs available for travelling, including the two Norwegian dogs, was now 45, which rendered the following distribution possible: SØLVER and ZACKÆUS had to be content with one sledge and ten dogs, NIELSEN and ELI each got a team of eight dogs, OVE a team of seven dogs, and GELTING and myself a team of six dogs each. SØLVER preferred this arrangement to having his own sledge with eight dogs, as would have been possible if he had travelled with ELI and myself. Six dogs would suffice for GELTING for his comparatively short reconnaissance journeys in the neighbourhood of the station, and as soon as spring set in, his work would consist in observing the development and flowering of the vegetation round the station.

The day after KNUTH's, ELI's, and ZACKÆUS's return from their last depot journey on March 29th, BÆK received a telephone message from the wireless operator IB POULSEN at the Eskimonæs station, informing us about the aforementioned disappearance of two Danish trappers in the days about February 20th, and on March 30th IB POULSEN telephoned a more detailed account of his search. After BÆK had communicated with Micardbu and the "En Avant", and learned that nobody in these places had seen the lost trappers, we sent for CHRISTIAN JENSEN from Hvalrosodden and discussed the matter with him. IB POULSEN had informed us that very shortly a fresh search party of two sledges would start from Eskimonæs northward, and we came to the conclusion that

the only thing for us at Hvalrosodden and Mørkefjord to do was to examine the huts in Dove Bugt in case the missing men should have visited them and left a note, as is customary when one visits a hut in these barren tracts. Such a search could take place as soon as the Norwegian trapper BJARNE DALSBØ[1]), who had been staying with us as a guest for some time, started southward to his station in Roseneath Bugt immediately north of the Oswald Heer hut, where POULSEN had found JOHANNESEN's anorak, and furthermore GELTING would have a careful look round when in a near future he went southward on a round trip in Dove Bugt. After the violent blizzards there was no hope of finding the bodies of the dead men till late in the spring, and then the Danish and Norwegian trappers down at the place would have to take action.

Yet another question urgently required to be dealt with before our departure northward, viz. the continuation of the Mørkefjord station and the renewal of the staff for the coming year 1939—40. On account of his constant journeys to the various centres of disturbance in Europe, EBBE MUNCK had been unable to deal with this matter, and the necessary negotiations had therefore now to take place over the wireless from Mørkefjord. BÆK knew where to find a wireless operator, CHRISTIAN MADSEN from the Royal Danish Army Flying Corps, and MADSEN agreed to replace BÆK. The Meteorological Institute was interested in the continuation of the observations and was willing to let us keep the instruments; Mr. M. P. PEDERSEN prolonged the loan of the large long-wave transmitter, and BÆK and I dispatched telegrams which opened up possibilities for more members, among others a young zoologist NIELS HAARLØV. EBBE MUNCK had been unable to procure means for the reequipment of the "Gamma", but the Administration of Greenland now promised to fetch us and to carry the goods, provisions, and fresh personnel in the "Gustav Holm", which was to call at Hvalrosodden. BÆK undertook the other arrangements that had to be made as regards the ordering of fresh equipment, provisions, tools, and spare parts for the coming year, in cooperation with our solicitor Mr. CHRISTIANSEN, Copenhagen, so that I could start northward, as I had hoped, knowing that the continuation of the station was ensured.

The chief consideration prompting this procedure was that scientific activities over several years would bear a more reasonable proportion to the considerable outlay of money and the work which the establishment of the station with its stock of dogs, its wireless plant, and other fixed material had required. Even if we should not succeed in engaging a large staff of scientists to winter in 1939—40, the station must at any rate be kept going so that the accumulator battery should not be

[1]) One of the two Norwegians who where rescued by the "Gamma" in the autumn.

ruined and we could avoid shooting the dogs, while MUNCK and myself could work in Copenhagen with a new expedition 1940—41 in view. We then intended, among other things, to place the station and staff at the disposal of geodesists in the hope that they would extend their systematical air photography of the country to our latitudes—a hope we had cherished from the very outset of the expedition.

April—May—June 1939.

The long journeys in the spring, which played such an essential role in the work during the winter of 1938—39, were now imminent. On Saturday the 1st of April the Dannebrog was hoisted in order to make more festive the solemn moment when the first sledge party started northward, namely NIELSEN and OVE, who were absent from April 1st to June 13th. The next to start were SØLVER and ZACKÆUS, whose journey lasted from April 7th to June 12th. On the same day as SØLVER, GELTING drove southward alone with his six dogs, to be absent from April 7th to 29th, and as the last party, finally, KNUTH and ELI on Easter Sunday the 9th of April started on their journey northward, which lasted from April 9th to June 26th. Reports on these journeys are given below (pag. 92 et seq.).

After visiting the southern islands and lands in Dove Bugt, GELTING returned on April 29th, but before the return of the north-going sledge parties he made three more sledge trips to Sælsøen and Annekssøen. On the first trip, May 5th to 11th, he was in company with ALWIN PEDERSEN, the second trip, June 2nd to 5th, he made alone, and the third trip, June 13th to 18th, in company with ZIEBELL. On all these trips an abundant number of musk-oxen were encountered—on the last trip alone fifty-one—and it may be assumed that the many other, unvisited, valleys in the mountain ranges of western Germania Land were also haunted by musk-oxen in the late spring. In the intervals between these trips GELTING made a trip to the ship at Store Koldewey and to Micardbu, as an opportunity offered for the expedition to send mail to Denmark by an airplane which had been ordered from Norway by the sick Count MICARD to carry him to a hospital in Europe. By the middle of May the sealing vessel "Vesle Kari" succeeded in sailing the airplane through the drift ice to an opening in the ice off Shannon, whence on May 19th it could fly to Micardbu to fetch Count MICARD and WILLIE KNUTSEN. GELTING dispatched preliminary reports on the work of the expedition, especially on his botanical investigations, adressed to EBBE MUNCK and to the Botanical Museum of Copenhagen.

ALWIN PEDERSEN, who on April 8th had returned from his trip with ZIEBELL to southern Dove Bugt, in addition to the above-mentioned

Fig. 21. The ice-bound Norwegian ship "Ringsælen" alias "En Avant" near the northmost point of Store Koldewey. Phot. by PAUL GELTING, May 14th, 1939.

journey with GELTING from May 5th to 11th, made another trip to Sælsøen and Annekssøen from May 17th to 20th, and subsequently he stayed in the environs of Port Arthur in the days May 23rd to 28th. For the remaining part of the summer he stayed at his house at Hvalrosodden, whence he often made excursions in the surrounding country, i. a. to the highland to the west.

After the return of all the members of the expedition at the end of June, the question arose whether there was any chance of being fetched by the "Gustav Holm" and what we ourselves ought to do to ensure our return journey. After the long and severe winter the ice lay unbroken over the whole of Dove Bugt, and even three days before the "Gustav Holm" was to leave Denmark, the ice was still 140 cm thick, as appeared from a series of observations made by SØLVER in order to ascertain how much it had decreased. It had happened before that navigation had had to be given up, and the conditions did not look

very hopeful. In the winter, having such possibilities in view, I had induced Count MICARD to promise that we might go to Norway in the "En Avant" when it got free from the ice; there was now every prospect that it would soon be free, for the open water off the coast reached Danmarks Havn. Captain NICOLAISEN counted upon returning home at the beginning of August. If we chose this alternative, however, it would be annoying if the "Gustav Holm" reached Mørkefjord with EBBE MUNCK and the new personnel onboard and they should find the station empty. Moreover it was of great importance that the new men should be informed by us of the conditions. At the station we also discussed many compromises, for instance to sledge the scientific collections and the most necessary goods to Danmarks Havn while the ice still made this possible, and to await the "Gustav Holm" out there, where the chances of its reaching the shore were much greater—or finally: to let three men (NIELSEN and the two Greenlanders) embark on the "En Avant", while the rest of us remained at the station awaiting developments, so that, in case the "Gustav Holm" failed to call, there would be a smaller number of mouths to feed on the provisions during another wintering.

For the time being the decision was postponed in the confidence that fortune would favour us, and more especially because none of us felt inclined to break up so early and thus miss the extremely valuable working time of the summer. GELTING did not want to miss one day or even one hour of the short growth period of the plants, and to me and my frozen ruins a week about the middle of August—or better still later on —meant almost just as much as all the other days of the year combined.

July 1939.

On our return from the long journeys the large snow drift in front of the station had thawed, while the shore terrace and the foreshore were still covered with snow. Gravelven had broken its cover, and outside its mouth, where the bay was shallow and dry at low-water, there was a small space of open water. Nests with eggs of ringed plovers and snow buntings were scattered over the terrain. The noon temperature ranged between 5° and 10° C., and the gnats began to appear. The melting of the snow on the ice impeded travelling with sledges, and the beginning of July was spent working at and around the station: GELTING made botanical investigations; SØLVER commenced taking observations for drawing maps of the area of the station on a scale of 1:1000, and of the whole Hvalsletten from Rypefjeldet to Lakseelven and Hvalrosodden on a scale of 1:25,000; KNUTH excavated the Eskimo house ruins near the shore; BÆK attended to the wireless; and the Greenlanders washed bear skins and went out hunting seal.

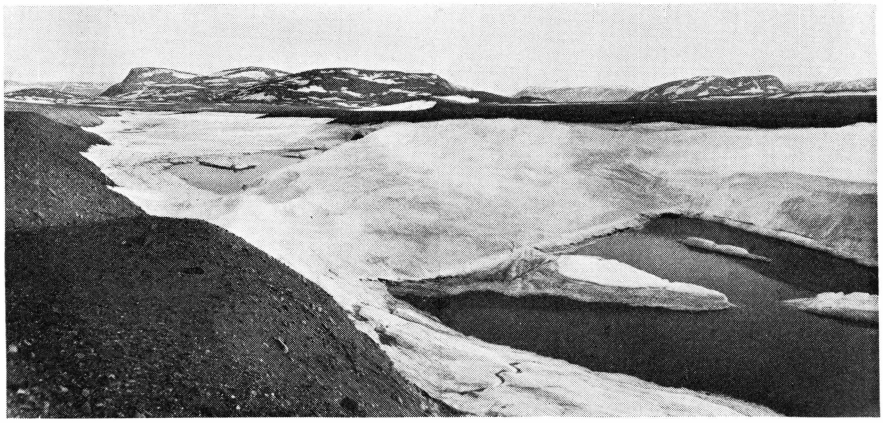


Fig. 22. The mouth of Lakseelven immediately before the ice broke on July 20th, 1939. Phot. by PAUL GELTING.

Assisted by ZIEBELL, who still served at the station, BÆK on July 9th dug out the motorboat from the snow, and started it next day. On July 12th the Greenlanders found the water basin in front of the river mouth large enough for launching their kayaks. On July 10th NIELSEN and OVE started with a sledge to pay a visit to the "En Avant", and on their return journey on July 12th OVE shot two walrusses at Lille Snenæs. Their journey showed that the ice was now practicable again after the caving in of the snow—though the surface was a labyrinthine system of pools—and KNUTH and ZIEBELL therefore started southward with sledges in order to dig out Eskimo ruins at Port Arthur, a trip which lasted from July 13th to 18th.

According to the reports of the trappers at Hvalrosodden and of ALWIN PEDERSEN, the ice in Lakseelven, the large outlet of Sælsøen, had broken in the night of July 20th. Soon afterwards the water masses of the ice-free river produced open water in front of the station at Hvalrosodden, where the trappers could launch their large motorboat and sail about. From Rypefjeldet we could observe this water, which slowly made its way outwards, south of the point of the headland, so that even from the Mørkefjord station below it could be distinguished as a dark stripe. At the same time something like a shadow was observed in the interior of Mørkefjord behind the pool-filled ice, and by the aid of the telescope we could ascertain that this, too, was open water moving outwards. A few days later a foehn wind had driven it right out past the "Danmarks Monumentet" and Pustervig to the western end of "Kalven". Open water was now also discerned far to the southward in Dove Bugt, but otherwise the holed ice was unbroken, only with occasional crevasses, for instance off Væderhornet and obliquely across from "Foraarsboplads" (spring settlement) to Vindseløen. SØLVER's

measurements of the thickness of the ice in front of the station on July 21st showed 103 cm, and on July 23rd 98 cm.

On July 22nd salmon nets were laid out outside the mouth of Gravelven, and from then on we had abundant quantities of salmon both for dinner and supper every day. The salmon first caught beat the record as to size, being 60 cm long and weighing 2.5 kg. From July 23rd to 26th GELTING and OVE made a sledge journey to Væderhytten with an ascent of the Væderen plateau to investigate the altitudinal occurrence of the plants; it was the last sledge journey of the season. The 25th and 26th of July became our warmest days, the mean temperatures in the sun being 27° and 22° C. respectively. The consequence was that the gnats were very annoying, so we shifted our working time to the cooler hours of the night, sleeping in the day. On July 28th the wireless reported that the "En Avant" had escaped from her winter quarters and had for two days been loading off Micardbu. The decision regarding our return journey could not be postponed any longer, and animated by the heat and the resulting progress of the melting of the ice, we all agreed to remain at the station, awaiting the arrival of the "Gustav Holm".

The "Gustav Holm" had announced its arrival about August 20th, but according to the latest bulletins from EBBE MUNCK the ship had trouble in the ice at Eskimonæs farther south, and the plan now was to postpone the visit to certain stations down there and try to reach Dove Bugt first, which meant that the ship's call at Mørkefjord would be advanced to August 16th. So now our return journey depended on whether the ice-cover of the bay, which was several metres thick and squeezed in between the mainland and the islands on all sides, would disappear in the course of nineteen days. Over the telephone we suggested that the ship should not go northward too early, as we knew that its navigation programme was comprehensive, including after Northeast Greenland both Scoresby Sund, Iceland, Angmagssalik, and West Greenland, so that it had hardly very much time to waste in making experiments as an ice-breaker in our latitudes if there should be difficulty in proceeding. We constituted but a small part of the large programme, and the directions from the Administration of Greenland said that the ship was to be out of the ice before a certain date. If a gale from the west did not set in soon, things would look serious for us—a westerly gale which could stir up the open water in Mørkefjord and increase its attacks on the ice in front of the station. However, the weather continued fine and calm. From the east—from the sea—little help in the form of wind and current could be expected, for there Store Koldewey formed a bulwark 90 km long, shutting in the bay. Had it not been for Store Koldewey, we should no doubt have had open water long ago.

Fig. 23. Looking inland through Mørkefjord to Pustervig and the "Danmarks Monumentet" after the ice had broken up. Phot. by Eigil Nielsen, beginning of August, 1939.

On the same day as we made up our mind to await the arrival of the "Gustav Holm", July 30th, we launched our motorboat the "Ebbe" in front of the station, where the stretch of open water had increased to a length of 500—600 metres. On July 31st ZIEBELL succeeded in sailing the boat through the land-water eastward to the open water off Hvalrosodden, which extended as far as Lumskebugten.

August 1939.

An attempt, on August 1st, to make our way into Mørkefjord with the "Ebbe" had to be given up, but at last in the night of August 2nd there came some of the wind so long desired, which freed the last part of the fjord from ice, broke up the ice in front of the station, and produced a broad belt of open water east of Væderen. Thus on August 4th we could make a trip into Mørkefjord; GELTING, NIELSEN, SØLVER, and I sailed as far into the fjord as possible without touching the clay from the river that empties into the head of the fjord. From this point we proceeded on foot towards the inland ice, and while NIELSEN and SØLVER walked across the Mørkefjordsplateau back to the station, GELTING and I sailed on a botanical and archæological reconnaissance trip to Pustervig and Kalven, returning to the station on August 6th. Large flocks of geese were seen along the river at the head of the fjord as also occasional musk-oxen. A herd of fourteen musk-oxen was observed at the head of Sælsøen by NIELSEN, who returned in the night between August 6th and 7th. In the early morning of August 7th KNUTH and OVE started on a voyage to Gefions Havn to make excavations in the southern Dove Bugt, having been invited to be passengers in the motor boat of the Hvalrosodden station and to accompany the trappers DALSKOV, JENSEN, and ØRNLEF. After various troubles we passed Væderen, and southward from Spydodden the bay was open. The trip lasted from August 7th to 12th. In the meantime SØLVER and the Greenlanders killed three walrusses east of Hvalrosodden.

The ice had now broken up from the station to Vindseløen, but large continuous ice fields were still found between Vindseløen and Orienteringsøerne. SØLVER was busy finishing his mapping work from the summits of Rypefjeldet and Brystet; KNUTH measured Eskimo ruins, GELTING collected the last plant samples, and a general packing was going on. On August 15th the "Gustav Holm" sailed northward off Lille Koldewey, and in the early morning of August 16th—the anniversary of our first landing in a motorboat at Rypefjeldet—open water was seen all the way towards the coast. In the afternoon the "Gustav Holm" dropped anchor off Hvalrosodden, and on August 19th goods and men from Mørkefjord had been taken onboard, the ship headed southward across Dove Bugt, while the new wintering party of three men

went ashore: the wireless operator CHRISTIAN MADSEN, the zoologist NIELS HAARLØV, and ANDREAS HVIDBERG, who partly on his own initiative had secured money for his stay, and who by virtue of his age

Fig. 24. KNUTH at the helm on the voyage to the head of Mørkefjord. Phot. by SVEND SØLVER. August 4th, 1939.

and experience became the leader of the station. ZIEBELL remained at the station as assistant.

As in the preceding year, this summer, too, the painter GITZ-JOHANSEN was a member of the expedition (by the support of Captain TROLLE) in order to make studies, and like EBBE MUNCK was a permanent passenger on the "Gustav Holm" during her circular voyage. The ship called at Gefions Havn, and then sailed round the north of Store Koldewey out of Dove Bugt. In the evening of August 31st, after calling at the colony of Scoresby Sund, we sailed out of Scoresby Sund in a dense fog, thus leaving Greenland and heading towards Isafjord

in Iceland. About midnight it was reported over the wireless that the war had broken out between Germany and Poland.

17. The depot journeys.

a. Route. Going.

It is beyond doubt that the Mørkefjord station was more unfavourably situated for northward journeys than Danmarks Havn; the sledge party of the Danmark-Expedition was able to follow the outer coast and to travel on the sea ice all the way, while, to reach Skærfjorden, we first had to make a troublesome sledging across Slædelandet—the lower portion of Storlandet (southeastern Germania Land), bounded on the west by Valdemarsmuren and on the east by Moskusoksefjældene. All sledgings thus had to begin up a hillside of a height of about 300 metres, moreover over stony ground, whose snow-cover owing to special circumstances was particularly poor. Thus it turned out that the two valleys of Sælsøen and Annekssøen running towards the inland ice (Storstrømmen) acted together as a regular storm valve through the southwestern highland of Germania Land. The wind blew almost constantly from Storstrømmen through these air channels towards Dove Bugt, sweeping all the snow away from the ground wherever it gathered. Part of the air current passed west of Brystet through the depression occupied by Gravelven, swooping down on the Mørkefjord station and its nearest surroundings. Another branch—probably the larger one—followed the main direction from Sælsøen southward through the valley (about a kilometre broad) around Lakseelven; and other secondary currents passed round the north of Trekroner, sweeping clean the ground in the southern lower-lying part of Slædelandet before the ascent to "Passet" began.

Thus the first twenty kilometres of our route were very tiresome, which was a disadvantage to us in many respects, for if depot journeys are to be effective, there must at the start be a liberal surplus of loads on the sledges so that not all the food is consumed in a short time, and in case a few days of bad weather should set in. Similar arguments may be advanced as regards the physique of men and dogs: it is important to economise one's strength during the first days so that it will suffice later on, whereas hard and tiring work at the start will before long reduce both motive power and morale.

As soon as the flat stony land east of Trekroner was passed, the ascent to "Passet" was easy; the rise was gradual, and since we were now evidently outside the range of the Sælsøen valve, snow was abundant. The point named by us "Passet" was merely a summit of the gradually

Fig. 25. A hitherto unknown work of Michelangelo, found in Northeast Greenland. A photograph selected from the film of the expedition. Phot. by EIGIL KNUTH. April 11th, 1939.

rising land, Slædelandet, immediately west of the portal found between the northern part of Moskusoksefjeldene and the mountains west of the glacier of Storlandet. Along the western side of the latter mountains the ground sloped evenly northward down to a small lake surrounded by low mountains. From this lake a river made its way through a ravine towards Fladebugt in Skærfjorden. When we drove down to the ravine on our first long depot journey in October, the snow was so loose and deep that we had to drive across a rock knoll to the left of the entrance, whence we descended by a steep slope into the ravine some distance farther on. It was only with difficulty that we succeeded in doing so, but even greater difficulties were in store for us at the bottom of the ravine, where large blocks of stone, lying in great confusion, barred our way. Inch by inch the sledges had to be pushed and lifted across the stones at the hazard of being pulled to pieces. The dogs were frightened because of the constant halts and got their traces entangled among the stones. Almost at the end of the ravine, looking towards the flat land in front of the bay, a large stone statue, shaped like a man turning his back upwards and looking across the fjord, was standing on a ledge below the mountain wall on the right side of the ravine. The way it was fashioned, its posture, and the whole pathos of

it reminded one of a roughly made statue of Michelangelo, and we therefore called the ravine after it: Michelangelos Kløft (Michelangelo's ravine).

Already a few days after our trouble in Michelangelos Kløft, on October 20th, a snowfall made it easier to negotiate, and gradually driving snow from the surrounding mountains accumulated in the ravine to a depth of many metres, so that even the largest stone blocks were covered, and we drove along as easily as on a highroad.

Fladebugt[1]), like the majority of the many ramifications of Skærfjorden, was exposed to local winds, so the going was rarely good here. In the autumn we encountered deep, loose snow, and later on very trying snow drifts. On the large, open Skærfjorden, however, we drove on a uniform, level surface, and northward from this fjord we met with the same conditions as the Danmark-Expedition. From Kap Amélie to Depotnæsset we encountered smooth snow-free ice, and we repeatedly experienced the heavy gales from the mountains which produce this smooth ice, especially near Depotnæsset (October 24th and 30th). Along the coast of Stormlandet from Depotnæsset to Orléans Sund we met rather varied going, and on our return journey from our last depot journey about March 20th—22nd the snow-drifts were troublesome both here and along the coast of Gamma Ø.

Travelling across Orléans Sund on our first depot journey at the end of October, while the snow was still sparse, midway between Kap Louise and Kap Isabella we discerned the outlines of some very large ice fields a couple of metres high, which made the bergs of the iceberg bank accumulate in a circle around them. Long ridges of wavy, smooth ice with cracks and crevasses were found here and there on the ice fields, and these wavy areas reminded me so much of landscapes from the inland ice that I regarded the vast ice fields as examples of the "floating inland ice" in Jøkelbugten mentioned by J. P. KOCH and WEGENER in their "Glaciologische Beobachtungen". Later on the snow smoothed the edges of the ice fields, transforming the terrain into a much broken field whose character and structure were precisely like that of Jøkelbugten. It is possible, therefore, that the undulations of this bay are due to similar separate broken fields of "floating inland ice" having frozen together and then been covered with snow.

Taking a lesson from the unpleasent experience of the Danmark-Expedition as to the going in the interior western part of Jøkelbugten, we took a more seaward route towards Lamberts Land, along the inner side of the series of islands which extends from Oktoberø to Schnauders Ø. Here we struck fairly good going, and the waves or crevasses

[1]) For deviations from earlier maps as regards the appearance of Fladebugt, cf. "Cartographical Remarks" on pp. 144—45.

of the "floating inland ice" were only slightly felt. Along the western side of "Hammeren" the ice had pressed a line of black gravelly hills, often of a height of 5—6 metres, up on to the shore, and it was not till we approached the south side of "Mellemfortet" that we encountered hills and valleys of any importance in the ice.

Winds from the north were prevalent on all our depot journeys, and according to their variation in strength they caused such frequent alterations in the ground that the going could only exceptionally, and only over occasional stretches, be characterised as perfectly good. The intense frost, also, exerted its influence, causing great friction as if we were driving on sand, not on snow. Just as ELI, ZACKÆUS, and I had laid out our final depot at "Mellemfortet" on March 16th on our last depot journey for the winter, a snowstorm came on which lasted for several days and entirely altered the going almost all the way right down to Skærfjorden, the surface becoming a labyrinthine system of high, sharp-edged snow-drifts. From then on the gales decreased in force, so that the driving snow could fill the hollows around the drifts, and we had the experience, the truth of which is known from many other places in Greenland, that not till the spring can the ground be characterised as good for sledging.

b. The depots, their weights and distribution.

From his earlier winterings in Northeast Greenland NIELSEN was accustomed to travelling alone on sledge journeys in the company of one Greenlander and had thus worked out his own travelling technique. So it was natural that on our expedition he did not feel inclined to cooperate with and be dependent on—partially even subordinate to—the rest of the members, who had much less experience. He had not only to make, but also to plan and prepare his journeys alone. The result was that both the depot journeys and the long journeys in the spring had to be made by two parties independent of each other, NIELSEN and OVE making up one, Party I, while the other, Party II, was originally planned to consist of SØLVER and myself and one of the remaining Greenlanders (on the depot journeys, however, both of them).

The notes in our diaries on the strenuous work of the depot journeys —for strenuous work it was—are too long to be included in this report, which will contain sufficient diary material from the other journeys. If these diaries were quoted, it would appear that the journeys of Party I were less toilsome than those of Party II, and at the same time that Party I covered greater daily distances. This was not due exclusively to NIELSEN's greater ability as a sledge driver, but also to the fact that his companion, OVE, was superior to his two Greenland comrades both

as a sledge driver and a hunter, and finally NIELSEN and OVE together had absolutely the best dog team of the expedition at their disposal. And when the right time for departure arrived, it was always NIELSEN and OVE who set out first, and accordingly they had the advantage as regards hunting which resulted from being ahead. Thus in the winter they killed four musk-oxen and one bear to feed their two men and sixteen dogs, while the rest of us secured only three musk-oxen and no bears for our four men and 32 dogs. As regards the four musk-oxen of Party I it was peculiar that two of them, killed on January 14th and February 15th respectively, in both cases on Slædelandet, were captured by the dogs in the same way as had happened at the station on January 2nd. On journeys to lay out depots successful hunting is, of course, of immense importance, for each animal killed saves feeding on the pemmican freighted with such great trouble, and makes it possible to add so many more tins to the depot.

The loads which are the most important item on depot journeys and constitute the basic unit in the intricate calculation of the depots are the dog-pemmican, since you may count on more than eight times as large a net weight of food for a team of eight dogs than for the sledge driver. To this must be added the packing material, which as regards the dog-pemmican must be fairly solid. The Danish firm Messrs. BEAUVAIS & RASMUSSEN had delivered the dog-pemmican in tins of 6 kg each, corresponding to the day's rations for eight dogs, and each of these tins weighed 0.6 kg net. The tins were packed in two kinds of cases, one containing six tins and weighing 5.5 kg net, while the other contained four tins and weighed 3.5 kg net. In the large depots this packing material came to play a role out of all proportion, as will appear from the statements below; thus for instance the depot at "Mellemfortet" amounted to c. 800 kg net, but 1020 kg gross weight, that is to say, it had a dead packing weight of more than 200 kg. The effect of the dog-pemmican as feeding stuff will be dealt with below.

A summary showing how the depots were moved on in the course of the winter may be given as follows (certain abbreviations are used, viz.: ts. = tins, dp. = dog-pemmican, mp. = pemmican for men, k = kerosene, n. = net weight, g. = gross weight, and cs. = cases).

1st sledging: October 13, 1938, 5 sledges with 8 dogs each; the station—Passet—back. Depots established:

At Sælsøen, 6 ts. dp. = 36.0 kg n., 45.1 kg g.
At Passet, 60 ts. dp. = 360 kg n., 451 kg g.

Distance covered, out and back, 50 km.

2nd sledging A: Party I (NIELSEN and OVE), Oct. 16—29, 1938, two sledges, 8 dogs each; the station—Fladebugt—Kap Amélie—Kap Isabella—NIELSEN's depot island north of Gamma Ø—back to the station.

Some goods from former depots were moved forward, and depots were established:

At Kap Amélie: 19 ts. dp., 2 ts. mp., some extra provisions, and 3 l k., total 124.9 kg n., 157.8 kg g.

On NIELSEN's depot island north of Gamma Ø: 26 ts. dp., 3 ts. mp., extra provisions, and 20 l k., altogether 185.7 kg n., 232.5 kg g.

Northernmost depot situated in c. 77°53′ N. lat., 120 km from the Mørkefjord-station. Sledging distance covered to establish it 450 km.

2nd sledging B: Party II (SØLVER, KNUTH, ELI, ZACKÆUS), Oct. 16—Nov. 2, 1938. Four sledges, 8 dogs each; the station—Fladebugt—Depotnæsset—Kap Isabella—Oktoberø—back to the station. Some goods from the depot at Passet were moved forward, and depots were established:

At Michelangelos Kløft: 3 ts. mp. = 8.1 kg n., 12.5 kg g.
At head of Fladebugt: 4 ts. dp. = 24.0 kg n., 29.9 kg g.
Oktoberø: 84 ts. dp., 8 ts. mp., and extra provisions, altogether 532.9 kg n., 671.1 kg n.

Northernmost depot "Oktoberø" situated in c. 77°53′ N. lat., 120 km from the station. Distance covered 390 km.

