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6. OG 7. THULE-EXPEDITION TIL SYDØSTGRØNLAND 1931—33
Leader: Knud Rasmussen

REPORT ON THE EXPEDITION

BY

C. C. A. GABEL-JØRGENSEN

WITH 105 FIGURES IN THE TEXT AND 1 MAP

KØBENHAVN
C. A. REITZELS FORLAG
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UDGIVET MED STØTTE AF CARLSBERGFONDET

FOREWORD

After Knud Rasmussen's death the writer who, as second-in-command, took part in the expeditions of 1932 and 1933 was entrusted by the Committee of the Thule Expeditions with the preparation of a complete account of the voyages of the 6th and 7th Thule Expeditions.

This account is first and foremost a summary of the tasks performed by the expeditions and the, both personal and material, results obtained, with a record of the many journeys and events.

Within the various branches of research the professionally trained leaders or experts, who had been chosen for the carrying out of this work, will account for the purely scientific preparation of the investigations made and the material brought home. A very full and detailed account has only been given of Knud Rasmussen's personal work and activity during his three last working years, which were so rich in events and achievement, and it has been my earnest wish to make these years live again. Unfortunately it has not been possible to include a special report on Knud Rasmussen's last work, his collaboration in the great Eskimo film "Palo's Bridal".

In preparing my report I have had recourse to a number of brief records collected by the individual leaders of the various scientific works, to the diaries of Knud Rasmussen and to the large photographic material taken by the 6th and 7th Expeditions — both on land and from the air — which is one of the most valuable results of the three years' journeys.

The art of limitation in selecting from among this very rich material has been an extremely difficult one; thus, I have practically been obliged to reject all pictures showing personal situations. Emphasis has, in the first place, been laid upon an illustration of the outer coast, and it is my hope that this, together with an enumeration of harbours and flying bases, may be of use for future expeditions.

As to the economic side of the expedition it will not be necessary in this place to enter into details. From the funds of the Thule Station Knud Rasmussen himself contributed very liberally, but these amounts were naturally not sufficient for the carrying out of such large enterprises, as are represented by these journeys. A long list of contributors,

headed by the Danish Government, have raised funds which, large and small, have contributed to the solution of the many important tasks. But an expedition also needs other things besides money, crafts, instruments, material and provisions, and the leader of the expedition and his helpers owe a debt of gratitude for much wise counsel and various assistance, both before, during and after the journeys.

On my last visit at Knud Rasmussen's sick-bed he expressed his longing to thank the many who has helped him to make all this possible, and I should like to carry his thanks further — the thanks which glowed in his heart, and which his lips were never allowed to utter.

His thanks to each of the members of:

the Committee of the Thule Expedition:
Viceadmiral G. C. Amdrup, Danish Royal Navy
Professor O. B. Bøggild, Ph. D., Director of the Geological Museum, Copenhagen
Mr. Dan la Cour, M. Sc., Director of the Meteorological Institute, Copenhagen
Professor Ad. S. Jensen, Ph. D.
Professor Knud Jessen, Ph. D., Director of the Botanical Museum of Copenhagen
Mr. Ib M. Nyboe, Civil Engineer
Professor N. E. Nørlund, Ph. D., Director of the Geodetic Institute of Copenhagen
Mr. Rudolf Sand, Barrister, Administrator of the Expedition
Mr. Thomas Thomsen, Inspector of the National Museum of Copenhagen

for wise counsel, valuable assistance and never failing interest and efforts.

His thanks to the many who in various ways constributed to make the expedition possible. This concerns:

The Prime Minister of Denmark, Mr. Th. Stauning
The Administration of Greenland
The Ministry of War
The Geodetic Institute
The Danish Royal Army Air-Force
The Royal Engineers
The Ministry of Naval Affairs.
The Danish Royal Navy Air-Force

The Lauritz Andersen Fund
The Carlsberg Fund
The Carlsen-Lange Fund
The New Carlsberg Fund

The Raben-Levetzau Fund
The Rask-Ørsted Fund
The Tuborg Fund
The Zeuthen Fund
The Botanical Museum
The Zoological Museum
The Aarhus Oil Mills Ltd.
The "Stjernen" Breweries Ltd.
The Carlsberg Breweries
The Carlsberg Laboratorium
The Danish Petroleum Company Ltd.
The Danish Spirit Factories
The United Oil Company Ltd.
The S. Johannesson Manufactories Ltd.
The Cryolite Mines and Trading Company Ltd.
The C. Schou's Manufactories Ltd.
F. L. Smidth and Company Ltd.
Svendborg Buckwheat and Oat Mills
The Tuborg Breweries
The Tuxham Machine Factory Ltd.
The Øresund Chemical Factories (by C. F. Jarl)

The Danske Landmandsbank Ltd.
The Fyens Discontokasse Ltd.
Kjøbenhavns Handelsbank Ltd.
Privatbanken i Kjøbenhavn Ltd.

Mr. C. L. David, Barrister of the Supreme Court
Mr. Reinhard van Hauen, Managing Director of the van Hauen Bakeries
Mr. August Holm, Managing Director of the Mønsted Margarine Manufactories
Mr. Knud Højgaard, Civil Engineer
Mr. Knud Jørgensen, Wine-Merchant
Mr. Per Kampmann, Civil Engineer
Mr. Ernst Michaelsen, Managing Director of the Vacuum Oil Company
Mr. A. P. Møller, Shipowner
Mr. N. H. Nielsen, Managing Director of the "Cirkus".
Mr. Svend Nielsen, Managing Director of the "Palladium"
Mr. M. P. Pedersen, Civil Engineer
Mr. O. Poulsen, Chemist.

His thanks not only for the means: for money, craft, material, even personnel placed at our disposal, but also for kind understanding,

for impulses and good advice towards collecting what was further needed in the course of the expedition. The will to sacrifice and the cordiality which he met meant more to Knud Rasmussen, than can be expressed in words.

His thanks to all our friends in Greenland and in the administration of the country, Danes and Greenlanders alike, for hospitality and support of every kind.

I here repeat his thanks as formerly given to:
Mr. A. Svane, Administrator of Southwest Greenland, Godthaab
Mr. O. Corp, Civil Engineer, Ivigtut
Mr. P. Ibsen, Manager of the settlement of Julianehaab
Mr. G. Rassow, Manager of the settlement of Angmagssalik
Mr. H. Høegh, Manager of the settlement of Scoresby Sund
The leaders of the Greenland wireless stations, the physicians, the hunting station Nanortalik, the inhabitants of the outposts and the dwelling places.

Our memories of collaboration in work and festive leisure hours are manifold and will always be treasured by us.

His thanks to the members of the administration of the Thule Station with Mr. RUDOLF SAND in the head of it and to the members of the expeditions, from the youngest messboy to the captain on the bridge, from the humble, all-round assistant to the scientifically trained specialist, Danes and foreigners, the young Greenlanders who went with us into the ice and into the mountains, and the old wise men who followed us as local experts. Everyone on his special post has made his important contribution to the total issue, and many have done extremely good work.

To all and for all I express Knud Rasmussen's thanks, and to these thanks I add my own.

In conclusion I wish to express personal thanks to:

Viceadmiral G. C. Amdrup, Editor of "Meddelelser om Grønland", and to the translator of the greater part of this report, Mrs. Aslaug Møller, M. A. for much good will and valuable advice during the completion of this work.

Roskilde, October 1939.

GABEL-JØRGENSEN.

THE 6TH THULE EXPEDITION
1931

I. Introduction.

Knud Rasmussen's own preliminary report on this journey begins with these words:

"A hundred years ago the Danish naval officer Lieutenant W. A. Graah worked round Kap Farvel in a Greenland umiak (ɔ: women's skin-boat) and layed for the first time a course northward to explore the ice-bound East Coast of Greenland. At that time the country was populated by dispersed groups of Eskimos who were to be found along the whole coast between Kap Farvel and Angmagssalik.

"It was not until fifty years had passed that the coast was again visited by scientists; this was when the famous expedition led by Gustav Holm and T. V. Garde succeeded in forcing a passage along the same coast in umiaks, mapping and exploring the whole stretch as far as the district now known as Angmagssalik. Kong Frederik den VI's Kyst, as Graah had called this part of Greenland, was still populated until the change of the centuries, when the southern East Greenlanders emigrated to the Julianehaab district in order to be in touch with the mission and trading station, while the northern groups moved up towards the regions about Angmagssalik.

During the fifty years which have passed since Holm and Garde's journey no expedition had examined this stretch of coast, unless Fridtjof Nansen's boat journey, which had completely different objects, be taken into account. Only Greenlanders had travelled here, either southwards from Angmagssalik or northwards from Kap Farvel, during longer or shorter hunting journeys.

In 1904 as a member of Mylius Erichsen's "Literary Expedition" to Greenland I was amongst a party attempting a boat journey from the south up and along the east coast. But the attempt failed; on account of exceptionally unfortunate weather conditions it was impossible for us to get in the row-boat we were using further than the district near the island Aluk. This effort to become acquainted with the east coast was, however, not without significance for my further work. In particular I met near Qernertormiut, east of Kap Farvel, a large hunting camp of East Greenlanders with whom I lived for some time. During this sojourn I obtained so much geographical and ethnographical information

about Kong Frederik den VI's Kyst that I decided that in time I should make my contribution to the exploration of Southeast Greenland."

That was in the year 1904.

Twenty-seven years had to go before Knud Rasmussen should again set eye upon Aluk; but in all these years he had not forgotten the East Coast. He had received from Aluk in 1904 an ineradicable impression of the rare beauty of the coastal ranges; the barrier of heavy pack ice had only reinforced his resolution and heightened his desire to go further north. In 1919 Knud Rasmussen had a glimpse of the southeast coast from a new angle, when on the 4th Thule Expedition he journeyed to Angmagssalik to collect myths and sagas. He was unable to make any journeys along the coast on this visit, and had to be satisfied with a few excursions to the nearest settlements and views of the coast to the north and south from the hills above Angmagssalik. He little realised then what this coast would later mean for him.

The southeast coast at an earlier time had practically speaking no open season. It was just ice and more ice — pack ice and glacier ice jumbled together in a next to impenetrable mass. In these conditions it took Graah three summers and two winterings to reach Dannebrogs Ø; Holm and Garde took the same time to reach the Angmagssalik district and return during their Umiak Expedition.

For some unknown cause the ice conditions bettered in the course of the years. The official reports made this unmistakeably clear and Knud Rasmussen's not less important unofficial accounts from Greenlanders in the Kap Farvel and Angmagssalik districts told the same story. In 1931 the navigation of the southeast coast was once again attempted.

Knud Rasmussen in his preliminary report stated only that ice conditions were so good that the time had come to make the voyage. It should, however, be mentioned here that this was certainly not the only reason for proceeding with his plan. In 1931 the Norwegians put forward their claims in East Greenland; this without doubt struck a note in Knud Rasmussen's heart; he could not sit at home but must at any cost be at the front of things when there was strife about his beloved Greenland; and the front line was East Greenland itself.

Thus began the 6th Thule-Expedition 1931.

In the course of time it had become the custom in Greenland to undertake all journeys along the coast in motor-boats. It seemed quite in the natural order of things that to force even the difficult ice of the East Coast a motor-boat, which, given the slightest opportunity, could command every advantage in the way of speed, strength and radius of action.

The motor-boat employed is more fully described on page 200. It was named "Dagmar" after Knud Rasmussen's wife. Besides a small space

for cargo and a pantry it had a good cabin with room to sleep for four men, a good wheel-house where a few others could be and an engine room aft. A fairly large dinghy was towed astern.

The boat was narrow in the beam and fitted with a powerful motor which gave a cruising speed of eight knots. The built-in tanks could carry sufficient fuel for the whole journey from Julianehaab to Angmagssalik and back without replenishment.

In all points of importance the "Dagmar" was well suited to its task; but it was hardly robust enough for heavy weather and, on account of its narrow beam, was not roomy enough.

II. Personnel of the Expedition.

Leader: KNUD RASMUSSEN

Name	Position (academic degree)	Member as
The "Dagmar" party[1])		
Crew of the motor-boat:		
F. Bangsbøll	Lieut. Cdr. R. N.....	Skipper
H. I. E. Wittrup Hansen	Lieut. R. N.	
L. Tokking.....	Mechanic R. N.	In charge of the engine
and the Greenlanders:		
Christian Poulsen.....	Hunter from Frederiksdal	Assistant
Edvard Johansen.....	Hunter from Nanortalik.	Assistant
Scientists:		
Johs. Olsen	Cand. mag., The Meteorological Institute, Copenhagen	Magnetic surveyor
Svend Nielsen.....	Managing Director of the "Palladium" Ltd. Copenhagen.....	Photographer
Archæological party		
Erik Holtved	Stud. mag., The National Museum, Copenhagen	Archæologist
Anton Adsersen	Hunter from Frederiksdal	Assistant
Esajas Jacobsen.....	Hunter from Augpilagtoq	Assistant

[1]) On September 2nd the young Danish farmer Hans Bruun, who had assisted Dr. Therkel Mathiassen during the excavations in the Angmagssalik district, was engaged. Hans Bruun took part in the "Dagmar"s return voyage along the coast from Angmagssalik to Julianehaab.

III. Departure and Start.

On August 3rd 1931 at 6 p. m. the cargo ship "Feddy" left Copenhagen for Greenland via Scotland with six members of the expedition.

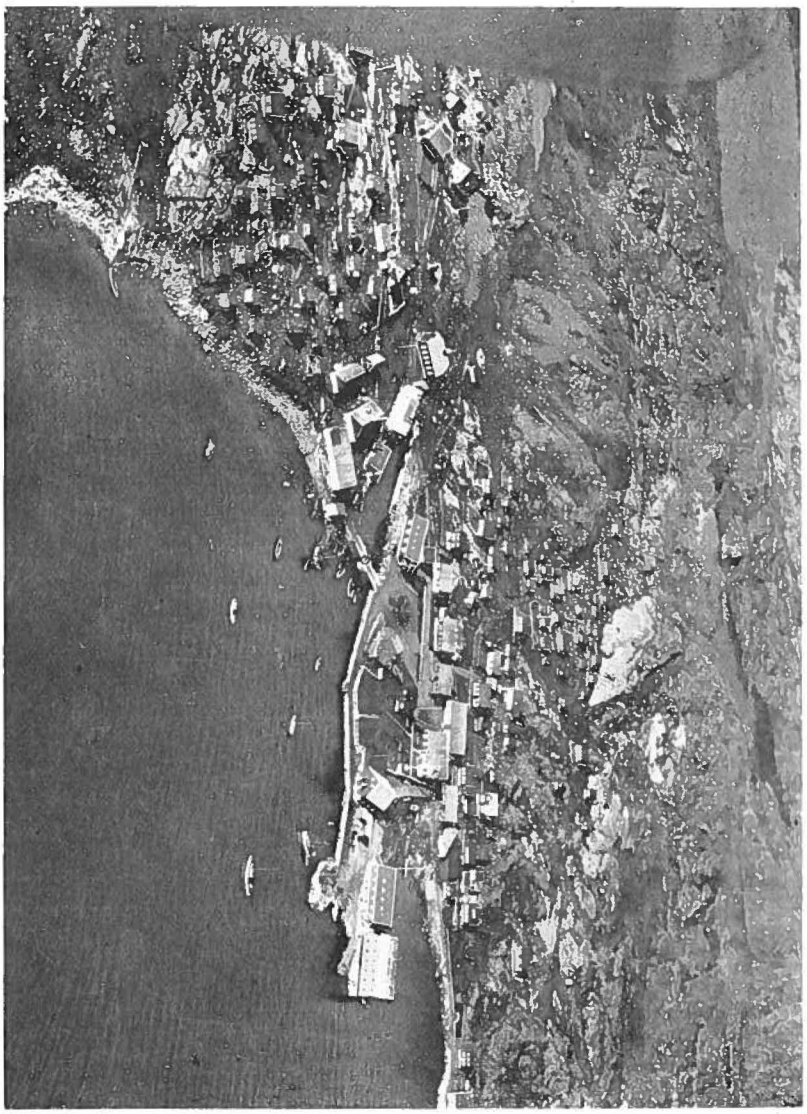

Fig. 1. Air-photo of the Julianehaab settlement from about 500 m height.

namely, Bangsbøll, Holtved, Nielsen, Olsen, Tokking and Wittrup Hansen on board as well as the motor-boat "Dagmar".

On August 5th Knud Rasmussen flew in the ordinary mail plane from Kastrup aerodrome to Amsterdam, leaving at 9.15 and arriving at 12.45. He went on by aeroplane at 1.30 p. m. and arrived in London at 4.15.

He continued his journey by the "Flying Scotsman" to Edinburgh, where he arrived on the morning of the 6th at 7.30.

A modern expedition had a modern beginning!

In the evening of the same day the "Feddy" came to Leith. The expedition was now assembled and on August 7th at 11.30 a. m. was able to begin the voyage to Greenland.

In the morning of August 16th the "Feddy" reached Julianehaab; on the 17th the "Dagmar" was set afloat and the rigging and fitting-out begun.

The first part of the East Coast journey, as far as Lindenows Fjord, was carried out in two motor-boats. The plan was to disembark the archæological party at Narssaq, which would be a base for investigations in fjords of the neighbourhood using a row boat as transport.

In order to waste no time, Knud Rasmussen decided that he himself would leave at once for the southern district in the Julianehaab settlement's motor-boat "Anders Olsen", so that he could, at his leisure, engage the necessary Greenlanders required for the voyage.

On August 18th at 11.30 a. m. the "Anders Olsen" departed for the south with Knud Rasmussen, Holtved and Nielsen on board. The route was laid past Ikerasârssuk to Nanortalik, which was reached in the evening of the 19th. The second party sailed in the "Dagmar" at midday on the 19th from Julianehaab and reached Nanortalik the same evening, only a few hours after the "Anders Olsen".

The voyage to East Greenland had begun.

The "Anders Olsen" party continued southwards the same evening, and in the course of the voyage (at Frederiksdal and Augpilagtoq) the Greenlanders Christian, Anton and Esajas were taken on board.

On August 20th Prins Christians Sund was passed in sunshine, dead calm and open ice so that the east coast was reached without hindrances of any kind. Some of the ancient sites of Aluk were visited, and the night was spent in a little boat harbour south of Cape Huitfeldt.

On the morning of August 21st — in company with the "Dagmar", which had left Nanortalik at 9 in the morning of the 20th and sailed non-stop so far — Lindenows Fjord was entered. Some minor explorations were made; Johs. Olsen started the magnetic observations, and the archæologists were installed in Tutein's hut near Narssaq, where at

4 p. m. the whole expedition were together for the last time, before the voyage to Angmagssalik.

Here the two boats parted company. The northern voyage was begun by the "Dagmar" the same evening, while next day — August 22nd — the "Anders Olsen" started for Julianehaab homeward bound.

IV. The "Dagmar's" Voyage to Angmagssalik.

(From Knud Rasmussen's diary.)

At 6.30 in the evening of August 21th the "Dagmar" left Narssaq for the north. Together with Knud Rasmussen there were altogether eight men on board. Course was laid through the night at about ten miles offshore. There was no ice of any importance to be an obstruction, and the weather was clear and calm. At 8 a. m. of August 22th Kap Tordenskjold was passed in brilliant and beautiful weather. At the front of the well-known glacier Puissortoq the boat was taken close in to the edge of the ice in order to take photographs; both motion and still pictures were made. Later in the evening a course was laid for Tingmiarmiut Fjord, where there was a certain amount of brash ice. It was, however, so spread that navigation was unhindered. A way was felt in the dusk, to reach finally a harbour into which Christian Poulsen steered the "Dagmar", now towed by the dinghy, with the greatest confidence. By midnight they lay safe and secure behind Hestesko Ø, in the bay off the old dwelling place.

Some investigations were made on August 23rd on the site of the ruined houses, and Johs. Olsen made a series of magnetic observations. At 11 a. m. the northward journey was again begun, but on account of fog the "Dagmar" had to find a harbour on the north side of Griffenfelds Ø. The harbour was named by Knud Rasmussen "Ebbas Havn" (after Mrs. Wittrup Hansen, whose birthday it was).

Immediately on getting under weigh on August 24th at dawn the rudder was damaged. Repairs delayed departure until midday. It was calm, but foggy weather with a number of icebergs about, but no pack of any significance. Off the Skjoldungen island the expedition met a little motor boat with two Norwegian hunters aboard belonging to Finn Devold's party, which had been landed from the Norwegian sealer "Heimen". In company with the smaller boat they followed the northern Skjoldungen fjord right to its head, where there is a small hunter's hut built on the northern side of Dronning Maries Dal (in the western part of the Skjoldungen Sydfjord).

On August 25th a camp was made ashore, and Johs. Olsen started

magnetic observations, Bangsbøll began the mapping of the inner part of the fjord, and the rest explored Dronning Maries Dal. Knud Rasmussen was greatly impressed by the beautiful fertile valley running in a cleft

Fig. 2. M/B "Dagmar" in the ice of East Greenland.

between the rugged mountains of the boundary of the inland ice. He wrote in his diary:

"After pitching the tents nearer the stream in the morning Christian and I went a tour up the valley. During the night Christian often went out of the tent, overwhelmed with memories.

"He (Christian) told me how this valley was once full of happy, laughing and singing men. At high water both banks would be crowded with men spearing salmon with a barbed spear, while the women moved over the mountain side picking berries, bursting ripe whortle and juicy dewy bilberries. It was warm, warm. The men would be so wet with sweat that they would throw off their clothes and jump into the river.

"The valley broadened and grew even more lush higher up, with a whole scrub of bushes and heather nearly as high as a man. Up the mountain sides there was tuft after tuft with willow-herb and panait, blue harebells and yellow dandelions."

August 26th went as the day before with magnetic measurements, survey, photography and exploration of Dronning Maries Dal. Knud Rasmussen himself went as far as "Tværdal" and climbed high to get a view over the inland beyond. As soon as the survey was finished in the evening Bangsbøll came home with account of an remarkable ruin he had found on a little point outside the large glacier at the head of the fjord.

At 10 in the evening the moon rose above the mountain in the southern sound. A hasty pencil sketch in Knud Rasmussen's diary is as it were an attempt to grasp and hold something of the magnificent and bleak character of the country: the black mountains, the indigo water, the moon with its silver streak, the stars in the night-blue sky and over all the magic sweep of the flickering green northern lights.

On August 27th Johs. Olsen continued the magnetic observations, while the remainder of the party divided into two groups, one carrying on with the exploration of Dronning Maries Dal and the other, with Knud Rasmussen, beginning the excavation of a ruined house at the head of Nordfjord. The great size of the house, its unusual position some way from the shore and its exceptional height (32 m) above the water led him to believe that he might have come on to a Norse site.

Digging was carried on the whole day, but without reaching any definite indications. In the evening the Norwegian station was visited.

On August 28th the magnetic surveys were continued, and at noon the whole expedition assembled to take leave of the two Norwegians, who marked the occasion with a fine meal. The tents were now pitched over by the big house ruin, so that digging could be begun in earnest. The weather was overcast, but calm and mild.

On August 29th it was still overcast in the forenoon, but from noon it was blazing sunshine, so warm that digging became a burden. The turf was removed from the whole site, together with the matted mass of arctic willow whose deep roots had anchored it fast in the ground and entangled it with the stones of the building. There were still no finds on the site; any objects recovered were of purely Eskimo origin.

The morning of August 30th was again devoted to the ruin, which was by now almost entirely cleared and measured. There was still no decisive evidence of the Norse origin of the house, however little its construction might appear to be typically Eskimo. Many pages of Knud Rasmussen's diary are given to drawing the various rooms and summarising the evidence for and against the hypothesis of Norse origin.

Fig. 3. Dronning Maries Dal.

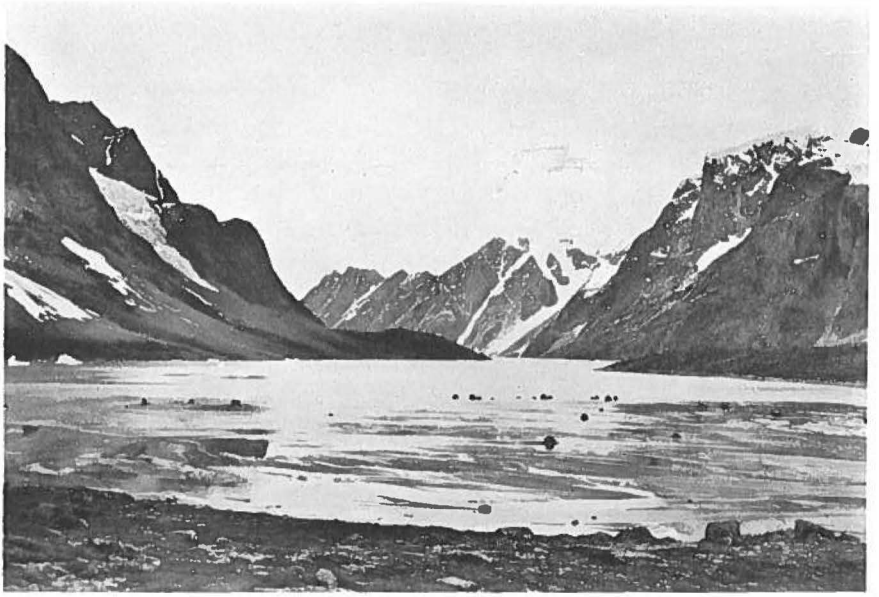

Fig. 4. View from Dronning Maries Dal towards the southern course of the Skjoldungen Fjord. Farthest to the right the rock "Droneren" ("The Boomer") from the top of which calving takes place.

The weather was magnificent, the mosquito-plague frightful—"One of my eyes is completely bunged up", Knud Rasmussen wrote in his diary. At 1 p. m. the work was discontinued so as to carry on with the voyage during the spell of fine weather. A start was made at 3.30 p. m.; after a short visit to the "House of the Dead", open sea was reached at 8 p. m. On account of much spread-ice and some bergs a course was laid 8—10 miles off shore and the ship kept going all night.

"A fantastically beautiful passage in utterly fairy-like moonshine, glassy calm sea, clear sky and still air," relates the diary. At midnight the "Dagmar" was off the northern part of Qeqertarssuaq.

On August 31st the sun rose over a glassy sea. At 7.30 the Norwegian sealer "Signalhorn" (of Aalesund) was passed close by. The ice was spread but decreasing. At 11 a. m. Umîvik was made; a search began for the inhabited place at the foot of the mountain Kingataq, but without success. So the ship was again turned seawards, and course laid for Angmagssalik. It was fine weather and moonshine.

Early in the morning of September 1st some heavy pack-ice was met with, which caused reduction of speed to very slow with many stops. A little way off Naujatalik Pastor Peter Rosing met Knud Rasmussen's ship in a little motor-boat, and at 11.20 Angmagssalik was reached—by the first motor-boat from West Greenland.

During the days September 2nd—5th various journeys were made into Angmagssalik Fjord, where Dr. Therkel Matthiassen worked investigating sites. Some motion pictures of the daily life of Greenlanders were made in Kûngmiut. It was part of Knud Rasmussen's ethnological investigation to make a record of their journeyings, their festivities, their skill with kayaks and their feasts.

The whole expedition collected again in Angmagssalik on the afternoon of the 4th; on the 5th all was made ready for the return voyage, and farewell visits were paid to all the Danes and Greenlanders of the settlement. Mathiassen's assistant, the young Dane Hans Bruun, came south with the party. During the stay in Angmagssalik Johs. Olsen had continued the magnetic observations whenever opportunity provided.

The homeward journey began at 10.30 a. m. on September 6th. Closely packed ice was encountered, and at 7 p. m. thick fog prevented further progress. The boat was made fast to an ice-floe some twenty miles to sea and remained there through the night.

On September 7th the floe was let go at 6 a. m., the fog having

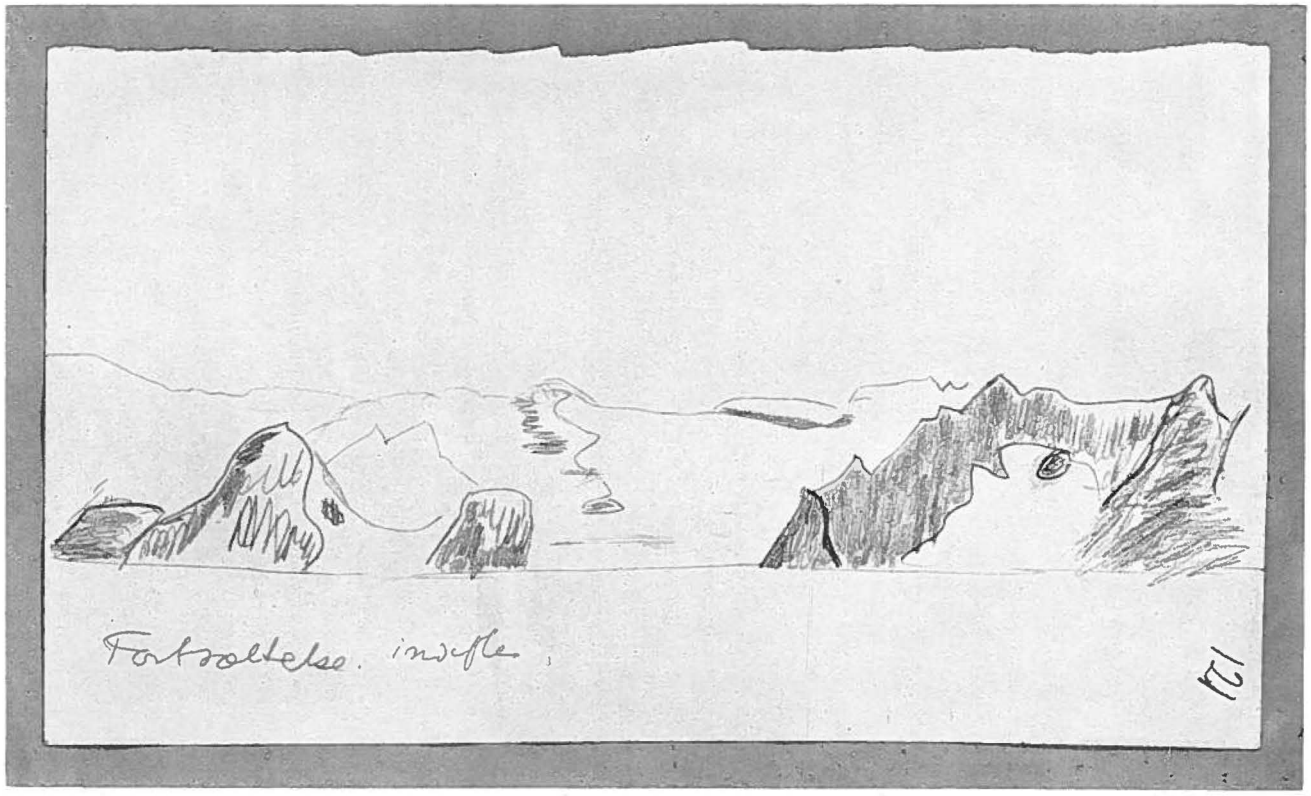

Fig. 5. Reproduction of drawing from Knud Rasmussen's diary. Part of the outer coast between Bernstorffs Isfjord and Umîvik. Designed from the motor-boat while on its way.

lifted slightly. The boat closed with the land and found in the fog an unknown harbour. Here the boat took the ground lightly and did not float again until high-water. When the fog cleared, they saw that they were in Pikiutdliutâ. Knud Rasmussen made use of the delay in measuring up some ruined houses.

The voyage was continued southwards at 7.15 a. m. in fresh weather. It was a magnificent passage along the southern coast of Køge Bugt at about ten miles off shore. New snow had just fallen. Knud Rasmussen wrote in his diary:

"The virgin snows seem to call to me; it is as if it were the country near Kap York. These landscapes get hold of me."

At 7.40 p. m. they anchored under the Umîvik peak and attempted to climb a little way to get a good view over the fjord to find, if possible, any trace of Watkins who had, with two other members of the expedition, set out on a voyage southwards along the coast in a small motor boat. Further, they wanted very much to make a contact with the existing Greenlanders' winter house, which should have been in some place or other quite near.

September 9th dawned in brilliant sunshine, and at 6.20 the voyage was continued in towards Umîvik Fjord; the glacier up which Nansen made his ascent to the inland ice in 1888 was passed. It was an infinitely dreary scene. Suddenly there appeared a red anorak—a little girl was playing happily on the mountain; at last they had reached men again.

Knud Rasmussen wrote in his diary:

"There lived here the two sealers and hunters, Nikodemus and Robert—altogether there were seventeen people in one house. They told us to our great regret that we had in the fog sailed past a settlement twice as large, which we should have much liked to have visited. But we were not aware that houses had been built at the head of the northern fjord of Køge Bugt.

There are now over one hundred people living south of Angmagssalik and Sermilik Fjord. They are for the most part families who were used to travelling in these parts, until the mission station established at Angmagssalik attracted them from the more outlying districts. But now that all are christened, and the children have learnt to read and write, they are finding their way back to the old hunting grounds, arranging it so that some man or woman of the little group takes over the daily teaching and weekly church service. The hunting districts and wintering houses stretch all the way to Tingmiarmiut. Here, at the outpost Patsâjuk, we were much impressed by the favourable hunting conditions which these coasts offer Eskimos who have kayaks and women's boats. There were large stores of seal meat put away as reserves for the

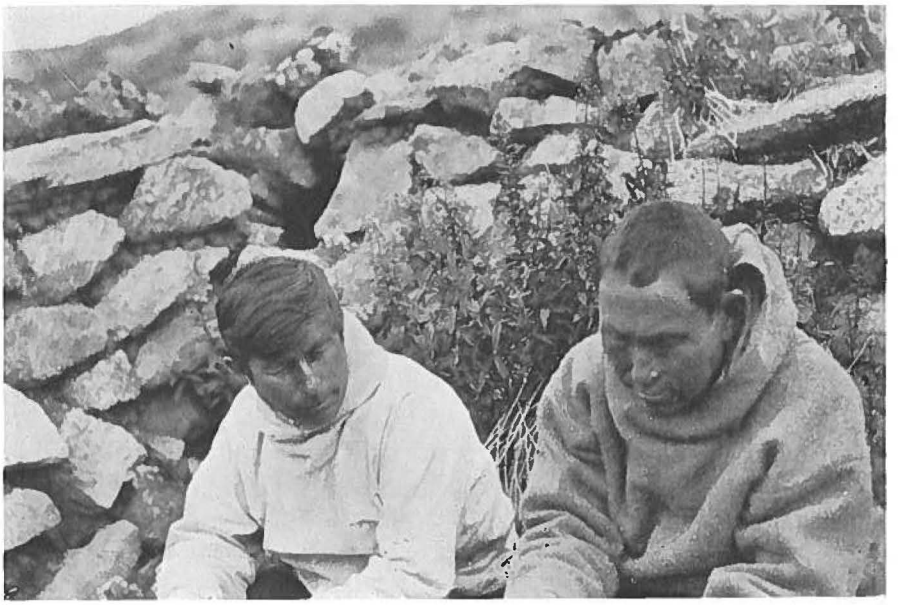

Fig. 6. Seated in one of the old ruins Christian Poulsen (to the right) relates to Knud Rasmussen of life on the East Coast during his early years.

winter, and all had an air of well-being as they strutted about with their handsome well-kept dogs."[1])

There was rain and wind all September 10th. The expedition remained in the settlement the whole day. Knud Rasmussen had many conversations with the Greenlanders and obtained much useful information about the living conditions, weather and ice of the Angmagssalik south district. His diary contains a great number of notes about these matters. Johs. Olsen continued his magnetic surveys round about the settlement.

The storm of September 11th—14th.

On September 11th the southward journey was continued. During the preceding days the weather had been unsettled, varying between snowfall and a moderate northeasterly gale, but the morning of the 11th brought a clearing. The immediate objective was Igdluluarssuit on the south side of Bernstorff's Isfjord. At 5 p. m. the fjord was reached successfully, and a channel was sought for which would lead from out-

[1]) Some of Nikodemus' prosperity was due to his association for the previous year with Watkins' B. A. A. R. Expedition, who had also supplied him with several dogs of West Greenland strain.

side the bank on which many ice bergs were stranded to some position inshore.

It was out here that the disaster occurred. During heavy weather from the northeast which had sprung up during the day a dangerous sea had begun to run off the fjord. A breaking sea threw the dinghy which was being towed against the boat, smashing the rudder and causing the towing-warp to go into the propeller. To save further damage amongst the ice the boat was worked seawards under sail, while all possible was done to effect repairs. For the 11th, 12th and 13th the boat lay hove-to in a violent storm during which it drove 125 miles to the south and 80 miles from the land. During all this period the boat's commander, Lieut.-Cdr. Bangsbøll, and his crew displayed fine seamanship so that in spite of the disaster all went well. That nevertheless there was some danger was shown by the fact that Knud Rasmussen once revealed to the author that at no time in his life had he ever felt so near death as in those days. They were grim days, made no less so by the danger of the fresh-water reserves being insufficient.

"Old Christian was so thirsty that he licked up the condensed vapour which formed on the inside of the boat, and the gulls swam close by and looked at us", wrote Knud Rasmussen.

At last on the afternoon of the 13th the storm began to moderate. On the 14th the propeller was working again and the land was closed. When the landfall was made it was found to be between Tingmiarmiut and Ûmánaq. The best thing to do seemed to be to come in to the Norwegian station at the head of the Skjoldungen Fjord, where there would be an opportunity for carrying out repairs. Late in the evening they reached a refuge in the mouth of the fjord where the night was spent. Thankfulness—that is the one word of so much meaning which closes Knud Rasmussen's diary account: he underlines the word with a heavy stroke. It is easy to imagine that it must have been a moment of great relief.

On September 15th the voyage was continued up the fjord, and at 7.50 a. m. the anchor was let go once more off the Norwegian hut near Dronning Maries Dal. There was great pleasure on all sides at the renewed meeting with the Norwegians, and help was given to the maximum extent. Knud Rasmussen was given timber for the repairs, and in return he made presents of fishhooks, lines and salmon nets, while one of the Greenlanders got busy making a kayak for the expedition's hosts. Once again the expedition divided, and Knud Rasmussen, Hans Bruun and old Christian were put ashore at Ruinnæs to continue the archæological work.

Johs. Olsen determined the daily range of declination and horizontal intensity, while the remainder of the crew under Bangsbøll's

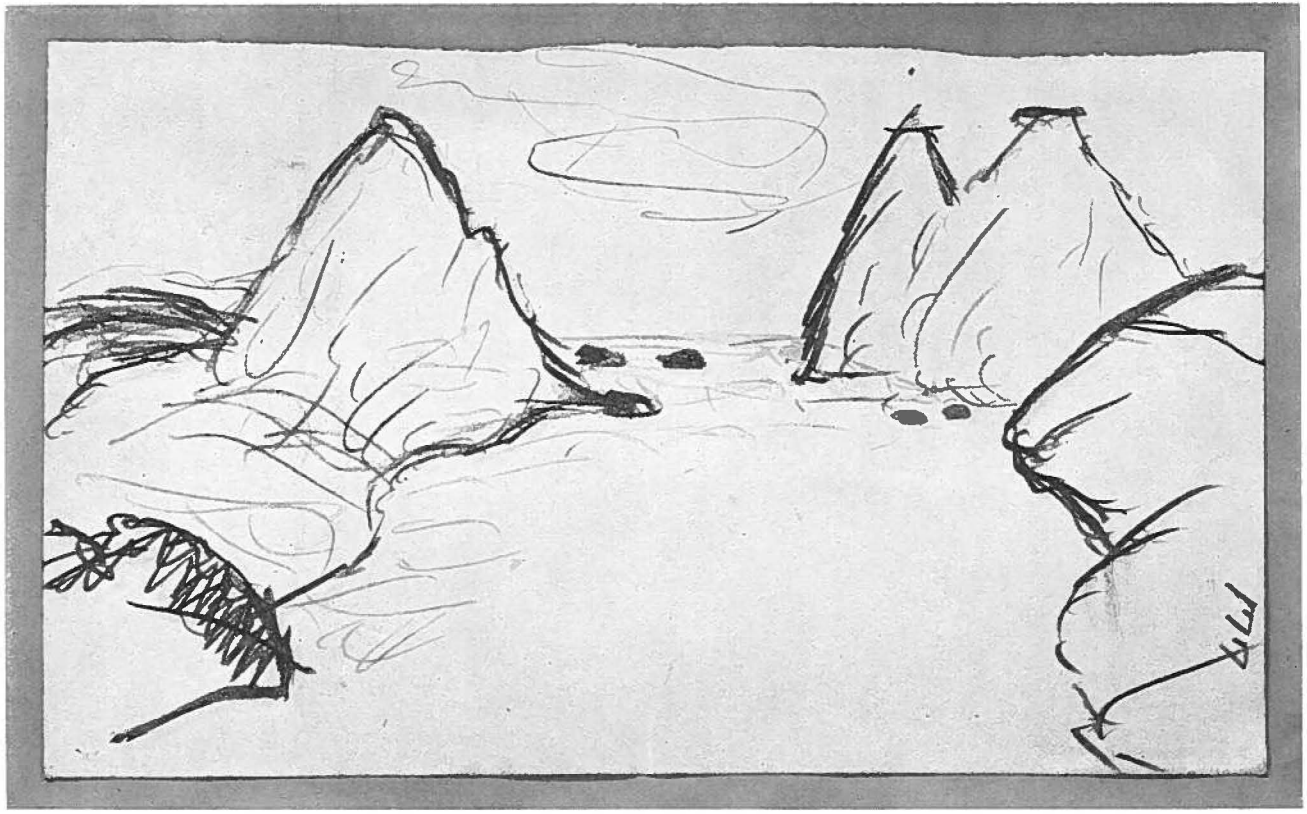

Fig. 7. Reproduction of drawing from Knud Rasmussen's diary. The two Ûmánaq peaks viewed from the fjord on the southern side of Griffenfelds Ø.

guidance dried the equipment, cleaned out the boat, repaired the rudder, overhauled the engine and made a new dinghy of wood and canvas.

In this way were spent the days from September 15th—18th. Knud Rasmussen dug energetically in the large ruin, which became more and more puzzling. He began to think that a whole complex of houses had been built on the site of a large Norse house, but still there was no decisive evidence and all finds were completely of Eskimo origin.

At last at 9 a. m. on September 19th the southerly voyage could be continued and the last farewells for the year paid to the Norwegians who had proved themselves such good friends. It was also the last good-bye to the lovely valley in which now the red and orange tints of autumn predominated, and a last farewell to "Drøneren", the magnificent mountain from whose ice-filled bowl-like summit the icestreams run in regular spacing—to-day just as in Graah's day. And finally the last good-bye to the lovely quiet Skjoldungen Fjord—one of the most beautiful in Greenland.

At 5.10 p. m. anchor was let go in Ûmánaq Fjord on account of rain and poor visibility.

The 19th—22nd September were spent in harbour. In the foggy, rainy weather no magnetic observations were possible. There was time to visit the very remarkable fjord which with numerous branches stretches into Griffenfelds Ø. Knud Rasmussen made a sketch plan of this fjord in his diary and drew the view from the land of the outer basin towards the two handsome Ûmánaq peaks. (See fig. 7).

Knud Rasmussen's description of the fjord in Griffenfelds Ø.

"From the two Ûmánaq entrances a basin runs in, ending in a narrow channel which becomes very narrow before again opening into a pretty, circular tarn with green and brown covered banks, which, nevertheless, have nowhere the fertility to suggest a Norse site. The channel is quite free of ice, except for isolated small chunks. Near the inner tarn a branch channel runs to the east[1]) closed in by mountains like a lake. This side-branch which begins quite small later broadens out to a tarn similar to the first and cut off from its own channel by a tongue of land only a few metres broad.

The whole scene is a typically gneiss landscape with low, light or white-marked high-water marks and many nooks; fertile terraces extend right up to 380 m on which are whortle- and isolated bilberries, while

[1]) This is a branch running to the west. Knud Rasmussen is here "turned round" as are the Eskimos, to where "west" is to seaward and "east" towards the land.