3rd sledging: Party II (SØLVER, KNUTH, ELI, ZACKÆUS), Nov. 9—24, 1938. Four sledges, 8 dogs each; the station—Fladebugt—Rekvedøen—Kap Marie Valdemar— Micardbu—Danmarks Havn—Snenæs—Mørkefjord. Goods removed from Passet to Michelangelos Kløft, the depot there being added to, and a depot established on Rekvedøen:

Michelangelos Kløft: 36.0 kg n., 45.1 kg g.
Rekvedøen: 54 ts. dp., 3 ts. mp. = 332.1 kg n., 417.4 kg g.

Distance covered 120 km.

4th sledging: Party I (NIELSEN and OVE), January 12—16, 1939. Two sledges, 8 dogs each; the station—Fladebugt—and back. Load uncertain. The depot in Michelangelos Kløft moved on. Distance covered 100 km.

5th sledging: Party II (SØLVER, ELI, ZACKÆUS), January 29—February 3, 1939. Three sledges, 8 dogs each; the station—Fladebugt—Rekvedøen—and back. A new depot in Michelangelos Kløft, and the Rekvedøen depot added to:

Michelangelos Kløft: 2 cs. Ammundsen mp., 40 l k. (88.0 kg n., 98.0 kg g.).
Rekvedøen: 90 ts. dp., 3 ts. mp., and provisions (565.1 kg n., 705.0 kg g.).

Number of travelling days 6; distance covered 150 km.

6th sledging: Party I (NIELSEN and OVE), February 2—9, 1939. Two sledges, 8 dogs each; the station—Fladebugt—Skærfjorden—N. of Rekvedøen —and back. Loads uncertain, depots from 4th sledging moved on. Number of travelling days 8, distance covered 210 km.

7th sledging A: Party I (NIELSEN and OVE), February 22—March 21, 1939. Two sledges, 8 dogs each; the station—Fladebugt—Kap Amélie—Kap Louise—island N. of Gamma Ø—south point of Hammeren—Kap Isabella—Rosio—Micardbu—Danmarks Havn—Mørkefjord. The whole depot from 2nd sledging A at Kap Amélie carried northward, likewise part of the northernmost October-depot of 2nd sledging A on the island N. of Gamma Ø. A new depot established at the southernmost point of Hammeren:

NIELSEN's depot island N. of Gamma Ø: 13 ts. dp., 1 t. mp., and some matches (80.8 kg n., 103.4 kg g.).

South point of Hammeren: 74 ts. dp., 1/2 cs. Ammundsen mp., 2 ts. Knud Rasmussen mp., 28 l k., and provisions and spare parts (513.3 kg n., 646.0 kg g.).

Northernmost depot, south point of Hammeren, now situated in 78°15′ N. lat., 160 km from the station; sledging days 24, stormbound one day, visit at Micardbu three days. Distance covered 650 km.

7th sledging B: Party II (KNUTH, ELI, ZACKÆUS), February 25—March 28, 1939. Three sledges, 8 dogs each; the station—Fladebugt—Rekvedøen—Depotnæsset—Kap Louise—Oktoberø—Sydgavlen—Mellemfortet—Kap Isabella—Kap Amélie—Rekvedøen—Kap Marie Valdemar—Micardbu—Danmarks Havn—Mørkefjord. Main part of depot on Rekvedøen moved on, while here as well as at Kap Isabella and on the island "Sydgavlen" in Jøkelbugten smaller depots were left. The whole depot of 2nd sledging B on Oktoberø carried northward to a new final depot on the southernmost point of the island "Mellemfortet".

Rekvedøen: 6 ts. dp. (36.0 kg n., 45.1 kg g.).

Kap Isabella: 6 ts. dp. + 1 t. mp. (38.7 kg n., 51.6 kg g.).

Sydgavlen: 6 ts. dp. (36.0 kg n., 45.1 kg g.).

Mellemfortet: 108 ts. dp., 8 ts. Knud Rasmussen mp., 3 ts. Ammundsen mp., provisions, clothes, 20 l k. (c. 800 kg n., 1020 kg g.).

Northernmost depot, south side of Mellemfortet, now situated in c. 78°25′ N. lat., 180 km from the station; sledging days 26, stormbound 3 days, visit to Micardbu 3 days, sledging hours c. 168; distance covered 780 km.

Altogether the depot journeys comprised 127 travelling days, on 107 of which the parties drove by sledge, the sledges of Party I covering a distance of 1460 km, those of Party II 1490 km, or a total of 2950 km.

The result of all the depot journeys was that goods of a total weight of 1529 kg net or 1941 kg gross weight were laid out in depots to the north. How the goods were distributed along the coast will appear from the accompanying map. The dog-pemmican alone constituted 1302 kg net or 1633 kg gross weight of these depots, while the remainder (227 kg net, 308 kg gross) consisted of food for human beings plus a very small quantity of clothes and various spare parts.

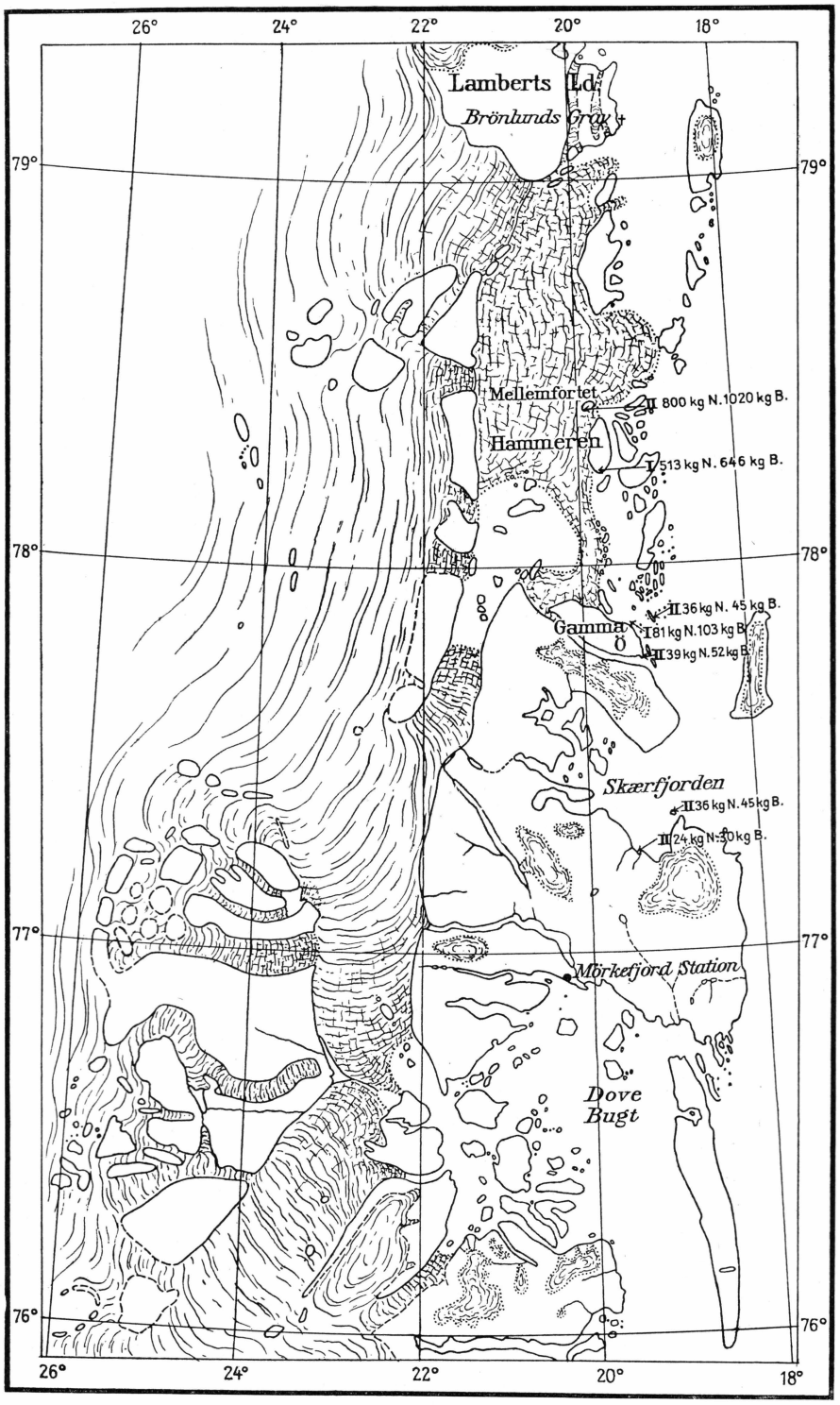


Fig. 26. The distribution of the depots northward after the depot journeys had been finished, immediately before our start on the journeys in the spring.

The food for men and dogs for consumption on the way on all the depot sledgings amounted to approximately 1588 kg net or 1985 kg gross, to which must be added the weight of kerosene used along the route.

In other words, on the depot journeys we gained the following experience: The quantity of goods to be laid out in depots (dog-pemmican, provisions for men, kerosene) almost corresponded to the food consumed along the route, apart from the weight of the kerosene used for cooking and for heating of the tent.

c. Temperature observations on the depot journeys.

A few examples of the kind of weather and temperature we had on some of our depot journeys in the course of the winter may be given here. On account of the exigencies of travelling the temperature observations could not be made at fixed times; I do not think, therefore, that they can be coordinated with our other meteorological material, but I give them here to amplify the picture of the depot journeys:

Date	Locality	Morning	Evening	Weather
2nd sledging B.				
Oct. 16	Mørkefjord	— 15	..	Fine
— 17	South. Slædelandet.....	..	..	Snowstorm, drift
— 18	— —	— 12.6	..	Fine
— 19	Passet	— 14	..	Foggy, some snow
— 20	—	— 22	..	Fine
— 21	Fladebugt.....	..	..	Foggy, some snow
— 22	—	— 16	— 19	
— 23	—	— 22	..	Fine and calm
— 24	Skærfjorden–Depotnæsset ...	— 10.5	— 8	Overcast, in evening gale
— 25	Depotnæsset–Orléans Sund..	— 11.5	— 17	Evening: northern lights
— 26	Orléans Sund–Jøkelbugten ..	— 13	—15¼	Foggy, some snow
— 27	Jøkelbugten	— 15	— 15	Fog, wind, slight snow
— 28	—	..	..	Fog, strong wind
— 29	Jøkelbugten–Kap Isabella ..	— 11.5	— 4	
— 30	Kap Isabella–Depotnæsset ..	— 6	..	Fairly clear. Even.: gale
— 31	Depotnæsset-Fladebugt.....	+ 1	+ ¾	Fog, rain
Nov. 1	Fladebugt.....	— 1	— 5	Fog, wet snow, drift
— 2	Fladebugt–Passet–Mørkefjord	— 9	— 9.6	Clear
3rd sledging				
Nov. 9	Mørkefjord	— 22	— 27	Fine. Sælsøen: wind
— 10	Passet–Fladebugt	— 29	— 28	Fine
— 11	Fladebugt–E. of Rekvedøen .	— 28.5	— 22	Fog
— 12	N.E. coast Storlandet.....	— 18	..	Wind, driving snow
— 13	— —	..	..	Blizzard
— 14	— —	..	..	Blizzard
— 15	Coast near Th. Thomsens Næs	— 13	..	Calm

Date	Locality	Morning	Evening	Weather
Nov. 16	Micardbu	..	..	Fine and calm
— 17	—	..	..	Wind, driv. snow, thick weather
— 18	—	..	..	Clearing in the evening
— 19	Micardbu–southward	— 16	..	
— 20	Øksebladet–southward	— 17	..	Windy, overcast
— 21	Danmarks Havn.....	..	..	Calm, snow
— 22	— —	..	..	Calm, fine weather
— 23	Stormbugt	..	..	Calm, fine
— 24	Farsund–Mørkefjord	— 20	..	Light wind
5th sledging				
Jan. 29	Station–Gaaseøen	— 26.6	..	
— 30	Gaaseøen–Passet	— 30	— 8.5	Wind in the evening
— 31	Passet–northward	— 14	..	Northerly wind, driv. snow
Feb. 1	Fladebugt.....	..	..	
— 2	Rekvedøen	..	..	Foggy
— 3	Fladebugt–Passet–station ...	— 35.5	— 32.4	
6th sledging				
Feb. 5	Fladebugt.....	..	— 35	
— 6	Rekvedøen	— 42	— 46	
— 7	Skærfjorden–N. of Rekvedøen	— 52	— 48	
— 8	Skærfjorden–Passet	— 56	..	
— 9	Passet–Mørkefjord	..	— 26.9	Snowstorm
7th sledging				
Feb. 25	Mørkefjord–Slædelandet....	— 24	..	Local storm Sælsøen-Gaaseøen
— 26	Passet–Fladebugt	— 25.5	— 30	Night wind, calm in morning
— 27	Fladebugt–Rekvedøen	— 38	— 44	Fine, calm
— 28	Skærfjorden	— 36	— 40.5	
March 1	—	— 36.2	— 47	Calm, mirages over the ice
— 2	Depotnæsset.....	— 43.2	— 41.5	
— 3	Depotnæsset–Kap Louise ...	— 38	— 38.5	
— 4	Kap Louise	— 32	— 30	Wind and driving snow
— 5	Kap Louise–Oktoberø	— 36	— 36	Calm, gathering clouds
— 6	Jøkelbugten	— 30.1	— 28	Overcast
— 7	Oktoberø	— 26	— 31.5	Clearing up
— 8	Oktoberø–northward	— 36.2	— 35.5	Wind from N., even. clouds
— 9	Oktoberø–Sydgavlen	— 43	— 42.8	Frosty fog over the islands
— 10	Sydgavlen.....	— 39.5	— 32	Fog, N. wind, snow
— 11	Sydgavlen–northward	— 39	— 30	Dense fog, N. wind, drifting snow
— 12	— —	— 24	— 22	Dense fog, snow-storm
— 13	Jøkelbugten–Hammeren	— 24	— 26.9	Wind & driv. snow from N.
— 14	Jøkelbugten–Mellemfortet...	— 36	— 37.5	Fine
— 15	Mellemfortet–Hammeren	— 45.5	— 35.5	Sky overcast
— 16	Mellemfortet	— 27	— 19.5	Snow-storm
— 17	—	— 19.5	..	Snow-storm
— 18	—	thermometer broken		Snow-storm
— 19	— ..... c.	— 40	..	Fine weather

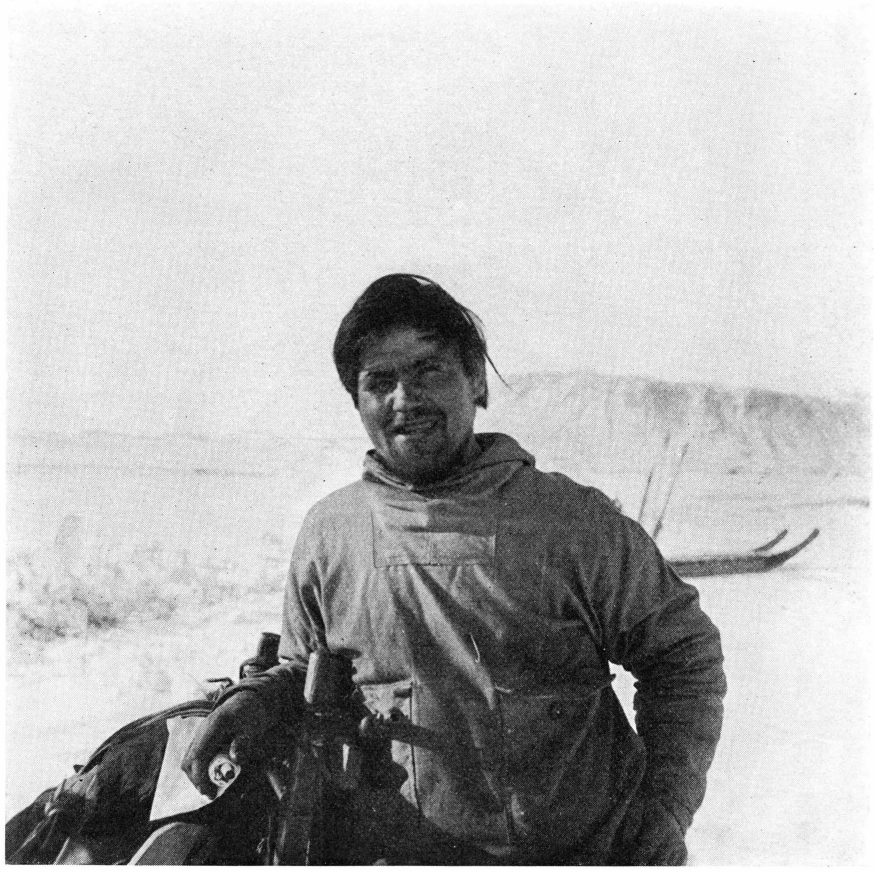


Fig. 27. NIELSEN's faithful companion on all his journeys, the Westgreenlander OVE ROSSBACH. Phot. by PAUL GELTING.

18. The journeys northward in the spring.

A. EIGIL NIELSEN's and OVE ROSSBACH's journey.

(According to NIELSEN's report).

April 1. 1939. Travelled from the Mørkefjord station across Hvalrosodden to the upper part of Michelangelos Kløft, where we camped.

April 2. Travelled through the ravine and along the land west of Fladebugt; having passed this bay, we headed towards Depotnæsset. The going was bad, hard snow-drifts giving us great trouble. Camped on a hill near Kap Amélie.

April 3. Continued northward past Depotnæsset, Kap Louise, and Kap Isabella. Camped some distance north of the lastnamed cape after seven and a half hours' journey, when fog and a heavy drift of snow from the north rendered it impossible to keep our course.

April 4. Drove from the camp to the October-depot on the island north of Gamma Ø, from which we took out six tins of dog-pemmican and ten boxes with matches, while we left seven tins of dog-pemmican and one tin of pemmican for

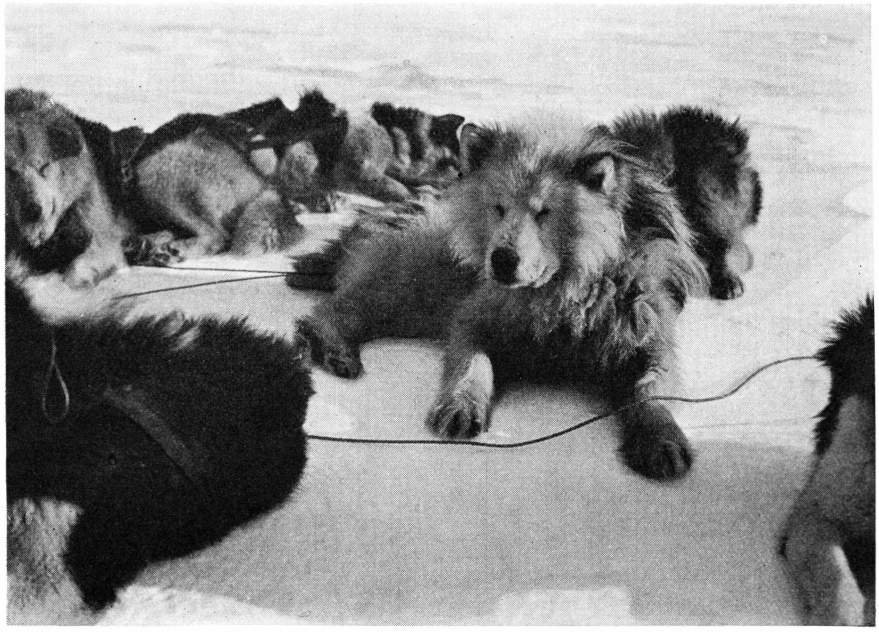


Fig. 28. NIELSEN's guide dog "Mequjoq" (i. e. the long-haired). Phot. by EIGIL NIELSEN.

men for our return journey later on from this point. Continued northward to a camp used on our last depot journey, where we had deposited some bear's meat, enough to once feed the dogs, and camped here.

April 5. Reached our main depot on the south point of Hammeren, after a six hours' drive with good going, at 2 p. m. Ascended a mountain top on the island to find out the best route across Jøkelbugten. Camped at the depot.

April 6. Drove northward east of Mellemfortet to midway between this point and Schnauders Ø with half of our goods, the total weight of which was now about 1000 kg and therefore forced us to drive twice over. Good going. Returned to the camp at the south point of Hammeren.

April 7. The camp and the remainder of the goods were carried northward to a point c. 5 km north of the goods of yesterday; the sledges went heavily, possibly because the weather had grown colder (temp. —26° C.).

April 8. Carried half of the goods to the east side of Schnauders Ø. Discovered the great disagreement between this island and the map. Travelled too near the south side of the island and therefore struck an area with hard snow-drifts. Camp as the previous night.

April 9. Drove with the camp and the remainder of the goods to the north side of the southernmost of the three islands situated east of Schnauders Ø. Avoided the bad going encountered yesterday by keeping at a greater distance from the shore.

April 10. Sledged half of the goods from the south point of Schnauders Ø to the island intersected by the 79th parallel (Achton Friis Ø). Ascended a mountain near Kap Drygalski to take a view of the land northward. Discovered two new islands. Camp as the night before.

April 11. Sledged the camp and the remainder of the goods to a point c. 5 km farther south than the place of the depot on Lamberts Land.

April 12. Driving snow. Sledged half of the goods on to the sea ice below the depot-locality of the Danmark-Expedition on Lamberts Land. Laid out a depot required for our return journey, consisting of rations for three days for the dogs and for ten days for us. Camp as the previous night.

April 13. Dense fog and light snowfall. Sledged with the camp and half of the goods northward to the two islands lying near each other in Nioghalvfjerdsfjorden. The dogs were evidently now fairly exhausted.

April 14. Sledged the goods deposited the day before yesterday to a point c. 5 km north of the two islands. Some snow-drifts. The dense fog continued. Camp as the previous night.

Have now covered 560 km, with an average of 40 km a day.

April 15. Sledged the camp and half of the goods to near Hovgaards Ø, which, however, was still not visible on account of the dense fog. The last two-thirds of the day's journey went over the ice of the glacier, where we struck very bad going.

April 16. Fourth day with dense fog. Fetched the goods from the day before yesterday and carried them to our camp on the glacier. The dogs were now very weak. From to-day three tins of dog-pemmican must suffice for four day. In this way we shall have enough dogs' food for another forty days, apart from the southern depots.

April 17. Sledged half of the goods to the sea ice between the northernmost of Bagatellerne and Kap Anna Bistrup. One of my dogs broke down. The going was very heavy. Killed a bear 3 km south of Bagatellerne. Camp as the two previous nights. Temperature 32° C. below zero.

April 18. Sledged the camp to the place where the goods were deposited yesterday. Camped at 4 p.m., when the dogs were exhausted, possibly on account of the heavy meal of meat. Water sky.

April 19. Fine weather. Sledged half of the goods 25 km northward along the coast of Hovgaards Ø. The going was good, but broad crevasses were encountered off a productive glacier midway on the coast. A little north of Kap Anna Bistrup we discovered a bear's den on the shore, recently left by a mother with two cubs. Had unfortunately to kill the dog that broke down the other day. Returned to the camp at Bagatellerne. Obscuration of the sun in the evening.

April 20. Sledged the camp and half of the goods nearly 30 km northward. Good going, but the dogs tired.

April 21. Sledged the camp and half of the goods to Dijmphna Sund some kilometres north of Kap H. N. Andersen. Fine going. In Dijmphna Sund the first seal was seen on the ice. Camp as the night before.

April 22. Sledged the camp and half of the goods to Mallemukfjældet on Holms Land; had to negotiate a great many pressure ridges on the last stretch. Splendid weather.

April 23. Have now covered roughly 800 km in fourteen travelling days and eight days of depot sledging at an average rate of c. 37 km a day.

With a view to my geological work I climbed Mallemukfjældet. In order to reach a small rock ledge above a steep stretch I had to put down my gun and rucksack. From the rock ledge I observed a bear and two cubs pass the tent at a distance of hardly 200 m; however, it took me a quarter of an hour to reach my gun and fire it to warn OVE, who was in the tent; but then the bears were already one kilometre away. Instead of them OVE killed a hare later in the evening. The open water extended to less than 5 km from the shore.

April 24. Fetched the goods deposited on the 21st, to the camp. As the camp was situated on the shore concealed by the high pressure ridges, we had marked

Fig. 29. Pressure ridges in Dijmphna Sund. Looking towards the south coast of Holms Land. Phot. by EIGIL NIELSEN. April 22nd, 1939.

its presence by a flag at the top of a high block of ice. Climbed the mountain again. In the evening DRASTRUP and CHRISTOFFERSEN arrived attracted by the flag. We had a festive meal consisting of soup, boiled hare, biscuits, and tea.

April 25. Worked in the mountains. Five seals were seen on the ice.

April 26. DRASTRUP and CHRISTOFFERSEN departed. Climbed a mountain after having been sledged by OVE some distance into the fjord. Here we secured a very large bear.

April 27. Worked in the mountains, but during my work I was caught in a violent blizzard. Reached the camp after an unpleasant trip.

April 28. The snow-storm continued till late in the afternoon. In the evening we deposited our collections from this place and some provisions and other goods in a depot below some large stones, and then went for a trip in the mountains.

April 29. Dense fog. Broke up camp (the double journeys were now to end) and sledged past Mallemukfjældet but so near the shore that we came into a very tiresome zone of pressure ridges where hour after hour we had to cut our way with ice axes. The heavy snowfall during the storm had spoiled the going both on the sea ice and on the flat land north of Mallemukfjældet. Camped on the shore between Mallemukfjældet and Hansêraqs Fjord on the east side of Holms Land.

April 30. Attempted to drive with fully loaded sledges, but on reaching Fældestrand we had to deposit the tent and half of the goods while we continued with the remaining goods across the land along the mountains and laid them in a depot. Returned to the tent and camped.

May 1. Sledged the camp and half of the goods to the northeastern point of Maagefjæld; in the evening the goods deposited the day before were fetched. During this work a blizzard came on, which made us lose the track and we nearly failed to find the camp.

May 2. During a violent blizzard we turned into Ingolfs Fjord with a large depot, which we deposited at the north side of Maagefjæld; then we continued with dogs' food for eight days farther into the fjord in order to find a passage to Danmarks Fjord. In the interior of the fjord it was calm and the sun shone, while the storm could still be seen blowing at Fældestrand. Camped near the westernmost of Wegeners Øer.

May 3. The snow-storm continued at the mouth of the fjord, but in the fjord it was calm except in a c. 10 km broad belt, where the snow-storm raged, too. During our passage through this belt we again secured a bear, which was so large that we could only carry the hind legs on the sledges, while the remaining part was laid in a depot. When according to the maps of the Danmark-Expedition and LAUGE KOCH's map we should have reached the head of the fjord, it turned out that what had hitherto been regarded as its head was actually a glacier which extended from the south across the fjord and which I therefore named "Spærregletscher" i. e. "barrier glacier". It was easily passable, and behind it the fjord continued inland, though considerably reduced in width, as far as the eye could reach. However, we camped immediately beyond Spærregletscher, after which I climbed the mountains to take a view of the land. In the night we were disturbed by a bear approaching the tent.

May 4. In the forenoon gale and snowfall, with temperatures slightly above zero, so the downpour was half rain. At 3 p.m. we proceeded inland, the driving snow continuing, in a northwesterly direction, but then the fjord bent southwestward at an acute angle. The drifting of the snow ceased, and the sun broke through the clouds; the mountains, flaming red in the sun, were covered with green, hanging glaciers, one more strangely shaped than the other, on either side of the fjord. Some

Fig. 30. Glacier west of Spærregletscher, seen from Prinsesse Caroline-Mathildes Alper. Phot. by EIGIL NIELSEN. May 4th, 1939.

of them, like folded drapery, came right down to the fjord ice, while others sent out tongues reaching only halfway down; one of them was like a large drop that had congealed midway on the rock wall, and I therefore called it "Draabegletscher" (drop glacier). After camping far in towards the interior of the fjord, I climbed the mountains.

May 5. We continued towards the interior of the fjord, which finally divided into two branches, both with affluents from large rivers forming deltas. We turned into the western branch, passing a short stretch with deep snow, while on the fjord the going had been excellent. Icebergs had drifted right in to the delta. Proceeded from the head of the fjord up through the valley, which extended in a westerly direction and which I called "Sødalen", along the river which on KOCH's map drains the large unnamed lake in the interior of Kronprins Christians Land southwest of Romers Sø. The river delta and Sødalen were almost free of snow and very difficult to cross; having travelled some ten to fifteen kilometres inland, it proved impossible to proceed with sledges, and we camped. Climbed the mountains.

May 6. Ascended a mountain far into the central part of Kronprins Christians Land. Climbed several mountain peaks to take bearings, the highest being about 900 m high. Returned next day after an eighteen hours' walk.

May 7. Slept most of the day, and afterwards went into the mountains. Saw two musk-oxen.

May 8. Drove back to Ingolfs Fjord, along the way ascending a mountain in the outer part of Sødalen. During this as during the other ascents I took bearings in order to sketch the newly discovered prolongation of the fjord, and I also collected plants for GELTING. Saw an ox. Camp at Draabegletscher.

May 8—9. As we were breaking up camp, the glacier sent an avalanche of ice blocks down towards the fjord. Climbed the mountains. Drove out through the fjord, and having passed Spærregletscher, discovered a tent on the north side of the fjord. It proved to be DRASTRUP's and CHRISTOFFERSEN's camp. They had been forced by thin ice at Kap Jungersen to try to reach Independence Fjord over land and were now on their way in through the fjord. We had tea together, I told them about our observations inland, and subsequently we proceeded on our journey in fog in order to find our bear depot from the other day in the broad part of the fjord. In this we succeeded, and we camped at the meat depot.

May 9—10. We were travelling in the night now. Before starting in the evening we secured a bear, which walked into our camp, so we had to shoot it. Could only take with us the hind legs. Drove to the westernmost of Wegeners Øer, whence THOSTRUP and WEGENER had mapped the interior of the fjord. Their cairn was still visible. After investigations here we continued our journey to the depot at Maagefjældet. Twice on the way we drove after bears to amuse the dogs, which seemed to frighten the bears very much.

May 10. Worked in the mountains from 2 p.m. till 1 a.m.

May 11. Drove in fog to Kap Jungersen on Amdrups Land.

May 11—12. OVE drove eastward along the shore to investigate the ice along the stretch which DRASTRUP and CHRISTOFFERSEN had been unable to pass. He returned with the news that the ice was excellent, and moreover he carried a large bear which he had shot because we were to remain here a couple of days while I was investigating the mountain.

May 12. Climbed the mountain at 2 a.m. and returned at noon. Again working on the mountain from 2 p.m. to 11 p.m. A large bear was prowling around our camp, but we did not need it.

May 13. Removed the camp eastward past the cape, and I ascended the mountain. A gale forced me to return, and for five hours we had the greatest dif-

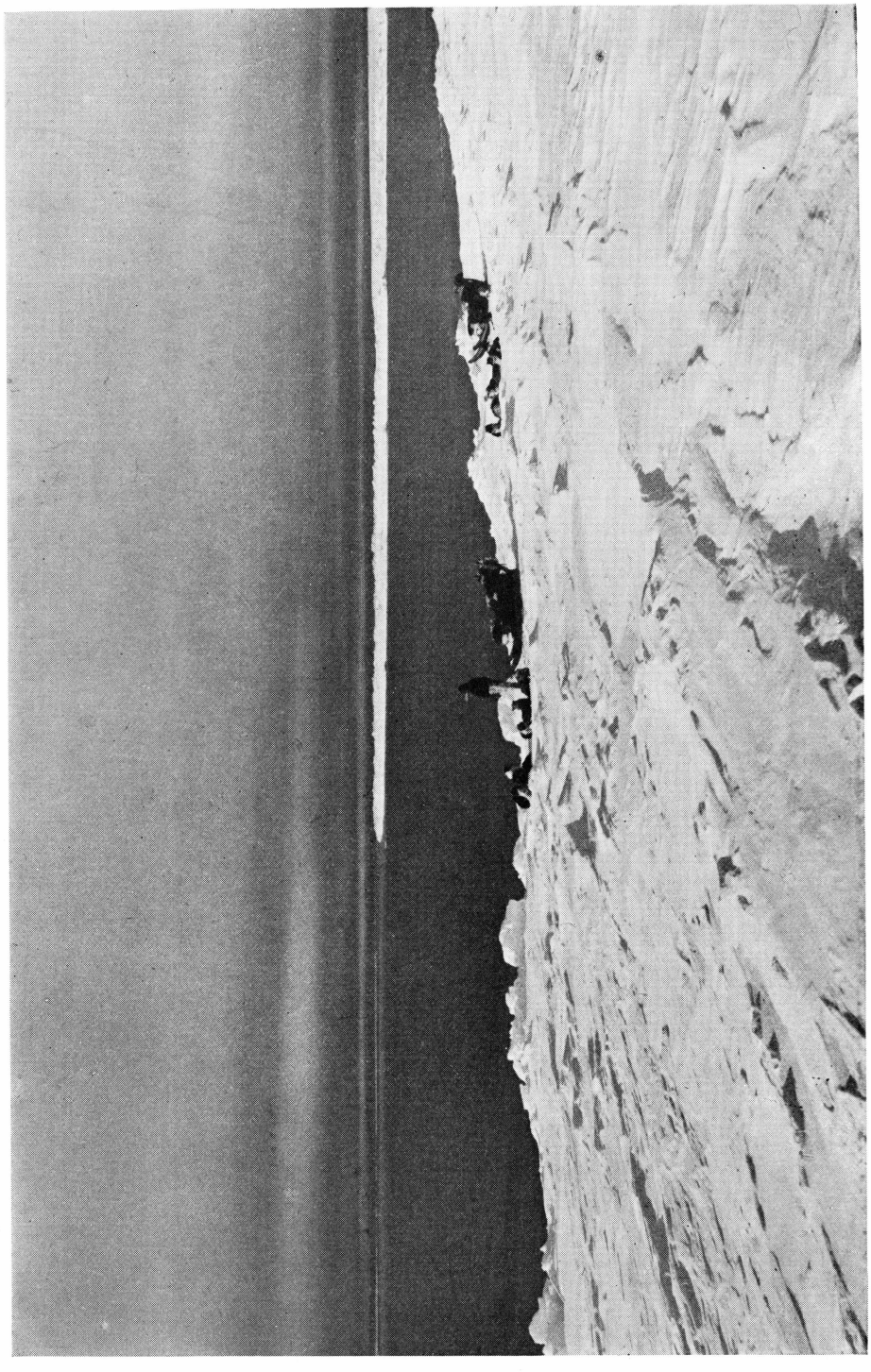


Fig. 31. The open sea along the coast of Amdrups Land. Phot. by Eigil Nielsen. May 14th, 1939.

ficulty in saving our goods from being blown into the sea. We lost some few things, among others the box for GELTING with the valuable plants from the interior of Kronprins Christians Land. At 5 p.m. the weather was calming down, and I climbed the mountain, not returning till 0.30 a.m.

May 14. Climbed the mountain after some hours' sleep. Returned at 5 p.m. and packed up collections till 11 p.m. Arranged the collections in a depot, and then headed towards Sophus Müllers Næs.

Night 14—15 May. Drove all night northward over the flat shore; reached a point slightly north of Sophus Müllers Næs, where we camped after 26 hours' continuous work.

Night 15—16 May. Deposited a letter to KNUTH in a box on an Eskimo tent ring. Drove northward along the west coast of Antarctic Bugt and then across the bay and along the glacier front of Flade Isblink. On account of dense fog we drove several kilometers up the "Kilen" before we discovered that we were driving over land. We then drove up on to the land ice and continued there almost as far as Erik S. Henius Land. Camped on the land ice. The day's journey c. 80 km.

Night 16—17 May. Continued on the land ice, which had several ugly crevasses, as we were driving c. 20 km from the perpendicular, productive sea front. After an hour's drive my sledge fell through the roof of a crevasse and it was only after several hours' work that we managed to get it out. We then drove along a snow-drift from the land ice down on to Erik S. Henius Land, following its shore to be certain to pass the easternmost point of Greenland, which is situated four degrees of longitude farther east than Mørkefjord. North of this point the snow formed hard drifts. We camped on the glacier which separates the southern nunataks of Nakkehoved from its northern main land. OVE was ill.

Night 17—18 May. Went up the mountains and then drove across the glacier. As the glacier was very rough, and one of OVE's sledge runners was very weak, we had to drive very cautiously. Passed Nakkehoved and continued westward. At a distance of 15—20 km from Nakkehoved a low foreland was seen below the inland ice with a very irregular shore line. In the northward continuation of a small cape of this land (Kap Prins Knud) there was a small island, which we visited. The open Wandels Hav forced us westward into an area of deep snow, where we camped. OVE looked ill.

Night 18—19 May. Very severe drift of snow. Since OVE had not recovered, we turned back at this point (c. 81°50′ N. lat., 14°20′ W. long.), though we had abundant food for the dogs to continue our journey. Returned to the highest part of Nakkehoved and camped below it.

Night 19—20 May. Climbed the mountains. The weather still thick with snow.

Night 20—21 May. Drove southeastward, now on the sea ice, now on the land ice near the edge of the high, vertical ice barrier, a dangerous game in foggy weather. One of my sledge runners was seriously damaged. Driving snow.

Night 21—22 May. Quite exceptionally it did not snow till the last two hours of our day's journey. Camped on "Kilen". The dogs somewhat exhausted, so we covered only about 40 km in the same time as we had covered 50 km on our outward journey along the iceblink

Night 22—23 May. Reached our camp of May 15th on the headland just north of Sophus Müllers Næs. The weather was thick with snow. Climbed a mountain at the head of Antarctic Bugt. Passed several very broad crevasses in the interior of the bay. The box with my letter to KNUTH was untouched.

Night 23—24 May. OVE discovered tracks in the snow on land and, on examining the box, found that KNUTH had been there and left a letter. The letter stated that ELI was ill. Drove to KNUTH's camp at Kap Jungersen. Had some drams.

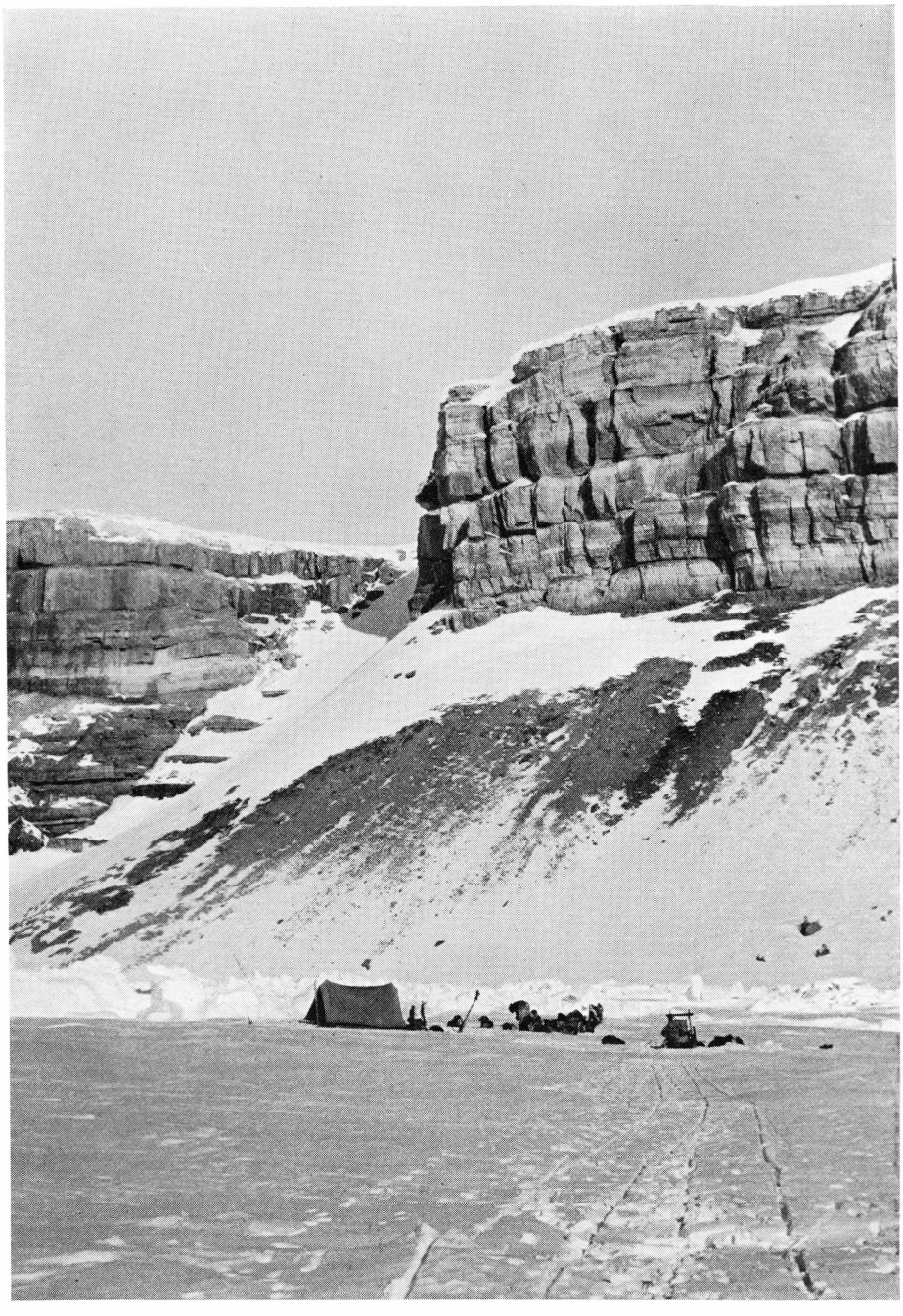


Fig. 32. Nielsen's and Ove's camp at Mallemukfjældet. Phot. by Eigil Nielsen. May 29th, 1939.

Night 24—25 May. KNUTH set out shortly after OVE and I had gone to bed. Drove around Kap Jungersen to a point on the south side of Amdrups Land c. 10 km west of the cape.

May 25. At work in the mountains.

May 26. At 6 a.m. OVE returned with a musk-ox and a hare. During the rest of the day he repaired sledge runners, while I worked in the mountains.

May 27. Packed collections and drove southward across the fjord to Holms Land. Loaded the sledges with the depot at Maagefjældet, leaving only the sledge skis behind. Proceeded across Fældestrand along the mountain range to Hansêraqs Fjord. Camped here.

May 28. Drove around Mallemukfjældet and camped on the ice at the foot of the mountain.

May 29. Worked in the mountains. In the night a gale.

May 30. Sledged a few kilometres westward and camped on the ice off the depot on Depotfjældet, which I climbed, and worked there for some time. In the evening KNUTH arrived and fried musk-ox steaks for us, while I packed up my collections and wrote a catalogue. Had drams

May 31. In the morning foehn winds from the mountain, which blew down KNUTH's tent. OVE and I voluntarily laid down ours. Travelled southward across Dijmphna Sund in a strong gale, and camped some distance south of Kap H. N. Andersen.

June 1. Strong gale. Passed Kap Anna Bistrup and Bagatellerne and continued some distance southward on the glacier of Nioghalvfjerdsfjorden. Camped on the glacier.

June 2. Travelled to some kilometres south of the two small islands called by me "Dobbeltøerne" (the double islands).

June 3. In three hours we reached the depot on Lamberts Land, where we camped and fetched the depot. Went out hunting hares, but were unsuccessful.

June 4. Drove southward inside of Schnauders Ø in dense fog and snow. Temperature about zero. Camped near the bent on the west side of Schnauders Ø.

Night 5—6 June. Immediately after starting we struck zones with pressure ridges, deep crevasses, thin ice, etc. They were friction zones between the ice accumulated behind the island and the more movable ice south of the island. After twelve hours' very tiresome sledging we camped, having covered 10 km.

Night 6—7 June. Headed due south to the southernmost point of Hammeren, where my former main depot was.

Night 7—8 June. Drove to the October-depot on the island north of Gamma Ø.

Night 8—9 June. Passed Kap Isabella, Kap Louise, Depotnæsset, and pushed a fairly great distance into Skærfjorden before camping. Very fine going.

Night 9—10 June. Sledged round Kap Marie Valdemar and then southward along the outer coast of Storlandet until we sighted Micardbu, where we camped at 4 a.m. At 8 a.m. we broke camp and sledged up to the house.

June 10. Stay at Micardbu.

Night 11—12 June. Sledged from Micardbu to Snenæs.

Night 12—13 June. Sledged home to the station.

Distance covered on the journey including sledgings out and back c. 2350 km.

EIGIL NIELSEN.

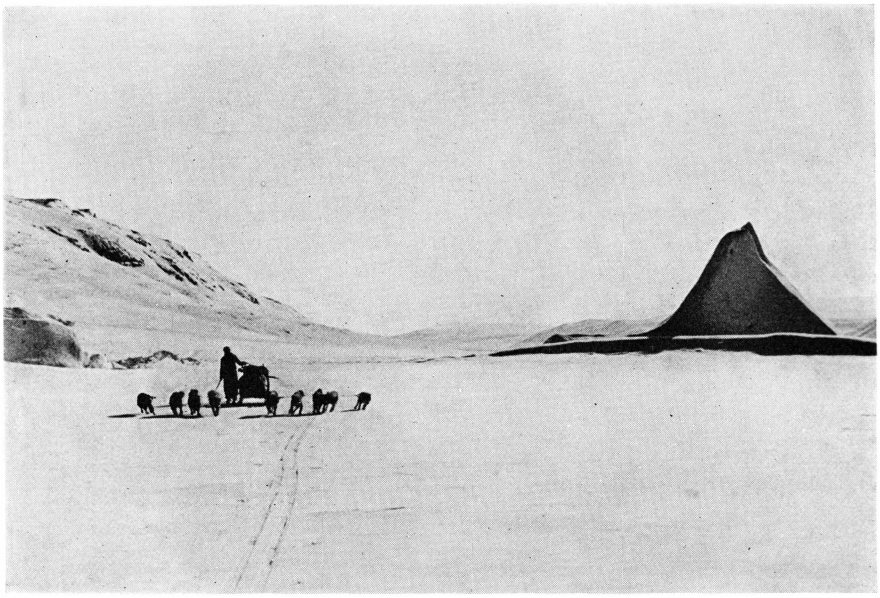


Fig. 33. Sledging along the south coast of Gamma Ø in the western part of Orléans Sund. Looking eastward through the sound. Phot. by SVEND SØLVER. April 17th, 1939.

b. SVEND SØLVER's and ZACKÆUS SANDGREEN's journey.

(According to SØLVER's report).

April 7. Set out with one sledge and ten dogs (ELI's six dogs + two Norwegian + two of mine) from the Mørkefjord station at 3.30 p.m. Drove round Hvalrosodden and up through Pemmikanelv towards "Udkigshøjen". Sledging time $5^1/_2$ hours.

April 8. Proceeded towards Passet, but only with half loads, since it was impossible to start the fully loaded sledges. After camping ZACKÆUS went back to fetch the remaining goods, while I went out hunting musk-oxen but without success. Without sledge skis the runners sunk deep into the snow. Sledging time 13 hours.

April 9. Drove with full loads and reached on to the ice of Fladebugt. Sledging time $10^1/_2$ hours.

April 10. Continued across Skærfjorden with half loads, bad going: Sastrugi with soft snow in between. Sledging time $12^1/_2$ hours.

April 11. Travelled with half loads in the forenoon, but with full loads in the afternoon, since the going improved at 5 p.m. Sledging time 12 hours 15 minutes.

April 12. Went ashore at Kap Amélie, where an old dog died. Continued on smooth ice along the coast, and on Depotnæsset found a depot laid out from Micardbu. A sudden foehn wind with a severe drift compelled us to tent at 6 p.m.

April 13. Established a depot in the bay between Kap Louise and the entrance to Orléans Sund, the sledge still being too heavy; it was too small for the load that was to be carried. Continued some distance into the sound in fog and with very bad going. Loose snow. Sledging time $11^1/_2$ hours.

April 14. Climbed a mountain c. 700 m high on the north side of the sound and had an excellent view of the greater part of the sound and far out towards

the SW-W-N-E-SE. Already now it was evident that even the visible nunataks behind Hertugen af Orléans Land would afford no information about the migmatite series and its origin. ZACKÆUS went out hunting. Only old musk-ox tracks.

April 15. Continued towards the west along the north side of the sound over deep, soft snow. Drew maps along the route. Some fog. Sledging time $10^1/_2$ hours.

April 16. Dense fog, visibility 2. Remained in camp, as I did not want to pass unknown land without seeing it. Repaired harness, etc.

April 17. Crossed the sound to a mountain on its south side. Climbed it to c. 420 m, but did not get the view across Kofoed-Hansens Bræ that I had desired. The land was heavily covered with deep, soft snow. Sledged onwards inside a zone of densely packed bergs. Sledging time 12 hours.

April 18. Climbed a mountain, c. 600 m high, in the forenoon and at last got a good view of the sound inland to Kofoed-Hansens Bræ and its front, which evidently lies west of Penthièvres Fjord. Sledged out through the zone of icebergs towards Hertugen af Orléans Land. Fine going, level ice with hard snow. Sledging up Kofoed-Hansens Bræ and down to Annekssøen seems possible, so here, too, there should be a road from Mørkefjord northward. Sledging time 10 hours.

April 19. Sledged to the shore and camped. Stayed on the land all day. It is intersected from north to south by large valleys, separated by ridges. Went across the valleys and the strike of the migmatite. Climbed mountains c. 300 and c. 600 m high. The tract was poor in vegetation, wind-swept and bare of snow; only a single old musk-ox track gave evidence of animal life. ZACKÆUS, who had gone out hunting, did not observe any living thing, either.

April 20. It was blowing up with drift from the north, which upset the tent. We gave up any attempt to proceed and remained in camp.

April 21. At 10 a.m. the wind had abated so much that we could start. Headed directly towards Mellemfortet over an undulating sikussaq ice with pressure ridges and water-filled crevasses in the troughs of the waves. Sledging time 11 hours.

April 22. Reached Mellemfortet. Sledging time 9 hours.

April 23. Arranged the depot. As it was now beyond doubt that not even the nunataks west of Hertugen af Orléans Land would throw light on the mode of formation and age of the migmatite, I made up my mind to seek the solution of these questions along the north side of Lamberts Land and the south side of Kronprins Christians Land. I carefully considered the advantages of double sledgings northward, but if there was to be pemmican left to make it possible to map the northern nunataks and for the return journey, the double sledgings could not be fully utilised with the remaining supplies. Moreover I counted on some game in the large land areas we were to visit. We therefore set out with twenty tins of dog-pemmican on the sledge, and in order to lighten it further we left behind some other goods, thus carrying only the things most necessary besides the scientific equipment. Sledged east of Mellemfortet and by the "highroad" northward until about midway between the depot and Schnauders Ø. Sledging time 9 hours.

April 24. Fog and light snow, visibility 3. About 5 cm of loose snow had fallen. Remained in camp.

April 25. Sledged some distance up along Schnauders Ø and went some distance across the island. Sledging time 10 hours.

April 26. Visibility 3, with snow. Broke up camp, as I hoped to be able to follow the coast without having to go into too many bays. At 3 p.m. the snowfall increased, and we had to halt. Sledging time 5 hours.

April 27. Visibility 3, thick with snow. Remained in camp.

April 28. Visibility 3, thick with snow. Remained in camp.

April 29. At last it cleared. Northeast of Schnauders Ø the sledge fell into

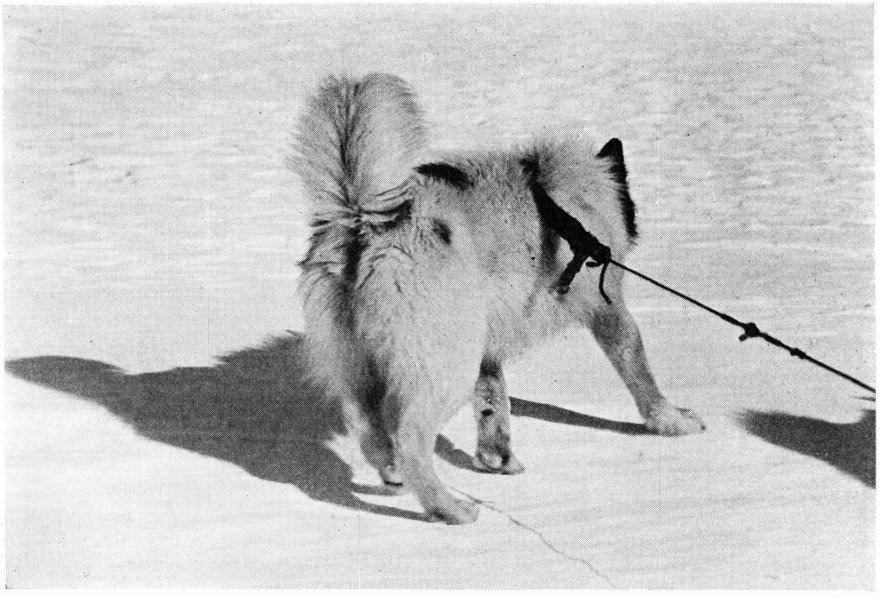


Fig. 34. The left flank dog of SØLVER's team. Phot. by SVEND SØLVER.

a snow-covered water-filled crevasse which I had crossed on skis. Ice brittle. Using great caution we saved the whole load and sledged it in several batches across the dangerous place. Travelling time 11 hours.

April 30. From the top of Achton Friis Ø we had a good view of the southeast coast of Lamberts Land, and subsequently proceeded on our journey. Again the sledge fell into a hidden crevasse. The monotony of the pemmican diet began to tell on us. Travelling time 11 hours.

May 1. Reached the depot on Lamberts Land and tented.

May 2. Arranged the depot and laid down some letters, made astronomical observations, and drove in hazy weather along the north coast of the land. Land and ice heavily covered with loose snow. Sledging time $7^1/_2$ hours.

May 3. Remained in camp. Possible to travel by compass, but it was no good travelling blindly past the land we were to investigate.

May 4. Remained in camp.

May 5. From an island I had a view of the islets in the southern part of Nioghalvfjerdsfjorden. Continued along the coast; encountered ice cracked by currents off NE-Næsset; passed the mouth of a new sound. Tented and made observations in clear weather from a rock 30 m high. Deep, soft snow. Sledging time 9 hours.

May 6. Not till 11.45 a.m. did it clear so much that we could continue westward along the coast. At last, as a change from the constant migmatite, the first quartsite appeared, whose transitions to the migmatite I examined. Very slow and laborious progress all day. Travelling time 8 hours.

May 7. Again dense fog in the morning; not till noon did it clear so much that we could travel along the shore. Passed a glacier that had calved, which delayed us for several hours. Made observations morning and evening. Constantly deep, loose snow. Sledging time $7^1/_2$ hours.

May 8. Continued across the fjord in a northwesterly direction towards the southern end of Kronprins Christians Land, where we tented a little east of Kap

Bernhoft. The dogs exhausted in spite of the short day's journey. Deep, loose snow. Sledging time 5 hours.

May 9. Were both on land all day, each in his place, to look for musk-oxen. Along the whole coast a broad zone of crevasses and pressure ridges. A good view from a mountain c. 500 m high. About 15 km west of this place the actual rise towards the inland ice begins; the latter looked broken and crevassed. The "islands" marked on recent maps along the northwest side of Lamberts Land are mountain tops around a firn lying behind at a height of c. 800 m. No trace of musk-oxen, and apart from one ptarmigan our hunting was without results. Possibly a wolf track?

May 10. The prospects for game being poor, I decided to give up the planned onward journey to Danmarks Fjord, and we started our return journey at 11 a.m. Tented at 8.30 p.m. off our camp of May 6—7.

May 11. Tented near our camp of May 5—6.

May 12. Reached the depot on Lamberts Land and tented there. My eyes much strained.

May 13. Arranged the depot and deposited a report. Drove some distance along the south coast of Lamberts Land, and then turned southward. Tented east of Kap Drygalski.

May 14. Travelled southward along the east coast of Schnauders Ø.

May 15. Proceeded southward along the east coast of Schnauders Ø.

May 16. Tented at the depot at Mellemfortet. Spring! Two flies were humming around the tent. The temperature at 1.30 p.m. was 1.6° C. above zero. Made a trip across the island.

May 17. Made observations and photographed from a hill towards Hertugen af Orléans Land and took a view of the conditions for our journey to that place. Arranged the depot and laid down a letter. Deposited all our extra clothes.

May 18. Dense fog, range of vision 200 m. Fall of frost rime. Started westward at 11.30 a.m. by compass. Later it cleared. Reached a pressure ridge at 4 p.m. and had to make a circuit to negotiate it. Passed three "trenches" bounded by perpendicular furrowed ice walls 4—5 m high. Found some snow-drifts on which to drive. Passed another pressure ridge, but subsequently struck level, smooth ice and tented at 6.30 p.m. The dogs exhausted.

May 19. Near the land the crevasses and pressure ridges increased in size and frequency, forcing us to make constantly longer circuits. The last four kilometres in front of the shore were particularly tiresome; in several places the sledge sank into the soft snow to the cross bars. The last distance we had to drive twice over. Tented on the shore north of Gammel Hellerup Gletscher. Reconnaissance in the mountains.

May 20. Established a depot immediately below the glacier, and then drove upwards. Things went smoothly, we met only a few and small crevasses, which could be passed on snow bridges. With more heavily loaded sledges double journeys will have to be made here. In two hours we reached a height of 350 m, when the ice grew less steep. Some nunataks appeared ahead, but shortly after it grew foggy, which barred our view, and we tented.

May 21. About 5 cm of snow fell in the course of the night. Dense fog all day. Remained in camp.

May 22. Continuous snowfall, c. 20 cm had come down. Remained in camp.

May 23. In the afternoon we could at last proceed on our journey. As we proceeded, the nunataks ahead proved to be continuous land. Light snowfall, the dogs were drowned in snow. Tented c. 300 m from the nunatak land. Took an observation for time.

May 24. Took an observation for time. Tried to reach the land, but every-

Fig. 35. Passing a depression in Jøkelbugten on the way from Mellemfortet to Hertugen af Orléans Land. The dogs act as brake down the slope. Phot. by SVEND SØLVER. May 18th, 1939.

where the ice rose vertically from the land. At last we found a practicable snow-drift. Observed quartzite beds, indicating that this is the edge of the folding. Ascended a mountain peak c. 800 m high, but had to descend after only five minutes, when the fog concealed everything.

May 25. The fog continued. Remained in camp.

May 26. Low clouds, but the land in the immediate vicinity visible. After finishing my observations, we travelled north of the land, heading towards Moltkes Nunatak. Passed a glacier crevasse by way of a snow bridge. Owing to the fog not very much of the land was visible. The going was heavy, and we tented east of Moltkes Nunatak.