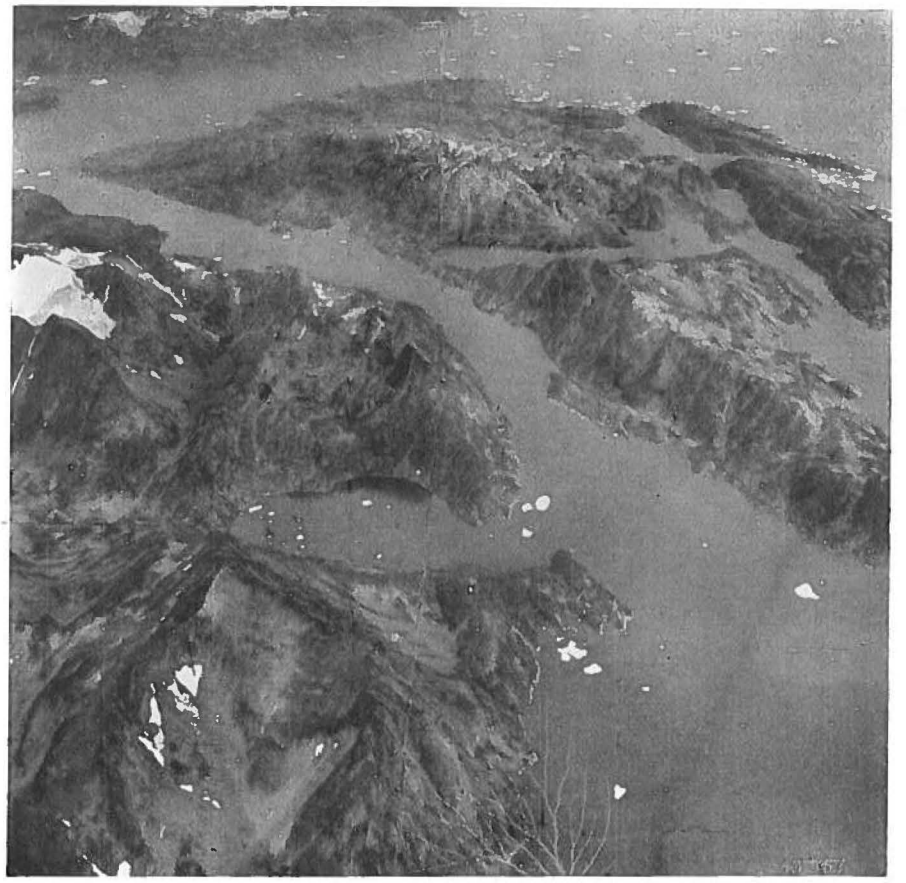

Fig. 8. Air photo of Griffenfelds Ø from about 3000 m height.

up to considerable heights there are little lakes—the deep "eyes" of the high mountains."

From 23rd—27th September.

The weather being tolerably good on the 23rd it was possible to continue southwards past Puissortoq's ice shoals, as Knud Rasmussen called them, and on to a harbour immediately under Kap Cort Adelaer. In this harbour, called by Knud Rasmussen "Bangsbøll's Havn", the expedition had some of its grimmest days.

Some of the pages of Knud Rasmussen's diary give a vivid account of the bad weather and discomfort, of its sudden oncoming and going and of the effect on the nerves of the party of continued inactivity.

September 25th.

"It has been a period of grim days of storm which we have spent here in Bangsbøll's Havn. There has been thick weather with heavy

rain, sometimes mixed with snow. Violent squalls have struck the ship—to swirl water, fog and rain all round—so that it pipes and whistles.

Will the anchors hold? Is there a mud-bottom?

Unmerciful bringer of bad tidings, the barometer falls steeply. We make ourselves blind by staring at landmarks on the rocks to see whether we are dragging. It generally freshens up in the evening just as it is getting dark; especially the first night it blows hardest. Since it is pitch dark with snow flurries, the engine is kept going in neutral for safety.

It is the same the next day—if perhaps a trifle earlier—as soon as evening falls; again the engine is set running as an effective additional scope to the anchor chain.

Again it freshens violently at about 9 o'clock, and from 10—12.15 the engine is running. The gale whistles by, and it can be heard roaring away in the mountain over the high, steep slopes. It is an imposing and disquietening constellation of unshackled forces; but once again the "Dagmar" displays the merits of her "round" build. When the squalls strike her, she quickly leans to the wind so that it cannot get hold of her.

The time seems infinitely long—once again there is nothing to do but wait and wait for a bettering. All we can do is to keep watch and keep awake in case we begin to drag. There is room enough in the bight in which we lie, but it ends in a high steep wall packed with ice which would be destruction to the boat if she drove into it.

Bangsbøll, who has kept watch the whole day, keeps up in the wheelhouse the whole night. At about 4 there seems to be a slight improvement; the squalls diminish in frequency, and Bangsbøll at last can get some rest.

At 8 in the morning the barometer begins to rise, and for the time being the storm seems to have blown itself out.

It will be exciting to see what happens to all the grounded ice bergs we sailed through; whether in fact there will be a way out, or whether we are caught in a trap and must wait for a wind from the opposite quarter before we can get out again. One thinks of many things at such a time.

There is torrential rain the whole day—an incredibly heavy downfall. At last at 3 in the afternoon there is a clearing, and we go ashore in various groups to climb up the mountains.

Johs. Olsen makes his observations.

Just inland from the landing place there are two old tent rings, carefully built-over with the usual wall of turf. The first thing we require is a view point from which we can see the bank on which the bergs stand stranded and over which we must navigate to come out. It is still in place as before. There is a way through, but out in the outer harbour

the seas are breaking enormously high—perhaps 25 metres—in a white spray which is most impressive, but alarming.

There is still fog offshore and a big swell.

Later in the evening it clears up—for a short while it is completely clear, but fog returns later. The barometer climbs steadily, but the day is grey and overcast without any certain improvement. There is mist round the feet of the mountains of Kap Cort Adelaer.

September 26th.

Turn out at 4 a. m., and magnetic observations are begun as soon as there is light enough. At 4.45 Wittrup and I go to the mountain and in an hour have climbed 300 m, almost to the top of Kap Rantzau.

We get to the top and stand at the edge of a deep—almost dizzy—precipice. At its foot boil the breakers in spurting vividly white spray. We see peaked ice mountains—Napassorssuaq Fjord—and have a view away over Anoritôq's granite dome, flat and bleak, polished by wind and sea, away over the islands of Qutdlît,—as far as Kap Tordenskjold's proud massif, and away beyond that to Kap Trolle.

It is calm to seaward without much ice—just a line running out from Inugssuit.

Out to sea it is fairly clear, as also beyond the mist-shrouded Kap Cort Adelaer. It is clear over the Skjoldungen district, but Kap Tordenskjold is blue and the inland ice has an ill-omened dirty tone. In vain the sun strives with clouds and fog, changeful from minute to minute. It is calm and almost free of ice beyond Anoritôq, but to the south the heavens are heavy with rain and threatening. We take photographs and descend. At 9 we are ready to sail and get under weigh at 9.30, but already the barometer has begun to fall. We work through the ice-bergs, often through such narrow channels that the engine has to be used to assist navigation. A mighty swell rushes like a cataract through the small channel which is our only way out. Bangsbøll is of the opinion that the risk is too great if the chance be taken, and since fog seems to be returning we about ship and return.

An hour afterwards it is thick weather. Rain, rain and more rain and soon after northeasterly storm which again during the afternoon and evening freshens to the same hard weather we have just had.

Ah—Patience.

Otherwise we are grateful and pleased with our good harbour which brought us through all the squalls of the previous storm. A good deal of ice drifts in on to us.

There is a grim stillness between two squalls. One waits and waits, knowing the next will come; time drags on, and then it comes howling

down through the rigging, listing the boat over as it becomes more violent with driving rain; then once again it is calm, collecting its forces for the next discomforting blast.

Will the anchors hold?

At last on September 28th they came clear and proceeded in fog over a swell southwards, finding at about 7 p. m. a way into an excellent harbour on the north side of Ilivileq. Knud Rasmussen called it Wittrup's Havn and wrote in his diary:

"A pleasant evening—there develops always a mood somewhere between comfort and relaxation when harbour is made after a trying day during which there is always the chance of having to keep the sea or being driven far out by the strength of the wind. These possibilities are especially disquietening now when fuel reserves are so very low.

During these days we have aquired a respect for the sudden changes of weather."

On September 29th the weather at last cleared up. At 5.50 a. m. they continued the southward journey through the sound inshore of the large island Ilivileq—having close at hand a rich and fertile landscape with plentiful vegetation on all islands and slopes towards the east. At 10.30 a. m. Kap Wallø was passed, and now there was every reason to think that Lindenows Fjord could be made; but at midday they were suddenly overtaken by a violent northwind (avangnaq) which came in driving squalls, so course was altered into Nanûseq Fjord where at 18.25 anchor was let go at the head of the fjord.

September 30th was again a rest day. Knud Rasmussen, Hans Bruun and old Christian were put ashore at the mouth of the stream and walked from there over the low pass to Narssaq.

There was great rejoicing when Holtved's party was met again, and all was made cosy with the stove burning in the hut.

"We have been through so much that it seems a miracle to be sitting once more in a warm room," wrote Knud Rasmussen.

During the afternoon Holtved and Anton went over the pass to Nanûseq to visit the "Dagmar" party.

On October 1st the "Dagmar" sailed to Narssaq and thereby assembled the whole expedition again. The day was marked by a festive evening in the little hut.

On October 2nd the shore station was closed, and stores were brought into the "Dagmar" and the little motor-boat "Apartoq"; the latter had arrived on September 30th at Narssaq from Nanortalik, in charge of the Greenlander Augustinus Kleist. Departure at 8.30 a. m. The two motor boats sailed in company inside Dronning Louises Ø (island) and so inside the skerries to the old dwelling place on Aluk, where Holtved and Bruun were put ashore to examine the ruins there. At 1.45 p. m. the

Fig. 9. View from the summit of Dronning Louises Ø across Lindenows Fjord.

entrance to Prins Christian's Sund was reached, and at last at 6.45 anchor was let go in the harbour of Augpilagtoq.

When, in the evening of October 3rd, the "Apartoq", which had been sent back to fetch Holtved and Bruun, was once more in Angpilagtoq harbour the whole expedition was assembled and therewith the journey to the East Coast successfully concluded.

V. The Work of the Archæological Party in Lindenows Fjord.

Erik Holtved has given the following short account of the work and sojourn in Lindenows Fjord during the "Dagmar" party's journey to Angmagssalik.

"On August 21st arrived at Narssaq at about 4 p. m.

On the 22nd the "Anders Olsen" took Anton, Esajas and me in to Tiningnertôq and landed us and the little dinghy before returning to Julianehaab.

There were no ruins at Tiningnertôq, but many plants were collected and pressed.

On August 24th camp was shifted to "Stendalen", a site somewhat further down the fjord with a few ruins.

We shifted again on the 27th to Igdlukulik, where digging took place until September 4th.

On September 5th we rowed out to Nanûseq and began to work on the ruins there. In the afternoon of the same day we had a short visit from a Norwegian sealer. I rowed out to ask for news, but did not go on board. After they had given us a few loaves of bread, they sailed away again. In Nanûseq bad weather and rain began to set in. Some salmon were caught.

On September 9th we rowed across to Kûgârmiut on the south side of the fjord, and started work on the ruins. We were a good deal inconvenienced by rain.

Not until the 13th did we get such good weather that we could row back to Narssaq and begin excavating the sites there.

On the 21st and 22nd I walked overland to the sites Nunatsuk and Pamiagdluk; the weather had become so unsettled that we could no longer make excursions in the dinghy.

The work in Narssaq was continued until the 30th, when Knud Rasmussen, Hans Bruun and Christian Poulsen came by foot over the pass from Nanûseq Fjord.

On October 2nd Hans Bruun and I went in the "Dagmar" as far as Aluk, where we were put ashore; but on account of snow there was not much to be seen. The next day we were fetched in the "Apartoq" and met the remainder of the expedition that evening in Augpilagtoq.

VI. Conclusion of the Expedition and Journey Home.

On October 3rd and 4th the expedition remained in Augpilagtoq in very unsettled weather.

On the 5th, at 5.30 a. m., the voyage was continued, first to Frederiksdal and thence to Nanortalik, which was reached at 2 p. m. Everywhere the expedition was warmly welcomed, by Danes as well as Greenlanders. In Frederiksdal the expedition was entertained by the settlement to coffee, and for Nanortalik Knud Rasmussen has written only the one word, Cannonade, indicating that the reception was hardly less hearty.

The Greenlanders, with the exception of Christian Poulsen, were

payed off and put ashore one after the other as they reached their homes. They had all, in fair and foul, displayed excellent behaviour and given valuable assistance. Knud Rasmussen could hardly find sufficient words of praise for them.

On October 6th Mr. Oldendow, Chief Administrator of South Greenland, came from Godthaab to Nanortalik in his large motor-yacht the "Holbøll" and gave the expedition valuable help in many ways.

October 7th. The diary states here abruptly and to the point: "The great surprise: Watkins' expedition arrived at 2 p. m."

Knud Rasmussen himself later told me that it was not merely a surprise, it was a great experience to meet the party. Watkins, Lemon and Courtauld had made the long journey from the expedition's base near Sermilik Fjord to the Julianehaab district in an open whale boat—something of the "Manne" type—with an outboard motor. "A distinguished achievement" Knud Rasmussen called it, deservedly; and added "I have seldom seen an expedition with so little equipment and would hardly have believed it possible to make such a journey at that time of the year."

On October 8th Frederiksdal was visited.

On October 9th the expedition was again in Nanortalik, where the party divided. Knud Rasmussen, with Christian Poulsen as his only companion, transferred into the little coasting schooner the "Bjørnen" belonging to Julianehaab. He would remain there for a period, while the rest of the expedition continued to Julianehaab to connect with a cargo ship homeward bound from Ivigtut.

The "Dagmar" party arrived on October 10th at Sârdloq and reached Julianehaab at 9.10 a. m. on October 11th.

At once work of laying up was begun; the motor was greased and gear put into store which would be needed next year.

Svend Nielsen and Johs. Olsen voyaged with Mr. Oldendow in the "Holbøll" on October 13th to Ivigtut, where they arrived on the 14th. They left Ivigtut on October 17th in the steamship "Marie Toft", reaching Copenhagen on October 30th.

For Knud Rasmussen the journey to the southern district worked out as follows:

On October 9th at 10 a. m. departure to Sangmissoq, where a stay was made next day.

October 11th spent in Itivdleq where Knud Rasmussen visited many houses, including that of a hunter called Augustinus Sigismundsen, who had in 1931 received royal regognition and reward for his courage and resource in a deed of rescue. Knud Rasmussen wrote in his diary the following charming phrases spoken by Augustinus:

"Greet the King and thank him for showing that his perception

and his memory reach even us, who have no white men amongst us[1]) and who live furthest away of all."

And Knud Rasmussen adds:

"The certificate of honour hangs below pictures of the King and Queen in a poor man's hut—and gleams—!"

On October 12th the settlement Nûk was visited.

Alone amongst the Greenlanders Knud Rasmussen had many experiences. He saw, he listened, he lived amongst them and into their life and work; all the time sketching the scenes into his pocket book for later use in little pungent sentences which make the whole scene so vivid. For instance he notes on the 12th:

"The old woman's (53 years) humour—her happiness. First of all: the street-urchins in tattered rags, crying Hurrah. What a sense of humour! Some of them were clothed in such rags that penis and rump and everything else were exposed.

The fat and happy mid-wife.

The young dissatisfied bolshevik, who wanted a special rate of pay for Sunday.

Boiled halibut in a chamber-pot—!

The old woman in Nigertarmiut who at once put my cigar into her mouth.

The old woman who sold her lamp—a large one of soap stone—to a Swede and now has to manage with a sardine tin."

In these little happy glimpses the whole visit to the settlement can be visualised from the reception on the gangway to the feast of honour in the primitive hut. There were festivities, humour and enjoyment in spite of the frequently very poor circumstances.

October 13th. Spent sheltering from bad weather in Augpilagtoq. "Rain—abominable weather—but as cosy as you like in the boat" wrote Knud Rasmussen. Besides the "Bjørnen" the Danish fishery inspection vessel "Maagen" was also in the harbour.

October 14th. Improvement in the weather. Voyage continued to Narssaq in the "Maagen", while the "Bjørnen" sailed for Nanortalik. The swell outside was, however, too great, and shelter had to be sought in the fjord. "A comfortable, pleasant day. Outside, the boiling ocean; here, we lie in a lake", narrates the diary.

October 15th. Continual improvement in the weather, but a very high sea running. The party reached Frederiksdal and collected post from Denmark. A lecture about the journey was later given to the people of the settlement.

October 16th. Early in the morning Igdlukasik was reached and thence Nanortalik.

[1]) There are no Danes living in the settlement.

October 17th. A rest day with a lecture in the evening.

October 18th. The diary states: "Departure to Julianehaab, via Igdlorpait, Lichtenau, Sydprøven, Sârdloq. Arrival in Julianehaab at 9 p. m." The journey was finished.

The voyage home.

For Knud Rasmussen the stay in Julianehaab did not last long. The time went quickly with the various preparations for the journey and packing. Here also a lecture was given about the journey, and here again the people of the south district showed an intense interest in the whole question of eastern Greenland.

In the morning of October 25th Knud Rasmussen left with the remainder of the expedition, *viz.* Bangsbøll, Wittrup Hansen, Tokking, Bruun and Holtved in the motor-boat "Anders Olsen" for Ivigtut, where they arrived in the forenoon of the 26th. The homeward journey from Ivigtut took place on the 29th in the Cryolite Company's "Julius Thomsen", which arrived in Copenhagen on November 10th.

VII. Results.

The 6th Thule Expedition was a reconnaissance journey and throughout was planned as such. If the results are to be fairly assessed, they must be viewed with this in mind.

The voyage, both planned and carried out with remarkable rapidity, in a motor-boat of perfectly normal construction without any special provision for ice navigation gave the new and welcome result that this coast, previously so completely blocked with ice, was, in the months of August and September, perfectly practicable for navigation in motor-boats.

In those places into which it had previously only been advisable to enter with an umiak, which could be quickly beached or hauled up on the ice there was now free passage for larger craft. If this improvement were maintained, new possibilities would be released for a more intensive exploitation of the short working season of the East Coast—the months of July, August and September. Until this period the coast is completely blocked with heavy pack; and afterwards the unsettled and stormy autumn weather sets in with such force as to prevent further field work.

Through the boat and aeroplane journeys of the Watkins' Expedition and through the "Dagmar" party's voyages it was as if much of the magic, remoteness, and inaccessibility of the South-East Coast of Greenland had vanished. Once more the route from Julianehaab to Angmag-

ssalik was open. Just as Knud Rasmussen in the years 1902—1904 on the "Literary Expedition" under Mylius Erichsen took part in "building a bridge" between Upernavik and Kap York, so had he also here built a bridge in opening the Greenlanders' old connecting route between Kap Farvel and Angmagssalik.

The most important scientific results were the magnetic observations. Johs. Olsen has given the following brief account of the scope and methods of the investigations:

"The magnetic researches in East Greenland comprised a determination of the strength and direction of the magnetic field at the places visited by the Expedition. Where the sojourn was of longer duration, further observations were made on the daily range of the declination.

A full magnetic station comprised a determination of the three magnetic elements: declination, horizontal intensity and dip. The direction of the field was taken with a declination magnet rotating in a pinol bearing, resting on a steel point. The magnet could be reversed during the observations. The measurement of horizontal intensity took place by determining the period of swing for a special magnet and at the same time in observing the deflection produced in another magnet placed at a known distance (Gauss' method). The dip was taken with an inclinometer equipped with two inclination needles in which the magnetisation could be reversed with two bar magnets.

A further part of the equipment was a light expeditionary theodolite with a horizontal circle, which was used for the determination of azimuth and as an adjunct to the instruments used in the other determinations.

In all were twelve stations occupied in East Greenland. Further magnetic observations were made in all seven stations in West Greenland, viz. in Augpilagtoq, Nanortalik, Julianehaab (two), Igaliko (three).

The daily cycle of variation was observed in Julianehaab, Nanortalik, Augpilagtoq, Eqalungmiut, "Eskimonæs", Angmagssalik and Kûngmiut. Altogether some 4000 determinations of variation were made. Corresponding observations of the daily cycle of horizontal intensity were made in a lesser degree in Julianehaab and Eqalungmiut.

The magnetic survey of East Greenland must be regarded as a necessary supplement to the geological investigations of the country, since the changes in the magnetic field from point to point can give weighty indications of subterranean geological features. To this comes the fact that until now the magnetic field in arctic regions had been little observed; every survey of a hitherto little known district makes a valuable addition to the construction of better maps of the magnetic elements for the world as a whole. Such maps are not merely of scientific interest, but also of the greatest practical importance, since ships and

aircraft in using the compass have need of the precise knowledge of the variation at any point of the earth's surface.

A novelty in this type of observation in the arctic regions was the importance attached to the precise determination of the daily cycle of variation, wherever conditions allowed. The method of work employed is based on the fact that magnetic conditions in the Arctic vary so rapidly that, merely by observing the needle for a few hours, some information can be obtained of its normal position. During the survey in East Greenland there were examples of a change in variation during eight minutes of the order of $2^1/_2{}^\circ$. Such phenomena could reasonably be accepted as a prediction of a vigorous aurora display, which indeed appeared as soon as the sun had set.

The results will be published in "Meddelelser om Grønland".

In this way the stretch of the East Coast visited by the expedition is better surveyed magnetically than any corresponding stretch of the West Coast. A further significance is given to the results by the fact that all these magnetic investigations were taken in the year before the Polar Year 1932. Denmark is the only country of those taking part in the Polar Year observations that can produce a preparatory set of results of this kind.

In the course of the archæological work Holtved excavated and examined in all twenty-five sites of houses, obtaining a collection from Lindenows Fjord of over 2000 examples, all of which were presented to the National Museum in Copenhagen.

The whole of this material has been examined by Therkel Mathiassen and published in Medd. om Gr., vol. 102, No. 2.

The many varied, but widely distributed archæological investigations carried out by Knud Rasmussen himself during the voyage to and from Angmagssalik—especially those at Ruinnæs in the Skjoldungen Fjord—were of great value to the work done under Therkel Mathiassen's leadership on the 7th Thule Expedition, indicating as they did the districts in which the most valuable detailed work could be begun.

A quantity of botanical and zoological material collected by the "Dagmar"s crew on the journey to Angmagssalik was lost during the storm, as it was packed in boxes in the large dinghy that went adrift on that occasion. Only those plants collected by Erik Holtved came back and have been examined and dealt with by Seidenfaden in Medd. om Gr., vol. 106, No. 3.

The survey work under the leadership of Lieut. Cdr. Bangsbøll was especially directed towards the Skjoldungen Fjord, where the party succeeded in making a sketch map of the inner part of the fjord. All this work could, however, only be carried on with difficulty as long as the duties connected with the boat had to be done, and further trouble

was caused by the bad weather. Since the fjord was entirely resurveyed in the succeeding summer there is no reason to reproduce specially the sketch of 1931. Of much greater importance was the excellent information collected about the harbours and refuges along the coast. The boat's crew also obtained these details under Bangsbøll's leadership, and the information was naturally of the greatest value to the crew of boats during the many journeys of the two following expeditions.