May 27. At last it cleared so much that observations could be made. Sledged to the land and climbed the highest peak, "Milepælen", on Moltkes Nunatak, c. 1700 m above the sea. On the summit blew a northwesterly wind, force 7—8, which made it difficult to stand upright. Very clear and excellent view in all directions.

May 28. Sledged southwestward to the nunatak area south of Moltkes Nunatak. After camping I drove with an empty sledge westward along the land, rounded it and went southwards till I observed its southern limit.

May 29. Observations from the camping site. Drove eastward along the land. A snow-storm was approaching from the inland ice, and soon it was blowing fiercely.

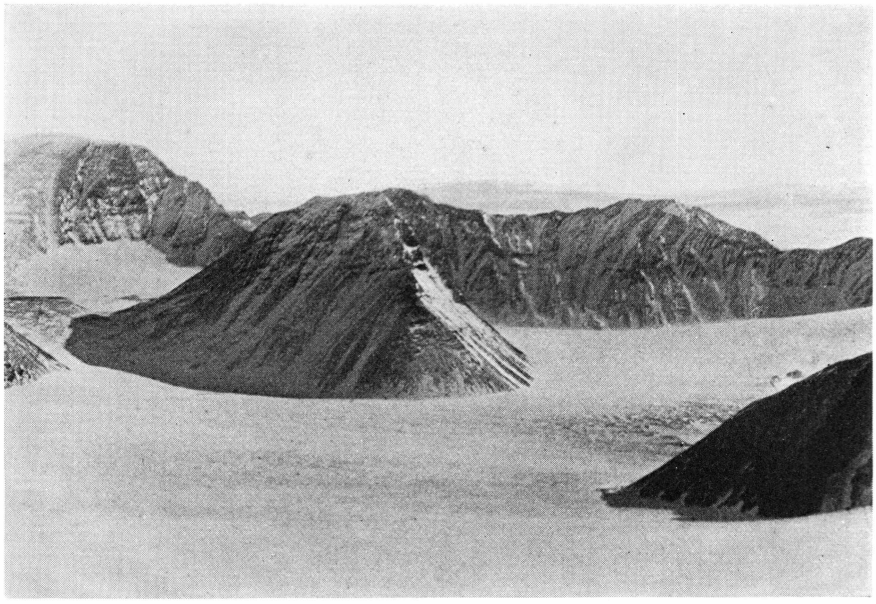


Fig. 36. Looking south from the summit of "Milepælen" (highest peak of Moltkes Nunatak) towards Gardes Nunatakker. Phot. by SVEND SØLVER. May 27th, 1939.

May 30. Started our return journey, reaching the depot at the foot of the glacier late in the afternoon.

May 31. The tent was blown down. Reconnaissance inland.

June 1. Reached the depot at Mellemfortet after twelve hours' sledging.

June 2. Observations from a rock knoll near the depot. ZACKÆUS shot a large bear, which came jogging on along the shore towards us.

June 3. Arranged the depot and wrote a letter to be deposited in it. Broke up camp and travelled eastward between Pariserøerne, where we observed many bear tracks. Tented off Kap Mérite and there found intrusive Rapakivi.

June 4. Travelled southward in fog along the east side of Storøen, where I repeatedly went ashore to reconnoitre.

June 5. As we were about to set out, a sledge suddenly arrived from the north. It brought DRASTRUP and CHRISTOFFERSEN with very lean dogs. Treated them to a meal and fed their dogs. Started southward at 10.30 p.m. on smooth ice towards the two rows of Bjørneskærene.

June 6. At 2 a.m. we sighted a bear, which we pursued into a crevasse of a hanging glacier, where it was killed. While we were skinning it, DRASTRUP and CHRISTOFFERSEN turned up again and had their part. Subsequently they attempted to continue their journey, but it was impossible to make the dogs go on.

June 7. Reached Kap Isabella at 3 a.m., and in the depot there found a letter from KNUTH dated April 4th. In order to make all secure for the work in Skærfjorden I took two tins of dog-pemmican from the depot. At 6.30 a.m. we reached the depot on the south side of the mouth of Orléans Sund and tented. Reconnaissance inland.

June 8. Passed Depotnæsset at 1.50 a.m. and found DRASTRUP in a camp at Kap Amélie. He treated us to tea. Continued southwestward across Penthièvres Fjord, and camped at 9.10 a.m. at the southernmost point of Joinvilles Ø. Recon-

naissance inland. In the evening we proceeded westward towards the interior of the fjord, where seals were observed on the ice, and halted in order that ZACKÆUS might approach them. I myself caught sight of a bear and shot it.

June 9. In my telescope I sighted a female bear with its two cubs. Many seals were seen, but they appeared to be rather shy. Drove with an empty sledge towards Kap Ellen, north of the entrance to V. Clausens Fjord. The snow was very soft and wet. Continued into V. Clausens Fjord, from the head of which I went inland for reconnaissance.

June 10. Returned eastward, visiting Joinvilles Ø, where I observed *Saxifraga opp.* in flower. In the evening we drove past Kap Récamier and turned into Fladebugt.

June 11. Tented above Michelangelos Kløft, north of the lake.

June 12. Travelled across Slædelandet and Passet down to Dove Bugt. Arrived at Hvalrosodden at 5 a.m. and at the Mørkefjord station at 8 a.m.

Length of journey c. 1110 km.

SVEND SØLVER.

c. EIGIL KNUTH's and ELI KRISTIANSEN's journey.

(From KNUTH's diary).

April 9. Started from Mørkefjord about 4 p.m., ELI with my eight dogs and a sledge load of c. 350 kg, I driving ahead with ZIEBELL's five dogs and one of our own dogs and a sledge load of c. 250 kg. The dogs were drawing well in spite of hard snow-drifts on the ice as far as Hvalrosodden. Continued our journey at 6 p.m. up the Pemmikanelv closely west of Udkigshøjen, where the snow-drifts were very high. Headed towards the depot which ELI and ZACKÆUS laid out the other day together with timber for a hut in Skærfjorden. However, as we reached the place, the foot of the southern corner bluff of Valdemarsmuren, it turned out that they had failed to lay out our dog-pemmican, as agreed upon, for use during the work in Skærfjorden on our return journey. Camped at 10 p.m., the temperature being 23° C. below zero. We had forgotten to bring an axe.

April 10. Sent ELI back to Mørkefjord to fetch the dog-pemmican and an axe, while I sledged the depot up to Passet. No musk-oxen visible. On my return ELI had arrived with an axe, dog-pemmican, and a bag with eggs from ZIEBELL. Temperature at noon 12° C. below zero, at 7 p.m. 17° C. below zero.

April 11. Light snowfall in the night. Morning temperature 11.5° C. below zero. Started at 11 a.m. in splendid sunshine, and I began taking moving pictures while we ascended towards Passet. Even after the depot had been loaded on the sledges, we made good progress towards Skærfjorden. A depot from DRASTRUP was found on the lake above Michelangelos Kløft; a pemmican tin bore the inscription by SØLVER: "Passed here Sunday afternoon. Good luck." Bad snow-drifts and wind from the southwest on Fladebugt, so we sought shelter near the mountains and dug a site for our tent in a slope. Evening temperature 9° C. below zero.

April 12. The south wind continued, temperature 8.5° C. below zero. High snow-drifts with newly drifted, deep, soft snow between, into which the rear part of the sledge sank each time we had to ascend a snow-drift. We perspired freely and were much exhausted. At 5 p.m. the going improved, and at 9.30 p.m. we camped on the ice at the foot of Kap Amélie in mild weather, viz. 4.8° C. below zero. Skærfjorden is a curious place as regards winds: local winds blow down the mountains everywhere and out through the many ramifications of the fjord. Thus during the first part of the journey a strong southwesterly wind was blowing at our backs; then it was calm for some distance, while severe drifts of snow were

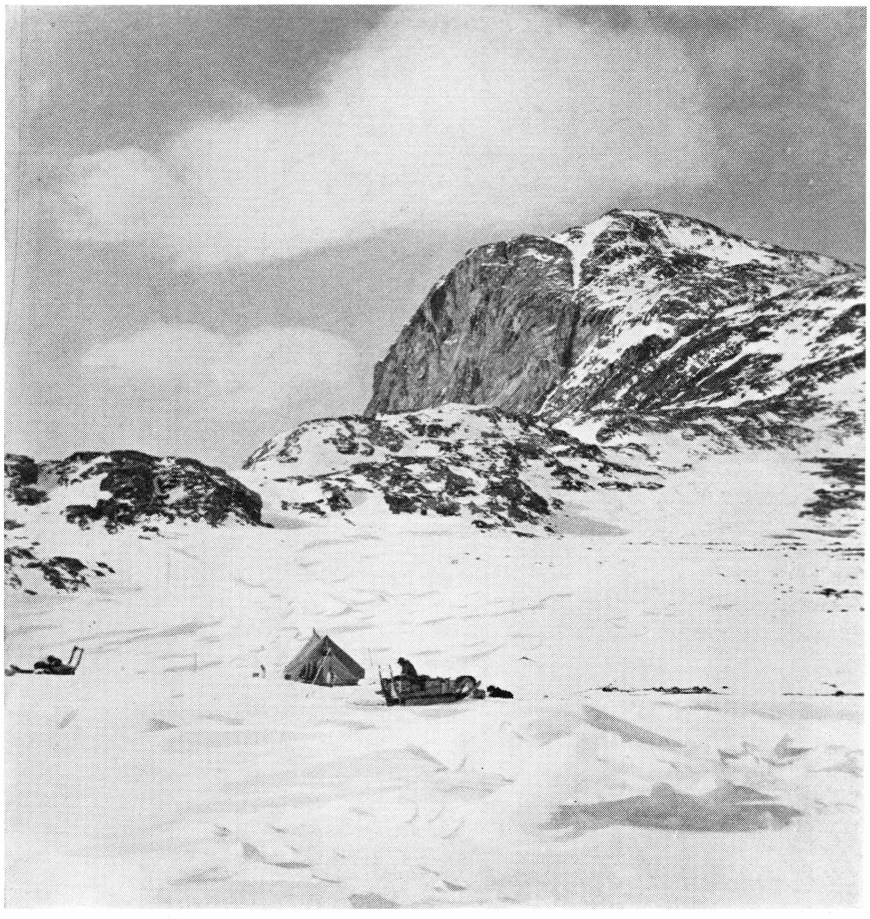


Fig. 37. KNUTH's and ELI's camp at Kap Amélie. Phot. by EIGIL KNUTH. April 13th, 1939.

seen over the crests of the high mountains in C. F. Mouriers Fjord. It was a magnificent sight, for the sun was in the sky behind and gave off a light resembling moonlight. Off Joinvilles Ø we were headed by a westerly wind with driving snow, and near Kap Amélie, finally, where we camped, strong gusts of wind constantly swept down the mountains behind us without, however, gathering to a foehn wind.

April 13. In the morning strong gusts of wind down the cape; temperature 7° C. below zero. From 10 a.m. to 0.30 p.m. ELI and I made a trip towards the interior of Penthièvres Fjord to look for Eskimo house ruins. At 2.30 p.m. we started northward with the camp in light snowfall, and with good going. At Depotnæsset we passed a depot of the Norwegian-French Expedition, and the case bore an inscription by SØLVER: "Passed April 12—all well." Crossing Orléans Sund we passed one of the large fragments of "floating inland ice"; while passing it, the sledge went through the snow-cover of a crevasse 6 m deep and one metre broad. Tented at 8 p.m. at Kap Isabella, where we met CHRISTIAN JENSEN, who was on his return journey after having assisted the DRASTRUP Expedition northward. Temperature at 10 p.m. 12.5° C. below zero.

Fig. 38. Fragment of solar halo with mock-suns in the middle of Jøkelbugten. Phot. by Eigil Knuth. April 14th, 1939.

April 14. Temperature at 10 a.m. 15° C. below zero, minimum of night temperature 18° C. below zero. Took out my ration of dog-pemmican from the depot and deposited a letter for Sølver. Started northward at 1.15 p.m., driving among the islands past Oktoberø. Here a dense fog of fine ice crystals gathered, and a solar halo, rainbows, and mock-suns appeared round the sun. Camped at the depot at the foot of Sydgavlen at 10.15 p.m. Temperature at 11 p.m. 18.9° C. below zero.

April 15. Night minimum 20° C. below zero. Temperature at 0.30 p.m. 17° C. below zero. Started northward at 2 p.m. and struck good going along the west side of Hammeren, where we found Nielsen's track. Again troublesome snow-drifts south of Mellemfortet. Arrived at the depot there in fog and a light fall of ice crystals at 10 p.m. Temperature at 11 p.m. 22° C. below zero.

April 16. Sunday. Night minimum 23° C. below zero. Temperature at 1 p.m. 15.2° C. below zero. Fog and fine snow, wind from the northeast. Drove up on to the land and fetched my part of the depot, altogether c. 462 kg. net or 575 kg. gross. From now on we had again to make double journeys northward, and started at 3.30 p.m. with the first load. After some time's sledging it cleared so much that

we could lay our course for Schnauders Ø. The icy waves of Jøkelbugten made themselves felt, and the valleys were occupied by large icebergs which could not be sighted till we reached the edges of the valleys. Passed NIELSEN's track. At 8.30 p.m. we unloaded the cases, and at 10.30 p.m. we were back at our camp. The sun was then still above the horizon. It was cold, with wind from the north. Evening temperature 19° C. below zero. The depot was situated slightly north of 78°30′ N. lat.

April 17. Night minimum 23.5° C. below zero, noon temperature 17° C. below zero. At noon the magnetic variation was roughly estimated at 40°. After arranging SØLVER's depot and depositing a letter, we started at 2.30 p.m. We reached the depot in four and a half hours, and then headed—as I believed—towards the southernmost point of Schnauders Ø. The valleys in the ice became more frequent and steeper, many looked like ravines with strange icy pressure ridges at the bottom. On halting at midnight after walking for more than nine hours in soft snow or over

Fig. 39. The Nunataks behind the Hertugen af Orléans Land seen from Jøkelbugten.

hard snow-drifts, we should have pushed some way past the southernmost point of the island, judging from the distance covered; however, there must be an error in the map, for the coast was still some 4—5 km distant. The dogs were tired, and it was cold. The sun shone till 11 p.m. Temperature at midnight 30° C. below zero.

April 18. Got up at noon. Temperature at 2.30 p.m. 23° C. below zero. Started at 3.15 p.m. to fetch the depot, and were back in camp at 11 p.m. Temperature at 11.15 p.m. 27.6° C. below zero.

April 19. Night minimum 29° C. below zero. Temperature at noon 18.8° C. below zero. Wind from the southwest and cold. Started at 0.15 p.m. towards Schnauders Ø. Passed the track of a bear with two cubs, which had passed our camp in the night at a distance of a few hundred metres, walking in NIELSEN's and DRASTRUP's tracks. After an hour's sledging we struck bad going in a zone of snow-drifts near a small island. It was now ascertained that the island had no sharp south point, as shown on the map, but a broad south side with a southwesterly and a southeasterly cape. Having rounded the latter, we drove northward past two islands in a large bay, and deposited the cases in one of NIELSEN's camp sites north of the northernmost of the islands. On the other island we observed fresh tracks of ptarmigans. Back at the camp at 10.30 p.m. Temperature at 11 p.m. 22° C. below zero. In the afternoon mirages.

April 20. Splendid calm weather after a light night wind. Night minimum 28° C. below zero. Temperature at 0.30 p.m. 14° C. below zero. Started with the camp at 2 p.m., driving in a large curve eastward to avoid the hard snow-drifts. Passed the depot near land and again struck bad going, so we headed seawards, and out there laid our course directly for Brønlund's Grave. North of Schnauders Ø distinct mirages were seen late in the evening, which distorted the whole landscape and made it impossible to determine a barrier of icebergs. The barrier was a lead full of pressure ridges. We passed it and camped off Achton Friis Ø. Temperature at midnight 22° C. below zero.

April 21. Calm and sunny, temperature 15° C. below zero. Fetched the depot in the south up to the camp on a six and a half hours' sledging. Temperature at 11 p.m. 21° C. below zero.

April 22. Night minimum 26.5° C. below zero. Temperature at 1 p.m. 17.5° C. below zero. Started at 2.15 p. m. towards Kap Drygalski, where we again struck NIELSEN's track after passing another lead with pressure ridges. A lead with packed icebergs extended from Kap Drygalski northeastward towards Norske Øer and behind this lead, in the eastward continuation of Achton Friis Ø, there extended a hilly ridge of glacier ice or snow-covered moraine islands—it was impossible to decide which. At 9.15 p.m. we reached the low eastern portion of Lamberts Land, where Brønlund's Grave should be, and where we found a tin with a letter from NIELSEN. We looked in vain for the grave. Tented on the ice below NIELSEN's depot site at 10 p.m. after seven hours' march. Temperature at 11 p.m. 23.5° C. below zero.

April 23. Temperature at 11 a.m. 14.5° C. below zero. Found the depot point of the Danmark-Expedition a little farther on, where an old box was lying, but Brønlund's Grave must be buried below one of the deep, hard-blown snow-drifts. Started southward at 1 p.m. to fetch the depot, returning with it to the camp at 1 a.m. after twelve hours' work. Tired dogs with bleeding paws. On our return the sky was overcast, and it began to snow slightly. Temperature at 1 a.m. 20.5° C. below zero.

April 24. A light foehn wind shook our tent in the morning, and at 2 p.m. the temperature was only 6° C. below zero. Took out the things to be laid in depot and sledged them up on to the land near the depot site of the Danmark-Expedition. From this place we sighted a bear in the bay to the north, and shot it. It backed down into a tidal crack and had to be secured by means of ropes. It was at the right moment that we got some meat; now the prospects for our journey northward brightened. ELI was a master at skinning a bear though he had never tried it before.

April 25. Temperature 16° C. below zero. Started northward at 1.50 p.m. with the depot, which after four and a half hours' sledging was unloaded some kilometres south of the two close-lying islets about midway in the fjord. Returned to the camp at 9.30 p.m. Temperature 26.2° C. below zero. A fog was gathering, and strange wool-like foehn clouds appeared above the mountain summits, so we were prepared for winds.

April 26. Wind and dense snowfall, which obliterated all tracks; the weather was quite thick, so we remained in camp. Temperature at 3 p.m. 11.6° C. below zero. Worked at my book and played at draughts with ELI.

April 27. Unfortunately the weather was worse than yesterday, with fog and more wind, so we had to remain in camp. Finished the first chapter of my book. Fed the dogs at midnight, when the temperature was 14° C. below zero.

April 28. In the evening it cleared. The snow lay deep everywhere, covering even the tidal cracks. As I was walking towards the headland south of our camp to look for Eskimo remains, I fell into the water through a patch of thin ice. I soon got out, but my splendid new Mausser rifle had gone to the bottom. For about an hour ELI and I tried to find it with the aid of stakes and ropes, but in vain. On this headland, too, we looked for Brønlund's Grave but it was nowhere to be found. Large cakes of musk-ox excrements were lying on the shore. Temperature at 7 a.m 13°, at 10 a.m. 14° C. below zero.

April 29. The weather was not particularly fine, though fine enough for breaking up camp. Night minimum 27.5° C., temperature at noon 17.5° C. below zero. Before our departure we placed the bear skin in the depot as also the wreath

which Vice-Admiral AMDRUP, Commodore BISTRUP, and First Lieutenant BENDIX THOSTRUP gave us in Copenhagen on behalf of the Danmark-Expedition. We hoped that the thaw would render the grave visible before our return journey so that we might place the wreath in the right place when we again were to visit Lamberts Land. All the cartridges for the drowned rifle were deposited there, too.

Started northward at 2 p.m. in deep, soft snow without any track, so the dogs ran about quite confused. At 7 p.m. we passed our depot from the other day, and at 10.45 p.m. we had to halt and camp off the north point of the northernmost of the two twin islands, "Dobbeltøerne". Foehn clouds and fog were gathering before the midnight sun, which was high in the sky and had mock-suns. Temperature at 11.45 p.m. 21° C. below zero.

April 30. Night minimum 27°, temperature at 1.30 p.m. 17° C. below zero. Started southward at 2.10 p.m. to fetch the depot, returning with it to the camp at 7 p.m. After an hour's rest we continued with the depot northward, sledging it onward for three hours over hard snow-drifts and deep snow. Then we deposited the boxes in c. 79°30′ N. lat. and set out homeward, reaching the tent 45 minutes past midnight on May 1st. We had difficulty in keeping warm on the sledge, and on our return at 1 a.m. the thermometer registered 29° C. below zero.

May 1. Night minimum 34° C. bellow zero, temperature at 2.30 p.m. in the sun 19.5° C. below zero. Fairly high wind from the south. Started at 4.10 p.m. The wind had improved the surface, so we reached the depot in 2 hours 15 minutes. We continued northward, and at 10 p.m. struck one of NIELSEN's abandoned camps with a piece of damaged bear skin. Even before that time the ice had become highly undulating as in Jøkelbugten, and at 11.30 p.m. we at last camped on the crest of a high wave, whence we had a view of Bagatellerne c. 10 km to the north-northeast. Accordingly we must be in c. 79°35′ N. lat. The wind and the driving snow abated somewhat towards evening, when ice crystals were falling, and the sun had a solar halo and three very fine mock-suns. The southwestern pinnacles of Hovgaards Ø presented a magnificent view with the midnight sun shining on the driving snow, which rushed down their sides like cascades. Temperature at 1 a.m. 23° C. below zero.

May 2. Temperature at 1 p.m. 18° C. below zero. Light wind from the north. Started at 1.30 p.m. to fetch the depot, which we reached at 3.45 p.m. Along the way clouds were gathering, which at last covered the whole sky and the summits of the mountains. A light snowfall set in, but we returned safely to the camp at 9.30 p.m, The temperature was then 14° C. below zero. The last bear's leg was fed to the dogs, which were now again to live on pemmican.

May 3. Light snowfall. Temperature at 11 a.m. 12° C. below zero, in the tent in the morning only 2° C. below zero. At 0.15 p.m. glimpses of land emerged from the fog, and we started at once. It was very heavy going, we sank into the snow to our knees, and the new-fallen snow stuck to our feet. The snow crystals fell in beautiful hexagonal stars of varying size. After three hours' toilsome work we approached Bagatellerne, and wet to the skin I headed towards the barrier of pressure ridges west of the islands. In the passage we chose we found NIELSEN's and DRASTRUP's tracks; we passed it and placed the depot on an ice hill just beyond. Were back at the camp at 7 p.m. The temperature was then 8.5° C. below zero, the snow was converted into water drops on the tent canvas, the remainder of the breakfast tea in the pot was fluid, butter and liver paste were soft, the salt crumbled —all new phenomena foreshadowing the spring.

May 4. Southeasterly wind from the sea with fog and snow. Temperature at 11 a.m. 5° C. below zero. On starting at 2 p.m. we could see nothing before us; the snow was entirely without shadows, it and the fog were of the same dazzling

whiteness. Everything on the sledge got wet at once because the dark colours absorbed the rays of heat. On the other hand we made good progress, and on reaching the depot we could take a full load on the sledge—for the first time since leaving Mellemfortet. We passed some large crevasses along the coast, and since ELI was caught in one of them with his sledge, we camped at 9 p.m. Temperature at 10 p.m. 4° C. below zero.

May 5. Sunshine, warm and calm weather. Temperatures at noon 10° C. below zero. Several crevasses to pass, the broadest off the glacier midway on the east coast of the island. This glacier is correctly indicated on the map of the Danmark-Expedition, but is not indicated by LAUGE KOCH on his new map published after his flight in 1933 ("A Day in North Greenland", Geografiska Annaler 1935). Deeper snow and heavy going northward. Camped at 10.30 p.m. in 79°50′ N. lat. Temperature at midnight 16° C. below zero. Thick water clouds to the westward, and a view of Mallemukfjældet on Holms Land.

May 6. Night Minimum 17° C., temperature at 3 p.m. 10.6° C. below zero. Started at 4 p.m., marching steadily and slowly northward. Near Kap H. N. Andersen the pressure ridges and the thin ice forced us to travel quite close to the shore. At this cape, too, KOCH has made a wrong correction by drawing the glacier back from the shore, for the cape is nothing but a large glacier pushing its rounded calving front into the sea. We passed the place and at the same time the 80th parallel by midnight, and camped some kilometres out on Dijmphna Sund at 1 a.m. c. 345 km from Mørkefjord. At 2 a.m. the temperature was 17° C. below zero.

May 7. Night minimum 20° C., temperature at 3.40 p.m. 4.5° C. below zero. Sky overcast with wind from the south, sunshine on the steep mountains at the heads of the sounds. Started northward across the sound at 4.30 p.m. Many seals were lying on the ice, and ELI constantly attempted to hunt them, but without success. Towards evening we secured a bear instead, and camped at midnight to skin it c. 5 km from Holms Land. Temperature at 1 a.m. 4° C. below zero.

May 8. At 9 a.m. the flenching had been finished and the dogs fed, but ELI had yet energy enough to set out hunting seal. He did not return till 4 p.m. dragging along a seal. A bear with two cubs passed the tent, and a gull was sitting outside. Temperature at 9 p.m. 6° C. below zero; overcast and windy. Started at 10.45 p.m. in order to reach the shore; in this we just succeeded during an increasing gale from the north, force 6—7. Tented in the bay east of the coal-measures of Sortebakker at 1 a.m. Below the layer of snow the ice of Dijmphna Sund was very transparent everywhere and in the tent shone with a deep blue colour owing to reflected light from outside.

May 9. At 1 a.m. the temperature was 7° C. below zero. Took out things to be deposited here, and at 5 p.m. drove with the depot-goods towards Mallemukfjældet in order, at the same time, to take a view of the way past it and possibly to find the tracks of the others. We sledged alternately on the hummocky ice and on the shore above the high pressure ridges of the tidal crack. Here we placed the depot among some large down-fallen blocks of rock containing fossils and crystal inclusions. A short distance farther westward, near the Depotgletscher, I discovered a bear's head appearing behind an iceberg and made preparations for shooting it, when it turned out that the head was merely a part of a bear cut up by NIELSEN, who had had his camp and a depot in this place. Five gulls were feasting on the meat. We returned to our camp, broke it up, and moved it to the bear's head. Fed the dogs at 7 a.m. of May 10th.

May 10—11. We were now sleeping in the day because of the heat. Turned out at 5 p.m. Fog and snowfall. Started at 9 p.m. travelling by the "streets" and

across the "squares" I sighted from a lookout yesterday among the pressure ridges in front of Mallemukfjældet. The snow was deep and everywhere saturated with the water from the ice. We had to push with all our might and to cut passages. However, in the course of three hours we passed the mountain, and off the Mallemukgletscher we travelled far seawards.

As we were approaching the shore again, a broad lead appeared, and all our goods had to be unloaded and carried across a pressure ridge. Camped at 6.30 a.m. immediately south of the mouth of Hansêraqs Fjord. Temperature at 10 a.m. 7.5° C. below zero.

May 11—12. Rose at 8 p.m. Drove with empty sledges inland to investigate Hansêraqs Fjord, which took us nearly three hours. On our return we sighted a bear and pursued it, but it escaped into the open water. When we were about to start northward with the camp, it was blowing up for a gale, and we decided to remain in the place.

May 12—13. Rose at 3 p.m. and started at 5.30 p.m. The weather was clearing up, and the going was good. We drove now on the flat shore, now on the ice along the coast (which was full of bear's tracks), and for some time out among the pressure ridges. From the last cape before Eskimonæsset we gained a view of the open sea as far as the eye could reach both to the north and south and only one kilometre from the shore. From Eskimonæsset we had a view of the mountain panorama in the interior of Ingolfs Fjord. We tented near two large stones, which were the only visible portions of the flat, snow-covered cape. After a zealous search everywhere, however, I succeeded in finding the floor-stones of a house or a tent place, before turning in.

May 13—14. Rose at 4.30 p.m. Below one of the stones I found a harpoon with a copper blade, but further excavation was postponed till our return journey. Started westward at 10 p.m. into Ingolfs Fjord, where, according to an agreement, NIELSEN was to have deposited a report on the easternmost of Wegeners Øer. Passed his track several times, and at 6 a.m. camped at the cape south of the westernmost island. A ptarmigan cackled on the mountain. Temperature at 7 a.m. 15° C. below zero.

May 14—15. Rose at 6 p.m. in splendid Polar weather. Started seaward towards the islands at 8.30 p.m. Went ashore on the easternmost island, but found no trace or letter from NIELSEN. Continued to Kap Jungersen, where, at 0.30 a.m., we found two letters from NIELSEN in a cairn on a point of the scree. As appeared from one of the letters, the cairn had been built by DRASTRUP, who had deposited a report in it, but this report had been taken out by NIELSEN on May 13th—two days ago—and replaced by a copy. The copy told us that DRASTRUP and CHRISTOFFERSEN after seventeen days of travel from Hvalrosodden had arrived at this place on May 1st, where open water and new ice northward compelled them to alter their travelling route and turn into Ingolfs Fjord in order to find a passage over land to Danmarks Fjord. Although they had lost two dogs on a bear hunt and had only food for ten days left for the remaining eight dogs, they still thought they would be able to make the journey arond the north of Greenland to Thule. In the other letter NIELSEN told us about his own journey, partly before sledging into Ingolfs Fjord (and this part of the letter, as I only realised much later, had been removed from another place without this being explained in it), partly after he had been in the interior of the fjord. It ended by stating that he was now on his way to Nakkehoved, from which it was evident that the ice along Kap Jungersen, over which DRASTRUP could not travel, was now practicable.

Having copied all these letters and added our own report, ELI and I continued northward past the cape and camped at 5.30 a.m. on a snow-free shore-terrace full

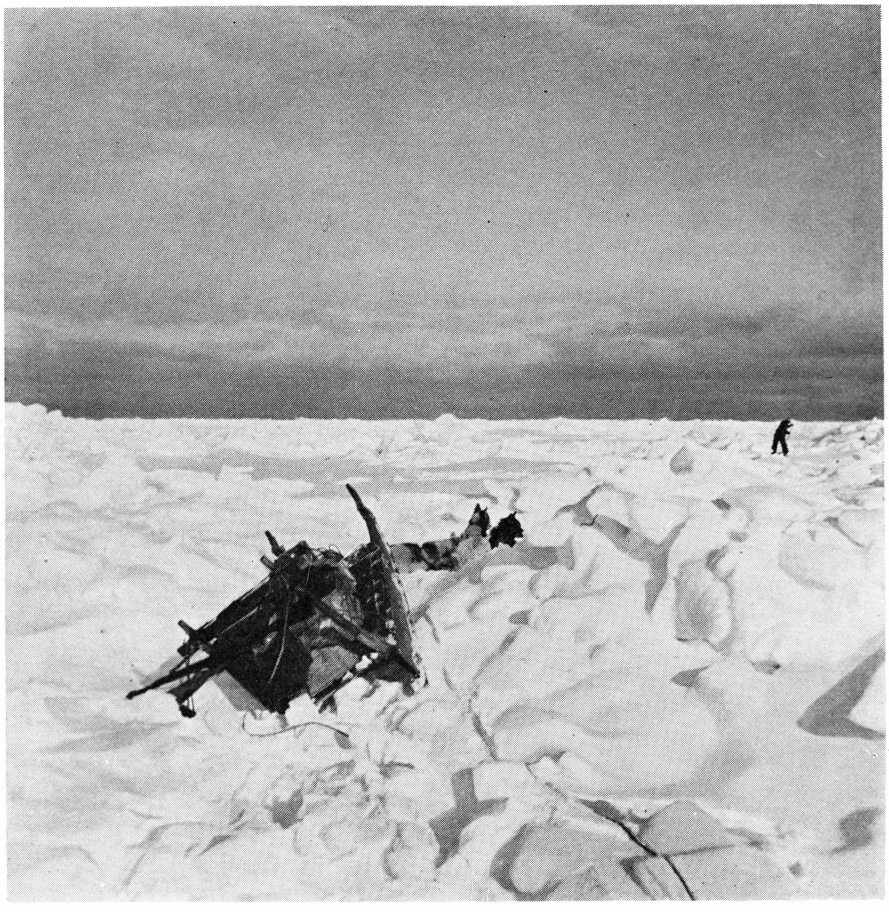


Fig. 40. ELI cutting a way through the pressure ridges in front of Mallemukfjældet. On the horizon the dark sky characteristic of open water. Phot. by EIGIL KNUTH. May 10th, 1939.

of Eskimo tent rings and meat caches, which NIELSEN, judging from the tracks, had already discovered. I gave it the name "Sommerterrassen". On the ice in front of them there lay a seal, which ELI approached, but in vain. I examined the place carefully and did not turn in till midnight.

May 15—16. Rose at 9 p.m. Thick snowfall and a temperature of 5° C. below zero. Worked in the place till 4 p.m. next day. At 1 p.m. the temperature was 2° C. below zero.

May 17. Rose at midnight. Temperature 5.5° C. below zero. The bad weather continued. Started northward at 4 a.m. Found good going on the land. Examined the whole coast, where the open water extended right in to the ice foot. A large flock of eiderducks was seen in a cove about midway off the land. Camped on the south side of Dværgfjorden in fog near an Eskimo meat cache without knowing where we were. Turned in at 8 p.m.

May 18. Rose at midnight, when the weather was clearing. Temperature

9.5° C. below zero. Climbed a mountain to get a view of the land. Started at 4 a.m. across Dværgfjorden and camped at 5.30 a.m. on Sophus Müllers Næs, where I found the house ruin and half an hour later began digging it out. Temperature at 2 p.m. 1.5° C. below zero. Turned in at 9 p.m.

May 19. Rose at midnight. Temperature 2.5° C. below zero. Windy and overcast with squalls of snow. Worked in the place till 10 p.m.

May 20. At midnight the temperature was 6° C. below zero. Still windy. Rose at 5.30 a.m. Wrote a report and arranged the finds in the morning. Temperature at 9 a.m. 2° C. below zero, and at 3 p.m. 5° C. below zero. Digging in the ruins in the afternoon. For some days ELI had complained of a headache, and to-day he seemed to be anything but well. He lay sleeping in his bag frowning and with his breath coming rapidly as if he were in a fever. He had spoken about red spots on his arms and legs. I had neither quinine nor aspirin.

May 21. Got up at 2 a.m. Wind, drift and snow outside the tent. I worked a little at my book. ELI still low and drowsy. In the forenoon I worked in the place. In the afternoon I drove alone four hours northward to look for Eskimo remains. On the next cape a letter from NIELSEN was found near an Eskimo meat cache, where he had had a camp. At 2 p.m. I turned back at c. 80°53′ N. lat., which became my northernmost point. It was neither wise nor useful to proceed further in the bad weather; it was foggy, windy, and the temperature was 6° C. below zero. On my return to the camp ELI's pulse was 100. He was perspiring, his breath came rapidly, and he complained of a headache. I decided to travel southward to Kap Jungersen in order that NIELSEN should not pass me here in the mountains inland. He would have to pass Kap Jungersen, and I might then perhaps get some quinine.

May 22. Rose at 5 a.m. ELI felt much better. Left letters for NIELSEN and DRASTRUP, and started at 9.15 a.m. Temperature 10° C. below zero. One of the female dogs, Anana, gave birth to three puppies before our departure and one later on during the drive, but all of them died in spite of our attempts to keep them alive. On our arrival at our former camp site on Sommerterrassen everything which had previously been visible was found to be covered with snow. NIELSEN had not been there yet. Unfortunately ELI's recovery was a delusion; his pulse was still 100, his head was strangely swollen, and both his appearance and his behaviour had changed entirely.

May 23. ELI remained in the sleeping bag all day. I worked in the place and tried what I could do as a seal hunter, but without success. Temperature all day 6° C. below zero. Turned in at midnight.

May 24. Some hours later NIELSEN and OVE arrived; I had a report of his whole journey. After they had pitched their tent beside ours I got some aspirin for ELI, but unfortunately NIELSEN had no quinine. When the others had turned in, ELI and I started southward at 2 p.m. Passed a great many seals on the ice of Ingolfs Fjord and arrived at Eskimonæsset at 11 p.m. A bear had been prowling about and dug up the snow everywhere.

May 25. Removed the snow from the "ruin" and turned in at 2 a.m. Wind and snow while we were sleeping, so the ruin had to be dug out again next morning. ELI tried to dig, but had to go into his sleeping bag and had some aspirin. Worked all day. Our sugar had been used up.

May 26. Got up at 7 a.m. Sunshine and calm weather. Temperature 9° C. below zero. To-day ELI's pulse was 120 and his spirits below zero. He did not do anything. I dug in the ruin.

May 27. Storm from the south, temperature 9° C. below zero. A Sisyphus task to dig, the ruin being constantly buried in drifting snow. ELI's pulse only 100;

he was looking at his hands and legs all the time, but said nothing. In the afternoon the wind abated, and it grew quite calm; I let him get up to feed the dogs, for we were at any rate to leave next day or the day after, so he had to be accustomed to be up. Arranged my finds and packed in the evening.

May 28. Splendid weather, but unfortunately ELI felt worse; now he felt bad all over, his legs hurt as well as his hands—which he was constantly looking at—and also his chest. He had been coughing and spitting all night, but his pulse was hardly 100. In the afternoon he attended to the dogs, and in the evening his pulse was 106. Temperature of the air 5° C. below zero. Turned in at 8 p.m. Towards midnight strong wind.

May 29. Remained in our sleeping bags till the wind had ceased at 11 a.m. ELI had been spitting in an empty tin all night, his expectoration contained some blood. Started at 2 p.m. in summer-warm weather. Drove southward over land looking for Eskimo remains. It began to blow and was bitterly cold. Camped on the cape south of the entrance to Hansêraqs Fjord near an Eskimo tent place at 7 p.m., when the wind had developed into a snowstorm, so that we could see nothing before us. ELI refused to eat pemmican, believing that his illness was due to the pemmican; but when he first fell ill, we had still seal meat in our cooking pots.

May 30. Got up at 10 .a.m and examined the place. The mouth of Hansêraqs Fjord measured 300 paces from mole to mole, or probably about 275 m. Temperature 7° C. below zero, with wind from the south. Started southward at 2.30 p.m. Drove over land to the northern part of Mallemukfjældet, where we had to descend to the sea ice across high pressure ridges, which gave ELI great trouble because he had no strength to manage the sledge. We had an easy passage along Mallemukfjældet, and immediately south of it we came across NIELSEN's camp on the sea ice near the old bear-head camp. We tented beside his tent, but unfortunately had to pitch our tent on the smooth snow-free ice. ELI fetched some sugar from our depot, and I fried steaks of a musk-ox which OVE had killed in Ingolfs Fjord. NIELSEN was packing up fossils, having finished his work up here; he intended to drive directly home the next day. Still cold and windy.

May 31. ELI looked very bad, and in the course of the night I contemplated exchanging him with OVE, so that he could return with NIELSEN, while I could continue my search for Eskimo house ruins leisurely in the company of OVE. However, as ELI felt a little better in the morning, I gave up this plan. While we were having our breakfast, a foehn wind came rushing down Mallemukfjældet, sweeping everything away over our heads; it took us two hours to gather our things together from nearby and distant places. NIELSEN and OVE started southward at 3.30 p.m., while we turned into Dijmphna Sund, travelling along its northern coast, at 5 p.m. A fresh gale, this time blowing from the interior of the fjord, caused some difficulty, and it proved impossible, owing to ELI's lack of strength, to get the tent pitched. Instead I dug a cave in the snow, where we did not turn in till far past midnight.

June 1. Got up at 1 p.m. and started westward at 3.30 p.m. In here the wind still blew, and heavy clouds lay over the high mountains of Lynns Ø. As the coast here was merely a dead morainic landscape, and the fjord ice became more and more hummocky, we turned round and drove back to Sortebakker, whence we headed southward to Kap H. N. Andersen. Across the sound we had rather heavy going, in places the ice was covered with very deep, soft snow. At midnight we camped in a small cove south of the cape. Temperature at 2 a.m. 2.5° C. below zero. The sun shone in the south, while behind us the weather was dark and stormy.

June 2. Started southward at 4.30 p.m., travelling on the shore. On the way we went ashore on a small unknown island some 600—700 km from the coast; I called

it Sophies Holm after HOVGAARD's wife. Farther southward we had some difficulty in passing from the shore cliffs across the pressure ridges of the tidal crack down on to the ice because ELI was unable to manage the dogs, and similar difficulties arose when we reached the crevasses off the glacier, when all the dogs fell into the water. Camped at 2 a.m. south of the glacier off some skerries which were not indicated on the map either. Turned in at 6 a.m. ELI had now grown thin beyond recognition and was weaker than ever.

June 3. It was only with difficulty that ELI got up in the morning, but he ate his porridge eagerly. I could hardly imagine that his illness was due to the food; his porridge was flowing with butter, milk, and sugar, and he had bread, rice, sardines, liver paste, ovomaltine, pemmican, and vitamin tablets, in short a mixed diet, though, of course, not food for a fever-patient. He was very anxious himself about his condition, and, I believe, he feared the worst. When I asked him how he was, he always answered: "All right—but I am finished."

Started southward at 5.30 p.m. Near Kap Anna Bistrup we travelled on land, a delightful place, with an abundance of grass, moss, and flowers thawed out of the snow. Even as far up as 150 m large, snow-free, grassy slopes occurred. We observed the fresh tracks of a bear, which had slid a long way down a steep snow-drift. From the cape we drove across a glacier out on to the fjord, keeping close to the shore, and at 2 a.m. we camped on Nioghalvfjerdsfjorden, while all land was concealed by clouds. The thermometer at zero for the first time.

June 4. Thick fog and light snowfall. Started at 8.15 p.m. southward, travelling by wind and compass in order to reach Dobbeltøerne, which after an hour's sledging appeared right in our course as two dark spots in the fog. On account of the weather we camped here at 11.30 p.m.

June 5. Snow-storm and quite thick, so I wrote all the forenoon. Started at 8 p.m., and after negotiating some fairly broad crevasses, we reached Lamberts Land at 1.30 a.m., where letters from SØLVER, NIELSEN, and DRASTRUP were found. The latter reported that he turned round at Romers Sø and passed here on June 1st. Temperature at 2 a.m. 6° C. below zero.

June 6—7. Rose at 3 p.m. Arranged the depot and laid down a report about a planned journey via Norske Øer—Pariser Øer. Looked again for BRØNLUND's grave, but in vain, and then let ELI place the wreath in the snow-drift at the ravine in which I supposed he was lying. Started eastward at 7 p.m. with heavy loads on the sledges. Near Norske Øer we met with wavy ice and several snow-covered crevasses. Rounded the northernmost point (Kap Nansen) of the large Norske Ø and noticed certain deviations from the map. Far out to sea in a northeasterly direction dark, dense cloud formations were seen which bore a marvellous resemblance to mountains, and I remembered the reports which stated that in 1933 those onboard the "Gustav Holm" thought they discerned the Fata Morgana Islands precisely from Norske Øer. Camped at the foot of the steep rock walls in the bay on the north side of the large Norske Ø at 4 a.m. Temperature at 5 a.m. 4° C. below zero.

June 7—8. Started at 7.30 p.m., driving southward on the eastern shore of Store Norske Ø. The shore consisted everywhere of chips broken off by the frost, which provided life conditions for a very sparse vegetation only: occasional grass tufts and poppies, later some willows and *Cassiope*. The weather was clear and fine with wind from the southwest. The southern end of the island was reached about 2 a.m. Like the northern end it did not agree with the map; BISTRUP and RING, too, experienced fog when they travelled here. A fairly large island lies in continuation of the larger one, and separated from it by a narrow sound extending in the direction west-east. At 3 a.m. we camped south of a cape midway on this

second island, and after having had a meal, I climbed a mountain to have a view of the position of the island. The highest part of the island was about 150 m. On my way back to the tent I shot a pair of ptarmigans; the female was in its summer plumage, whereas the male was snowy white. ELI was now recovering slowly, though he still sat motionless on the sledge during the journeys No open water was visible

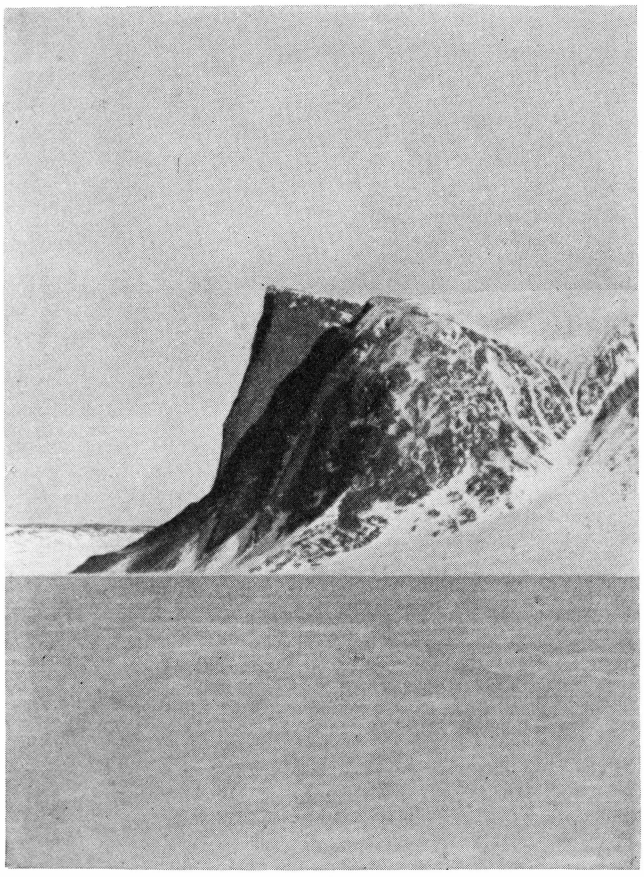


Fig. 41. The grandest cape along the whole coast, Kap Récamier in Skærfjorden. Phot. by SVEND SØLVER. June 10th, 1939.

eastward as far as the eye could reach, nor did we discern any icebergs. As far as I could make out, Pic de Gerlache and the northernmost point of Schnauders Ø were on a line with the southernmost point of the large Norske Ø, while its position is quite different on the map.

June 8—9. Temperature 1,5° C. above zero at our start at 8. p.m. We first rounded the low, snow-covered south point of the island and then headed southward between Franske Øer. Tented at 4 a.m. at the island north of Kap Bergendahl. Strong southerly wind.

June 9—10. Started at 8.30 p.m. Continued southward along the outer side of Franske Øer and Pariserøerne. Splendid view of the Pic de Gerlache area between the islands. The inland ice looked alluring, it looked as if one could drive the sledge

right on to the top of the large nunatak south of the Pic de Gerlache land. Tented in the narrow sounds between the islands east of Ambolten at 6 a.m. Ascended a mountain to hunt ptarmigan near a ravine full of soft, grassy carpets, where musk-oxen had recently been grazing. Gathered flowers for GELTING, and saw a small *Saxifraga* in full flower on the edge of a vertical cliff. Sunshine. Water in the basins of the rocks.

June 10—11. Placed the greater part of our goods in a depot, and drove with the tent and our sleeping bags through the sounds north of Ambolten to Mellemfortet to find a report from SØLVER, which we did. Very heavy going. Ascertained that only one island, viz. Mellemfortet, and not two, as shown on the map, is situated north of Hammeren. The trip took about eight hours, and in the morning we again camped at the depot on the Pariserøerne. ELI at last declared that he had fully recovered, and now it was he who climbed the mountains to hunt ptarmigan. The result was two ptarmigans.

June 11—12. Very hot in the tent, and a meat-fly was buzzing outside. Started at 9 p.m., sky overcast and some snow. Temperature in the light 2.5° C. above zero. Passed Kap Mérite and drove southward along the east side of Storøen, where we found SØLVER's and DRASTRUP's tracks from a bear hunt. Camped at 6 a.m. among the skerries in Troldehaven south of Storøen.

June 13. Started by midnight, travelling southward past Oktoberø to Gamma Ø. Heavy going past Bjørneskærene. At Kap Isabella, at 5 a.m., we found letters from SØLVER and NIELSEN. In half an hour we reached SØLVER's depot south of Orléans Sund, and at 7.30 a.m. we tented near Kap Louise. Temperature at 9 a.m. 5.5° C. below zero, while the night temperature out at the islands had for the last few nights been 0.5° C. above zero, 0°, or 0.5° C. below zero.

June 14. Started at 1.30 a.m. Temperature 5.5° C. below zero. Foggy with wind from the north. Drove at a rapid rate to Depotnæsset, where Eskimo remains were examined, and the goods laid out in a depot, while at 2.30 p.m. we continued due eastward to Kap St. Jaques on the southernmost point of Ile de France, where we arrived at 4.30 p.m. in dense fog. Towards evening the weather cleared, and out here near the open water (at Kap Philippe) it was warmer again: 2° C. below zero.

June 15. As thaw might set in at any moment, we dared not remain there any longer. After reconnoitring some distance northward along the west coast of the island in the morning, we left the island at 7.15 a.m., and at 9.15 a.m. reached the depot at Depotnæsset. From this point we continued to Kap Amélie and onward over smooth snow-free ice into Penthièvres Fjord in a northwesterly direction and camped here on the ice after killing three musk-oxen. Very hot in the tent.

June 16. Reached the head of Penthièvres Fjord with dogs exhausted with the heat and overfeeding. The summer was much advanced here, with snow-free slopes, purling brooks, and flowers and flies in abundance. Climbed a mountain behind the camp to a height of 200 m along a large and steep river ravine.

June 16—17. Started southward at 8.30 p.m. along the east side of Silfverbergs Ø and Joinvilles Ø. At times the going was very heavy, partly due to deep snow, partly to water-filled holes in the ice. Killed a gull at the foot of a steep sea-gull cliff. At 4 a.m. we reached the southernmost point of Joinvilles Ø and here found SØLVER's trail, but not the hut JENSEN had promised to erect here while we were in the north. Continued towards Kap Récamier and camped on the ice before reaching the cape.

June 17—18. At 9.30 p.m. we started southward around the cape and bent into C. F. Mouriers Fjord. It was the worst going encountered on our whole trip, soft and wet slushy snow a metre deep. At 6 a.m. we rounded the last cape on the

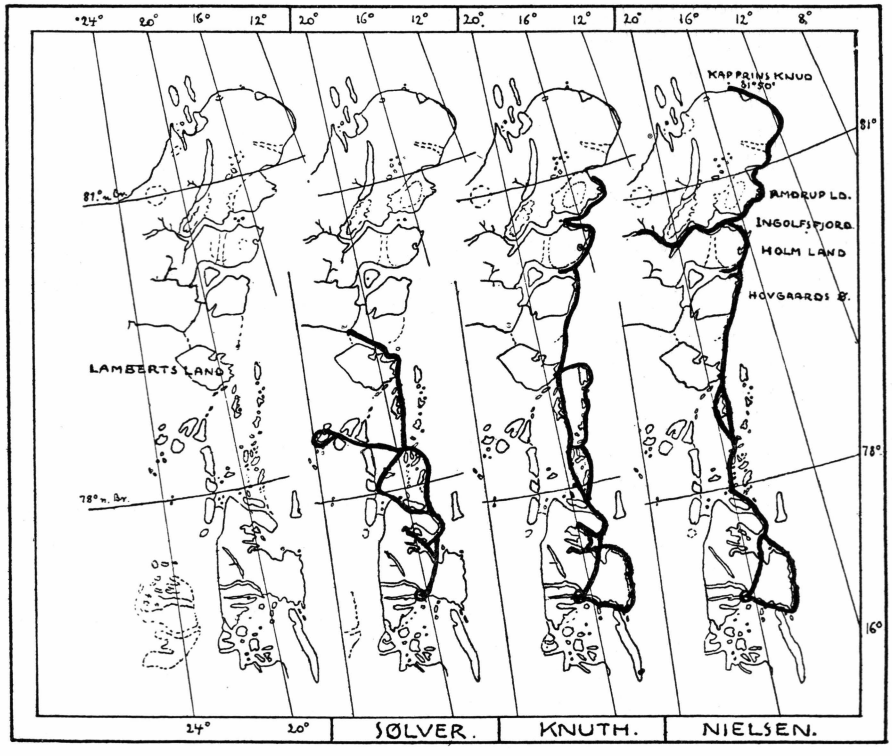


Fig. 42. Sketch map for comparison of Sølver's, Knuth's, and Nielsen's journeys northward.

south side of the fjord, gaining a view of the innermost cove, which differed little from the supposed termination of the fjord stippled on the map of 1933 prepared by Dr. Malmqvist (cf. Gunnar Seidenfaden and Thorv. Sørensen, Medd. om Grønl., Bd. 101, Nr. 4, p. 20). Camped at 8 a.m. near the river by Odinsborg.

June 18—19. Started at 10.30 p.m. travelling on land above the ice-foot to Kap Li and onward across Fladebugt, which contrary to all expectation presented fairly good going. Passed Rekvedøen at 7.30 a.m., and camped at 9.30 a.m. near Kajkap.

June 19—20. Started at 11 p.m., and arrived next morning at 9.30 at Micardbu, where we heard of Count Micard's and Willie Knutsen's flight to Norway.

June 21. Stay at Micardbu.

June 22. Stayed at Micardbu. Started southward at 10 p.m. Very bad going on the first part of the way. To-night the temperature was 5° C. above zero. We travelled at a rate of only 1 km an hour.

June 23. Farther southward the going was better, and we drove in several inches of water on the ice. Observed fresh bear tracks, a snowy owl, arctic gulls, and a sea-swallow. Camped at noon at the Eskimo house ruins south of Sytten-kilometernæsset.

June 24. All the house ruins were frozen to the bottom. Started southward at 5 a.m. The ice was covered with water 10—20 cm deep. Øxebladet and its coves

were difficult to pass. Arrived at 9 a.m. at Danmarks Havn, where we killed three musk-oxen behind the house. Along the way I had killed a hare. At Danmarks Havn there was a bustling life of eiderducks, geese, arctic gulls, ringed plovers, and sea swallows, which had their eggs just in front of the house. The water stood one foot high in the house, and I had to make a hole in the outer wall to get it out. A seal was lying on the ice in front of the house. Turned in at 5 p.m.

June 25. Started at 1.30 a.m. homeward bound. I went ashore at Baadskæret and at the Eskimo settlement on the east side of Stormbugt. Here, too, the ruins were frozen to the bottom. We crossed Stormbugt with very bad going over deep, soft snow, and arrived at Snenæs at 9 a.m. The cape lay like a small isle of life amidst the wintry surroundings, with snow and ice on all sides. Worked in the place all day till 7 p.m.

June 26. Rose at 4 a.m. The weather was foggy and cold. Dug, measured, and made drawings. Started homeward at 2.30 p.m. Crossing Farsund we had to go ashore several times to avoid large crevasses. The river in Lumskebugten had broken up. By 6 p.m. we reached Hvalrosodden, and at 8.30 p.m. we arrived at Mørkefjord in thick fog.

Length of the journey, including advance and return sledgings, c. 1710 km.

19. Comments on the sledge journeys northward.

a. List of the kind of goods carried.

For sledge and dogs.

Harness.
Frontstraps.
Traces.
Lashes.
Dogs' kamiks.
Spare line for lashing.
Spare line for front straps.
Spare line for traces.
Spare harness, ready-made.
Girth for spare harness.
Whip.
Lash for the whip.
Spare wood for handle of whip.
Spare wood for cross bars.
Sledge skis.
Spare sledge skis.
Iron chains for the dogs.
Swivel hooks.
Emergency links.
Dog-pemmican in tins.
Keys for opening tins.
Axe for dividing food.
Chisel.
Hammer.
Screw-driver.
Tenon saw.
Nails of different sizes.
Screws of different sizes.
Sailmaker-glowes.
Triangular sail needles.
Waxed thread.
Sledge sack.

For the traveller in the terrain.

Rifle, Mausser of model 1889.
Parlour rifle.
Cartridges for the rifle.
Cartridges for the parlour rifle.
Cleansing rod.
Twist.
Rifle oil.
Telescope.
Compass.
Wristlet watch.
Moving picture camera.
Camera.

Films for the moving picture camera.
Films and plates for the camera.
Electric exposurer meter.
Yellow light filter.
Green light filter.
Portrait lenses.
Telephoto lens.
Waterproof tubes for films.
Sun glasses.
Spare glasses for the sun glasses.
Dagger.
Spare daggers.
Pocket knife.
Spare pocket knives.
Cartridge belt.
Shooting sail.
Shooting sledge.
Rucksack.
Skis.
Extra ski points.
Extra ski ties.
Extra ski clams.
Ski lubricant.
Ski boots.
Boot grease.
Pick axe.
Glacier spurs.
Glacier ropes.
Map of the travelling route.
(Theodolite. Nautic tables.
Chronometer).

Camping outfit.

Tent.
Tent bag.
Tent pegs.
Tent bottom layer.
Reindeer skins or rubber mats.
Tent poles.
Extra tent poles.
Sleeping bags.
Sack for sleeping bags.
Large spade for digging snow.
Small besom for snow.
Clothes line.
Clothes pins.
Primus stove.
Kerosene.
Funnel.
Cleaning needles.
Spare burner for Primus stove.
Spare stuffings for Primus stove.
Screw driver for Primus stove.
Box for Primus stove.
"Meta" dry spirit bars.
Matches.
Stearine candles.
Electric torch.
Spare elements for same.
Spare electric bulbs for same.
Toilet paper.
Cooking pots.
Frying pan.
Plates.
Spoons.
Knives.
Forks.
Jugs.

Clothes of the traveller.

Rag socks, short.
Rag socks, long.
Camel wool socks.
Camel wool trousers.
Camel wool anorak.
Camel wool helmet.
Thick under jacket.
Thick drawers.
Shirt.
Down waistcoat.
Bear-skin trousers.
Reindeer-skin anorak.
Fabric mittens.
Woollen finger mittens.
Bear-skin mittens.
Working gloves.
Extra mittens.
Icelandic sweater.
Finnish felt komaks or kamiks.
Bladder sedge for kamiks.
Laces.
Muffetees.
Scarves.
Handkerchiefs.

Material for repairs.
Spare buttons.
Needles and thread.
Safety pins.

Provisions for men.

Pemmican.
Oat meal.
Barley groats.
Crisp bread.
Butter.
Rye biscuits.
Liver paste.
Smoked sausage.
Honey.
Ovomaltine.
Norwegian whey cheese.
Bouillon cakes.
Tea.
Coffee.
Dried milk.
Salt.
Sugar.
Vitamin tablets C.
Vitamin tablets A—D.
Milk chocolate.
Nut chocolate.
Cooking chocolate.
Toffee.
Boiled sweets.
Dram or brandy.