For the results reference should be made to the section on harbours of the south-eastern coast, page 206.

Finally it should be mentioned that the expedition's two photographers, Svend Nielsen and Wittrup Hansen, brought back a number of excellent pictures, both still and motion pictures.

For Knud Rasmussen himself the journey was a great experience. The South-East Coast of Greenland impressed and inspired him. He felt that there was a great field of work there which awaited his attention. The incomplete map of the Skjoldungen district was the incentive to an entirely new and systematic survey of the whole South-East Coast; the sight of the many ruined houses led his thoughts to the rich life which once had been lived here and compelled investigation of the possibilities of again turning the coast into a populated region.

Se "Knud Rasmussen's Posthumous Notes On The Life And Doings Of The East Greenlanders In Olden Times" edited by H. OSTERMANN in Medd. o. Gr. Vol. 109 No. 1.

Thus the results of the 6th Thule Expedition were nevertheless ample, not least because they gave the impulse to the many sided investigations and operations which fall under the single heading, the 7th Thule Expedition 1932—1933.

THE 7TH THULE EXPEDITION
1932

I. Introduction.

After his return from the 6th Thule Expedition Knud Rasmussen immediately began to work out his plans for the investigation of the South-East Coast of Greenland, and especially the stretch from Kap Farvel to Angmagssalik. During the winter the wish to make his investigations comprise the whole distance from Kap Farvel to Scoresby Sund grew stronger and stronger. It so happens that in the course of time this stretch had become the part of the Greenland coast of which we possess least information, partly because the pack-ice has made it a closed country, and partly because the country in itself is so extremely inaccessible that Knud Rasmussen was perfectly justified in calling it the most difficult coast in the world.

Knud Rasmussen fully realized that this task could not be solved by a single expedition, but that several voyages would be required, and the first of these he intended to take place to the area round the Skjoldungen Fjord, which by a singular coincidence had never been properly surveyed.

The first map of the whole outer land or, more exactly, the outlines of the coast from Lindenows Fjord to Dannebrogs Ø dates from the pioneer journey of W. A. Graah in 1825—28. Unfortunately Graah lost his map sketch of the Skjoldungen area, but having wintered there — at Imarsivik—he was so well aquainted with the region that he could reproduce the main lines of the country from memory and among others those of the Skjoldungen island and fjords.

On the Umiak expedition undertaken by Holm and Garde in 1883—85 the whole distance from Kap Farvel to Angmagssalik was resurveyed, Holm measuring the northern and Garde the southern part. According to the standard of those days this survey work was an excellent piece of work and supplied many new details, also in some cases information as regards the inland; but by another and still more singular coincidence neither happened to survey the Skjoldungen district. Consequently, also in this, the second map of those parts, the gap had to be filled by the map sketch drawn by Graah from memory, and thus matters were left until 1932, in other words, for more than a hundred years.

This fact is quite obvious for anyone sailing along the coast with Holm's and Garde's map before him; until the stretch between Sehesteds Fjord and Bernstorffs Isfjord the use af this excellent map is a great pleasure, but thence it suddenly becomes difficult to find one's whereabouts, and one must grope one's way, as many details of the map do not agree with actual conditions. This discovery was made by Nansen, when in the spring of 1888 he drifted by on his ice floe, and Knud Rasmussen experienced the same surprise, when in 1931 he made the trip round Skjoldungen in the "Dagmar".

It was therefore quite natural that Lieut. Cdr. Bangsbøll commenced his survey work in the Skjoldungen district. It was clear to everybody concerned that this was the obvious task, though too great and exacting considering the time and the instruments at the disposal of the expedition.

Knud Rasmussen, however, fully realized that this was first and foremost the place to carry out a piece of modern, rational mapping. After consultation with the Geodetic Institute of Copenhagen the present writer was put in charge of the survey work, besides being appointed second-in-command of the Expedition, and this being done, the final work of preparing for the 7th Thule Expedition 1932 was proceeded with under the leadership of Knud Rasmussen.

On the strength of my experiences of survey work in West Greenland I concluded that it would be possible to carry out a terrestric-photogrammetric survey of this area in the course of the summer, but the desire of including an aeroplane for use of mapping was naturally fervid; consequently, all our energy was directed to the attainment of this purpose, and at the last moment our efforts were crowned with success.

The possibility to procure air-photographs of a given area absolutely revolutionizes the work on the ground, and not least in areas so inaccessible as this stretch of coast. A good deal of the survey work which requires most time and trouble can be done directly from the air-photographs. In this manner the area which one surveyor can determine by points on the ground becomes so much greater, and consequently it is possible to utilize the working hours much more intensively, which is of essential importance on the East Coast, where the pack ice excludes navigation before July 1st, and gales prevent all systematic work after October 1st. When subtracting from this the time which it takes to travel to the field of work and back again, it only leaves about two months of actual working time.

For the work of the expedition the acquirement of the aircraft meant not only that it became possible to map the 50 km of the Skjoldungen district, but also that the investigations could be extended to

Fig. 10. Knud Rasmussen, Wittrup Hansen, C. Jørgensen,
Th. Petersen, H. Jacobsen, O. Nielsen, Østergaard, Tegner, Bøgvad, C. Madsen, R. Sand, Gabel-Jørgensen, L. Jensen, Erik Rasmussen.

comprise the more than 500 km long stretch of coast from Kap Farvel to Umivik, an extension which necessitated a considerable increase both of personnel and material.

A re-survey of the whole coast, including the part which had already been so efficiently mapped by Holm and Garde, was not only justified by the fact that the whole of the technique of mapping had undergone a rapid development in the fifty years which had elapsed since then. By means of air-photography it had now also become possible, to map the large area between the coast and the inland ice, the features of which had hitherto only been quite loosely sketched, or which had not yet been visualized by the eye of man.

Map making by means of air-photography is the ideal method in these parts, indeed over long distances practically the only possible one, seeing that the country is so incredibly wild and inaccessible. But these air-photographs alone, which are the easiest to procure, unfortunately do not solve the whole of the problem. The difficulty is to find the fixed points, four for each photo pair, which are necessary in order to make use of the air-photographs, in itself a considerable number of points to be measured, and this necessitates much sailing about in difficult and ice-filled waters and much climbing in a steep country filled with glaciers, where it is furthermore only possible to ascend the outer coast. The difficulties of penetrating into the interior of the coast regions are so great that special expeditions are required for this purpose.

Unfortunately it was not till the end of May that we received a final promise of an aircraft, a seaplane, which was generously lent to us by the Royal Danish Naval Air-Force, and the main lines of the survey work were thus laid down as late as May 27th, at a meeting which took place in the Geodetic Institute between Knud Rasmussen and the representatives of the naval and military air-forces as also of the Geodetic Institute.

The original scope of the expedition being thus entirely disrupted, we were confronted with an extremely difficult task, *viz.* within the fortnight which was left before our departure to procure new personnel, new instruments and more motor-boats. These difficulties were further increased by the fact that the Iceland and Greenland expeditions already departed had literally depleted the country of all available instruments and all professionally trained surveyors.

These days of preparation therefore became some of the hardest during the expedition; nearly in all respects we were obliged to reduce our demands, and we had to content ourselves with instruments which had since long passed out of use, and in many respects were even quite unsuitable for measuring in so difficult a climate. Also, the time being so short, it was unfortunately out of the question to train the non-professional surveyors; indeed, the last of them could only obtain his leave

from the Navy two days before our departure. We consequently left for Greenland, conscious of being in several respects very deficiently equipped, but persuaded that we could make up for these defects by multiplying our efforts in the field of labour.

On May 30th Knud Rasmussen at last was able to make known the final plan of the expedition.

II. Plan for the 7th Thule Expedition, 1932 (Extract).

Principal task:

1) Mapping from the air of the East Coast from Kap Farvel to Umîvik in lat. 64°10′ N.

Other tasks:

2) Geological investigations
3) Archæological investigations including, wherever opportunity offers, anthropological, zoological and botanical collections.

The start of the 7th Thule Expedition and the large scope given it by the very latest negotiations, which enabled it to undertake such important tasks, was owing to the excellent and generous support of men and institutions in many various fields. In particular I must, on behalf of the expedition, make mention of the efforts made by the following:

The Prime Minister, Mr. Th. Stauning
The Ministry of War
The Ministry of Naval Affairs
The Geodetic Institute
The Administration of Greenland
The Cryolite Mines and Trading Company
The Øresund Chemical Manufacturies
The Raben-Levetzau Fund
The Carlsen-Lange Fund

for which efforts I offer my most heart-felt thanks.

The expedition has the exclusive use of the following craft:

1) M/S "Th. Stauning", mother-ship for flying party
2) M/B "Dagmar"
3) M/B "Manne"

and also for shorter periods the disposal of two hired motor-boats.

The programme of the work to be carried out is as follows:

A. Geodetic Operations.

The fixing of control points.

At the earliest moment after the expedition's arrival in Julianehaab the two motor-boats are to start together with the two hired boats and with the survey party and the geologist on board; the route to be followed is towards south through Prins Christians Sund, and from there up to the Skjoldungen districts, reconnoitring along the East Coast for harbours suitable as flying bases, in accordance with experiences gathered in the course of the 6th Thule Expedition of 1931.

On arrival in the field of work the hired boats are to be sent back and the survey parties distributed in two boats to proceed independently with the fixing of control points along the coast from the north southwards.

Flights.

The personnel and materiel are expected to arrive in Ivigtut about July 8th, and here the seaplane is to be mounted and exercised.

To secure the safe transport of the plane on the journey up and still more on the journey down, it is considered advisable to use the transport case of the Heinkel machines.

As the period calculated for the training is three weeks in all, the spare time may, weather and ice conditions permitting, perhaps be used for an air survey of the areas round Ivigtut and Julianehaab.

The M/S "Th. Stauning" which is to act as a mother-ship for the flights along the East Coast, is to proceed from Thule with the leader of the Expedition on board. It is expected to arrive in Ivigtut about August 1st, from where, at the earliest opportunity, it will start to Lindenows Fjord, carrying the personnel and materiel of the flying party with the following exceptions:

machine
pilot and
mechanic (wireless operator)
and a small depot of fuel.

As soon as possible after the mother-ship's arrival in Lindenows Fjord, the flight from Ivigtut to Skjoldungen takes place in the safest manner possible and with a landing at Lindenows Fjord. After the arrival at Skjoldungen the survey flights commence. In order to secure the closest possible collaboration between mother-ship, flying party and surveyors both the leader of the expedition and the leader of the survey work will be present at the beginning of the flights here.

The air survey begins at Umîvik, moving in a southern direction, the mother-ship following and all the time making use of the harbours reconnoitred by the survey parties on their voyage up.

The last flying base is expected to be in the Lindenow district, and

from there the meteorological service will again be carried out in communication with the wireless stations of Ivigtut and Julianehaab, so as to secure, in the best possible manner, the return flights of the seaplane to Ivigtut, where after the conclusion of this flight the plane will be dismounted and sent home as soon as possible, together with the pilot and the two mechanics.

On the receipt of the report at Ivigtut of the safe arrival of the seaplane, the "Th. Stauning" leaves at once for Copenhagen, with the remainder of the flying personnel and the scientific collections.

The flights being ended, the survey parties are to continue with the fixing of control points and to proceed in a southerly direction, so that the last of the parties may be in Prins Christians Sund about the middle of September; from there they proceed to Julianehaab where everything is made ready for the return journey which is to take place at the earliest opportunity.

B. Geological work:

The preparation of a geological map of the largest possible area from Kap Farvel as far as Umîvik, to continue and control the geological map from Gustav Holm's expeditions.

Simultaneous investigations of:

The strike of the gneiss and other conditions relating to it;

The boundary between the younger eruptives and the gneiss and the mutual relation of the latter etc.;

The direction and age of diabase and other dykes;

Changes of level, particularly such as refer to raised shore lines;

Traces of former glaciation;

Glaciers and inland ice;

Drift ice and material carried along with it;

Further investigations of sediments and basalt and

Collections of minerals.

The geologist in the ordinary course of events follows the survey parties, the object being to make the collaboration between geologist and surveyors as close as conditions permit.

Simultaneously with the geological investigations botanical and zoological collections will be carried out, and all members of the expedition will take part in the geological, botanical and zoological collections.

C. Archæological work.

This part of the work will first and foremost include the districts round Skjoldungen and Auarqat (lat. 61°15′). The complete carrying out of these investigations, however, presupposes that the expedition

succeeds in securing the collaboration of Dr. Therkel Mathiassen, who is at present in Angmagssalik; this will possibly be arranged at the initiative of the Administration of Greenland.

In accordance with the wish expressed by Professor F. C. C. Hansen anthropological collections will be made, wherever the opportunity offers and to the extent permitted by conditions.

sign. *Knud Rasmussen.*

The plan presents a novel feature as compared with the earlier expeditions carried out under the leadership of Knud Rasmussen, *viz.* that the principal object is survey work, archæology and geology being of secondary importance. In this manner Knud Rasmussen has clearly shown that he realized the importance of producing, at Danish initiative, a modern map of the whole of our great colony, and not least of the East Coast, which was the first point of attack in the comprehensive Greenland campaign of our Norwegian kinsmen.

III. Personnel.

Leader: KNUD RASMUSSEN

Name	Position (academic degree)	Member as
Survey works:		
a. *Geodetists:*		
Gabel-Jørgensen, C. C. A.	Captain, R. I. (the Geodetic Institute of Copenhagen)	Cartographer, leader of the survey works and second-in-command of the expedition
Madsen, C. H. A.	Lieut. Commander R. N.	Cartographer
Tegner, J. V.	Lieutenant R. N.	Cartographer
Wittrup Hansen, H. J. E.	Lieutenant R. N.	Cartographer
Møller, C. A. R.	Radio Petty Officer	Wireless operator assistant
Ramstad, C. M.	Quartermaster	Engineer
Petersen, Th.	Mechanic	Engineer
Clemmensen, E.	Skipper	Skipper
b. *Flying party:*		
Rasmussen, E.	Lieutenant R. N.	First pilot
Petersen, Th. H. J.	Quartermaster	Aviator
Nielsen, O.	Lieutenant in the Reserve, (R. A.)	Photographer
Jacobsen, H. C.	Lieutenant in the Reserve, (R. I.)	Photographer

Name	Position (academic degree)	Member as
Hansen, H. C.	Cartographer (the Geodetic Institute)	Photo-technician
Jensen, L. J.	Flight mechanic	Flight mechanist
Jørgensen, C. E. L.	Flight mechanic	Flight mechanic and wireless operator
Geological investigations:		
Bøgvad, S. R. E.	Mag. scient., minerologist at the Øresund Chemical Manufacturies	Leader of geological investigations
Østergaard, K.	Fisherman and hunter	Skipper
Archæological investigations:		
Nörlund, Poul	Dr. phil., Inspector of the National Museum	Archæologist
Mathiassen, Therkel	Dr. phil., Inspector of the National Museum	Archæologist
Rasmussen, E.	Carpenter	Assistant
Fishery investigations:		
Hansen, Poul M.	Cand. mag.	Leader of fishery investigations
Toftum, A.	Skipper	Skipper
Artists:		
Hansen, Ernst	Painter, draughtsman	Illustrator
Rimmen, H. F.	Films photographer	Films photographer
Crew of M/S "Th. Stauning:"		
Pedersen, P. M.	Skipper at the Thule station	Skipper
Jacobsen, P.	Mate	Chief Officer
Frederiksen, J. C.	Mate	Second Mate
Henriksen, C. C.	Engineer	Chief Engineer
Kruse, C.	Engineer	Second Engineer
Winther, P. C. C.	Lieut.,(R.E.)Civil engineer	Wircless operator
Pedersen, B.	Baker	Steward
Karlsen, E.	Carpenter	Carpenter
Petersen, S. K.	Seaman	A. B. Sailor
Olsen, J.	Seaman	A. B. Sailor
Petersen, C.	Sailor	Ord. Seaman
Hansen, P.	Mess boy	Mess boy
		In all 37 Danes

Name	Position (academic degree)	Member as
Greenland members:		
Christiansen, Niels.....	Kivfaq at Julianehaab..	Skipper on M/B "Anders Olsen"
Kleist, Jacob	Kivfaq at Julianehaab..	Handy-man
Kleist, Gerhard	Smith at Julianehaab...	Workman onboard
Bentzen, Jacob.....	Smith at Julianehaab...	Workman onboard
Kleist, Augustinus.....	Kivfaq at Nanortalik ...	Workman onboard M/B "Dagmar"
Kleist, Jens.....	Fisherman at Nanortalik	Assistant
Johansen, Edvard	Hunter at Nanortalik...	Assistant at survey work
Sørensen, Adam.....	Kivfaq at Nanortalik...	Engineer
Silassen, Augustinus	Hunter at Nanortalik...	Assistant at surveys
Chemnitz, Lars.....	Fisherman at Nanortalik	Assistant at surveys
Hansen, Andreas	Fisherman at Nanortalik	Assistant at surveys
Hansen, Gabriel.....	Hunter at Nanortalik...	Assistant at surveys
Petrussen, Anders	Fisherman at Nanortalik	Assistant at surveys
Mathiasen, Zakæus	Hunter at Nanortalik...	Assistant at surveys
Simsen, Ferdinand.....	Hunter at Nanortalik...	Assistant at archæological investigations
Andreasen, Malakias	Hunter at Nanortalik...	Assistant at archæological investigations
Abelsen, Johan.....	Fisherman at Sârdloq...	Assistant
Benjaminsen, Apia	Hunter at Augpilagtoq..	Assistant
Jacobsen, Esajas	Hunter at Augpilagtoq..	Assistant at survey work
Assersen, Anton.....	Hunter at Frederiksdal .	Assistant
Isaksen, Abraham	Fisherman at Frederiksdal	Assistant
Poulsen, Christian	Ex-hunter at Frederiksdal	Assistant at archæological investigations
Anton.....	Hunter at Frederiksdal..	Assistant
Mathisse.....	Hunter at Frederiksdal..	Assistant
Josef.....	Kivfaq at Arsuk	Engineer
		In all 25 Greenlanders
	Total of the whole...	In all 62 members

IV. The Voyages to Greenland.

The vessel of the expedition not heavy large enough to accomodate all, the various members must undertake the journeys to and from Greenland in parties.

The vessel used for the Expedition was the new M/S "Th. Stauning" (Length: 141 ft., width: 28 ft., depth: 13 ft., speed: 11 (naut.)

miles), which had been built as a refrigerator for the transport of fish from the Faroes and Iceland.

This vessel had been chartered by the Thule Station to fulfill a double purpose in the course of the summer, firstly as mother-ship of the expedition, with especial regard to the flying operations, secondly to carry out the normal navigation of the Thule district, rather an unusual task for a fishing vessel.

It was naturally not easy to adapt a vessel to a purpose so different from that for which it had been built, but happily the "Th. Stauning" from the start possessed such excellent qualities as a mother-ship for air operations that, everything considered, it answered very well. The large, open and smooth "basin" in the centre of the ship was constructed as a carrier for the sea-plane, which could easily be taken on-board and swung out on the water with derrick and winch. On the other hand, the cabin and outdoor accomodation for passengers was very limited so that only a part of the members of the expedition could travel with the vessel.

The journeys to and from Greenland, therefore, became a separate and very intricate chapter in the history of the expedition, the actual programme for the journey up being as follows:

Summary of voyages to Greenland.

Date of departure from Copenhagen	Vessel	Members of the Expedition	Route	Arrival	
				Date	Place
June 2nd	M/S "Disko"	Knud Rasmussen K. Østergaard	direct	June 12th	Ivigtut
June 18th	M/S "Th. Stauning"	R. E. Bøgvad Gabel-Jørgensen C. H. A. Madsen C. Ramstad I. V. Tegner Wittrup Hansen	direct	June 28th	Julianehaab
June 26th	S/S "Julius Thomsen"	H. C. Hansen H. C. Jacobsen L. Jensen C. E. L. Jørgensen O. Nielsen Th. H. J. Petersen E. Rasmussen Ernst Hansen	direct	July 6th	Ivigtut
July 21st	S/S "Susaa"	C. A. R. Møller F. Rimmen	direct	Aug. 5th	Ivigtut

In Greenland the following Danes joined the expedition:
1) E. Clemmensen (from Ivigtut)
2) P. M. Hansen and A. Toftum (from the West Coast)
3) Th. Mathiassen (from Angmagssalik)
4) P. Nørlund (from the Julianehaab fjord)
5) E. Rasmussen (from Thule)

As Knud Rasmussen could not join the expedition from the start, his plan was to depart as soon as possible so as to arrive in Julianehaab early enough to take part in all the necessary preparations, and then on the arrival of the "Th. Stauning" to proceed northwards without loss of time. The navigation of Thule should be finished as quickly as possible, so that the "Th. Stauning" might be back at Julianehaab before the end of July, as the flights on the East Coast were to begin in the early part of August.

The ice in Melville Bugt is, however, not always an easy thing to deal with, being the cause of many delays on that route, but in this case the journey fortunately was very successful, and the whole of the programme given above could consequently be carried out in all details.

Knud Rasmussen had sixteen days at his disposal, before the "Th. Stauning" arrived in Julianehaab on June 29th, and during those days preparations of great importance for the accomplishment of the expedition had been made. Motor-boats had been acquired, Greenlanders had been engaged to serve as crews and to help in the work of the expedition, depots had been laid and provisions bought, while arrangements had been made as regards accommodation, and several significant agreements had been concluded with other scientists.

V. The Boat Journey to the East Coast.

On our arrival in Julianehaab on June 29th we were received by the leader of the expedition with the following joyful news:

Besides the "Dagmar", the private motor-boat of the expedition, a little-motor boat, the "Gerda", had been chartered for the whole summer, and for part of it the somewhat larger motor-boats, the "Anders Olsen" and the "Quarto", belonging to the Julianehaab settlement and the Ivigtut cryolite mines, respectively. Further, an arrangement had been made with the leader of the fishery investigations in Greenland, cand. mag. Paul Hansen, who from about medio August was to join the expedition with the M/B "Ûmarigsoq", and furthermore the archæologist, Dr. Poul Nørlund, had been invited to take part in the depot journey as far as the Tingmiarmiut district, which would enable him

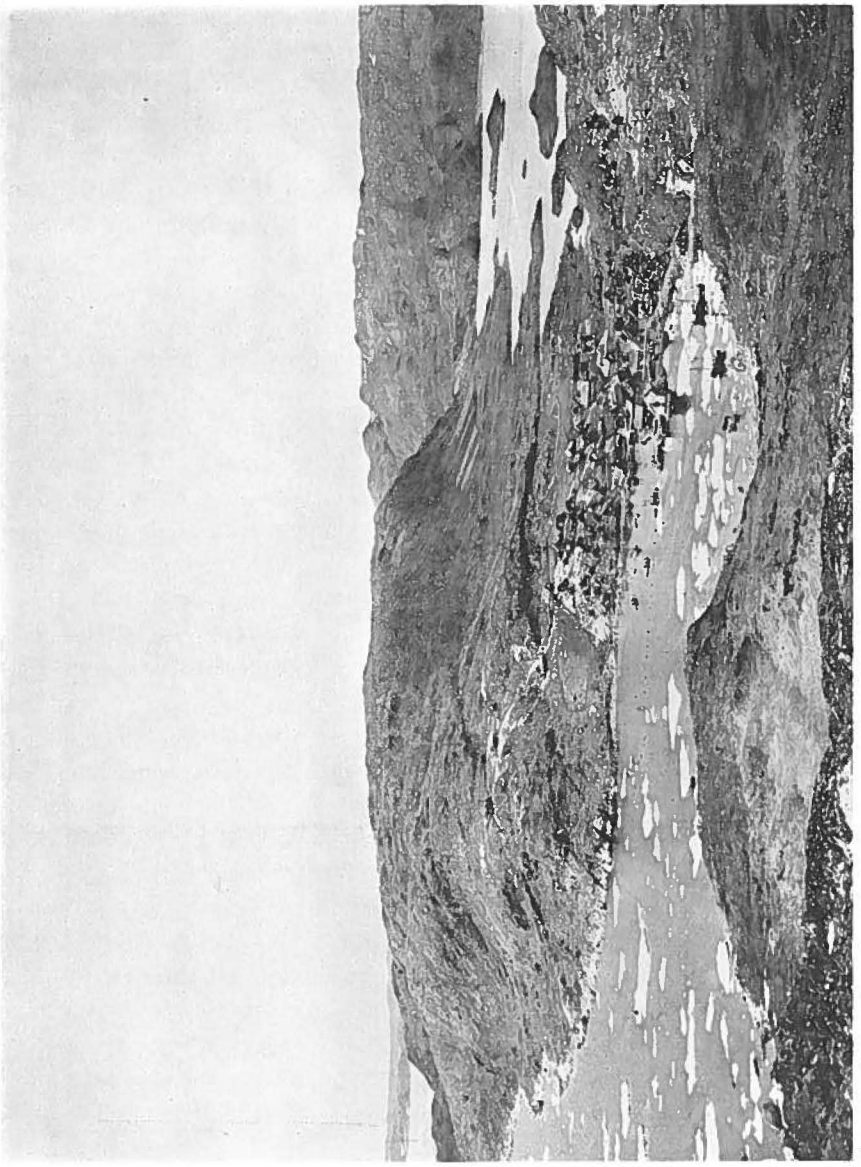

Fig. 11. Topo-photo of the Julianehaab settlement, viewed from "Peter's cairn".

to carry out some Norse-archæological investigations of the southern part of the East Coast.

Also the very important task of selecting Greenlanders for the work of the expedition had been carried out satisfactorily, whereas ice obstacles had prevented the forcing of Prins Christians Sund, so that the laying of depots of petroleum had not proceeded beyond Augpilagtoq at Kap Farvel, whereas it had been hoped that it would have been possible to reach Lindenows Fjord.

This time in Julianehaab which was spent in the company of Knud Rasmussen, Professor Hatt and Dr. Nørlund is among the most unforgettable memories of the whole journey. The days were passed in feverish activity to get everything ready, and the nights in enjoyable comradeship. Knud Rasmussen's wonderful ability to "make headway" asserted itself in the most triumphant manner during these days and nights, and he practically conjured up both men and materiel. But the parting hour was drawing near, and at a last meeting he expressed his full confidence in us, temporarily handed over the leadership to the second-in-command, Captain Gabel-Jørgensen, and wished us a happy journey. Our wishes for his and the "Th. Stauning"'s success on their northward journey were no less sincere, nor were they less warmly expressed. How we wished that their destination had already then been the East Coast; how we longed for the meeting at Skjoldungen in the first week of August, and how strange to have so part just after we had just met!

On June 29th, the "Th. Stauning" left the Julianehaab harbour— the journey to Umanak and Thule had begun. We had hoped that we would have everything ready for the departure of the boat parties on July 3rd, but owing to a number of difficulties caused by the engine of the "Dagmar" we were obliged to put it off till July 5th. However, we did not succeed in getting the engine ready for that date, and we were then confronted with the difficulty of having to leave without the leader boat and without Lieut. Wittrup Hansen. This was all the more unfortunate, as he was the only one among the Danish members of the boat parties, who had ever been on the East Coast. However, we were determined to reach the field of work as soon as possible, and as the repairs of the "Dagmar"'s engine were supposed to last for another 4—5 days, we resolved to go without it.

At 9. a. m. on a fine summer morning, July 5th, the "Quarto", the "Anders Olsen" and the "Gerda" left Julianehaab harbour bound for the East Coast. It was a memorable moment, the East Coast being for all of us wrapped in the glamour of adventure, nor were our expectations less vivid regarding the journey through the southern district of Julianehaab and round Kap Farvel. Only, it was painful to have to take leave

Fig. 12. Air-photo of Kap Tordenskjold, taken from a height of about 500 m. In the background the island of Qutdlît, just visible.

Fig. 13. Air-photo of the country behind Kap Tordenskjold, taken from a height of about 1000 m.

of the "Dagmar" and her crew—none of us knew when and where we would meet again.

Our route was laid over Sârdloq, Nanortalik, Frederiksdal as far as Augpilagtoq where the last Greenland members of the expedition and the last supplies were taken onboard, and on July 7th we entered Prins Christians Sund. Our journey had until then been very successful, the ice offering no hinderance of any kind, but now the difficulties began.

At the very mouth of the sound the pack ice formed as it were a kind of stopper, which it was utterly impossible to force. We waited until the following day, but conditions being entirely unchanged we turned about and laid our course for Ikeq Sund, the mouth of which is much broader, and where the chances for getting out seemed greater.

On July 9th we were in Ikeq Sund, Tunua and Qipisarqo. Here Dr. Nørlund had the opportunity to reconnoitre the inner parts of these fjords where he found some new, hitherto unknown Norse sites. The boats were separated in the fog, and some time was lost before they again found each other.

In the forenoon of July 10th all the three boats had safely penetrated through the rather heavy ice off the mouth of Ikeq. But the fog was still hovering over the ice, and for a few hours we went into harbour out at Aluk, from where, however, we continued in the evening in a northerly direction, arriving in the course of the night at Narssaq in Lindenows Fjord, where we anchored for the night off Tutein's hut.

On July 11th in the afternoon we again proceeded north, our route being laid through Nanûseq Fjord with a view to reconnoitring landing place and harbour for the seaplane.

On July 12th we were in Auarqat Fjord, where we visited the dwelling place at Tâterait, the grottos at the entrance and finally the dwelling place on the north side of the fjord. Here we found the gun described by Graah, which was now greatly dilapidated, and so we resolved to take it with us to Julianehaab, where it might be repaired and put up. At Aluk we also laid out a depot of fuel and left a preliminary report.

In the early morning of July 13th we continued in a northerly direction. The fog was very dense, and the boats tried to find a harbour in the lee of Kap Tordenskjold, where there was an excellent harbour basin. The day ended with a pouring rain.

On July 14th at 9 a. m. the rain stopped, and we left the harbour. We visited the Qutdlit island where we found a good and spacious harbour for vessel and aircraft, though rather exposed to the swell. By ascending a mountain I got a view of the ice towards north; it lay rather close, but not more so than that we could easily get through. As dark clouds began to gather, and the wind rose, we went into harbour at Kap Rantzau where we found an excellent anchoring place.

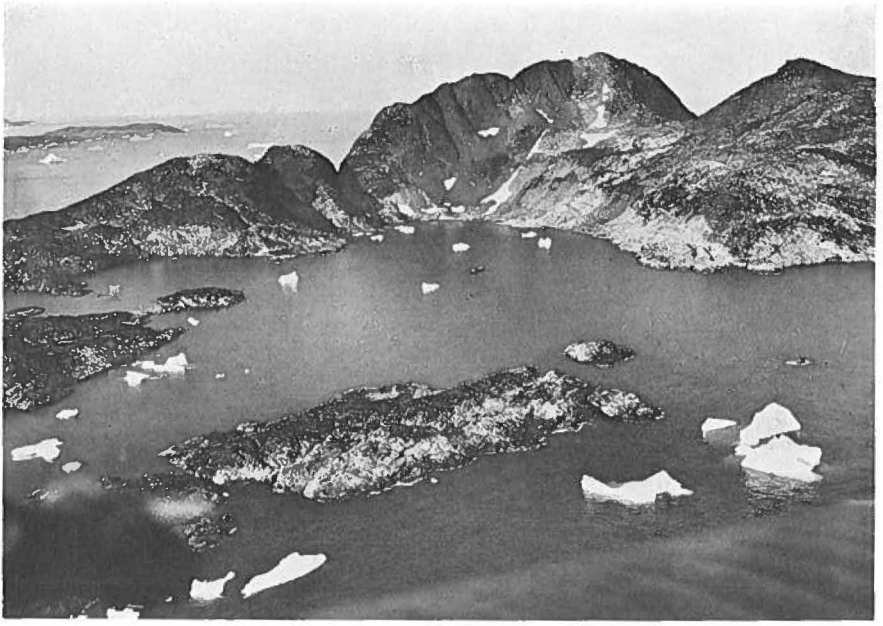

Fig. 14. Air-photo of the Qutdlît island. In the anchorage the "Th. Stauning".

In the course of the night of July 15th the sky cleared up, and at 3 a. m. we proceeded north in glorious weather. Off the harbour Clemmensen, the skipper of our boat shot a bear, the only one we saw on our journey.

The Puissortoq glacier scarcely seemed formidable, and there was not much ice outside it.

At 3,30 p. m. we reached Tingmiarmiut Fjord, where we made for the small islands to the west of Hestesko Ø. The southernmost and largest of the islands has a small natural harbour. Here a depot was established; the island was made a basis of the survey work, and the astronomical measurements were begun at once.

The journey to our East Greenland field of work had ended. The greatly feared ice had, it is true, delayed us somewhat, but it had never been so thick as to make it impossible for us to squeeze through. The weather had been excellent, as a rule quite calm, and only the arctic fog had troubled us a good deal. As an experience the voyage had surpassed even our wildest dreams. The coast is a thing of beauty, the culmination of which is the Tingmiarmiut Fjord. From the base island the view all round the horizon was perfectly wonderful. The sea and the ice in the east, the inland ice in the south and west and the splendid alpine landscape with its pointed peaks together form a unique panorama full of novelty and change.

VI. Start of the Work and its Course until the Meeting with the "Th. Stauning".

A division of the work of the expedition was now necessary. The surveys and the various investigations began at once. The astronomical stations were selected and marked out, and the observations to the sun began. The "Gerda" was set ashore at highwater to be repaired for a leak, which it had sprung in the ice, and together with Dr. Nørlund I undertook a reconnoitring trip in the "Quarto", our destination being the old dwelling place on the southern side of Tingmiarmiut Ø.

July 16th.

Bøgvad and Nørlund left in the "Anders Olsen" on a longer reconnoitring trip in the Tingmiarmiut area. The survey party measured bases and reconnoitred the first base stations. A very rainy day.

July 17th.

The survey work continued. In the evening the "Anders Olsen" turned up again, and everything was made ready for Nørlund's return journey which was fixed for the following morning.

July 18th.

The day became a day of mark.

In the morning—in fine weather—the "Anders Olsen" started southwards. Once more we had to say good-bye with heavy hearts—how we wished we might have kept Dr. Nørlund among us!

In the afternoon the weather cleared up, and we experienced our great sensation: the "Dagmar" came puffing towards us with the "Manne" in tow. In return for the boat we had lost we had now got two more, though the "Dagmar" unfortunately must be run ashore at high-water to have its screw righted.

July 19th.

The "Manne" was now turned over to Bøgvad for the use of the geologist party, the hunter Østergaard and the Greenlander Esajas acting as crew. Madsen and Wittrup Hansen measured within the base net, while Tegner and I onboard the "Quarto" left for the Uvdlorssiutit island, where the first large mountain station was measured. The weather calm and hot.

July 20th.

Tegner measured the station on the Nagtoralik island. The remainder of the survey party finished the base net.

July 21st.

Madsen and Tegner on the "Gerda" finished their work in Tingmiarmiut Fjord, while the "Quarto" and the "Dagmar" continued

Fig. 15. The M/B "Manne" and the Skipper K. Østergaard.

northwards to Graah's Havn which had been selected as the situation of the next base.

On this trip a depot was laid for the use of the geologists at the bay in Griffenfelds Ø (outer basin), but on our northward journey we met with an accident, which from the start seemed likely to throw out all our plans. Off the northern end of Griffenfelds Ø we suddenly heard a crash in the engine of the "Quarto", followed by an ominous silence. The rod and crank had been broken, bursting the cover of the crank case, which damage we were utterly unable to repair on the spot. What made the situation still worse was the fact that the somewhat faster moving "Dagmar" had been sent on in advance to reconnoitre, so that we lay utterly helpless in the ice. Fortunately, the sea was quite calm, and by dint of sails, rowing and, finally, by towing from the shore, we at last managed to get the boat into a small harbour on the northern side of Griffenfelds Ø. We made a small reconnoitring trip ashore, and in a cairn we found a report from Knud Rasmussen!! It was Ebba's Havn we had drifted into. Here on August 18th 1931 the birthday of Mrs. Wittrup Hansen had been celebrated, and the whisky-bottle containing the report still smelt pleasantly of the festive occasion.

July 22nd—24th.

Misfortunes rarely come single—at any rate not on an expedition. We were unable to catch the attention of the "Dagmar", although we kept watch on the mountain throughout the twenty-four hours and had

Fig. 16. Air-photo of the long chain of lakes on the north-eastern side of Tingmiarmiut Ø. Top right the Qingalik cliff.

large fires going. The "Dagmar" sailed by, without noticing anything, but eventually she found a report of our whereabouts, which had been left on a small cape. In the afternoon of the 24th we were together once more; a little later also the "Manne" turned up, and had we been scattered before, we were now again at last in the same harbour! It was then resolved that the "Dagmar" was to tow the "Quarto" back to Julianehaab, a resolve which, even while we took it, filled us with dismay. It was hard to say good-bye to our two largest motor-boats, but it could apparently not be otherwise. We had already kept the "Quarto" longer than arranged, and under sail alone it could not possibly get back within a reasonable period.

The days on Griffenfelds Ø were, however, by no means lost. I had reconnoitred the base and base station and measured them both as well as a main station on the summit of Griffenfelds Ø. What was

Fig. 17. Air-photo of the great fjord to the west of Tingmiarmiut Ø.

left was only the actual base measurement and determination of astronomical positions.

July 25th.

At 1 p. m. the "Dagmar" left with the "Quarto" in tow. At the entrance of the harbour the "Dagmar" suddenly struck an unknown submarine rock, and before it was possible to shift the helm, the "Quarto" ran up and smashed the rudder of the larger boat. Again an almost incredible accident! By our united efforts we somehow succeeded in repairing the damage so that the departure could take place on the following day. This was fortunately the end of our troubles; the towing back passed off smoothly, and already on July 30th Julianehaab was reached.

July 26th.

Glorious weather. Madsen and Tegner carried out the astronomical observations, while I went in the "Gerda" to the Ûmánaq peaks, which I ascended in order to finish the surveys.

July 27th.

Camp was packed up, and we continued northwards to Graah's Havn. We found a still better camping site at Imarsivik, where the main camp was pitched. We had to move in two turns, as it was impossible to transport all our goods and all the members of the expedition at one time in the small "Gerda". The second and last batch was fetched on the following day.

July 28th—30th.

A period of unbroken calm and sunshine. We grew every day more and more enthusiastic about our new camp, a very beautiful place to be in. Starting from a base at Imarsivik we built a net of triangles which was to be continued towards north and south as well as round Skjoldungen. Contact with the "Manne" established.

July 31st.

The main camp was still at Imarsivik in charge of the two old hunters, Anton and Abia. The remainder of the party continued north in the "Gerda" to Sagdliaruseq at the mouth of Bernstorffs Isfjord. In the night there came a violent storm which overturned the tents and drenched us in rain.

August 1st—3rd.

We reconnoitred the Sagdliaruseq base, measuring it and the base net; then we carried out determinations of astronomical positions and built a net of triangles with main stations which could be carried further towards north and south. A glorious place with splendid hunting. During these days we revelled in seal meat, and everywhere we found the remains of old Greenland settlements.

August 4th.

Finished measuring and again proceeded southwards. Sailed inside the skerries to Imarsivik and succeeded in slipping through the little "channel" close to the west of the camp. The "Manne" had just arrived, and we were together once more. The day ended with a pouring rain.

August 5th—6th.

The rain continued the whole of the 5th, which we used for making computations. On the 6th we proceeded with the measurements all round the Skjoldungen, starting from the Imarsivik base and passing from there through Nordfjord.

To anyone travelling in Greenland the Skjoldungen Fjord is a perfect revelation. Not only was everything new to us, but the map corresponded so little with reality that at every turn in the course of the fjord we were

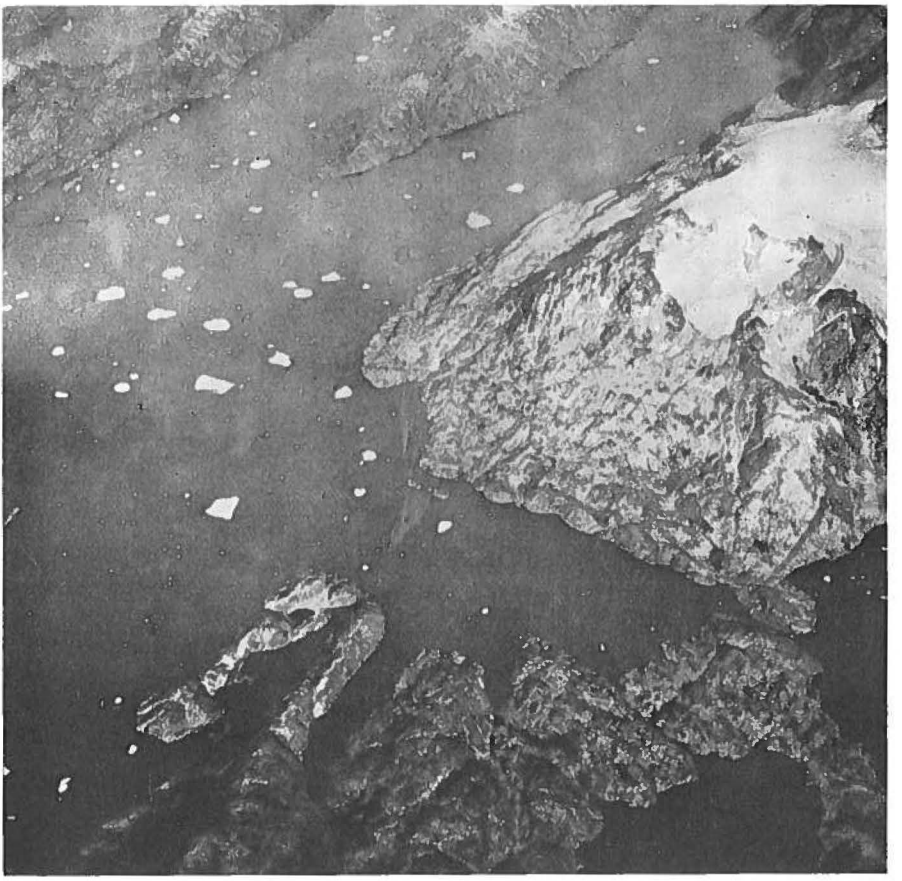

Fig. 18. Air-photo of the anchorage of Imarsivik, from about 3000 m height.

confronted with new surprises and new discoveries. We made good progress, and the many small stations where one must jump from point to point are a good way for beginners to acquire practice as regards reconnoitring and measuring. We spent some wonderful days there, greatly excited at the prospect of meeting our comrades on the "Th. Stauning" which was expected one of these days.

August 7th.

Glorious weather from the early morning. After having ended our morning survey we stood out of the fjord in the early afternoon. We were cooking our dinner, when we suddenly heard a whirr which after a while quite drowned the sound of our hissing primus. All of a sudden we realized that it was an aeroplane. Hurrah — then Knud Rasmussen on the "Th. Stauning" could not be far away! After a little while Lieut. Rasmussen landed with the seaplane close to the boat, and a few minutes

Fig. 19. Air-photo from about 3000 m height. Skjoldungen Fjord and Dronning Maries Dal (partly in shade).

afterwards I jumped onboard as I stood, and we set our course for the vessel.

This was my first flying trip in Greenland. A wonderful experience for a geodetist to be so high up in the air, and to see the country spread under him, as some day he wishes to see it on the map. Here in the air he reads at a glance the many small "riddles" which on the ground can only be solved by laborious measuring and climbing, and in minutes he ascends to heights which it would take hours to climb. What impressed me more than anything else was the sight of the peculiarly shaped peninsula, called Langenæs, which divides the northern fjord from Imarsivik. On the ground one is constantly confounded by its smooth, long valleys and their peculiar grouping, but from the air it all looked so simple. Far towards the north the bank of glaciers of Bernstorffs Isfjord were visible, and towards the south the horizon was closed by the splendid

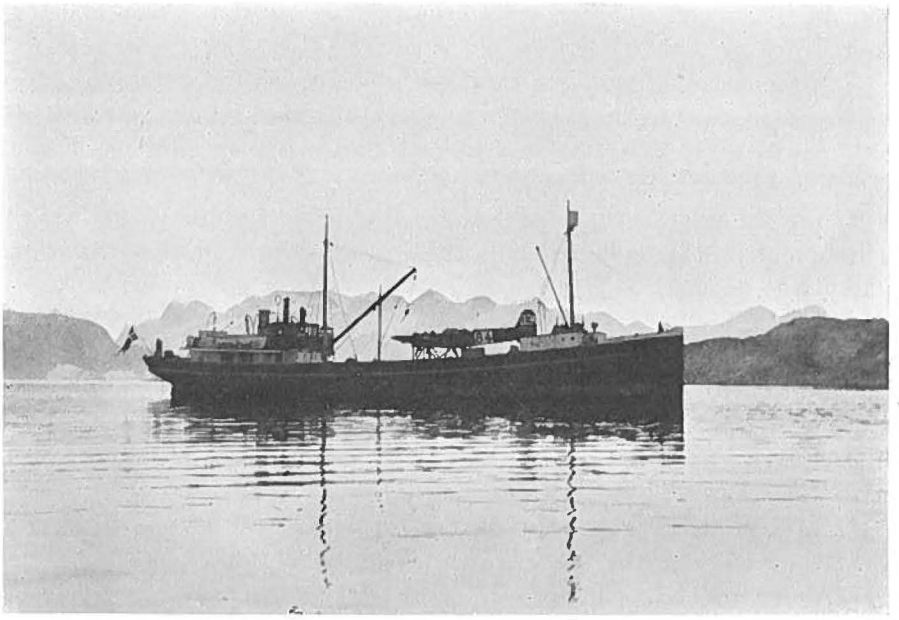

Fig. 20. The vessel of the expedition M/S "Th. Stauning" at Imarsivik.

massifs of the Skjoldungen area. Only here and there on our flight we caught a glimpse of the southern country.