Medicine.

Military dressing-packings of different sizes.
Hydroscopic wadding.
Hydrophobic wadding.
Hansa plast.
Leucoplast.
Perubalsam.
Boracic vaseline.
Ointment for burns.
Sun cream.
Soap.
Iodine.
Quinine.
Acetyl-salicyl.
Morphine.
Scissors.
Scalpel.
Fracture leggings.
Dental instruments.

Private things.

Diary.
Note books.
Fountain pen.
Ink.
Literature.
Pipe.
Tobacco.
Cigarettes.

Requisites for scientific work (e. g. archæology).

Spade.
Small excavators.
Tape measures.
Inch scale.
Pencils.
India rubbers.
Squared paper.
Compasses.
Triangle.
Metal numbers.
Linen bags.
Newspapers.
Small boxes.
Twine.
Literature on the subject.
Cases for packing finds.

b. The rations for men a dogs.

It has been stated on p. 86 above that our tins for dog-pemmican had been made of a size to contain 6 kg, corresponding to a day's ration

for a team of eight dogs. Thus on the long sledge journeys each dog had 750 g pemmican a day, which should correspond to the following nutritive content:

Daily ration per dog	Albumen	Fats	Carbohydrates	Calories
750 g	111.8 g	317.3 g	116.3 g	3765

For comparison I may mention the daily rations of dog-pemmican on two other expeditions for both of which the pemmican had been supplied by *Beauvais & Rasmussen.* viz. EJNAR MIKKELSEN's Alabama Expedition in 1913, and the Expédition Française Transgroenland 1936. Both expeditions fed 500 g per day to their dogs, and found that it was too little. In so far as the composition of the food was the same in the three cases, our rations of 750 g should accordingly be better, and actually they were sufficient in the long run—when supplemented with game—to keep the dogs in good condition.

It should be added, however, that with a different composition or perhaps merely with the addition of other components the dog-pemmican might possibly be more thoroughly utilised. As it was, on our expedition, it always caused fluid evacuation from the animals, and they ate it eagerly again after it had passed through the digestive tract, which must mean that it still contained unutilised nutritive substances. Not only were the dogs seen to eat each other's excrements, but they also hastened to eat their own before the others could get at them; this never took place when the dogs were fed with musk-ox or bear's meat. So, perhaps, the percentage of albumen should be increased. After feeding with meat their diarrhoe stopped.

Besides the benefit to the dogs themselves of a more suitably composed pemmican, several drawbacks during sledging might be avoided, for instance the constant fighting in the team whenever a dog was obliged to stop to ease itself or they all discovered old frozen excrements from earlier journeys. After feeding with meat there was more order and discipline on the drives.

The chief element of the food rations for the men on the journeys was the man-pemmican, of which we had two kinds prepared by the firm *Beauvais & Rasmussen:*

	Albumen per 100 g	Fats per 100 g	Carbohydrates per 100 g	Calories per 100 g
KNUD RASMUSSEN pemmican ...	18.1 g	35.5 g	17.9 g	463
AMMUNDSEN pemmican.....	23.5 g	43.5 g	21.7 g	572

Theoretically the day's rations should accordingly contain 270—300 g (= $^1/_{10}$—$^1/_9$ tin) of KNUD RASMUSSEN pemmican or 250 g (= 1 piece) of AMMUNDSEN pemmican, but in practice NIELSEN, SØLVER, and I each took the quantity answering to our requirements and the length of the journey. As the KNUD RASMUSSEN pemmican contained various ingredients which were not found in the AMMUNDSEN pemmican, as for instance rice and raisins, and was fairly sweet when eaten alone, while the AMMUNDSEN pemmican, when eaten alone, was too fat and poor in sugar, we often mixed the two pemmicans together according to our taste. SØLVER made it even more composite by adding dog-pemmican, while NIELSEN and OVE used the latter for lunch, taking it cold in the pure state on their journeys.

However, it was not only the pemmican which we varied, each in his own way, but the composition of our food as a whole, with rations of porridge, bread, chocolate, and extra dainties, and so it was different for the different sledge parties, though, as will be seen, the differences were not greater than that a certain agreement existed as regards the daily quantity in grammes and the nutritive calorific value. In giving the subjoined ration tables of the three sledge parties, I wish to emphasize that the tables show only the theoretical basic rations; in the first place the game secured (stated after each table) is disregarded, and secondly, on many days greater rations of pemmican, porridge, chocolate, boiled sweets, and caramels were consumed than stated in the tables, in part because of the supply of game. However, as fundamental rations on a sledge journey under the particular circumstances as regards hardships and weather the figures may be of some interest and useful for a calculation of the quantity of provisions and sledge loads needed.

For the preparation of the tables I am greatly indebted to Professor Dr. med. L. S. FRIDERICIA, the chief of the National Laboratory for Practical Health Investigations, where Miss ELLEN BRASK with scrupulous care computed SØLVER's and my sledge provisions. Later on, however, a closer inspection of SØLVER's and my notes caused alterations in some of the figures—especially as regards my part—and the resultant new computations were made by myself and I have likewise computed the values of NIELSEN's rations by means of the scale which I received from the National Laboratory for Practical Health Investigations. This scale is based in the main on Dr. E. GROTH-PETERSEN's book, "Grundlag for Beregning af Kostens Næringsværdi" (C. E. Gad, publishers, Copenhagen 1940).

NIELSEN's and OVE's rations on the long journey April 1st—June 13th.
Rations per man per day.

	Total quantity	Albumen	Fats	Carbo-hydrates	Calcium	Phosphorus	Fe.	Calories
	g	g	g	g	mg	mg	mg	
KNUD RASMUSSEN pemmican, 1/9 tin	300	54.3	106.5	53.7				1389
or	275.0	56.6	107.7	54.0	..	..	..	1410
AMMUNDSEN pemmc., 1 piece	250	58.8	108.8	54.3				1430
Dog-pemmican	125.0	17.6	52.9	19.4	..	..	..	624
Oaten grits	62.5	9.4	4.1	43.1	46.3	252.8	2.56	243
Crisp bread	70.0	6.7	0.6	57.0	28.7	210.0	1.00	260
Butter	5.0	0.1	4.2	..	0.9	0.8	0.12	38
Sugar	42.3	..	..	42.3	..	..	..	165
Chocolate	30.0	1.6	8.7	16.5	22.2	90.0	0.75	150
	609.8	92.0	178.2	232.3	98.1	553.6	4.43	2890
Percentage distribution of total calories	..	12.7 %	55.5 %	32.2 %	..	..	..	..

The rations were actually kept to in the period April 1st to April 17th, or for sixteen days, till NIELSEN and OVE were successful for the first time when hunting in Nioghalvfjerdsfjorden. After this time the rations were supplemented by the game secured, which amounted to five bears, one musk-ox, and one hare.

SØLVER's and ZACKÆUS's rations on the long journey April 7th—June 12th.
Rations per man per day.

	Total quantity	Albumen	Fats	Carbo-hydrates	Calcium	Phosphorus	Fe.	Calories
	g	g	g	g	mg	mg	mg	
KNUD RASMUSSEN pemmican, 1/28 tin	96	17.4	34.1	17.2	..	..	..	444
AMMUNDSEN pemmican, c. 7/8 piece	216	50.8	94.0	46.9	..	..	..	1236
Dog-pemmican	54	7.6	22.8	8.4	..	..	..	269
Grits	45	6.8	3.0	31.1	33.3	175.5	1.8	175
Crisp bread	16	1.5	0.1	13.0	6.6	48.0	0.2	60
Liver paste	22	2.4	6.4	1.8	0.9	22.0	0.6	71
Butter	26	0.2	21.6	..	4.4	4.2	0.1	200
Sugar	36	..	..	36.0	..	..	..	140
Chocolate	61	3.3	17.7	33.6	45.1	183.0	1.5	306
Ovomaltine	10	1.4	0.8	7.1	..	..	..	42
Honey	9	..	..	7.5	0.4	1.4	0.1	29

(continued)

	Total quantity	Albumen	Fats	Carbo-hydrates	Calcium	Phosphorus	Fe.	Calories
	g	g	g	g	mg	mg	mg	
Boiled sweets and licorice..	9	..	..	9.0	..	..	..	35
Rice	6	0.5	..	4.6	0.2	6.0	0.1	19
Barley grits	18	1.5	0.3	13.7	3.1	37.8	0.5	58
Rye biscuits	2	0.2	0.2	1.3	0.4	3.0	0.0	7
Meat chocolate.....	15	3.3	3.5	6.6	..	..	..	71
Dried fruits	9	0.3	0.1	6.0	4.7	6.7	0.3	27
Smoked sausage.....	4½	0.7	2.0	0.2	0.2	6.8	0.1	23
	654½	97.9	206.6	244.0	99.3	494.4	5.3	3212
Percentage distribution of total calories	..	12.2 %	57.8 %	30.3 %	..	..	..	..

The rations were actually kept to in the period April 7 to June 2 or for 56 days, in which period the game secured consisted of only one ptarmigan, killed on May 9th. In the period June 2 to 12 three bears were killed.

KNUTH's and ELI's rations on the long journey
April 9th—June 26th.
Rations per man per day.

	Total quantity	Albumen	Fats	Carbo-hydrates	Calcium	Phosphorus	Fe.	Calories
KNUD RASMUSSEN pemmican	g	g	g	g	mg	mg	mg	
1/10 tin.....	270	48.9	95.9	48.3				1250
or	245	50.1	95.6	47.9	..	..	..	1252
AMMUNDSEN pemmc., 7/8 piece	219	51.4	95.2	47.5				1253
Oaten grits	83	12.5	5.5	57.3	61.4	323.7	3.4	323
Crisp bread, 5 pieces.....	42	4.0	0.4	34.2	17.2	126.0	0.6	156
Liver paste	25	2.8	7.3	2.0	1.0	37.5	0.6	81
Butter.....	25	0.2	20.8	..	4.3	4.0	0.1	193
Sugar.....	80	..	..	80.0	..	..	..	311
Chocolate	30	1.6	8.7	16.5	22.2	90.0	0.8	150
Ovomaltine	25	3.6	2.1	17.6	..	..	..	106
Honey.....	20	..	..	16.6	0.8	3.2	0.1	65
Dry milk	15	3.8	3.5	5.6	..	..	..	69
Boiled sweets and caramels	30	..	..	30.0	..	..	..	117
Rice.....	10	0.8	..	7.6	0.4	10.0	0.1	32
	630	79.4	143.9	315.3	107.3	594.4	5.7	2855
Percentage distribution of total calories	..	11.1 %	45.4 %	44.1 %	..	..	..	..

These rations were actually kept to in the period April 9th to 24th or for 15 days, after which the game secured, until we reached Micardbu, amounted to: two bears, one seal, three musk-oxen, and five ptarmigans.

The figures resulting from my alterations and computations giving the nutritive composition of the food and the quantity of calories for SØLVER's rations agree in all essentials with the figures arrived at by the Laboratory for National Practical Health Investigations. The differences are so small that the comments on SØLVER's rations with which Miss BRASK accompanied the computations in her letter, must still be said to apply and will therefore in part be quoted here. It is pointed out in the letter that the computation of the content of mineral matter must be regarded as doubtful, as the specification of the ingredients was deficient for many provisions. The letter goes on to say:

"The caloric content has been computed to be c. 3500 calories per day. This amount of calories is regarded as adequate for adult men with comparatively easy bodily work, but is probably hardly sufficient for men exposed to the exertions of an expedition.

Thus Mr. SØLVER states that the whole period of the journey was characterised by heavy bodily work day after day, and that all the work required an effort of will because the food was not sufficiently satisfying.

The percentage distribution of the total calories with 12.2 % for the albumen differs somewhat from the most frequent Western European food compositions for adults, in which the albumen calories as a rule constitute only 11 % of the total amount of calories; however, the difference is unimportant.

As regards nutrition, no rational explanation is so far available of the relation between foods rich in fat and such as are rich in carbohydrates. The usual distribution in Danish food compositions is 31—41 % of fat calories and c. 50 % of carbohydrate calories.

In the computed diet the proportion is somewhat different, 57.8 % being fat calories and only 30.3 % carbohydrate calories, a difference that is characteristic of and probably necessary, too, for the diet in Arctic regions.

The mineral content is lower than the following norms, which usually, according to SHERMAN, are indicated as the daily requirement of adults:

0.65 g calcium
1.30 g phosphorus
10—12 mg iron."

As will be seen on comparing the tables, ELI's and my table is that which agrees most closely as regards the percentage distribution of the total calories over albumen, fat, and carbohydrate with the Western European norm mentioned in the letter, and as for myself I may say that on the whole the rations agreed with me and were sufficient even though for some time I might feel hungry, especially for sweets. On several occasions I for my part preferred pemmican, even if fresh

meat was at hand, because my organism had become accustomed to the regular diet.

In respect of travelling technique NIELSEN's rationing was perhaps the most practical, but it applies to all three rationings, I think, that they need an addition of mineral substances, which may be obtained for instance by adding cheese, grits, and more bread, possibly also ferreous tablets and sufficient purely secondary calcium phosphate.

The vitamin content has not been included in these computations, since only deficient information about the foodstuffs is available, and at any rate SØLVER's and my sledge party took Ido-C and Decamin tablets every day.

When the game secured as well as the rations of tinned goods, which are somewhat greater in practice, are taken into consideration for all sledge parties, I think it can be taken for granted that NIELSEN and I had the same average figure, viz. a ration of 660 g and an amount of calories of c. 3300 per man per day, and while we both felt well on this ration, to SØLVER it was nearly the minimum ration without game, which, according to his own statement, he found insufficient.

20. GELTING's journeys.

(Report based on GELTING's diary.)
(cf. map. p. 159).

a. Sledge journey in company with OVE ROSSBACH via Kap Stop to Lindhards Ø, November 5th to 15th, 1938.

Nov. 5. Started from the station in Mørkefjord at 1.30 p.m., hard and good going. Occasional snow flakes fell from the sky, but the weather was clear. At 2 p.m. we passed Væderhornet, where a musk-ox was observed. We met smooth ice as far as Hellefjord, and our course was laid east of the island in the mouth of the fjord. On Spydodden we observed a good many musk-oxen, which fled into the mountains as our sledges approached. The crevasses off the capes were merely covered by quite thin ice. At 5 p.m. we reached the hut at Port Arthur, where the trappers ZIEBELL and ØRNLEF had just arrived from Hvalrosodden. OVE and I tented outside the hut. The frost was increasing (c. 20° C. below zero), the snow squeaked and sang under our feet like metal. The moon was increasing and almost full, and the ice along the shore therefore gave way considerably to the movements of the tide.

Nov. 6. While the trappers drove southward to the hut at Kap Stop, OVE and I sledged to the head of Port Arthur. A solitary bull was walking on the ice in the middle of the bay heading towards the hut. We shot it, let the dogs eat the entrails, and loaded the meat on our sledges. When darkness fell, we left the bay, sledging towards Kap Stop. In Strømsund the wind came up from the west, blowing, with a force of 6, in distinct periods of c. 20 minutes, ten minutes wind and ten minutes calm in constant alternation. In the narrowest part of the sound we passed a hole in the ice which had recently frozen over. Gradually the wind subsided entirely, and it grew clear with some few cumuli below the moon. The sledges kept in connection with each other by means of the electric flash lights. By midnight

we reached the hut and tented outside it. Temperature 25° C. below zero, and driving snow from the west.

Nov. 7. Sky overcast, but visibility good. Sledged with Ove to the bay north-east of Kap Stop. The valley north of the cape was blocked to the south by a high morainic ridge, but inside it the valley extended as an excellent sledge way along Borgfjord. It is sheltered against the winds from the glacier and was therefore deeply covered with snow. The few and small snow-free patches of vegetation had been thoroughly cropped by musk-oxen and hares. In addition bear tracks were observed. On our return journey we sledged up on to Kap Stop to get a view of the going in Borgfjord. The whole fjord north of Kap Stop had been swept free from icebergs before freezing up in September, and it was level and practicable as far as the front of Brede Bræ. South of Kap Stop the glacier ice lay close to Carl Hegers Ø. Late in the night there was a total eclipse of the moon. In the tent the temperature was 17° C. below zero.

Nov. 8. Drove to Borgfjord, where we found good going, and reached the southernmost solitary glacier island, Knasten, where the vegetation was extremely sparse. Excrements of musk-oxen and hares were observed. As the weather was growing thick with snow, we returned to Kap Stop.

Nov. 9. To-day the trappers finished the inspection of their traps and sledged back to Port Arthur, while Ove and I drove to Edvards Ø. This island was deeply covered with snow, and we noticed the tracks of three musk-oxen and one calf. From the island we had a good view of Dronning Louises Land and Reval-Toppene, and Dannebrogs Tinder behind Carlsbergfondets Land. On our return journey we sighted a solitary ox on Kap Stop. Calm; temperature when we turned in 32° C. below zero.

Nov. 10. By noon we drove across Borgfjorden north of the icebergs, heading towards Kavallerfjorden in Lindhards Ø. The going was hard and good. At the mouth of Kavallerfjorden we turned southward along the coast of the island. Here the icebergs were pressed up against the shore, and where this was steep, the gorge between the bergs and the cliffs was filled with snow-drifts up to c. 50 m high, which, however, were firm and easy to sledge on. We passed another fjord or bay (it could not be decided which in the darkness) in Lindhards Ø and reached the hut in clear moonlight. Calm weather, temperature 33° C. below zero.

Nov. 11. In the course of the night the temperature rose, and the sky became overcast. As we turned out, it was blowing slightly from the west, and the temperature was only 20° C. below zero. A couple of musk-oxen were moving along behind the hut, but the land seemed to be deeply covered with snow everywhere. We followed our sledge trails back to Kap Stop, and here, near land, passed two small skerries before we reached the hut.

Nov. 12. Snow-storm, with a severe drift across the roof of the hut. Temperature 8° C. below zero.

Nov. 13. The gale still blew with unabated force. The hut was entirely buried in snow, so we had to dig out the chimney. Temperature 8° C. below zero.

Nov. 14. Continuous storm, which compelled us to remain in the hut all day.

Nov. 15. The storm had abated, and the temperature was falling. Clouds still lingered among the mountains, but the drift of snow had ceased. We sledged northward with the wind on our backs and had good going all the way to Mørkefjord. Sighted fifteen musk-oxen on the southeastern slope of Maagefjældet. Below Væderen we encountered strong eddy winds of the waterspout type.

The journey showed that the autumnal rainfall had extended to all the lands and islands touched by the journey, with the result that practically all closed

vegetation was covered by snow with a firm icy crust above. The resultant difficult grazing conditions forced the animals to constantly migrate; large herds of musk-oxen, as observed by us before the rainfall, were no more met with, but numerous smaller herds scattered over a vast terrain were observed. In the days immediately after our return to the station two oxen were seen to walk across the ice of Dove Bugt, going ashore on Hvalrosodden.

b. Sledge journey in company with ELI CHRISTIANSEN to Mørkefjord, Hellefjord, and Port Arthur, January 4th to 8th.

Jan. 4. Set out with two sledges and sixteen dogs at 7 p.m., when the moon was full, to the Mørkefjord hut. Temperature 31° C. below zero. Fine going, cloudless sky. On our arrival at the hut opposite "Danmarks Monumentet", we found that the windows had been broken by a bear.

Jan. 5. Searched the coast on either side of the hut and sledged across the fjord, up the Pustervig valley, past FREUCHEN's house ruin, and onward over the land to Hellefjord. The going was fine through the whole length of the valley, and the height of the pass hardly exceeded 100 m. The land was greatly encrusted with ice and snow-covered, only the plants most resistant to the wind emerged here and there. Passed the night in the hut.

Jan. 6. Crossed the fjord at 1 a.m. to continue through Helledalen to Port Arthur. The ascent of the valley was gradual, but our progress was impeded to some extent by the stony and gravelly terrain which was entirely free of snow. We reached the height of the pass (c. 75 m) at a distance of only 1—1.5 km from the south side of Hellefjord, and then crossed two small lakes covered by smooth ice. South of these lakes the valley bent eastward, and here we struck bad going, snow-free land alternating with much hummocked snow, however, after nearly two kilometres' sledging we reached the largest lake of the valley, whose longitudinal direction is almost east-west. It is c. 600—700 m broad and possibly 5 km long, as far as I could make out in the faint light. Travelled on smooth, snow-free ice along the south coast of the lake. The lake was divided in the middle by a morainic ridge; it drained towards Port Arthur, and near its outlet from the lake the valley bends due south. The sledging on the river was much impeded by stones in the river-bed, which serpentines through an ancient morainic landscape filled with numerous holes of "dead ice", now lying as circular water basins. On Port Arthur we had bad going, deep snow covered by a crust which could not support the sledge. Only people who have some definite object in going to the valley can be advised to travel by this route, and very strong sledges are required. Old musk-ox tracks were observed in the valley.

Jan. 7. Sledged northward to the hut on Væderen.

Jan. 8. Returned to the station without seeing any trace of game along the way.

c. Sledge journey alone to Gefionshavn and the south coast of Dove Bugt, April 7th—29th.

April 7th. Started from Mørkefjord at 5 p.m. with one sledge, six dogs and pemmican for the dogs, provisions, and kerosene for two weeks. Still smooth, snow-free ice along Væderen, and as on my last trip the eddy winds blowing down the mountain exerted their influence. At 7 p.m. I passed Spydodden, and as there seemed to be good going over Dove Bugt, I headed directly towards Teufelkap. The wind, blowing from the northwest, was at my back. The snow lay in broad, hard ridges, extending partially in the direction of my route, and they were ex-

Fig. 43. Gravel terraces south of Kap Niels on Rechnitzers Land in southern Dove Bugt. In the background Adolf S. Jensens Land. Phot. by PAUL GELTING. April 21st, 1939.

cellent to sledge on; east and north of Røde Ø I struck hard snow-drifts with sharp-edged furrows between. The sound between Edvards Ø and Godfred Hansens Ø was densely packed with icebergs discharged from Brede Bræ. I passed northeast of the icebergs, and gradually I could identify the island on which the hut should be. By midnight the sun was behind Væderen, and it grew very cold, but I succeeded in finding the hut and at the same time ascertained that the two islands indicated on the map here are actually combined by a small, low isthmus consisting chiefly of marine deposits. The isthmus had been visited by musk-oxen. I named the island after the botanist of the Danmark-Expedition, ANDREAS LUNDAGER.

April 8. Started from the Nørre Sundby hut at 11 a.m., travelling along the coast of Godfred Hansens Ø, where Sylen all the way gave me an indication of where the hunting station of Gefionshavn was situated. In the bay north of Sylen I laid my course over land across a pass which I supposed would lead to the station, and this proved to be the case. The height of the pass was c. 120 m. At Gefionshavn only the trapper DALSKOV was at home.

April 9—13. Stay at Gefionshavn. The weather was calm and clear, with sunshine and broiling heat, so that the snow on the south-facing slopes was much

sublimated and reduced, especially on April 10th, when, indeed, it became slightly hazy in the evening. On April 11th the formation of haze was impeded by a foehn wind, which lasted from midnight of the 11th to 2 a.m. of the 12th. Here and there the willow bushes had bursting bud-scales. On April 11th DALSKOV started towards Mørkefjord to send off a wireless message. On April 12th I heard and saw the first snow-sparrows. On April 13th a foehn wind was blowing from the west all day, and it was very warm; thus at 6 p.m. the temperature in the shade was 10° C. below zero.

April 14. Drove to the western point of Teufelkap island and onward along the south coast of the island to Teufelkap. Passed a small bird cliff (gulls?) on the south coast of the island (the birds had not yet arrived) and crossed A. Stellings Sund to Bælgen, where I found the tent-ring discovered by the Danmark-Expedition. At 7.45 p.m. it grew very cold, and rime was falling on the north side of Bælgen. I headed towards Gefionshavn, which I reached at 10 p.m., when the temperature was 22° C. below zero.

April 15. Light low-lying haze with a bright sun behind, so the light was very intense; just the kind of weather that makes one snowblind, and I wore glasses all day. Clouds gathered around Vivians Fjeld and over Adolf S. Jensens Land. Temperature at noon 15° C. and at midnight 20° C. below zero. Prepared ptarmigan crops and labelled plant collections.

April 16. Stay at Gefionshavn. Snow-storm, thick weather. In the middle of the day the force of the wind was 8—9; it was blowing from the northwest, but the haze came from the south and southeast. Temperature all day 15° C. below zero.

April 17. Calm and sunny weather. Drove westward along the south coast of the island and up on to its flat southwestern portion, "Sønderstrand". Saw an owl and shot a ptarmigan. DALSKOV returned from Mørkefjord, where everything was all right. The Italians have invaded Albania.

April 18. MARIUS JENSEN returned from Hochstetter Forland. Later on we kept company to Tvillingerne and Tuxens Ø to fetch a depot. Temperature by midnight 22° C. below zero.

April 19. Cold wind from the northwest with temperatures c. 25° C. below zero all day. Stay at the station.

April 20. Calm, sunny, and warm weather. Shortly after noon I sledged with JENSEN across Inderbredningen to the Jarner hut (the Bræfjorden hut) on Lindhards Ø. On the skerries in Inderbredningen we observed tracks of musk-oxen, bears, and gulps of snowy owls. Towards midnight wind from the northwest.

April 21. Made a trip into Bræfjorden between Lindhards Ø and Rechnitzers Land. Five-six musk-oxen were standing on the northern shore at a height of ca. 200 m. The going was very bad, so we turned back, and sledged around Kap Niels past the deserted Norwegian hut. Smooth, snow-free ice off the cape. Spent the night in the Danish hut at the foot of Ravnefjældet. Sunshine and warm weather all day.

April 22. Drove southward with good going to Kap Ullidtz and Soranerbræen. Continued to the island in front of Soranerbræen and onwards along the northwest coast of Adolf S. Jensens Land, where there was a small archipelago which is not indicated on the map. It consists of several islands, among which we struck bad going. While the sledges constantly sank down into the snow, fresh tracks of a bear showed that this weighty animal had recently passed without sinking into it.

April 23. After a visit to the mountain north of the hut, we sledged northwest of Tvillingerne to Gefionshavn. Good going. Cloudy and light snowfall.

April 24. Stayed at Gefionshavn. Snowstorm from the northwest. Indoor weather.

April 25. Drove with the trappers to Nanoks Ø and also visited Orgelpiben. Sunshine all day.

April 26. Stayed at Gefionshavn. Wind all day.

April 27. The wind ceased towards evening, and at 7 p.m. I started home towards Mørkefjord. Visited the skerries east of Godfred Hansens Ø and arrived at the Nørre Sundby hut on Lundagers Ø at 10 p.m. It was clear, but a local dense cloud-bank lay over Storstrømmen.

April 28. The same bank of clouds over Storstrømmen when I started northward. Visited Granatskæret and Bratskæret in the middle of Dove Bugt, but here the weather grew thick with snow, so I turned back. Had some difficulty in finding the hut again among all the skerries, as my sledge trail had been buried by the drifting snow.

April 29. Sunny and calm weather when I started at 7.30 a.m., but the bank of cloud still lingered over Storstrømmen, and the drifting snow swept out of Hellefjord like a flat stream, while the remaining part of Dove Bugt was clear. Soon the wind reached me, too, and off Bratskæret I was enveloped in the driving snow. The force of the wind was 8, and it was blowing almost right ahead, but I could distinguish the clouds over Væderen and laid my course after them. They hung high above the drift illuminated by the sun. The furrows in the snow in the middle of Dove Bugt had grown deeper since my outward journey, some were more than one metre deep, but the going was good. At noon I was abreast of Hellefjord, where the eddy winds, as usual, raged along the east coast of Væderen, and where the ice was smooth and free of snow. Returned to the station at 1.15 p.m.

d. Sledge journey in company with Alwin Pedersen to the head of Sælsøen and the southern end of Annekssøen May 5th—11th.

May 5. Started at noon from Mørkefjord with two sledges and twelve dogs across Hvalsletten to Lakseelven. Good going along the northern bank of Sælsøen past Trekroner to Tvillingnæs, where two musk-oxen were killed. A good deal of snow-free land with a good vegetation was found here, and water occurred in the tidal crack. By midnight the sky was overcast, and the temperature was 4° C. below zero.

May 6. Sky overcast, with low clouds and snowfall on the mountain summits. Luxuriant vegetation in several places along the northern bank of Sælsøen. Saw three oxen in Cirkuskløft and later on nineteen at the western end of the lake, where we tented. Killed an old bull. Temperature by midnight 5° C. below zero. Turned in at 10 a.m. of May 7th.

May 7. Rose at 6 p.m. Walked to the glacier in fog and thick snowfall. (This period of fog was not noticed at the station in Mørkefjord and was perhaps a local phenomenon, an offshoot of the cloud bank above Storstrømmen, cf. above).

May 8. Returned to the tent a little past midnight, and then sledged up the valley along the north side of the glacier. At an altitude of 100 m a dense fog set in. Turned back and sledged to the south side of the glacier. Subsequently I drove some kilometres eastward along the northern bank of the lake, where another old bull was killed. In the course of the day it grew clear and sunny.