The flight only lasted five minutes; then the pilot again prepared for landing. Below us, off Ruinnæs we saw the "Th. Stauning", and after a little while I stood on the deck clasping Knud Rasmussen's hand.

An unforgettable moment!

After a short consultation Knud Rasmussen accepted Imarsivik as a station and flying base; the plane immediately started in that direction, and the "Th. Stauning" set its course out of Nordfjord in order to reach it as soon as possible. On our passage outwards first the "Gerda" and later on the "Manne" were taken in tow, and late in the evening we finally anchored at Imarsivik.

VII. The new Dispositions.

Knud Rasmussen's arrival practically revolutionized the work of the expedition. As described in his own report of the journey he had on July 30th had the unpleasant experience to see the "Dagmar" coming into the Julianehaab harbour with the "Quarto" in tow. He realized at once that the expedition was in serious want of assistance. The "Dagmar" had to be put on the slip for repairs, and the seaplane was

sent to Qagssorsat in order to hire the M/S "Pomasoba" which belonged to the fishing master Larsen.

And now the "Pomasoba" lay gently rocking on the water beside the mother-ship, and the flotilla of the survey parties, which had hitherto only consisted in the little "Gerda", was increased by another boat. It was put in charge of Frederiksen, the mate of the "Th. Stauning", as Wittrup Hansen was considered indispensable for the survey party and, consequently, had to be onboard the mother-ship. And thus the whole party was assembled once more.

It was now decided that the survey party on board the "Gerda" should continue its work in the Skjoldungen Fjord for some days, and in the meantime the "Pomasoba" was to remain at Imarsivik as a base station from which the photo flights could be started. Knud Rasmussen himself was to proceed northward to Angmagssalik with the "Th. Stauning" in order to fetch Therkel Mathiassen.

In about three days we were all to meet again at Imarsivik, and then the plans for the remaining work would be finally prepared.

About midnight on August 7th the "Th. Stauning" again stood out of Imarsivik harbour—out into the dense arctic fog, and on the bridge were three old comrades: Knud Rasmussen, Captain Peder Marcus Pedersen, who for many years had been in charge of the Thule navigation, and old Christian Poulsen, Knud Rasmussen's travelling companion from the 6th Thule Expedition. On the journey the "Th. Stauning" was also to reconnoitre ice conditions in Umîvik and Krumpen Fjord in view of landing possibilities for planes.

The party further included Madsen, who had taken over the work of the mate Frederiksen, and Bøgvad, who was to carry on investigations in preparation of the geological work of the following year.

August 8th—10th.

Thus we were again scattered for a little while. In the early morning of the 8th I continued the survey work near the Skjoldungen Fjord together with Tegner and Wittrup Hansen. Besides we paid several visits at the Norwegian station out at Dronning Maries Dal.

The spell of fine weather still held good, and the days we spent in this beautiful fjord were glorious. But in the evening the fog came rolling and interrupted our work.

On the 11th we measured the tall pointed peak in which Langenæs terminates. It is about 1100 m high, and yet it looks quite insignificant besides the colossi of Skjoldungen. The view from this peak is wonderful, but there is hardly room enough to permit of walking round the instrument.

At 23,30 p. m. by moon- and candlelight we arrived at Imarsivik, where we anchored beside the "Th. Stauning" which had arrived from Angmagssalik in the morning.

Fig. 21. Air-photo from about 3000 m height. The northern fjord of Skjoldungen and the peninsula Langenæs.

August 12th—16th.

These days were some of the busiest and happiest of the whole expedition. Therkel Mathiassen, whose arrival was hailed with great joy, was sent ashore with a working team to the big house ruin, while the geologist and surveyors continued their measurings in the neighbourhood of Imarsivik.

Finally, in the afternoon of August 13th, the "Dagmar" arrived at Imarsivik. The journey had been successful, but the engine had caused difficulties, the screw having been bent, so as to make repairs necessary underway. The able young engineer of the "Th. Stauning", the mechanic Th. Petersen, had now been put in charge of it, and he proved to be the right man for this task. From the moment he took charge, the engine difficulties ceased, the last serious accident being the one which occurred on the way up, when the screw had been bent in the ice and must be straightened out. However, the days did not pass without other small

accidents of various kinds. The engine of the "Pomasoba" caused incessant trouble, and while manoevring to come alongside the mothership, the mast of the motorboat caught the projecting end of the wing of the seaplane and damaged it. This accident was all the more annoying as the weather was glorious, and soon the engineers and mechanics were hard at work, being practically engaged both day and night.

Nevertheless, these were festive days, for it was the only time when the whole of the expedition was assembled in one place. New members had joined us, having been called by wire from Denmark. Thus the artist Ernst Hansen and the photographer Rimmen had both been sent for to assist Knud Rasmussen in providing professional and artistic material to show the scenery, the fauna and human life of the southeast coast, an illustration for coming generations of the report of the expedition, in line and colour as well as in definite, vivid pictures.

Further, in order to keep up communication with the survey party, a small transmitting station had been forwarded; the radio was to be installed in the "Dagmar" and was to be operated by R. Møller, radio petty officer in the Danish Royal Navy.

Ernst Hansen had come onboard the "Th. Stauning" in Julianehaab, whereas Møller and Rimmen had made the journey along the coast from Julianehaab in the "Dagmar".

Finally the young Danish constructor and carpenter, Emil Rasmussen, had come all the way from Thule, where in 1931—32 he had been engaged in building the new hospital.

During the next few days the leader and second-in-command worked out a plan for the remainder of the expedition. Written instructions were given to the various work parties. The following is an extract of these instructions:

7th Thule Expedition 1932.
Imarsivik, August 14th 1932.

Division into parties and fields of work.

Party	Boat	Personnel	Field of work
Surveyors	1) "Dagmar" + 2 kayaks	Gabel-Jorgensen Wittrup Hansen Th. Pedersen, R. Møller and the Greenlanders: Augustinus Kleist Jacob Kleist Gabriel Hansen Anders Petersen Zakæus Mathiasen	Umîvik-Tingmiarmiut (both included)

Party	Boat	Personnel	Field of work
	2) "Gerda" + 2 kayaks	Madsen and the Greenlanders: Adam Sørensen Augustinus Silassen Anton Assersen Lars Chemnitz	Mogens Heinesens Fjord—Lindenows Fjord(both included). The two parties were to collaborate along the whole stretch, Madsen being especially in charge of the astronomical place determinations
	3) "Pomasoba" + 2 kayaks	Tegner Ramstad and the Greenlanders: Eduard Hansen Andreas Hansen Esajas Jacobsen	
airmen	following the "Th. Stauning" + 2 kayaks	no changes	Skjoldungen—Lindenows Fjord
Geologist	Bøgvad was for the time being to follow the "Gerda" and the "Pomasoba", as the survey parties were to establish a collaboration which gave the geologist the best possible chances of getting right into the field of work. Assistants were to be supplied from the survey party		Mogens Heinesens Fjord—Lindenows Fjord (both included)
Archæologists 1. party	following the "Th. Stauning" + 2 kayaks	Therkel Mathiassen Emil Rasmussen and the Greenlanders: Malakias Andreasen Ferdinand Simsen	Tingmiarmiut—Lindenows Fjord
2. party	"Manne" also following the "Th. Stauning"	Knud Rasmussen Ernst Hansen Rimmen Knud Østergaard and the Greenlander: Christian Poulsen	Bernstorffs Isfjord—Kap Farvel

Special Instructions (extract)

a) The "Th. Stauning" will act as mother- ship for the plane and will, weather permitting, be at:

Skjoldungen in the period about $^{7}/_{8}$—$^{17}/_{8}$
Tingmiarmiut - - — — $^{18}/_{8}$—$^{22}/_{8}$
Auarqat - - — — $^{23}/_{8}$—$^{27}/_{8}$
Lindenow area - - — — $^{28}/_{8}$—$^{31}/_{8}$

The survey flights must be completed by the end of August, as the "Th. Stauning" is to depart for Julianehaab on September 1st.

b) Artist and photographer will under my direction illustrate, as fully as possible, the country traversed and also the manner in which the work of the expedition is done.
c) The leader of the expedition will go by the "Th. Stauning" on its voyage along the coast, in order personnally to superintend both the flights and the archæological work.

When the "Th. Stauning" leaves the East Coast, I will take up my residence at Narssaq in Lindenows Fjord, in order to await the return of the various parties of the expedition and to make the necessary dispositions for our return.

(sign.) *Knud Rasmussen.*

About midday on August 14th Knud Rasmussen called together the members of the expedition on the deck of the "Th. Stauning"—fifty in all, Danes and Greenlanders. With the exception of Therkel Mathiassen's party, which consisted of four men, we were all assembled once more. On this occasion the new instructions were given out, and in the afternoon the "Gerda" and the "Pomasoba" headed southwards in order to start work in the southern area.

On August 16th Knud Rasmussen himself proceeded northwards with the "Manne", accompanied by Ernst Hansen, Rimmen and Christian Poulsen, whereas the "Dagmar" only started on the morning of the 17th, when the necessary repairs were at last finished. From now onwards the expedition was working at full speed in the various fields of work, and this was the last time we all met on the East Coast.

The programme laid was carried out almost to date. The main party followed the "Th. Stauning" which proceeded southwards as mothership for the flying party its actual dates being as follows:

The Imarsivik area	until	$^{18}/_{8}$
The Tingmiarmiut area	—	$^{20}/_{8}$—$^{22}/_{8}$
The Auarquat area	—	$^{24}/_{8}$—$^{29}/_{8}$
The Lindenow area	—	$^{29}/_{8}$—$^{2}/_{9}$

Within the periods mentioned above, the survey flights and the archæological investigations were completed in the areas in question.

On September 2nd Knud Rasmussen flew from Lindenows Fjord to Julianehaab, returning with H. M. S. "Maagen" on September 8th and remaining at the Narssaq camp until the 18th.

The "Th. Stauning" left Lindenows Fjord on September 3rd, it returned on the 9th and sailed from there on the 10th (via Scotland (Aberdeen) 17th) to Copenhagen, where it arrived on September 20th.

Fig. 22. Air-photo from about 1000 m height. Head of Anoritôq Fjord.

A short summary of the activity of the survey party during the last period of their stay will complete the report of the boat journeys:

The "Gerda" and the "Pomasoba".

These two boat parties must be mentioned together, as they were in very close collaboration, in the course of which Madsen more particularly carried out the determinations of astronomical positions.

In the period August 16th—30th the area from Mogens Heinesens Fjord as far as south of Auarqat was surveyed, and in the subsequent period, August 31st—September 17th, we continued southwards with Aluk as our most southerly station, though without reaching as far as the interior of Lindenows Fjord.

After having concluded our surveys we immediately returned to Julianehaab. On September 15th the "Pomasoba" and on the 18th the "Gerda" left Narssaq, the latter with Knud Rasmussen onboard. He was fully convinced that the "Dagmar" would get through, and so he did not await its arrival.

The return journey of the two boats went satisfactorily. The "Gerda", however, had rather a curious fate, for on September 26th, when lying in the Julianehaab harbour, it broke from its moorings in a gale which came up so suddenly that it was impossible to get a crew onboard. The boat was flung against the quay with the result that the bottom was knocked out of it, and it sank.

Strange that this little boat should have weathered the ice masses and the wild jagged coasts of Southeast Greenland and then met with its fate in the otherwise peaceful Julianehaab harbour.

M/B "Dagmar".

From August 17th—19th supplementary surveys were undertaken in the area immediately south of Bernstorffs Isfjord, this party collaborating with Knud Rasmussen's party in the "Manne". Newly discovered land as far as the glacier was navigated, and also the big arm of the fjord, called the "inner water" just behind Kap Møsting.

On August 20th we continued northwards to Umîvik in the most glorious weather we had had the whole summer, and at midnight we went into harbour at the Umîvik peak.

From August 21st—24th, still in very fine weather, we carried out a long series of surveys in the entire fjord area, and we succeeded in penetrating as far as the inner island. On the 24th the ice in the fjord had shrunk so much that it would have been possible to circumnavigate the great Upernârsivik Ø. We ascended the Umîvik peak from which there is perhaps one of the most beautiful views in East Greenland. Umîvik is something quite apart among the many fjord systems of East Greenland. The inland ice in smooth, even waves comes right down to the shores, only now and then with glimpses of dark rocks. Here if anywhere is the ice realm. The ice cap, the ice borders of the sea shores, the ice masses of the water and the ice domes of the islands together form a fairy scenery, of all shades from the sheerest white to the bluest blue—everything endowed with a wonderful beauty all of its own. And above everything the Umîvik peak lifts its dark, sinister cone, a beacon of a peculiar and majestic shape.

In the days August 24th—31st we had one furious gale after the other with a heavy downpour. During short pauses in the gale we ventured out from our comfortable harbour near the dwelling place Patsâjuk. Our greatest difficulty was to carry out the astronomical observations, as we had to catch the sun through the drifting clouds, and the actual length of the base must be limited to about 6 m, as it was impossible in the gale to use the long steel tape. The work in the Umîvik area was extremely interesting, giving quite a new aspect of the fjord and more particularly of the interior part.

On August 26th we received a wireless message informing us of Watkins' death, which made a strong impression on us and seemed quite inconceivable.

On August 28th we made a short stay in the place where Nansen in 1888 had made his ascension, hence starting on his famous ski journey across the inland ice. In a small cairn we found a short report, dated

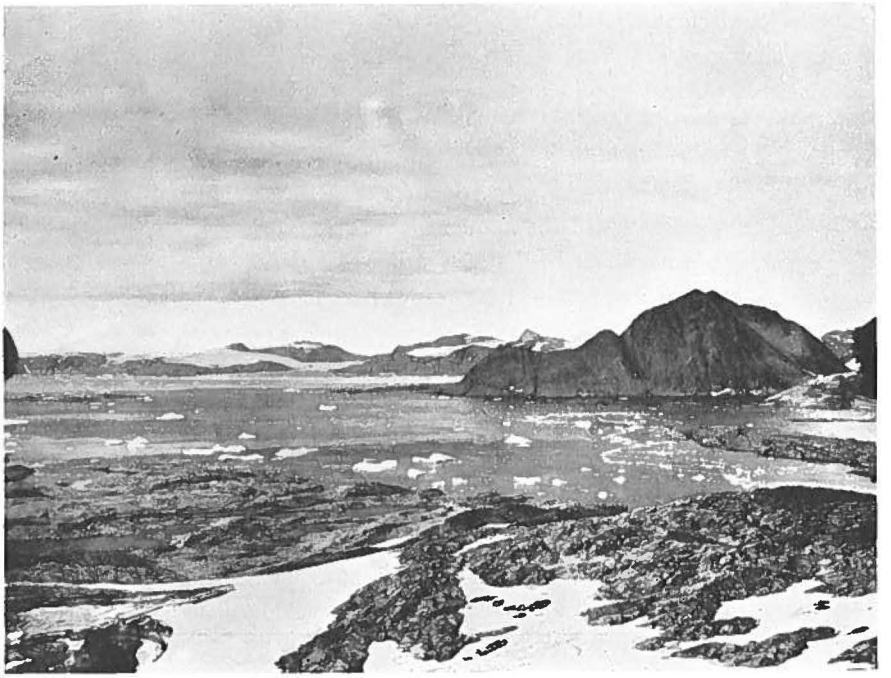

Fig. 23. Topo-photo from the summit of Gerners Ø. The Umîvik fjord and peak.

August 1931, from a Norwegian expedition, which had called there in the "Heimen" from Tromsö to try, if possible, to find some remains of the last camping site of Nansen. This report had been minuted as follows:

Umivik Sep. 3rd, 1931.

H. G. Watkins, Capt. P. Lemon, A. Courtauld called here on their way from the base of the British Arctic Air Route Expedition near Angmagssalik to Julianehaab on the West Coast.

(sign.) H. G. Watkins.

There was an inexpressible pathos in standing here with this sign of life from a young man of such exceptional gifts, and to know that he was no more. He could do everything, and the sportsmanlike way in which he and his brave companions carried out their expedition was absolutely unique and broke new ground; when at the end of the expedition he divided it into parties, which in their turn trudged the inland ice and continued down the coast in a "toyboat", it was a firework of arctic sportsmanship which could not but rouse enthusiasm and admiration. And this was only the beginning—no wonder that our expectations were raised to fantastic heights.

And now he was no more.

I shall never forget the moment when I stood there with that scrap of paper in my hand on which the live, unforgettable Gino Watkins had scribbled those few words about one of the most courageous expeditions the world.

How like him! I felt an almost unconquerable desire to appropriate this treasure. But it could not be, and I put it back into the cairn —the cairn commemorating Nansen and now also Watkins, wishing that it might remain there for ever, in the place from which Nansen started on his pioneering journey and where Watkins ended his journeys[1]).

On September 1st the weather finally cleared up; the last observations were made, and we again headed southwards. We had planned to call at Krumpens Fjord, but this plan must unfortunately be abandoned. The period of gales had caused the swell to rise to perfectly incredible heights, and the waves which were beaten back from the vertical walls of the rocks and from the mouth of the fjord with its graveyard of glaciers made a roaring sea, impossible to force in a small boat like our own. The navigation on that day was extremely difficult, and we were flung about in the most incalculable manner so that all the fixtures of our boat broke loose. The distance between Umivik and Bernstorffs Isfjord is decidedly one of the most difficult stretches of the coast, and wherever we passed, the water was always in an inexplicable state of unrest, even in calm weather.

In the days September 2nd—10th the measuring all round the Skjoldungen were finished. We spent a good deal of time with the Norwegians at Dronning Maries Dal, and we have all very pleasant memories of these hospitable people.

On September 11th—16th the systems of triangles were joined together as far as the Tingmiarmiut area, and so our task was solved. It was now up to us to proceed southwards as quickly as possible, the days being an incessant fight against the inclement, constantly changing autumn weather.

On September 17th we were at Tâterait, and in the afternoon of the 18th at the Lindenow hut; there we learned that Knud Rasmussen on that very morning had proceeded southward in the "Gerda"—he dared not keep the little boat on the East Coast any longer, and he also longed to get on with his work on the West Coast. He was fully confident that the "Dagmar" would get through, but on the other hand he knew that it would not come, until the task had been satisfactorily completed.

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[1]) On August 31st and September 9th 1931 Knud Rasmussen called at Umivik and passed the place of ascent. Thus, after not having been seen by Europeans for many years, Umivik was visited by four parties in the course of one summer.

On September 19th we passed Prins Christians Sund; on the 20th we reached Nanortalik and finally, on the 21st, Julianehaab. The last boat was in harbour, and the actual task of the expedition had been solved.

VIII. Summary of Distances operated by Sea and Air.

M/S "Th. Stauning"	approx.	6000	naut. miles
M/B "Dagmar"	—	3150	— —
M/B "Gerda"	—	1800	— —
M/B "Pomasoba"	—	1150	— —
M/B "Manne"	—	1200	— —
M/B "Anders Olsen"	—	1050	— —
M/B "Quarto"	—	1050	— —
M/B "Umarigsoq"	—	200	— —
		15600	naut. miles
	approx.	28880	kilometers
The seaplane	—	19000	— —
Total during the summer		47880	kilometers

IX. Geodetic Operations.

a. Introduction.

In "Oversigt over Medd. o. Gr. 1876—1926" Th. Kornerup gives a summary of the journeys made until 1925, with the object of contributing to our knowledge of southeastern Greenland.

The pioneer was here, as already mentioned, W. A. Graah, Lieutenant of the Danish Royal Navy, who from an umiak journey in 1828—31 brought home the first primitive map sketch of the southern area of the southeastern coast. Danish naval officers followed his track and carried on his work in the finest manner.

From 1883—85 Gustav Holm and T. V. Garde, Lieutenants of the Danish Royal Navy, carried out an almost complete re-survey of the whole distance from Angmagssalik to the northern district (see Medd. o. Gr. vol. IX).

Of later works of importance for the topography of southeastern Greenland the following should be mentioned:

In 1912 Quervain—on his journey across the inland ice from Jacobshavnsland to Angmagssalik—discovered and sketched the tall mountain area called "Schweizer Land" near the margin of the inland ice, about

150 km from the outer coast at Sermiligâq. The highest peak of Schweizer Land, Mount Forel, was indicated at 3400 m and has hitherto been regarded as the highest mountain of Greenland, but it has now been detronized by the 3700 m tall Gunbjørns Fjæld, in Knud Rasmussens Land. In 1930—32 an English expedition, "The British Arctic Air Route Expedition" with H. G. Watkins as a leader, wintered on the East Coast in the Angmagssalik area. This expedition became of great importance because it was the first to take aeroplanes to Greenland for reconnoitring and air-photography, and it brought home air-photographs, which proved an excellent link in present-day mapping (see The Geographical Journal vol. 79, Nos 5, 6 and 8).

In 1932 Ejnar Mikkelsen was the leader of the Scoresby Sund Committee's 2nd Expedition to Kangerdlugssuaq, the nearest coast land of which is now ready-mapped, and the expedition also succeeded in mapping part of the outerland of the Blosseville Kyst by means of modern terrestric-photogrammatic measuring (see Medd. o. Gr. vol. 104, Nos 1 and 2).

In the instruction given by the Geodetic Institute of Copenhagen there are distinct directions for the whole of this work.

This instruction is, with a few alterations, the same as that which was given to the surveying parties in 1933, and which is rendered nearly *in extenso* in the plan of the expedition 1933, page 136.

The field work therefore comprises both the determination of control points and flying for photography (to be described in the following paragraphs):

b. Determination of Control Points.

In the Introduction (page 42) the circumstances are described which resulted in the fact that the expedition was unable to acquire as modern a set of instruments as was required.

In all it was possible to equip each of the two planned survey groups with the following instruments:

1 Universal Wild Theodolite (little Wild), with one stand.
1 13.5 Universal instrument Wanschaff, with stand.
1 Paulin altimeter.
1 Box chronometer.
2 Naval deck watches.
2 Thermometers.
2 Pairs of binoculars.
1 2 metre measuring tape.
1 25 metre measuring tape.

Wireless Equipment.

1 4 valve short-wave receiver (transportable).
1 Field aerial.
For both groups as reserve there was also taken:
1 Universal Theodolite by Kerrn.

Of the greatest significance to the expedition was the lack of equipment for the short base technique developed by Lieutenant Colonel P. F. Jensen.[1])

It was impossible to obtain any of the necessary tripods, sighting targets or subtense bars etc, so that this, the only really efficient method, had to be abandoned completely.

The survey methods had to be laid therefore along more "old-fashioned" lines. A triangulation had to be built up from short bases measured with steel tapes, and fixed by means of astronomical determinations (to the sun) and connected together as far as possible as a further check. In this way a consequent system of points was built up which actually over considerable stretches approximated to a chain of triangles, but which was at some places only connected through isolated conspicuous points, and so was merely checked by this single control.

All in all there was constructed a strong, well-placed, well-dimensioned, connected series of polygons along the length of the coast, a series which was further strengthened and checked in 1933 with an extended series of supplementary observations i. e., base measurements, rounds of angles, determinations of azimuth and position.

Bases.

The measurement of the seven bases were made by means of the 25 metre steel tape which was standardized in the Institute before and after the expedition.

Astronomical Determinations of Position.

These, all of which were taken to the sun, were observed, in the case of Umîvik using the little Wild (by Gabel-Jørgensen), but in other stations (by Madsen) with the 13.5 c. m. Wanschaff Universal Instrument. The observations, which include longtitude, latitude, and azimuth, are very complete, but otherwise contain no special features for mention.

The time was read from the box chronometers. The comparison of chronometers took place two to four times each day during the periods of observation. The time signal from "Pontoise" was that most used. The short-wave receiver functioned perfectly. Wireless signals from Europe are very well received in the coastal regions of East Greenland.

[1]) Cf. Lieut. Col. P. F. Jensen, "Om Opmaaling i mindre Maalestokke". Meddelelse No. 6. Geodetic Institute. Copenhagen, 1935.

Triangulation points.

In all, the four observers occupied 129 stations, the principal points of these stations forming the underlying framework of the survey. Extending from these there were a number of special small triangulation systems to fix certain fjords.

Control Points.

From the stations themselves a great number—in all about 100—of natural fixed points, such as the tops of mountains, well-marked objects in snow fanes etc. were intersected.

Near Points.

The height of occupied stations was determined by the angular measurements observed (including measurements of vertical angles) to particular points at sea-level e. g. on the water line of skerries, islands, glacier faces etc. Then, using the height of the station as the vertical base, a long series of coastal points—in all about 3600—was fixed in sufficient number to be able to draw from them a connected and certain coast line.

The station was marked by driving a copper bolt into a small hole made in the rock by means of a rock drill. At most stations a brass plate was further bolted to the rock with the inscription: Geodætisk Institut, Danmark.

As soon as the observations were finished, we built a round stone cairn over the station. This was usually one metre in diameter at the base and $1^1/_2$ to 2 metres high. Then came the descent and one was clear to get under weigh for the next station.

On the "Gerda" and "Pomasoba" it was possible for each group to live onboard. On the "Dagmar" we were so many that the shore party —Gabel-Jørgensen and the Greenlanders Gabriel Hansen and Anders Petrussen—had to live in a tent on shore.

For a surveyor the summer is long and tiring. Day in and day out he must go up into the mountains in order to stand for hours in the baking sun or be plagued by flies, or frozen by the cold. On the other hand there is no one who knows the country as well as the surveyor, and the view over the mountain ranges and over the ocean is every time so thrilling that it is worth all the effort.

The summer passed without a single misfortune, and the task was completed. The gaps in our equipment gave us experience which was frequently of the greatest value in the expedition of the following year.

c. Flights.

Preparatory Work.

S/S "Julius Thomsen" arrived in Ivigtut in the afternoon of July 6th, and immediately afterwards the flying party set about landing the

plane, which during the voyage had been dismounted and packed into large cases.

On the 7th the material was taken ashore; on the 8th the fitting began, and already on the following day it was finished, thanks to the splendid technical aid which we found in Ivigtut, i. a. the large crane. As long as the plane was at Ivigtut, it was lifted after each flight on to the quay by the crane, and there it naturally was much safer than on the water.

Fig. 24. Aircraft moored at the "Th. Stauning".

On July 10th the first trial flight was undertaken, and in the course of the 11th and 12th trial photography and trial flights were made from a height of 4000 m, this being fixed upon as the normal height of the actual mapping flights; besides, we profited by the opportunity to test the special wireless station onboard the seaplane.

The programme of the flying group was:

1) Principal task: mapping flights on the East Coast of the distance from Umîvik to Kap Farvel.
2) Secondary tasks: mapping flights over the Julianehaab district, and further.
3) Special photography of the old Norse dwelling places in the interiors of the Julianehaab fjords, in support of the archæological investigations of Professor Hatt and Dr. Nørlund.

Pending the return of the "Th. Stauning" from the Thule journey the flying party set about their work on the West Coast, with Ivigtut and Julianehaab as their bases. All the flights—both on the West Coast and on the East Coast—are for practical purposes collected in the table on page 80, and so in the following mention will only be made of the flights, which are of particular interest.

Unfortunately we did not succeed in carrying out the mapping flights in the Julianehaab district. The principal cause of this was the very rainy and foggy weather during the latter half of July, and further that the mechanism of the large air camera failed so many times that constant repairs were necessary; this took a good deal of time and often happened on days which would apparently otherwise have been suitable for mapping flights. A number of photo routes were, however, carried through, though unfortunately with less satisfactory photographic results which, as will be mentioned later on, was due to technical flaws in the film and the use of a too tight fitting yellow disc.

The air-photographs taken for the use of the archæologists were rather more successful, and both Professor Hatt and Dr. Nørlund had further the opportunity to get up in the air so as to obtain a general view of this memorable region.

And now at last the journey to the East Coast was about to commence.

On July 28th the "Th. Stauning" arrived from the north with Knud Rasmussen onboard. The vessel had called at Ivigtut to fetch the remaining members of the flying party, equipment of various kinds and fuel. In Julianehaab the seaplane had also been taken onboard, and so everything was ready for the journey. The breakdown of the survey party's engine, however, caused the departure to be delayed for a few days, but finally, on August 3rd, it took place from Julianehaab, and on the 4th the expedition was in Nanortalik where a day was passed owing to rain and bad visibility. On the morning of the 5th the journey was continued in a southerly direction through Prins Christians Sund to the East Coast, where a heavy swell forced the vessel to seek harbour behind the island of Aluk. On the morning of the 6th the journey was continued in a northern direction, and finally on the 7th the meeting with the geodetists took place in the Skjoldungen Fjord; the Umarsivik base was reached, and the flights on the East Coast could begin.

Aircraft.

One of the ordinary Royal Danish Navy's three-seater reconnaissance seaplanes of the Heinkel type H. M. 11. No. 84. A more detailed description is to be found in "Craft of the Expedition" page 201.

For this particular purpose the seaplane had been equipped in a special manner which is mentioned in detail under "Flights" of 1933 page 168.

Here emphasis should, however, be laid on the following points:

In order better to be able to observe the aircraft after a possible emergency landing, planes, body and floats had been painted with a striking chrome-yellow colour.

Fig. 25. Aircraft in readiness on the quay at Ivigtut.

With a view to establish communication in case of forced landings a small battery-driven short-wave transmitter was installed; also special equipment and provisions for a fortnight had been packed for the crew in case of forced landings.

As the photographer who had his place on the third seat was particularly exposed to the cold which at a height of 4000 m must be estimated at about — 20—25° C, the equipment comprised warm clothing of the type usually used by the destroyer crews (the L. B. II. type). The lowest temperature of the air, measured at a height of 4000 m, was — 22° C, but the temperature was ordinarily only about — 10—12°, for which reason the air-photographers did not wish to make use of the warm clothing, which also greatly hampered their movements. This apparel was therefore not included in the equipment of 1933.

As to the wireless equipment of the aircraft see the chapter on "Wireless, Security and Meteorological Services" (page 85).

Camera. "Eagle III".

At the bottom of the third seat the camera used for the taking of mapping photographs was built in; it was an "Eagle III" from Williamson Manufacturing Co. Ltd. London.

Focus: 6 (English) inches.

Size of the film: 5 by 5 (English) inches.

2 film chambers each with a roll of films of about 100 exposures each. The camera had an electric release, the current for which was supplied by a small windmill on the side of the hull of the plane.

This installation operated very well.

In 1932 the mechanism of the camera proved too delicate which caused many time-wasting disturbances in the work, and only because of the unusual ingenuity of the mechanic L. Jensen did it become possible to make the necessary repairs on the spot and thus to keep air photography going.

The greater part of these deficiencies were, however, corrected before 1933.

Finally our photographic equipment included two smaller cameras for the taking of special photos.

Summary of flights.

Coast	Period from — to	Days in all within the period	Number of flying days	Number of flights	Flying time hrs. mins	Number of kilometres
West Coast	$^{10}/_{7}$ — $^{2}/_{8}$	24	10	30	29 — 50	ca. 4500
	$^{3}/_{9}$ — $^{28}/_{9}$	26	12	28	22 — 50	ca. 3500
East Coast	$^{3}/_{8}$ — $^{2}/_{9}$	31	19*)	49	73 — 00	ca. 11000
Total in Greenland ..	$^{16}/_{7}$ — $^{28}/_{9}$	81	41	107	125 — 40	ca. 19000

*) of which 12 days with fine photo weather.

Air-Photographs.

All photos were taken with focus 4 (widest apperture) with a yellow disc added and a time of exposure of $^{1}/_{40}$ seconds; all the films taken are, however, underexposed.

The reason of this is partly that the film itself which was orthocromatic was too slow-working, partly that the yellow disc was too tight-fitting. These errors were corrected in 1933.

The total number of photographs taken was about 900, the greater part being oblique, taken at a height of about 4000 m, and in pairs according to the plan agreed on. Base 2.5 km; interval 7.5 km; inclination 8°.

About one fifth are tail photos taken directly astern, with an inclination of about 30° and from heights of about 3000 m. These pictures supply a number of good details, but unfortunately the horizon is not included in them, which puts great difficulties in the way of the process of adjustment.

The pictures taken with the hand cameras are all excellent.

The development of the films took place onboard the "Th. Stauning", where a small dark-room had been installed in one of the forward deck houses. It was not an ideal place, but the best which it had been possible to provide. The photo technician of the expedition, the cartographer H. C. Hansen, had great difficulty in procuring the right temperatures for the actual development and also lacked suitable accommodation for the drying of the long film rolls. As soon as the film was dry, the necessary sets of prints were taken to be handed over to the different work parties, which was an excellent help, more especially for the survey parties and the geologist.

Everything considered, the photo material from 1932 is below the average and particularly for the Skjoldungen district, which was first photographed and so once more the victim of adverse chance.

Special Flights.

When the weather permitted, and mapping flights were out of the question, the members of the expedition were given a chance to obtain a useful view of the field of work from the air. In other cases the seaplane has been of invaluable use as a means of couveyance, having in hours completed what it would otherwise have taken days to do, so that valuable time has been gained. And, finally, the plane has been sent out to assist people in cases of emergency.

Among those who in this manner have been up in the air mention must be made of the following: Dr. Knud Rasmussen, Capt. P. M. Pedersen, Dr. Nørlund, Professor Hatt, Dr. Therkel Mathiassen and a few superior employees and workmen from Julianehaab and Ivigtut. On the East Coast: Dr. Knud Rasmussen, Capt. Gabel-Jørgensen, Lieut. Wittrup Hansen, the photographer Rimmen (for the taking of motion pictures), the artist Ernst Hansen, Knud Østergaard and the Greenlanders Christian Poulsen and Ferdinand Simsen.

A flying trip in Greenland is a wonderful experience, and it would be of the greatest value if both geodetists and geologists might begin their work by flying across the area which is to be investigated. After this it is possible to plan the work and to carry it out with greater safety and speed.

Air photographs of the field of work greatly facilitate the detail work and the identification of the points on the ground. With the stereoscopic photos and a small hand stereoscope at one's disposal one has the possibility of studying all the land forms before ascending a mountain, so that one may beforehand seek out the points which it would be of importance to determine. In this manner it is possible to carry out a far more rational distribution of the points of control.

Fig. 26. Air routes being studied before the start. From left to right: Knud Rasmussen, O. Nielsen, E. Rasmussen and C. Jørgensen.

On September 12th a flight was undertaken from Julianehaab to Skjoldungen to assist the Hutchinson family who had been obliged to make a forced landing among the icebergs of Ikerssuaq near the shore (about 60 km west to south of Angmagssalik), whence they sent S.O.S. signals. The flight which was ably carried out in very stormy weather became of importance, in so far as the "trail" to Angmagssalik could now be said to be "broken". In 1933 the whole distance from Ivigtut to Angmagssalik was flown with the Norwegian station as a landing place. The expedition owes a debts of gratitude to the Norwegian station for valuable assistance rendered on this occasion.

Conclusion of Flights.

On September 1st the mapping flights on the East Coast were ended.

On September 2nd the "84" left Lindenows Fjord and flew, with Knud Rasmussen as a passenger, across the country to Julianehaab.

Fig. 27. Air-photo from about 4000 m height. Head of the Skjoldungen Fjord.

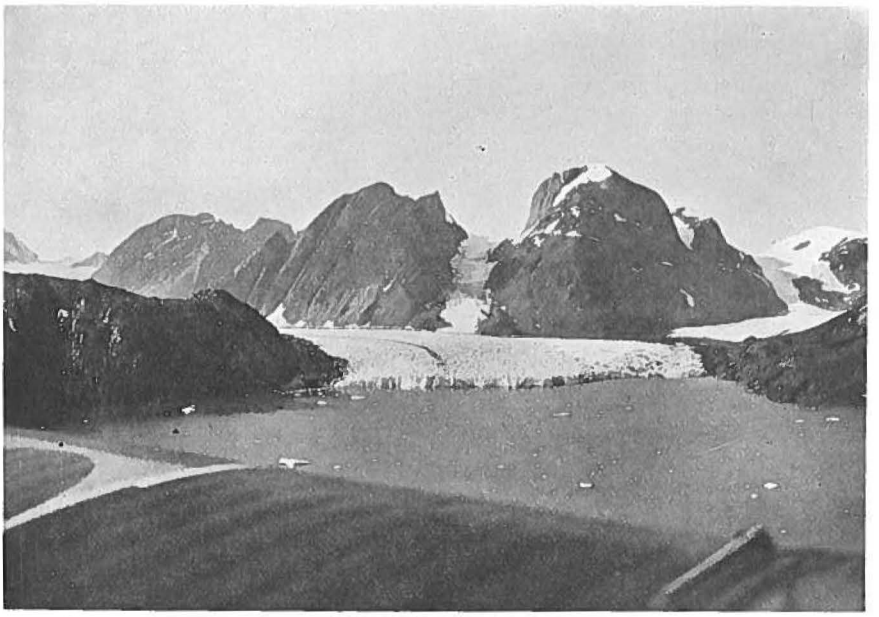

Fig. 28. Air-photo from about 500 m height. The great gletcher at Head of the Skjoldungen Fjord.

As there was no chance of getting a passage for the seaplane to Denmark before the beginning of October at the earliest, it was decided that all our energy should be directed towards carrying out the photo flights in the Julianehaab district; these flights were meant as a continuation of those on the East Coast, which had been carried out as far as Prins Christians Sund (not included).

Julianehaab or Ivigtut was to be used as base stations, and as one flying party was now considered sufficient, the assistant Petersen and the air-photographer Lieut. Nielsen were sent home with the "Th. Stauning" which left Julianehaab on September 8th.

The following weeks were, from the point of view of work, very dull for those of the flying party who had been left behind. The weather conditions were extremely unfavourable, and day by day the "84" lay weather-bound, moored to its buoy in the Julianehaab harbour. On the only day which seemed really suitable for photography, the camera was damaged after ten minutes only, so we were not in luck.

Still, a number of flights were undertaken as for instance for the archæologists. Towards the end of the month we realized that the chances of the right kind of weather for photography were infinitesimal, and at last Nature herself put a dramatic stop to this part of our work.

In the hurricane-like foehn gale, which sprang up suddenly on the evening of September 26th, the "84" lay as usual moored to its buoy in the harbour. The moorings were happily solid, and though the tail was only 10 m away from the breakers foaming against the rocks, it still rode out the gale. The gusts were, however, so strong that the propeller was pulled round with it.

On the following day the seaplane was carefully examined; the damage done was happily found to be small, and only the side rudder was slightly twisted. Nevertheless it was resolved that the flights were now to be discontinued.

On September 28th the "84" was flown to Ivigtut, dismounted, packed into cases and sent home in S/S "Laura Mærsk" which left Ivigtut on October 28th and arrived in Copenhagen on November 15th, the cartographer H. C. Hansen and the mechanics L. Jensen and C. Jørgensen being on board.

d. Wireless, Security and Meteorological Services.

With regard to the flights a special wireless and meteorological service had been installed within the area of the expedition; in charge of it was the wireless operator of the "Th. Stauning", Lieut. P. C. C. Winther, who was also the radio expert of the expedition.

Wireless Service.

The task of the mother-ship, the "Th. Stauning", was to keep up communication with:

the aircraft, when in the air,
the emergency transmitter of the aircraft in case of a forced landing far away from the vessel,
the Greenland wireless stations, i. a. with regard to the meteorological service, and
the M/B "Dagmar".

The wireless equipment of the vessel consisted of:

1/4 K.W. quenched spark transmitter
a 50 W. telephonic and telegraphic transmitter
a 10 W. short-wave transmitter, thereto added an azimuth compass of the frame type
a receiving apparatus.
the antenna.

The wireless equipment of the aircraft consisted of:

the normal R. N. long-wave transmitter of the 75 Watt type with the appertaining receiver.

Wave radius 300—1300 m. Anode tension and filament current from a propeller-driven generator. The apparatus can only transmit and receive when on the wing. As most photos were taken at a height of 4000 m it would be possible, in case of a possible engine stop, to indicate the position during the downward glide flight, but thereafter the plane would be cut off from the surrounding world. Consequently it was resolved to install:

a small battery-driven short-wave emergency transmitter of 10 Watt.

The filament current was taken from the accumulator of the camera which, when fully charged, could drive the transmitter for forty hours. The anode current was taken from four 6 V anode batteries, coupled in series. Wave-radius 15—60 m. The antenna, a dipol antenna of 22 m was supported by light wooden masts, consisting of 3 joints of 1.5 m each. This antenna could be rigged up in less than 5 minutes. There was no special receiver, seeing that the normal receiver was used in connection with the accumulator battery.

M/B "Dagmar" was equipped with a small Reuter transmitter and receiving station. Owing to various conditions the wireless communication with the mother-ship could not be maintained, and so mention will only be made of the station under the wireless service of 1933. The

receiver of the boat, on the other hand, worked very well, and the comparisons of watches which were necessary in order to carry out the determinations of longitude were made by means of the latter. The signal used was more particularly the Nauen time signal, which was generally well received.

The wireless communication between mother-ship and aircraft worked uncommonly well and never failed. The transmission from the plane was extremely well received and always from great heights. On the flight of September 12th, from Julianehaab to Skjoldungen, Julianehaab heard the plane all along the route, the longest distance being 400 km. Angmagssalik heard the "84" at a distance of 500 km and finally the Reykjavik radio at distances of 1000—1300 km.

On the other hand, the plane could only hear the permanent stations at very short distances, Ivigtut only at up to about 50 km and Julianehaab at up to about 100 km. Here topography plays a very great part, the sheltering effect of the mountains being very great.

After the flights in 1932 it was decided that it would be very desirable for the aircraft to be equipped with receivers which were able to take the Greenland stations at distances also exceeding the 100 km.

Security Service.

The stretch mapped was for the greater part quite uninhabited, and so it was of vital importance at any moment to know the position of the seaplane, as the emergency wireless installation might well be damaged in a possible forced landing. Consequently, during all longer flights a constant radio watch was kept both on the aircraft and on the "Th. Stauning".

Most of the Greenland place names are both long and difficult to spell, and in order to facilitate telegraphy the various points and districts to be overflown were designated by the letters A. B. C. etc. Before the beginning of the flight, the routes and control points to be plotted were communicated to the wireless station of the "Th. Stauning", where they were entered on a map exactly similar to that of the seaplane.