May 9. Calm, clear, and warm weather. Sledged with both sledges inland along the north side of the glacier to a height of 225 m above the sea, where we gained a good view of Storstrømmen and Dronning Louises Land. Continued to a height of 300 m, whence we ascended a mountain, "Muslingefjæld", of c. 425 m above the sea. From this point it could be distinctly seen that the west coast of Okselandet along Storstrømmen was low and practicable by sledge as far as Kofoed-

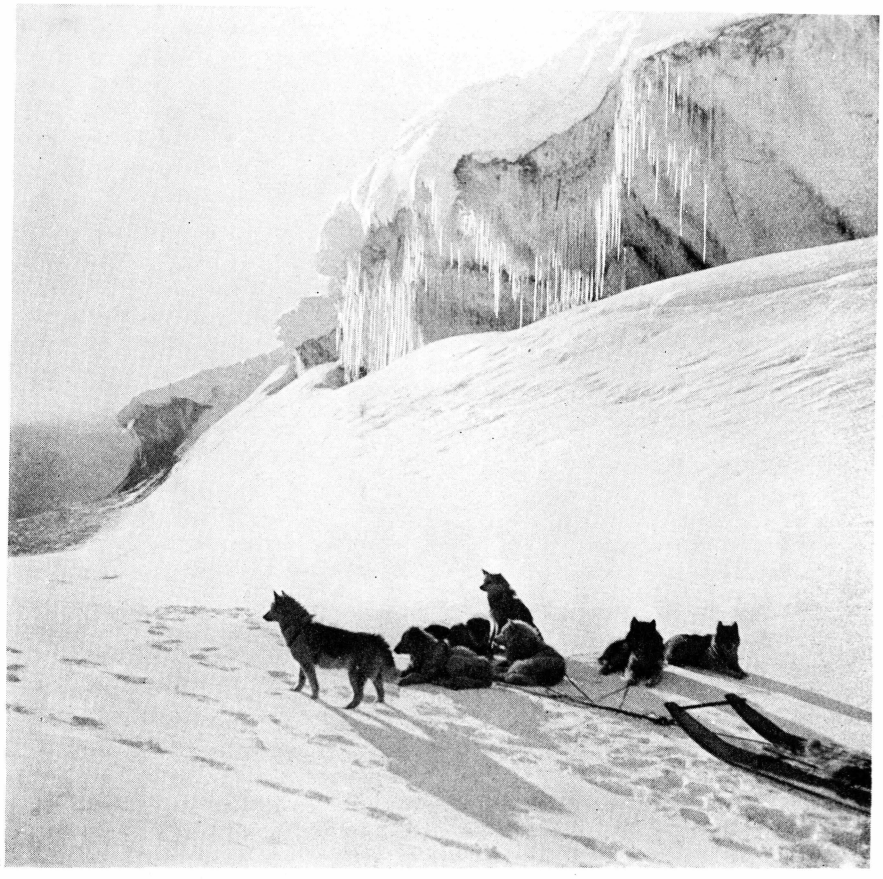


Fig. 44. Below the edge of the inland ice south of Sælsøen. Phot. by PAUL GELTING. May 9th, 1939.

Hansens Bræ. A broad valley, draining towards the west, ran parallel to Sælsøen and 5—6 km north of it. Here some few musk-oxen were seen. Sledged then to the southern bank of Sælsøen inland along the glacier, where we ascended by way of a snow-drift and drove some kilometres on Storstrømmen. The going on the inland ice was excellent, and no crevasses were seen, the winter precipitation having been abundant that year. After winters with as much snow as this one, it will no doubt be easy to sledge to Dronning Louises Land; however, the land was still deeply covered with snow, so we had but little to do there. At a rapid rate we sledged back down the glacier to Sælsøen. Here, too, the heavy precipitation had left its traces, the greater part of the calving front being so thickly covered with snow that with the exception of a few places we could easily drive across it. This was not the case on the Danmark-Expedition (cf. KOCH and WEGENER 1911, p. 22, Fig. 13).

May 10. Sledged with the tent eastward in fine sunshine along the northern bank of Sælsøen. Below the high, steep cliff 2—3 km west of the westernmost trapper's hut we found two musk-oxen which had fallen down the mountain since we passed it the last time, and had been killed on the spot. I called the place "Okse-

faldet" (see pag. 140). In the hut we met the trapper MARIUS JENSEN and told him about the animals, which he then sledged to Hvalrosodden. We then drove through the passage to the south end of Annekssøen. The land in the passage is almost exclusively made up of loose deposits, morainic ridges, and river gravel, and the river bed which Sydelv has cut on its way to Sælsøen, is the deepest cut I have seen in loose deposits in East Greenland; in places the sides are c. 100 m high. In the sides of the cut well-beaten musk-ox paths were found in several places, which were evidently often used by the animals on passing from one lake into another. At the southern end of Annekssøen the gravelly landscape passed evenly into the clayey brinks and muddy flats of the lake. The lake had evidently recently been drained somewhat, causing a lowering of the surface of the water. The actual lake does not begin till off the small glacier on the eastern bank, that is to say c. 5 km farther northward than indicated on the map of the Danmark-Expedition. The height of the pass between the two rivers, by which we crossed, was elevated about 60 m above the surface of Sælsøen. Camped on the clay flats. The going had been good all day.

May 11. The banks of the lake being deeply covered with snow, we deposited part of our provisions and kerosene for later use, and returned to Mørkefjord. Good going.

The trip had shown that the stock of musk-oxen was to be found in these parts of Germania Land, but that their life conditions were still hard, only small portions of the vegetation-covered land being free of snow. Still, the conditions in these regions were better than in most other places, and the land promised well for the botanical investigation at a later season of the year when more of the snow had melted.

e. Sledge journey alone to Annekssøen and Tværdalen, June 2nd—5th, 1939.

June 2. Started from Mørkefjord at noon and drove across Hvalsletten to Trekroner, where a cackling male ptarmigan tried to divert my attention from his mate. Tvillingnæs abounded in barnacle geese. At the crossing to Annekssøen I sighted five musk-oxen; a great deal of snow-free vegetation was found here. The snow in the rivers had decreased since my last visit, and in places the surface was very stony. Here and there thaw-water pools were found on the ice and on the land. Tented in the morning of June 3rd at the depot at the southern end of Annekssøen and turned in at 9 a.m. The sun shone, and it had been very warm during the whole journey.

June 3. Woke at 7 p.m. For once it was blowing from the southeast. I loaded the depot on the sledge and by midnight I drove northward across Annekssøen.

June 4. Travelled along the east side of the lake to Søgletscher, whence I drove across the lake to Sortefjæld, where I tented. Sledged subsequently with an empty sledge into Tværdalen, whose bottom was occupied by several lakes and meanders, a fine sledge route. Four musk-oxen moved about on the south slope of Sortefjæld, which presented a fairly rich vegetation, and 4 km farther into the valley I sighted one. About 5 km up the valley I passed two lakes, and beyond them the valley bent westward. This bend was a couple of kilometres long, and west of it the valley continues northwestward parallel with its former direction. From the western end of the bend a smaller valley extends westward, possibly connecting with the valley seen by us on April 9th from a height of 425 m at the western end of Sælsøen. Beyond the bend one more lake, of the length of c. 1 km, occurs in Tværdalen, after which the valley rises slowly to the height of the pass

(c. 100 m), whence it again slopes down towards Kofoed-Hansens Bræ. I examined the vegetation in the bend, where the five oxen were standing, and found a goose-cliff inhabited by some 20—30 barnacle geese and two sea-gulls. Later in the day it grew thick with snow and fog, and wind came from the west. Returned to the tent by midnight.

June 5. Thick with snow. Sledged southward to the crossing to Sælsøen, where large swarms of geese occurred. Fell through the ice on a newly formed thaw-water hole. East of the crossing I laid out a depot of provisions and kerosene. The going was still good in Sælsøen right to the eastern end, but bad on the middle parts of Lakseelven and on Hvalsletten. Arrived at Mørkefjord at 9 p.m.

f. Sledge journey in company with CARLOS ZIEBELL to the western end of Sælsøen June 13th—18th.

June 13. Started from the station at midnight with two sledges and twelve dogs, reaching Sælsøen about 1 a.m. Sledged along the southern bank, and about 3 km before reaching Svingnæs at the first bend of the lake, found a bird cliff with 49 herring gulls and four barnacle geese. Continued to the northern bank of the lake, where we tented on the western Tvillingnæs. Turned in at 2 p.m. in warm and sunny weather.

June 14. Same camp, whence I made reconnaissances in the neighbourhood of the crossing and on the mountains. Between 10 a.m. and 3 p.m. the temperature did not fall below + 5° C.

June 15. Sledged to Midternæs west of the crossing in the middle of the day and accordingly had bad going. There was much water along the banks of the lake, and we had difficulty in reaching up on to the land, when we tented at the trapper's hut in Terrassekløft (the westernmost hut in the lake). Luxuriant meadows were found behind the hut.

June 16. Sledged westward along the northern bank of Sælsøen, investigating the vegetation in several places along the route. Near the steep cliff one more ox that had fallen down was found, it was now thawing out of the snow. While we were working on the slopes of Farvefjældet, a large stone slide took place, which shattered the snow-covering and sent the snow in cascades down the mountain side. Tented at the western end of the lake; the northern marginal river of Sælsøen had broken up and had evidently been flowing for some time; a good deal of water covered the ice of the lake. The vegetation in here was distinctly more advanced in development than at Mørkefjord.

June 17. Warm and sunny weather. Examined the vegetation north of the glacier and towards evening sledged eastward across the lake. Tented in the morning of June 18th at the depot 3 km east of the crossing to Annekssøen.

June 18. Sledged back to the station. Fairly good going.

In a botanical respect the journey had yielded a good result; and as to musk-oxen we had counted 51 along the stretch between the crossing and the western end of Sælsøen. In addition we had seen a single suckling calf here and four hares.

g. Sledge journey in company with OVE ROSSBACH to the hut on Væderen and ascent of Væderen July 24th—26th.

July 24. The tidal cracks off the station had now developed into such broad sounds between the floes that we had difficulty in passing. It took us two hours

Fig. 45. GELTING and OVE starting towards Væderen on July 24th, 1939, on the last sledge journey of the season. Phot. by SVEND SØLVER.

to get out on to the ice and we repeatedly fell into the water, to the amusement of the staff of the station, who were enjoying the sight from the shore. However, a couple of kilometres from the shore the going was fairly good, though we could not keep to the snow ridges between the thaw water pools, but had to sledge across the pools, which were often more than 70 cm deep, so gradually our sledge loads became saturated with water. Fortunately the bottom of the pools held in most places, but as it was nighttime and the new ice on the pools was up to 2 cm thick, the dogs had difficulty in breaking it with their paws, so we had to help with our sea-boots. At 6 a.m. we arrived at the hut on Væderen, where the tidal crack was closed at that time, so it was easy to get ashore. Turned in, and in the evening I started my ascent of the plateau.

July 25. Reached the plateau and ascended to a point c. 775 m above the sea. From this point Hellefjord could be seen to be free of ice from head to mouth, while Mørkefjord was ice-free as far as Kalven. The whole of Dove Bugt was still covered with ice in its outer portion, but between Daniel Bruuns Land (south of Hellefjord) and Orienteringsøerne the greater part of the ice was covered with thaw water. The belts of ice between the pools hardly covered 25 per cent. of the area.

During my ascent the weather was calm, and the gnats were extremely annoying. Later a wind sprang up from the west. About 7 a.m. I returned to the hut, we had a meal, and turned in.

In the evening we started towards Mørkefjord. The last few days had made the going even worse than it was on our outward journey; off Væderen, whose water masses cascaded down the mountain side, and where thousands of tons of thaw-water were pumped into Dove Bugt, our sledge fell through the bottom of one of the holes; OVE managed the situation fairly well by clinging to the sledge, which floated on the water, while I sank in to the ears and had to strike out to swim to the margin of the ice.

In the morning of July 26th we arrived at the station, where sledging was easy because the wind pressed the ice towards the shore. It was the last sledge journey that was made in this season; shortly after the inner ramifications of the bay were emptied of ice, and on July 30th our boat was floating on the water.

The total length of GELTING's journeys amounted to c. 1000 km.

The reason why notes on the journeys of ALWIN PEDERSEN are not included in this report is that he occupied a more independent position on the expedition, and as a matter of course his observations were chiefly observations on animal life; as such they will form the content of his own publications.

21. The total distance covered by sledge on the expedition.

If the daily sledgings of the Greenlanders on hunting and fishing trips are estimated at the low figure of 350 km in all, a distance of 11,000 km was covered by the expedition during the wintering of 1938—39, this being the sum total of the distances covered by each sledge party, whereas no account is taken of the number of sledges in the caravan. The number of travelling days corresponding to this, including, however, the days spent in camp on account of bad weather and the visits to the Norwegians, is 524 days. The number of kilometres corresponds to eleven crossings of the inland ice in its broadest place, or to a distance 1000 km longer than the distance along a meridian from the Pole to the equator. The 11,000 km were distributed as follows over the different travelling parties of the expedition:

		Depot journeys	Spring journeys	Minor trips				
NIELSEN's	journeys	1410 km	2350 km	150 km	= 3910 km	covered in	135	days
KNUTH's	—	1340 km	1710 km	130 km	= 3180 km	—	151	—
SØLVER's	—	710 km	1110 km	50 km	= 1870 km	—	110	—
GELTING's	—			1000 km	1000 km	—	61	—
PEDERSEN's	—				820 km	—	59	—
Greenlanders'	—				350 km	—	8	—

11130 km covered in 524 days.

This table, however, gives a wrong idea of the contribution of the Greenlanders; for as stated above, they not only participated in most of our journeys, but also made several trips by themselves. Thus, of the 11,000 km they took part in 10,545 km, distributed as follows:

Ove Rossbach	4375 km	covered in	160 days
Eli Kristiansen	3425 km	— -	167 —
Zackæus Sandgreen	2745 km	— -	150 —
	10545 km	covered in	477 days.

If, finally, the figures for all the eight travelling members of the expedition, Danes as well as Greenlanders, are added up, the result will be: 11,130 less 350 plus 10,545 = 21,325 km.

22. Cartographical remarks.

The present report is accompanied by two maps, one of the area of Dove Bugt on a scale of 1:17,500,000 (on p. 159) and one (inserted as a plate at the end of the book) of the stretch from Bessels Fjord and Kap Trolle to Independence Fjord on a scale of 1:2,000,000. The maps show certain minor alterations from the earlier maps on the basis of which they were drawn, viz. the maps of the Danmark-Expedition, and Ejnar Mikkelsen's, J. P. Koch's, and Lauge Koch's maps. On our expedition only a limited cartographic survey was made by Mr. Sølver of the nunataks behind Hertugen af Orléans Land and the environs of the Mørkefjord station, and the results of this work (unfortunately) are not yet available, so the maps reproduced here with the corrections inserted on them are only to be regarded as sketch maps.

The chief differences from the earlier maps are, on the large map, the length and shape of Ingolfs Fjord and the representation of the area behind Hertugen af Orléans Land. E. Nielsen has already explained the alterations in Ingolfs Fjord and around Nakkehoved in his paper (Medd. om Grønl., Bd. 126, Nr. 2), and as regards the nunataks, the north coast of Lamberts Land, and the inner part of Mørkefjord the reader is referred to the forthcoming publications by S. Sølver in the "Meddelelser om Grønland".

According to the observations I myself made on my journey northward I have made the following corrections: Minor alterations in the coast lines of Amdrups Land and Holms Land, especially by the indentation south of Sophus Müllers Næs ("Dværgfjorden") and the bay in the middle of the coast of Holms Land (Hansêraqs Fjord). In the extract from my diary on p. 115 my observations on the glaciers issuing from

the ice cap on Holms Land are mentioned, according to which certain alterations have been made. I have moved the northernmost point of Lamberts Land some distance southward owing to the observation that travelling northward after leaving BRØNLUND's Grave we very soon obtained a view up the glacier of Nioghalvfjerdsfjorden to the land around Blaasø. The east coast, too, of Lamberts Land, with the capes around the grave have been redrawn, as their dimensions seemed to me to be too exaggerated on the earlier maps.

The islands of Jøkelbugten have been subjected to several alterations, the most conspicuous of which have reference to Schnauders Ø and Norske Øer. Both have been dealt with in the passages quoted from my diary on p. 112 and pp. 120—21 above. Independently of each other NIELSEN and I discovered the error in the representation of Schnauders Ø and sketched our alterations to be proposed, which agreed as regards the south coast but varied somewhat as regards the east coast. However, I have drawn the island as it looked to me. None of us made any observations which may give an idea of the width of the island or of the relation of its western to its eastern outline. As regards Norske Øer I wish to point out that the southernmost point of the large Norske Ø, the northernmost point of Schnauders Ø, and Pic de Gerlache seemed to me to be lying on a line with each other, which, however, would imply such great alterations in the map that it would hardly be justifiable to make them until they can be based on a fresh, exact triangulation.

During my journey southward from Norske Øer I altered distances and the relative sizes of the groups Franske Øer and Pariserøerne, according as the sledging time showed that something must be wrong. The three large islands in the middle of Jøkelbugten, Hammeren, Ambolten, and Stigbøjlen, have been entirely redrawn in order to make their outer points agree with the time of sledging and sights along the coasts, but a special reservation must be made here as to the appearance of the islands, the straits between them not having been visited. There is greater probability of the correctness of the alterations in the skerries east of Ambolten and south of Pariserøerne and of the shifting of Mellemfortet and the removal of the small island shown on the map of the Danmark-Expedition northeast of Mellemfortet. Kap Mérite has been moved farther northward. The skerry complex "Troldehaven" south of Storøen is more complicated than it has been possible to represent.

As regards Skærfjorden, its whole appearance has been altered in accordance with D. MALMQVIST's map in GUNNAR SEIDENFADEN's and THORVALD SØRENSEN's botanical paper (Medd. om Grønl. Bd. 101, Nr. 4, p. 20). The termination of C. F. Mouriers Fjord is my own addition, the same applies to the alteration in the appearance of the interior of Flade Bugt. The reliability of the last-named alteration is not very great,

since darkness and bad weather as a rule hindered proper observations in the place.

The correction of the inner part of Mørkefjord, where a series of lakes has been added in front of the edge of the inland ice, is based on the observations made by SØLVER, whereas the re-drawing of Lundagers Ø and the surrounding islets in southern Dove Bugt north of Godfred Hansens Ø have been made according to the directions of GELTING. As regards Rechnitzers Land and Adolf S. Jensens Land south of Dove Bugt a compromise has been attempted between the map of the Danmark-Expedition and LAUGE KOCH's map; the same applies to Dronning Louises Land, where regard has also been taken to J. P. KOCH's map and the map of the Alabama Expedition. The appearance of Lindhards Ø is based on LAUGE KOCH's map, and the details around Kap Stop on J. P. KOCH's map.

23. Namegiving of the expedition.

The following names, proposed by the expedition to be given to places within the area visited, have been approved by the Commission on place names in Greenland at meetings held on July 23rd, 1940, and on December 23rd, 1941.

1) Kap Prins Knud — Small cape below Flade Isblink; the point where EIGIL NIELSEN turned back on his sledge journey and the northernmost point reached by the expedition.
2) Kilen — Wedge of land in Flade Isblink.
3) Kødgravene — Land area north of Sophus Müllers Næs with many Eskimo meat caches.
4) Dværgfjorden — Small indentation of the sea south of Sophus Müllers Næs.
5) Sommerterrassen — Eskimo tent place on shore terrace north of Kap Jungersen.
6) Wegeners Øer — Islands in Ingolfs Fjord with WEGENER's observation cairn.
7) Bagdalen — Valley running in a mainly north-south direction behind Amdrups Land.
8) Spærregletscher — Glacier issuing from the south, which bars the way to the interior of Ingolfs Fjord.
9) Draabegletscher — Drop-shaped glacier, the northernmost glacier on the east side of the innermost branch of Ingolfs Fjord.
10) Prinsesse Elisabeths Alper — Mountain range north of Ingolfs Fjord.
11) Prinsesse Caroline-Mathildes Alper — Mountain range south of Ingolfs Fjord.
12) Hjørnegletscher — Glacier issuing from the north, at the bend in the interior of Ingolfs Fjord.
13) Taagefjældene — Mountain range along the west side of the innermost branch of Ingolfs Fjord.
14) Næsen — Mountain at the head of Ingolfs Fjord between its innermost ramifications.

15) Sødalen — Valley running westward from the interior western branch of Ingolfs Fjord.
16) Portfjældet — The southern corner bluff of Sødalen.
17) Nøglefjældet — The northern corner bluff of Sødalen.
18) Profilfjældet — Mountain on the north side of Sødalen west of Nøglefjældet.
19) Vestfjældet — Next mountain on the north side of Sødalen inside Profilfjældet.
20) Palisaderne — Last mountain on the north side of Sødalen west of Vestfjældet.
21) Troldsøen — The lake whence the river of Sødalen issues.
22) Firndalen — Valley running north-south across Holms Land.
23) Maagegletscher — Glacier tongue issuing from the large ice cap on Holms Land and descending into Ingolfs Fjord between Eskimonæsset and Wegeners Øer.
24) Maagefjældet — Mountain east of Maagegletscher, south of the mouth of Ingolfs Fjord. Breeding place for gulls.
25) Hansêraqs Fjord — Small fjord midway on the coast of Holms Land.
26) Mallemukgletscher — Northernmost glacier moving down Mallemukfjældet.
27) Depotgletscher — Southernmost glacier down Mallemukfjældet.
28) Depotfjæld — Mountain west of Depotgletscher, where the Danmark-Expedition and our expedition had depots.
29) Sortebakker — Hills with coal-seams west of Depotfjæld.
30) Kap Marie Dijmphna — Cape at the entrance to Dijmphna Sund west of Kap Poul; named after KNUTH's mother, who christened the ship "Dijmphna".
31) Sophies Holm — Small island south of Kap H. N. Andersen, called after HOVGAARD's wife.
32) Gletscherskærene — Small skerries at the south side of the large glacier midway on Hovgaards Ø.
33) Snespurvefjæld — Mountain near Kap Bernhoft on the southernmost point of Kronprins Christians Land.
34) Kai Nielsens Fjæld — Steep mountain on the north side of Lamberts Land, called after the creator of the MYLIUS-ERICHSEN monument, the sculptor KAI NIELSEN.
35) Panoramaø — Small island near the north side of Lamberts Land, whence SØLVER took photographs.
36) Lægervallen — Flat cape on Lamberts Land north of BRØNLUND's Grave.
37) Kap Nansen — Northernmost cape of Store Norske Ø.
38) Achton Friis Ø — The island north of Schnauders Ø.
39) Nordkap
40) Østkap
41) Sydkap
— Capes on the altered Schnauders Ø.
42) Nørreland — Northernmost portion of Hertugen af Orléans Land.
43) Gammel Hellerup Gletscher — The glacier south of Nørreland, called after SØLVER's school.
44) Nørre Mellemland — The northernmost part but one of Hertugen af Orléans Land.
45) Blæsebræ — Glacier south of Nørre Mellemland.
46) Søndre Mellemland — Southernmost part but one of Hertugen af Orléans Land.
47) Sønderland — Southernmost part of Hertugen af Orléans Land.

48) Nørre Biland — Part of Nørreland, separated from it by a glacier.
49) Tuborgfondets Land — Nunatak land west of Nørre Mellemland.
50) Moltkes Nunatak — Correction of the earlier "Moltkes Nunatakker", which is only one nunatak.
51) Stenen — Mountain at the northern end of Moltkes Nunatak.
52) Milepælen — Southernmost peak of Moltkes Nunatak, 1700 m high.
53) Grønne Nunatak — The largest of Gardes Nunatakker.
54) Mellemfortet — Island in Jøkelbugten east of Nørre Mellemland, used by KNUTH as a depot island.
55) Hammeren (westernmost)
56) Ambolten (easternmost)
57) Stigbøjlen (southernmost)
} Three large islands in Jøkelbugten south of Mellemfortet.
58) Sydgavlen — Depot island east of Hagens Ø, last large island of the inner row southward from Hammeren.
59) Storøen — Largest island of the outer series of islands south of Stigbøjlen.
60) Troldehaven — Complex of islands south of Storøen.
61) Oktoberø — Terminal depot place for the journeys in October, 1938, situated just south of Troldehaven.
62) Gamma Ø — Large island north of Orléans Sund, called after our expedition ship.
63) Knøsen — Mountain on the south coast of Gamma Ø.
64) Stormlandet — Northeasternmost peninsula of Germania Land between Orléans Sund and Skærfjorden.
65) Depotnæsset — Easternmost cape of Stormlandet, opposite Kap St. Jacques on Ile de France.
66) Nordmarken — Northernmost part of Germania Land, bounded on the east by Stormlandet and on the south by a line running in c. 77°30′ N. lat. from V. Clausens Fjord to Kofoed-Hansens Bræ.
67) Søndermarken — Triangular land south of Nordmarken, bounded on the north by the above-mentioned line, on the west by Annekssøen, and on the east by Valdemarsmuren (cf. No. 69).
68) Okselandet — Triangular land west of Annekssøen, bounded on the west by Storstrømmen and on the south by Sælsøen.
69) Valdemarsmuren — Western edge of the highland of which Søndermarken and Okselandet form parts.
70) Storlandet — The whole large peninsula of Germania Land east of Valdemarsmuren.
71) Slædelandet — The lower, gradually rising part of Storlandet between Valdemarsmuren and Moskusoksefjeldene, used as a passage from Mørkefjord to Skærfjorden.
72) Michelangelos Kløft — River gorge leading from Slædelandet down to Fladebugt in Skærfjorden.
73) Passet — Highest point of the sledge route across Slædelandet.
74) Micardbu — The Norwegian scientific station north of Fyrretyvekilometernæsset on the outer coast of Storlandet.
75) Tværdalen — River valley running from the west across Okselandet towards the valley of Annekssøen.
76) Sortefjæld — The mountain north of Tværdalen at the corner of Annekssøen.
77) Søgletscher — Glacier descending from the east towards the southern end of Annekssøen.

78) Nordelv — River coming from the south and emptying into the southern end of Annekssøen.
79) Muslingefjæld — Mountain in Okselandet, a couple of kilometres north of the western end of Sælsøen.
80) Sælsøgletscher — The outlet of Storstrømmen into Sælsø.
81) Farvefjældet — Westernmost large mountain on the north side of Sælsø.
82) Cirkuskløft — The ravine east of Farvefjældet.
83) Terrassefjæld — Mountain on the north side of Sælsøen east of Cirkuskløft.
84) Oksefaldet — Steep wall on the north side of Sælsøen at the foot of which GELTING found some musk-oxen that had tumbled down.
85) Terrassekløft — Ravine at the northernmost cove of Sælsøen, where a trapper's hut is situated.
86) Midternæs — Almost the midmost cape on the north side of Sælsøen, east of Terrassekløft.
87) Sydelv — River running from the north towards Sælsøen, south of Nordelv.
88) Depotkulle — Rock ledge on the north side of Sælsøen, c. 4 km east of Sydelv.
89) Tvillingnæs — Double cape on the north side of Sælsøen east of Depotkulle.
90) Vifteelv — River on the north side of Sælsøen, east of Depotkulle.
91) Svingnæs — Cape on the south side of Sælsøen, at the point where it bends westward.
92) Naujat — Mountain with herring gulls and brent geese, c. 3 km southeast of Svingnæs.
93) Mørkefjordsplateau — The whole mountain plateau between Sælsøen and Mørkefjord.
94) Vigfus Dal — Valley behind the head of Mørkefjord, called after the Icelandic member of J. P. KOCH's expedition in 1913, VIGFUS SIGURDSSON.
95) Mørkefjordselven — River running through Vigfus Dal to Mørkefjord.
96) Pytten — Westernmost lake in Vigfus Dal.
97) Gloes Sø — Easternmost lake in Vigfus Dal, called after J. P. KOCH's dog.
98) Bundfjældet — Innermost mountain on the north side of Vigfus Dal.
99) Redekammen } Mountain formations in inner part of Mørkefjord, on the
100) Tanden } south side of the fjord.
101) Ankerpladsen — Point on the north side of inner Mørkefjord, where our motorboat anchored.
102) Pyramidedalen — Morainic cone valley west of Fuglenæbsfjeldet on the north side of Mørkefjord.
103) Hjælmen } Mountains west of Pyramidedalen on the north side of Mørke-
104) Jærnvæggen } fjord.
105) Hætten — Mountain between Fuglenæbsfjeldet and Brystet behind the Mørkefjord station.
106) Gamma Havn — The bay where the Mørkefjord station is situated, and where the "Gamma" anchored.
107) Tangodden — Headland west of the station, bounding Gamma Havn on the west.
108) Termografengen — Meadow west of the station where GELTING's soil thermographs were found.
109) Radio Bæk — Brook between the station and Termografengen.
110) Gravsletten — Plain immediately east of Gravelven.
111) Lagunenæs — Cape between the Mørkefjord station and Hvalrosodden.
112) Oksestenen — Large stone on cape east of Lagunenæs.

113) Stjernesøen — Largest lake (star-shaped) between the station and Lakseelven.
114) Terrassesøerne — Five small lakes between the station and Brystet.
115) Slambugten — Bay on the north side of Dove Bugt between Hvalrosodden and Lumskebugten.
116) Pemmikanelv — River emptying into Slambugten.
117) Østre Skanse — Plateau east of Pemmikanelv.
118) Vestre Skanse — Plateau west of Pemmikanelv.
119) Pemmikankløft — The depression between the two plateaus, occupied by Pemmikanelv.

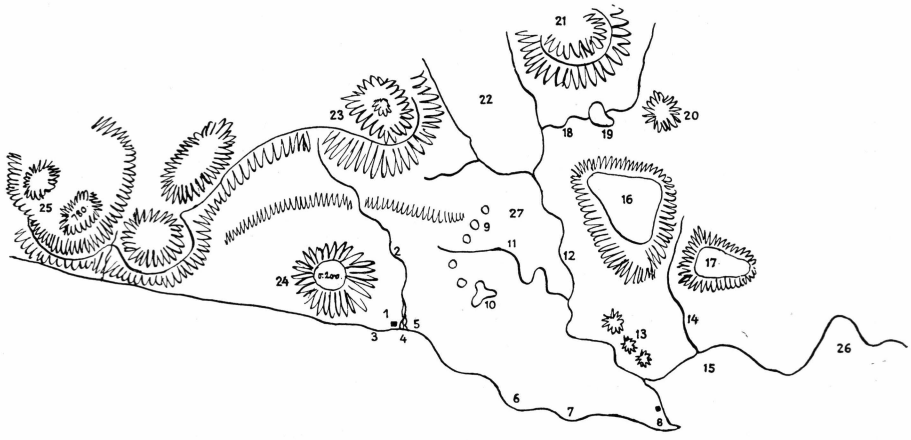


Fig. 46. Sketch showing the surroundings of the Mørkefjord station.
1. The station. 2. Gravelven. 3. Tangodden. 4. Gamma Havn (i. e. Gamma harbour). 5. Gravsletten. 6. Lagunenæs. 7. Oksestenen. 8. Hvalrosodden with the Nanok trappers' station. 9. Terrassesøerne. 10. Stjærnesøen. 11. Slyngelv. 12. Lakseelven. 13. Bastionerne. 14. Pemmikanelv. 15. Slambugten. 16. Vestre Skanse. 17. Østre Skanse. 18. Gaaseelv. 19. Gaasesøen. 20. Udkigshøjen. 21. Trekroner. 22. Sælsøen. 23. Brystet. 24. Rypefjeldet. 25. Fuglenæbsfjeldet. (The new names are spaced).

120) Skansekløft — Depression north of the two plateaus Østre and Vestre Skanse.
121) Gaaseelv — River running through Gaasesøen.
122) Slyngelv — Highly meandering tributary river to Lakseelven, coming from the west.
123) Hjørnefjæld — Southernmost mountain of Valdemarsmuren opposite Trekroner.
124) Stormdalen — Valley across Storlandet occupied by a river which empties into Stormbugt.
125) Kløvskæret — Small island at the outer coast of Storlandet north of Øksebladet.
126) Kalvodden — Headland on the northwest side of Væderen opposite the western end of the island Kalven.
127) Væderhornet — Northeasternmost low point of Væderen.
128) Fugleø — Small island in northern Dove Bugt between Væderhornet and Pladen.

129) Pillen — Small island in northern Dove Bugt between Fugleø and Vindselø.
130) Røde Væg — Mountain wall on the north side of Hellefjord.
131) Helledalen — Valley leading from Hellefjord to Port Arthur across Daniel Bruuns Land.
132) Spydøen — Small island north of the northern point of Spydodden.
133) Mosaikskærene — Skerries off Spydodden with sharp limits between red and white zones of the rocks.
134) Flade Teltø — Island with large Eskimo summer tent place off the coast near Port Arthur.
135) Midterholmen — Island immediately north of Røde Ø.
136) Ringøen — Island situated immediately north of Midterholmen.
137) Andreas Lundagers Ø — Large island immediately north of Godfred Hansens Ø, named after the botanist of the Danmark-Expedition.
138) Granatskæret — Small island immediately north of Andreas Lundagers Ø.
139) Bratskæret — Small island north of Granatskæret.
140) Stakken — Small island east of Godfred Hansens Ø.
141) Stakkeløbet — The waterway between Stakken and Godfred Hansens Ø.
142) Fireskæret — Skerry east of Godfred Hansens Ø, south of Stakken.
143) Nørresund — The sound between Godfred Hansens Ø and Andreas Lundagers Ø.
144) Søndersund — The sound south of Godfred Hansens Ø.
145) Sylbugten — Southernmost bay on the east side of Godfred Hansens Ø, north of the mountain Sylen.
146) Slædepasset — Sledge road from Sylbugten to the trappers' station Aalborghus, Gefions Havn.
147) Sønderstrand — Shore on the south side of Godfred Hansens Ø.
148) Trangsund — Narrow sound between the island Tvillingerne and the land south of it.
149) Fangersund — Sound inside skerries off the coast of Adolf S. Jensens Land between Soranerbræen and Syttendemajfjord.
150) Ravnefjældet — Mountain on the east side of Rechnitzers Land, north of Kap Ullidtz.
151) Ravnedalen — River valley occupied by a river which empties south of Ravnefjældet.
152) Inderbredningen — Waterway between Rechnitzers Land, Godfred Hansens Ø, Soranerbræen, and Syttendemajfjord.
153) Bredningsskærene — Skerries in Inderbredningen.
154) Moræneø — Small island at the entrance to Bræfjorden at the foot of glacier descending from Rechnitzers Land.
155) Isfjældsund — Sound with icebergs between Edvards Ø and Carl Hegers Ø.
156) Knasten — Island in Borgfjorden northwest of Kap Stop.

The names 1—2, 6—24, and 26—29 inclusive have been dealt with in more detail in EIGIL NIELSEN's paper (Medd. om Grønl., Bd. 126, Nr. 2), and like the names 3—5, 25, and 30—32 inclusive they are indicated on the map inserted at the end of that paper. The remaining names will be found to be indicated, as far as place has permitted, on the map accompanying the present report (inserted at the end of the paper) or on the detail map of Dove Bugt on p. 159. Where names could

not be inserted on account of the size of the maps, the reader is referred to the forthcoming papers by Mr. SØLVER (as regards Lamberts Land and the nunatak area behind Hertugen af Orléans Land) and by Dr. GELTING (as regards Sælsøen, Annekssøen, and southern Dove Bugt).

WINTERING II, 1939—40

ANDREAS HVIDBERG, born May 17, 1897, at Middelfart on Funen.
KRISTIAN MADSEN, born August 10, 1913, at Dreslette, Funen.
NIELS HAARLØV, born August 2, 1919, at Rindom, Jutland.
CARLOS ZIEBELL, born September 7, 1914, at Copenhagen.

The leader of the new wintering party was ANDREAS HVIDBERG, who was familiar with conditions in Greenland from his wintering as a trapper on Sabine Ø 1929—31. As stated on pp. 73-74, one of the objects of the wintering was to keep the station with its wireless plant and stock of dogs going until sufficient means had been procured to make it the basis of fresh advances northward by sledge or by aeroplane. But apart from this, the year 1939—40 was planned to produce its own scientific results of various kinds, partly in continuation of the work of the first wintering, but also—as regards stud. mag. NIELS HAARLØV —in new fields. In spite of his youth HAARLØV had already specialised within his branch, zoology, and with a recommandation and instructions from the Zoological Museum, Copenhagen, it was his object to investigate the microfauna around Mørkefjord and in addition to continue Dr. GELTING's investigations of the soil on a somewhat wider scale. Some few passages from the instructions will be quoted here (translated from the Danish):

"The main object will be an investigation of animal life in the upper layers of the soil within the most important biotopes near Mørkefjord, to demonstrate which species, principally of spring-tails and mites, live in these biotopes, and what their life cycle is viewed in relation to the ecological factors of the place, in order, perhaps, in the last instance, to be able to supply information about the part these animals play in the chemical processes of the Greenland soil."

"Of ecological factors the following should be investigated: a) the temperature of the soil—during the summer by means of simple thermometers, in the winter by means of thermographs—, b) the degree of acidity—by means of the electric hydrogen-ion concentration gauge found in the place."

"In addition to this main object, to which, however, no other purposes should present obstacles, it is desirable that collections for purely zoogeographical use should be made of insects and other articulate animals on land and in fresh water, as well as of mammals; of the latter a collection is especially desired of smaller forms as for instance lemming and ermine, which should be measured and skinned. Observations on the biology of these forms should be made, in particular to ascertain how early the breeding period sets in. In case mammals or birds are caught or

found, their parasites should be collected, and the same is the case if birds' nests or mammals' dens are found."

The continuation of the thermograph observations of the soil was a great advantage, which was bound to increase the value of the observations in this field made during the first wintering, and a similar increase of value with a retrospective effect was attained through the continued climatological observations both at the wintering house and at the summit of Rypefjeldet. The wireless operator KRISTIAN MADSEN was the meteorologist of the station. He not only attended to the climatological observations three times a day down at the house, and observed the northern lights every night at 12 p.m., but he also alternately with CARLOS ZIEBELL climbed Rypefjeldet, and read the apparatus at the cairn during the whole dark period.

The work of Mr. MADSEN was further increased in the autumn of 1939, when a weather service was established at Mørkefjord, with wireless weather forecasts three times daily, corresponding to three times of observation, not coinciding, however, with the climatological ones; so MADSEN had to take six readings a day. The weather service was established on application from Norway ("Værvarslingen i Tromsø"), whose meteorologists were interested in filling in the gaps in the chain of northern forecasting stations that had arisen because Micardbu had been put out of action. Mørkefjord was now issuing its weather forecasts as CQ-telegrams, that is to say, telegrams sent out to everybody with no special address, and after being sent via Jan Mayen to "Værvarslingen i Tromsø", they were forwarded by the latter, according to agreement, to the Danish Meteorological Institute at Copenhagen. In its capacity of weather forecasting station Mørkefjord could be counted among the northernmost weather bureaus of the globe, for as long as Micardbu was uninhabited, it was number six, as is shown by the following list:

Ostrov Rodolfa (Rudolf Island), northern Franz Joseph Land ..	81°17′ N. lat.
Bouchta tichaja, southern Franz Joseph Land	80°19′ N. lat.
Ostrowa Kameneva (Stone Island), Sewernaja Semlja (Northland)	79°30′ N. lat.
Isfjord, Svalbard (Spitsbergen)	78°04′ N. lat.
Cape Tjeljuskin, the Siberian mainland	77°43′ N. lat.
Mørkefjord, Northeast Greenland.....	76°56′ N. lat.

At the time of publication of this report, HVIDBERG, MADSEN, and ZIEBELL are still in Greenland, while HAARLØV was able to return to Copenhagen in the autumn of 1940. The information of the further progress in the wintering year 1939—40 obtained by the leaders of the expedition is based on his report, written down after his return, and on letters from HVIDBERG and MADSEN brought home by him.

The hunting in the autumn had been fairly successful, a supply of four walrus (two of which had been killed by SØLVER in the summer), one bearded seal, and a few minor seals providing food for the dogs till late in the spring. On the voyages to hunt walrus a constant look-out

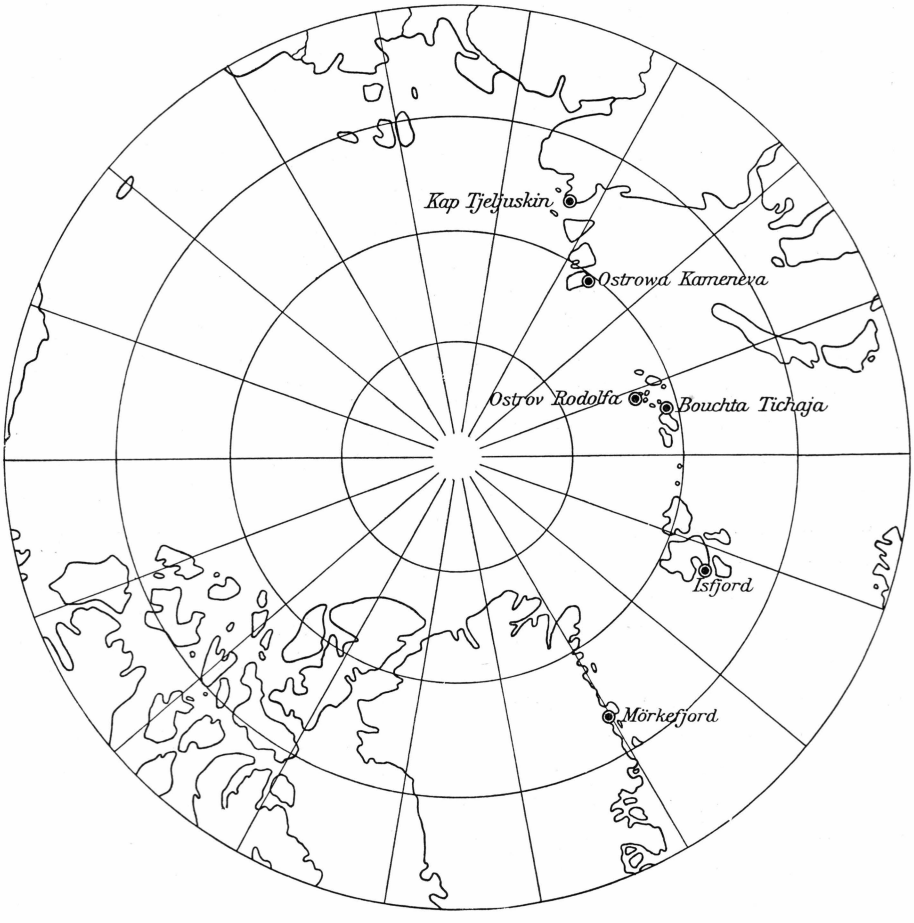


Fig. 47. Polar chart showing the six most northerly weather forecast stations in action in the autumn of 1939, among them the Mørkefjord station.

had been kept for musk-oxen along the coasts, but none were observed. After bays and fjords had frozen over about September 15th, HVIDBERG and ZIEBELL had made several short sledge trips, visiting Sælsøen, the interior of Mørkefjord, Hellefjord, Port Arthur, and Danmarks Havn, but without encountering musk-oxen in any of these places.

In the autumn and even till late in the spring of 1940 sledging on land was almost impossible because of a very scanty snowfall. In the course of the autumn and winter there were only a few light snowfalls,

which just covered the ground, snow-storms not setting in till about May 1st. In the autumn of 1939 the cold was normal, but a period of wind and cold (about 20° C. below zero) in September-October in connection with the lack of snow became fatal to some of the dogs, which had not yet changed to their winter phase and failed to find sufficient snow for shelter. Four of them died. In the spring of 1940, when a protracted period of cold weather set in over the rest of Europe, the temperature was abnormally high at Mørkefjord, culminating in a temperature of 1—2° C. above zero for a whole day. Otherwise the temperature fluctuated around 30° C. below zero during the first months of 1940, increasing gradually in the months of spring. The minimum for the whole wintering was probably not under 40° C. below zero. At July 1st, 1940, Lakseelven broke up—twenty days earlier than in the year 1939 (se pag. 77).

The programme for the wintering included an attempt to erect some huts in Skærfjorden as a support in case of future journeys northward, and even before the dark time set in, HVIDBERG and ZIEBELL made their first attempt to transport some timber northward on two-wheeled carts with Icelandic horses borrowed at Hvalrosodden. After the return of the sun and as soon as driving across Passet became fairly practicable, an attempt was made with sledges, and materials were transported to Fladebugt, where the hut (according to a letter from HVIDBERG) was placed "on the first northwestern cape after the descent to the bay from Passet, c. 18—20 km out", that is to say, in all probability on Kap Li. The hut contains two berths and is free of snow and surrounded by a low wall of stones.

At the end of March a solitary musk-ox was shot in the innermost part of Sælsøen, the first musk-ox during the wintering. On May 13th HAARLØV left the station in company with the trapper KARL HENRIK SCHULTZ, Hvalrosodden, setting out on the 1000 km long sledge journey to Scoresby Sund with the faint hope that he might return to Denmark from that place. It was late in the summer when HAARLØV reached the colony at Scoresby Sund two months later, and on the way he and SCHULTZ had encountered many hardships owing to the thaw. On arrival at Scoresby Sund they found a telegram from Mørkefjord, stating that a Norwegian vessel, the "Vesle Kari"[1]), was under way for the Norwegian station "Havna" in Kong Oscars Fjord. Without hesitation HAARLØV at once set out, travelling northward on foot across Jameson Land to Fleming Fjord and onward to "Havna", where he arrived on August 8th—a journey of about 150 km. However, here he had to wait for ten days before the "Vesle Kari" turned up, and the ship was then accompanied by the "Fridtjof Nansen", which, being in English service, had

[1]) "Vesle Kari" mentioned above on p. 40 and p. 74.

captured the "Vesle Kari" south of Ella Ø. HAARLØV sailed in the "Vesle Kari" to Reykjavik, whence, with the permission of the English, he travelled to Bilbao in Spain onboard an Icelandic trading vessel carrying a cargo of split cod. Subsequently he had to stay for seven weeks in Spain before his papers were in order, after which he covered the stretch Madrid-Berlin in an airplane, and arrived at Copenhagen on November 13th—precisely half a year, to the day, after he had left Mørkefjord.

WINTERING III, 1940–41

Old party: ANDREAS HVIDBERG, leader.
KRISTIAN MADSEN, wireless operator.
CARLOS ZIEBELL, assistant.

New party: IB KNUD POULSEN, wireless operator, born April 29, 1909.
KURT ALBØG OLSEN, assistant wireless operator, born November 5, 1922.
JENS MARIUS JENSEN, assistant, born December 17, 1911.

By the "Vesle Kari" EBBE MUNCK and I had (thanks to the courtesy of the Norwegian hunting company the "Arktisk Næringsdrift") sent up a new wintering party of three men, because we had promised the previous party that it should be replaced, and because we still wished to keep the station going in the hope of better times and a renewal of the expedition. The three men were: IB POULSEN, wireless operator, for several years chief of the wireless station of the Danish State at Eskimonæs; KURT OLSEN, who had just passed his examination as a wireless operator, and the former Nanok-trapper JENS MARIUS JENSEN, who had wintered at Gefions Havn in Dove Bugt in 1938—39, while the first wintering at the Mørkefjord station took place.

On account of the capture of the "Vesle Kari" the three men were landed at Eskimonæs, and the old wintering party—apart from HAARLØV—had to remain at the station in Mørkefjord. A good deal of supplies had been sent up with the new party, the most important being coal, butter, milk, potatoes, and tobacco. POULSEN, JENSEN, and OLSEN at once prepared to carry these provisions northward, and on August 26th, 1940, they went to Hochstetter in a borrowed motor boat, but here thick new ice in Shannon Sund prevented their further advance northward. Half of the fresh supplies were deposited in the Ailsa hut (built by "Nanok" in 1932), and the three men then went southward again with the remainder of the supplies and settled down at the Norwegian trapper's station at Kap Herschel, which they borrowed from the trapper RUDI in return for attending to the traps within his district and handing over to him half of the catch.

While JENSEN remained here to hunt during the winter, POULSEN and OLSEN waited for good going so that they might sledge the fresh supplies and the letters from home to the Mørkefjord station. With four adult dogs and three half-year pups they reached their goal on November 5th with part of the supplies, and as the going was fine, POULSEN assisted by ZIEBELL immediately started southward again to carry the remainder of the depot from the Ailsa hut to Mørkefjord, where they arrived on November 28th. OLSEN, as a wireless operator, could now relieve MADSEN, who besides his wireless service was much engaged in attending to the third year's climatological observations. During the dark period these observations, similarly as in the preceding years, were supplemented by observations at the summit of Rypefjeldet, made daily without a single interruption during a period of 106 days from November 10th, 1940, to February 24th, 1941.

In order to earn part of the increased expenses due to the unintentional doubling of the personnel caused by the war an attempt was made to establish a hunting territory in Skærfjorden in connection with the building of another hut at Kap Amélie, the erection of which had been planned already during the first wintering of the expedition. This hut was i. a. to serve as a base for climatological observations in Skærfjorden during a continuous period, so that it might be found out whether or not the cold minima ascertained up there in 1939 were phenomena recurring every year. In the first days of February, 1941, POULSEN and ZIEBELL, travelling via Danmarks Havn, sledged the main part of the materials for the hut to Kap Amélie, where the hut was built by POULSEN, ZIEBELL, and MADSEN on March 15th.

The announcement in April by the superintendents of West Greenland that Northeast Greenland would hardly be visited by any ship in 1941 put an abrupt end to the work in Skærfjorden after twenty-six days and necessitated a return to Mørkefjord in order that preparations might be made for a partial evacuation of the station shortly after. Thus, though the activities northward came too quickly to a close, the leaders of the expedition, however, found consolation in the fact that amidst the raging of the war Danish men were quietly continuing the peaceful conquest of our own country with a view to future activities. The hut at Kap Amélie and the hut built at Kap Li in 1940 are the two northernmost huts in East Greenland; the hut at Kap Amélie, in c. 77°30′ N. lat., is the northernmost hut, and as it was intended for fairly long stays, it is very solidly built, with stones right up to the roof, solid doors, and a good stove. We owe its erection to IB POULSEN's initiative. It stands there as a fixed outpost for the continuation of the scientific exploration of the northernmost parts of

Greenland, which the expedition hopes to start as soon as it is possibile to carry out this work again.

On April 2nd, 1941, HVIDBERG, and on April 17th MADSEN, ZIEBELL, and OLSEN, went southwards to try to obtain occupation in the service of the Administration of Greenland in places situated within the range of regular navigation. At the same time JENS MARIUS JENSEN was to interrupt his hunting activities at Kap Herschel to go to Mørkefjord in order to assist IB POULSEN in looking after the station. JENSEN's part of the catch at Kap Herschel constituted 18 foxes and one bear, while up to April 16th, 1941, the other members of the expedition had caught 17 foxes and two bears.

WINTERING IV, 1941–42

IB POULSEN, wireless operator, leader of the station.
JENS MARIUS JENSEN, assistant.

Since the spring of 1941 there have been few messages from the Mørkefjord station, but it must be assumed that the two men mentioned above have remained at the station in order, as it was agreed upon from here, to keep the station going and continue the climatological observations for one more winter, the fourth consecutive year—we hope not the last—in the history of the station. The latest message received from IB POULSEN, dated April 18th, 1941, reported that the further working of the station until conditions allowed sledging in the spring of 1942 would be fully justifiable as far as the provisions were concerned.

Southern area of the expedition.

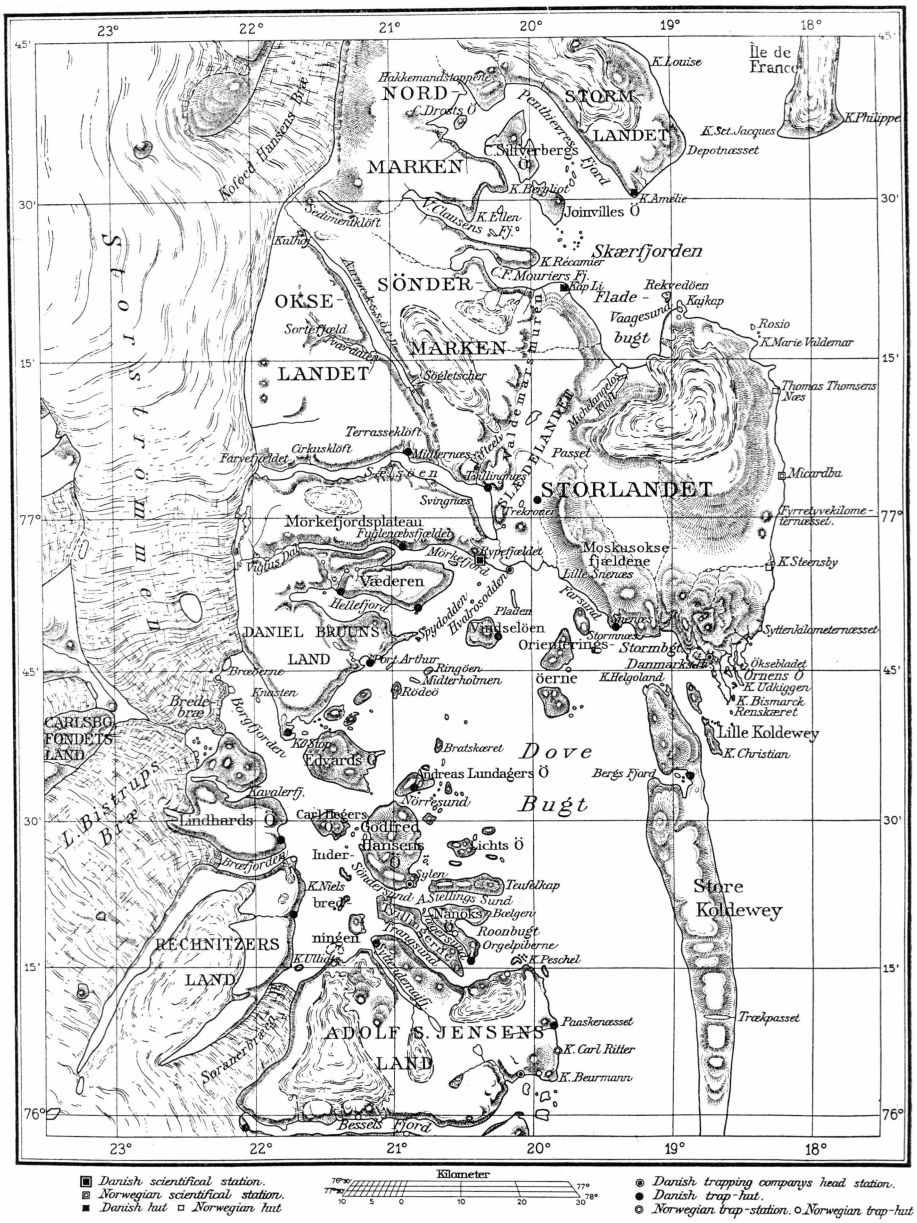


Fig. 48. Map (on a scale of 1:17,500,000) of Dove Bugt and Germania Land with insertion of the new place names given by the expedition, mentioned i. a. in GELTING's diaries.

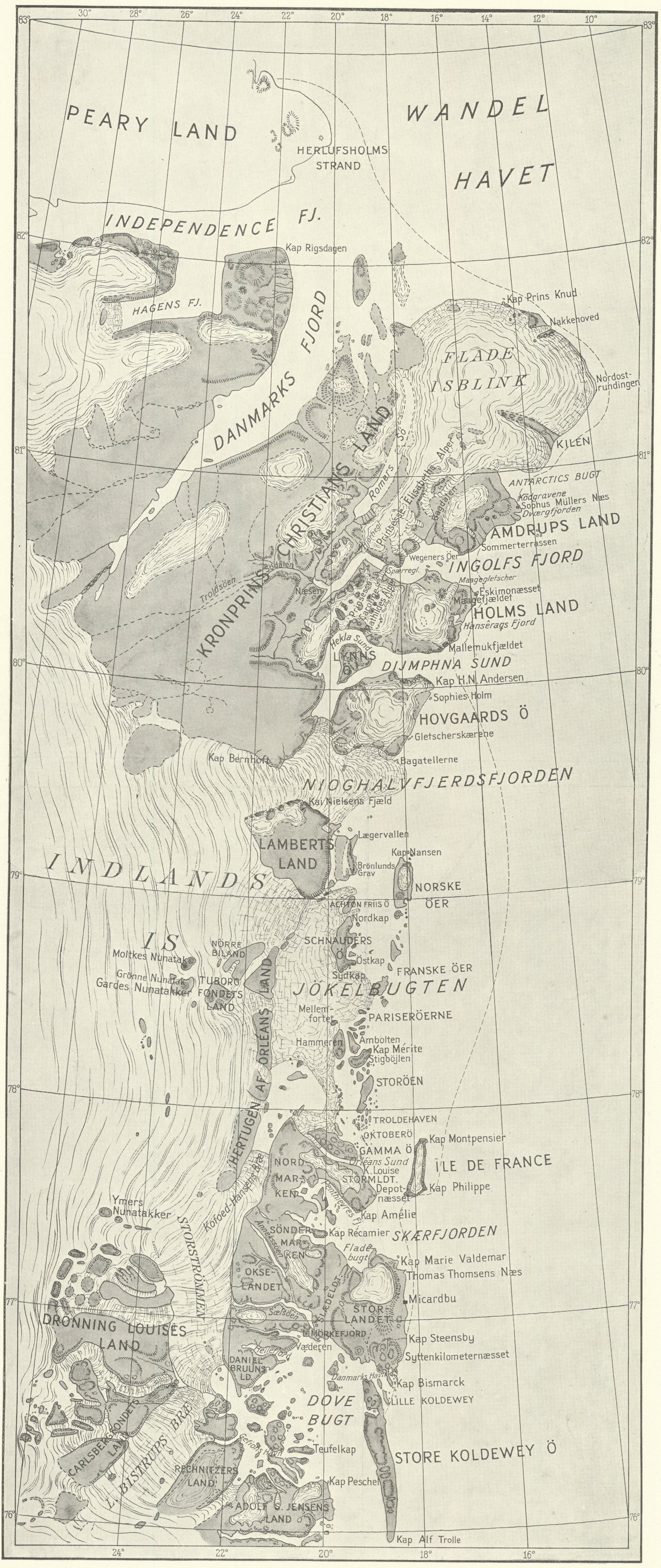
Færdig fra Trykkeriet den 27. Juni 1942.

Sketch map of

NORTHEAST GREENLAND

from lat. 76° to lat. 83°

based on previous maps and with corrections, sketched from observations made on sledge-journeys by the Danish Northeast Greenland Expedition 1938 - 39 and by the Drastrup Expedition, which kindly allowed us to use the bearings, taken in the interior of Kronprins Christians Land



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