Owing to the fairly great distances a long time might elapse between the flight reports at the different points, and so it was arranged that every ten minutes the plane should call the base, even though there was no actual report to be given; in this manner we might all the time be sure that the wireless communication was in order. An example will show the course of the correspondance. It is here a question of a photo flight by the route: Nanûseq to the eastern part of Prins Christians Sund,

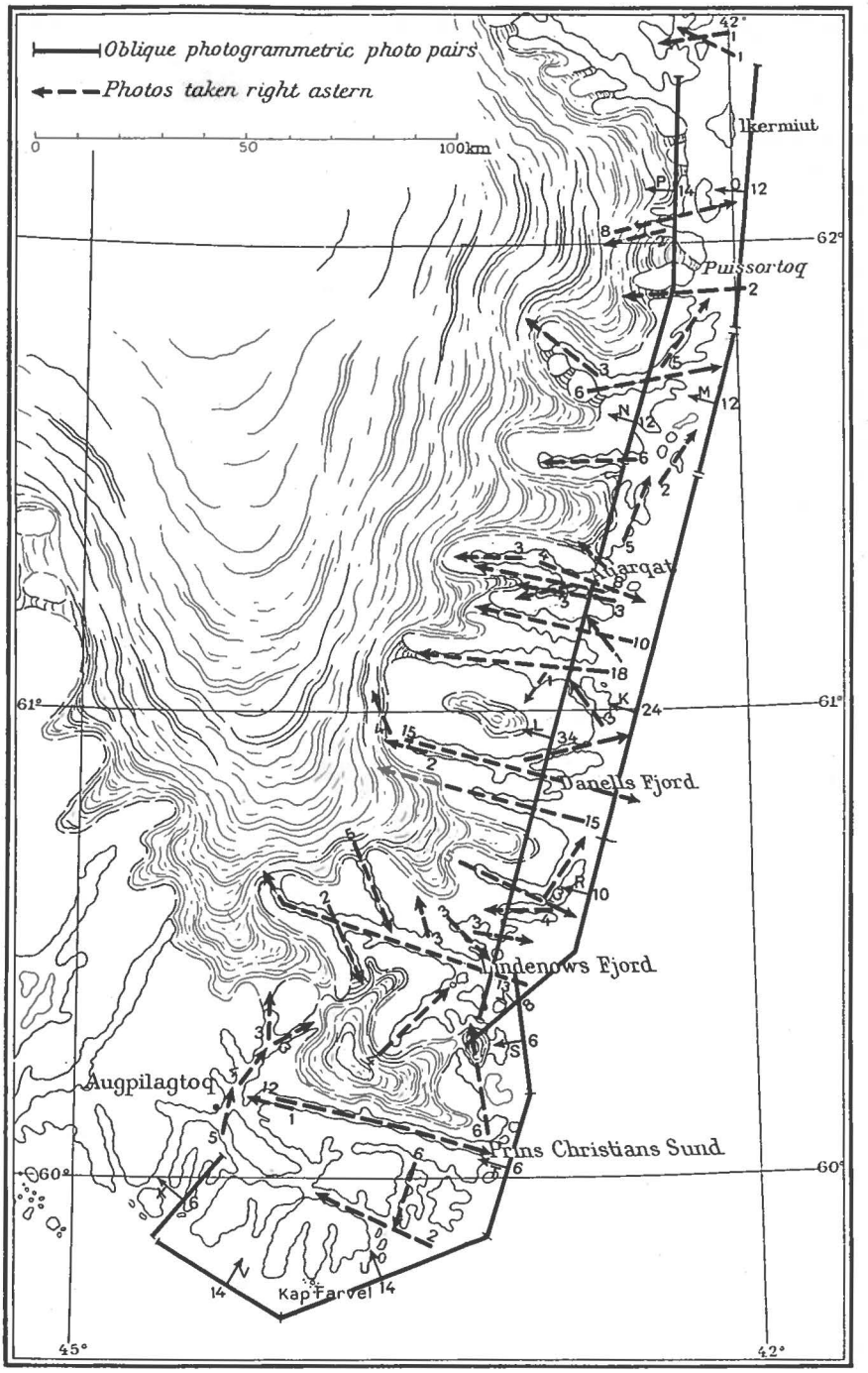

Fig. 29. Map showing the southern part of the air-photo routes carried out in 1932. Figures indicating number of photo pairs (or photos).

round Kap Farvel—Frederiksdal and back to Nanûseq over land (July 31st 1932).

Received at:	Report of the aircraft:
0831 hrs.	Start 828; all well.
0840 -	All well; nothing to report.
0850 -	— —
0900 -	— —
0911 -	Passed Anna 0909.
0920 -	All well; nothing to report.
0932 -	Passed Betty 0920.
0941 -	All well; nothing to report.
0948 -	Passed Caja 0945; — 18°, all well.
0951 -	All well; nothing to report.
1007 -	Passed Dorthe — 20°, all well.
1022 -	All well; nothing to report.
1030 -	— —
1042 -	— —
1052 -	— —
1100 -	— —
1111 -	— —
1116 -	Pamiagdluk at Frederiksdal northeast-going 1115.
1122 -	All well; nothing to report.
1030 -	Western part of Prins Christians Sund directed towards base; height 3800 m 1128.
1141 -	Dismounting the antenna, lands at basis.

Meteorological Service.

During the period July 7th—August 31st the Julianehaab wireless issued weather reports from the six Greenland stations: Godhavn, Godthaab, Ivigtut, Julianehaab, Angmagssalik and Scoresby Sund at the following hours (Greenland time) 06^{00} — 09^{00} — 15^{00} — 18^{00} — 21^{00}. The ordinary transmissions normally take place at 09^{00} — 15^{00} — 21^{00}, whereas the two extra transmissions—including the weather report of Reykjavik—was arranged with a view to the flights in Greenland.

The code used was the ordinary Greenland one, which gives information of air pressure, velocity and direction of wind, temperature, weather and tendency of barometer. It would be more useful for flying purposes if the stations would change to the new international code.

It was very difficult to draw up even a fairly probable weather chart on the strength of these weather reports, partly because the distances between the stations are very great, partly because local condi-

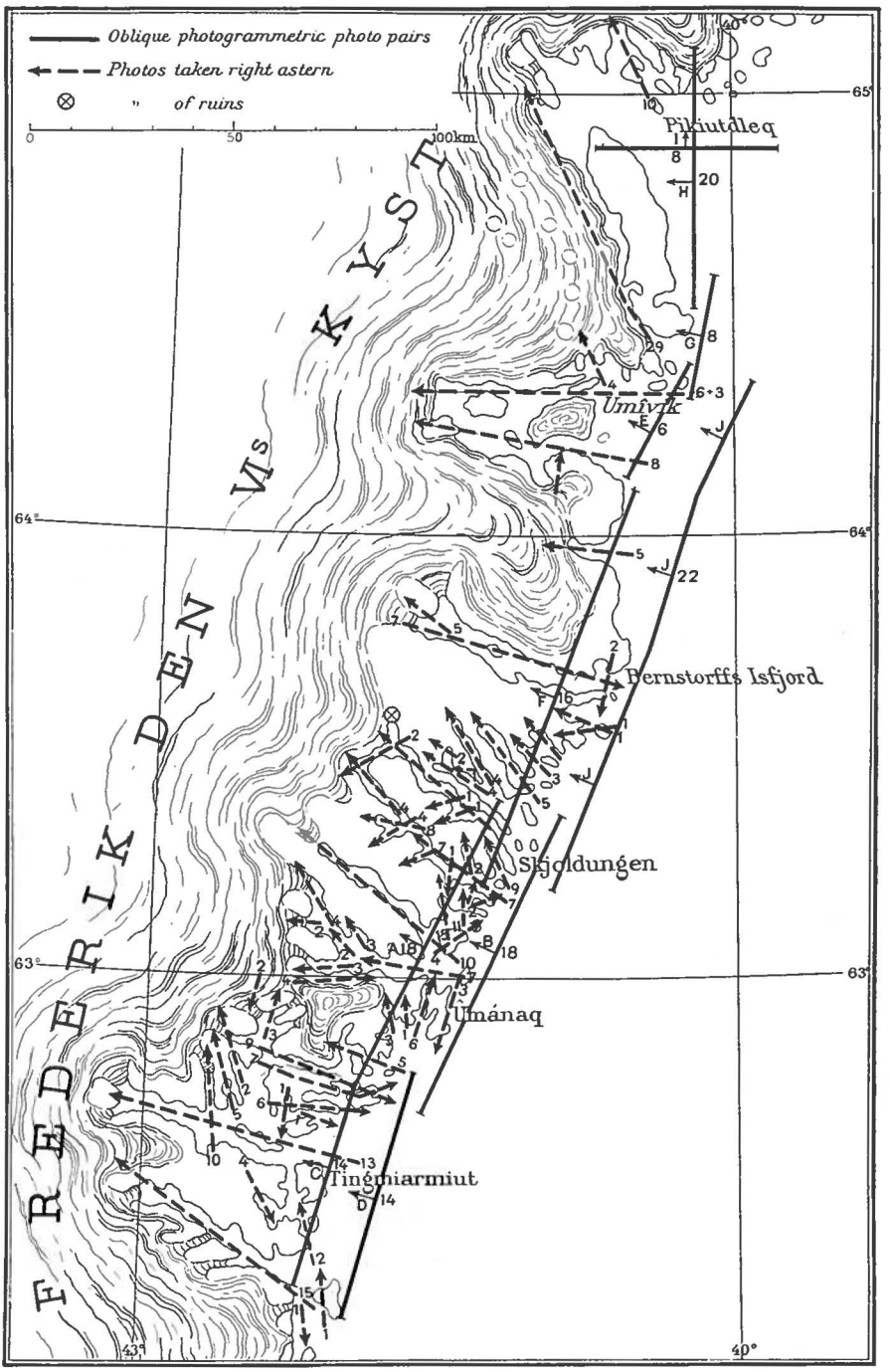

Fig. 30. Map showing the northern part of the air-photo routes carried out in 1932. Figures indicating number of photo pairs (or photos).

tions play a decisive part, so that the height of the barometer and its tendency is practically the only foundation of the weather map.

The months of July and August are extremely well suited for flying and photography.

On the East Coast fogs were rare, and any wind velocity worth mentioning was not measured during those months.

On the West Coast the weather conditions in 1932 were much worse and far more unstable than on the East Coast. In the Julianehaab bay particularly the sea fog was very troublesome on all clear and cloudless days. The fog then drifted towards the shore and covered the whole of the outer coast, and it was only checked by the actual highland. This fog in the bay, as a rule, lay very low and would not have prevented air navigation along the coast, but only coast photography. In the interiors of the fjords the weather was then always clear and fine.

When the velocity of the wind grows stronger, the air in mountain regions always becomes very turbulent, and an aircraft should not, if possible, pass too close to the mountains, while the crew under such conditions must always be strapped to their seats.

e. Geodetic Operations on the West Coast.

These operations comprised:

1. The determination of astronomical positions at Qagssiarsuk for Professor Hatt, which were carried out in the period September 25th—October 4th by Lieut. Cdr. Madsen, assisted by Lieut. H. Wittrup Hansen. The determinations of longitude, latitude and azimuth which have all been made to the sun, were undertaken at station A in the net of triangles measured across the old Norse fields at Qagssiarssuk.

2. At the request of Dr. Poul Nørlund, Capt. Gabel-Jørgensen and Lieut. Tegner (assisted by Lieut. Jacobsen) determined a number of points in the period September 27th—October 5th. These measurements were made in the so-called Vatnahverfi—the area abounding in lakes between the Igaliko and Amitsuarssuk Fjords—according to the same principles as those followed on the east coast.

The measurements were unfortunately not completed. The dinghy was smashed in a violent foehn gale, which came very near to wrecking the motor boat. This interrupted the work, and owing to the fast approaching home journey it was not resumed.

3. The special air-photography has already been mentioned, and further details are not to be given in this place.

4. Special determinations of astronomical longitudes were carried out at the station which Lieut. Col. P. F. Jensen established in

the garden of the trading manager of Julianehaab, to be used in comparisons between the results from that time.

As to further details of this see under 1933.

5. Tide gauging at Nanortalik. For the determination of the mean water level a number of observations were made at Nanortalik in 1883—85 by the Holm and Garde expedition. An iron bolt was cast into the rock, and its height above the mean water level was determined at 20.07 ft (See: Medd. o. Gr. IX p. 339). In order to get a possibility of examining the movements of uplift or subsidence during the forty-eight years which had elapsed since then, the leader of the geodetic works decided, before leaving for the East Coast, that he would determine afresh the height of the tidal mark above the mean water level. See page 183.

6. Survey of the large Julianehaab Lake. In compliance with a wish expressed by the Italian flight commander Recagno, the leader of the expedition agreed to undertake a survey of the large lake near Julianehaab. The idea was to use it as a landing place for the hydroplanes of the great air squadron which was to be sent from Rome to the World Exhibition of Chicago in 1933 under Air-Marshall Balbo.

The survey which was undertaken by Lieut. Tegner was carried out from one point (with a vertical base), from which there was a general view of the whole lake.

X. Geological Investigations.

Report by R. Bøgvad in Medd. o. Gr. vol. 107.

XI. Norse Archæological Investigations.

On his arrival in Julianehaab, at the beginning of the 7th Thule Expedition, Knud Rasmussen met Dr. Poul Nørlund, the leader of an expedition for the purpose of investigating the sites of the old Norse ruins in Tunugdliarfik Fjord. Knud Rasmussen invited Dr. Nørlund to join the survey parties on their boat journey to the East Coast. This could be done, because they were obliged to take an extra boat for the transport of fuel and oil, and as this boat would have to return to Julianehaab as soon as possible after its arrival in Tingmiarmiut, Dr. Nørlund would be able to return to his own expedition within a reasonable period.

Dr. Nørlund has made the following report on the journey and its results:

"To the Leader of the 7th Thule Expedition,

Mr. Knud Rasmussen Ph. D.

I am very grateful for the opportunity which was given me this summer to accompany one of the boats of the Thule Expedition to Tingmiarmiut, and thus to become personally acquainted with this coast which has given rise to so much dispute, also as regards the investigations of Norse remains. As far as possible at this early date I will in the following give an account of my investigations which, it is true, must rather be by way of orientation. The motor boats were to return to Julianehaab at the earliest possible opportunity, and besides I myself was unable to spare the time for more detailed investigations, being obliged to hurry back to my own excavations at the farm of Erik the Red, Qagssiarssuk in Tunugdliarfik Fjord behind Julianehaab.

I had originally thought that my short visit to the East Coast might have taken place in the month of September, when we had in the main finished our own excavations at the farm of Erik the Red. But from the discussions which took place in Julianehaab after the arrival of the "Th. Stauning" on June 28th it appeared that the safest mode of journeying would be by making use of the transport of depots at the beginning of the expedition. I fully realized the risk I ran, *viz.* that by unfavourable ice conditions, engine trouble or the like I might be delayed beyond the three weeks, which the trip was calculated to last, and that this might mean a serious set-back to our excavations. But I was so lucky as to have excellent collaborators to replace me, and further I considered it extremely desirable to make use of this opportunity to supplement the fairly extensive knowledge, I already possessed of the East Settlement in the fjords of the Julianehaab region with a glimpse of conditions on the East Coast, and more particularly the site of the Greenland outpost, the remote hunting places of the Norsemen in medieval times. I therefore decided to run the risk and consequently paid a short visit to Qagssiarssuk where, in collaboration with Dr. Stenberger and Erik Holtved, I drew up a plan of the work to be done there during the following months. Throughout a long summer night we discussed the situation and future possibilities, and on the following day I returned to the settlement in order to join the Thule Expedition. As its preparations there had not yet been completed, I profited by the period of waiting to make an excursion on my own accord to the Ûnartoq Fjord, which had practically never been investigated from the point of view of Norse

sites. The results of this excursion were unexpectedly valuable, for in one day I found no less than six hitherto unknown Norse homesteads, and near the largest of these (Narssarssuaq) a rather imposing church ruin. There can hardly be any doubt that this must be the site of the only nunnery of Greenland, which is mentioned by Ivar Baardsøn as being situated in this very fjord (Rafnsfjord).

On July 5th the first party of the expedition started, and I went by the motor-boat "Anders Olsen", which was in charge of Lieut. Cdr. Madsen. This journey to Tingmiarmiut lasted ten days, and its general course has, beyond doubt, been described in other reports, so that I will content myself with a description of some particular incidents. The ice difficulties which we met in Prins Christians Sund at last, after two vain attempts to force our way, made it necessary for us to return and to try to find a passage through the broader Ikeq Sund. This proved very lucky for me, as it enabled me to inspect a couple of unknown Norse settlements which were situated in the most southerly regions and on the south coast of the great Christian d. IV's Ø. These regions have evidently been very little visited during the period of Norse settlement, being far wilder and more desolate than the fjords farther up the West Coast, and the land available for the keeping of domestic animals seems to have been very confined. In this respect the regions round Kap Farvel are most closely associated with the East Coast, and in reality the actual continuous Norse settlement terminates at Herjulfsnæs (Ikigait). In older maps several Norse sites have been indicated in the fjord regions north of Augpilagtoq, but only one of these dates back to the Norse period *viz.* Igdlorssuit in the most northernly branch of the Ilua Fjord quite close to the glaciers[1]). I visited this site on my way back from the East Coast and found it for the greater part covered by gravel, which in recent years had been washed down the mountain slope by a local glacier.

Besides this I only know of one real Norse farm in these parts, *viz.* the one which we found on our journey out through Ikeq Sund, and which lay in a sheltered cove on the north coast, a little to the east of the outpost Sangmissoq. Just as Sangmissoq is the most southerly and easterly trading post in the present Julianehaab district, in the same manner the Kangerdlutsiaq farm is, as far as I was able to ascertain, the most southerly and easterly within the old Norse settlement. Here we found in all 6 widely scattered ruins. The site of the main building is above 10 by 10 metres, and near it a smaller outhouse is situated; the ground round it still has the character of a home field cleared of stones. Farther back from the shore there is at the foot

[1]) At the head of the Kangikitsoq fjord there seems to be a "sæter" building belonging to a more remote farm.

Fig. 31. From the Kap Farvel area: The Norse ruin of Pilikeq (with the two Greenlanders standing).

of a small rock a well-preserved stable, on the inside 2.25 metres broad and 11 metres long, and as usual divided into two compartments, and above this a site, measuring on the inside 8.75 by 3.4 metres. Two other sites were less distinct. With the exception of these remains there can only have been temporary shelters for hunters, ship-wrecked people or outlaws.

This e. g. applies to the other site which we found on the southern point of Christian d. IV's Ø, near Ikeq Sund towards the open sea, a short distance up Tunua Sund. The Greenland name for this place is Pilikeq or Pilivfik. On a very small grass-covered spot in a perfect wilderness of stone heaps we found the ruin of a house, or rather of two houses built together and, as far as we were able to judge without undertaking excavations, divided into eight small compartments. This ruin has many points of resemblance with Rolf's ruin at Narssaq in Lindenows Fjord, which I had the opportunity to see, both on the journey up and back again, but which unfortunately seems to have been greatly disarranged by the subsequent building-in of Eskimo houses with house passages in front so that it will be difficult to obtain a definite plan of the original homestead without undertaking protracted excavations. Also here we found compartments built together and distributed in two rows, one behind the other. The two ruins cannot be characterized as mere temporary shelters, the many compartments giving the impression of a more permanent habitation, though not with a view to farming in the West Greenland sense.

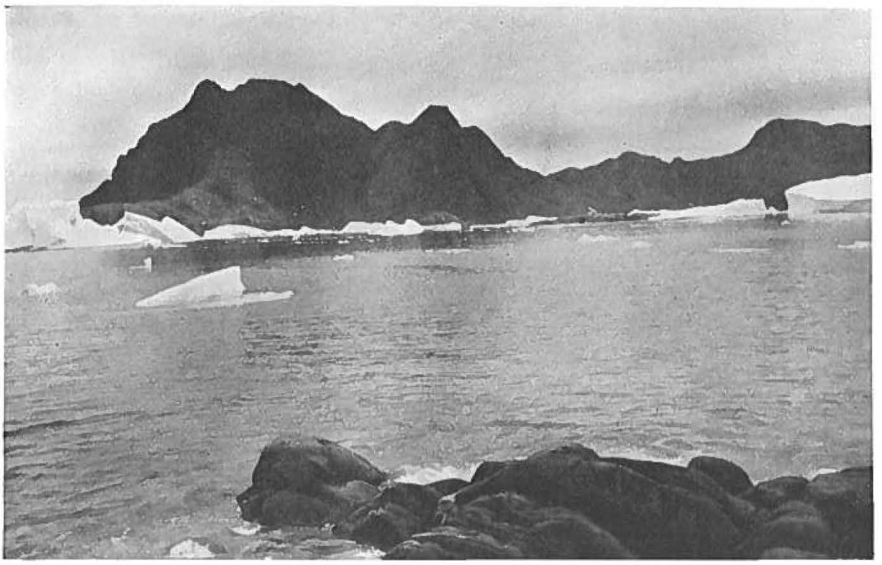

Fig. 32. From the Kap Farvel area. The Aluk peak seen from the north.

At Narssaq the keeping of a small stock of sheep would perhaps not be entirely excluded, but at Pilikeq there is no such possibility whatsoever. The man who lived here must have subsisted exclusively by hunting.

While the party in the "Anders Olsen" were undertaking these investigations of Norse ruins at Ikeq, we became separated from the other two boats, which was rather awkward, as the orders were that the three boats should proceed in close formation to Tingmiarmiut. We anchored for the night at Pilikeq and started at dawn, *viz.* at 3—4 a. m., to look for the others. We first cruised for some time in the fjords and mouths of fjords within Kap Hoppe, but seeing no trace of our missing comrades we concluded that they must have gone farther north towards Lindenows Fjord. We then shaped the same course, but got soon into pack-ice and were obliged to find a harbour among the small islands south of the mouth of Prins Christians Sund, where we lay ice-bound for twenty-four hours. On the following day we succeeded in getting out again, and shortly afterwards we met the two other boats.

This little accident also proved to be of benefit to my investigations, as I became much better acquainted with the coast between Ikeq and Prins Christians Sund than I should otherwise have been, and I consider it extremely probable that these were the regions where the old Norsemen went for their summer hunting. Ivar Baardsøn gives some sort of description of the regions where they stayed and mentions i. a. a fjord called "Bærefjord" with a large reef across its

entrance. Such a reef I found across the mouth of Ikerasakasik, and in medieval times this reef must have been even more noticeable, seeing that since then the country has subsided considerably. It would carry me too far to set forth my further reasons for establishing that the long fjord, Öllumlenger, is Prins Christians Sund, as was also presumed by Professor Finnur Jónson, and that Korsø, the property of the Bishop and visited for the sake of the bear hunting, is one of the islands north of Prins Christians Sund, in all probability Aluk. The island Aluk has also in later centuries played a great part and is a dominating feature of the landscape, whether one comes sailing along the coast, or passes quickly by in the open sea. The situation of these localities is a problem of considerable interest, because several investigators have wanted to localize them much farther north, placing Korsø as far north as Angmagssalik, which would presuppose a perfectly incredible radius for the hunting activity of the old Norsemen. It hink we may now establish as a fact that, on the usual summer hunting expeditions, they only covered a short distance of the East Coast.

Finally, I received a very valuable confirmation of my conception of Hvarf, which in the sources is mentioned as the place for which the Icelandic or Norwegian navigators of Greenland shaped their course. The older and very natural supposition was that Hvarf must have been indentical with Kap Farvel, whereas in more recent times there has been a tendency to localize it as Kap Egede on the southern point of Sermersôq, northwest of Nanortalik. The latter supposition is an extremely unlikely one, seeing that Kap Egede is not a particularly prominent point for those who approach the coast from the sea. According to my opinion Hvarf is not Kap Farvel itself, but the whole of the large alpine block which forms the southern point of Greenland south of Prins Christians Sund and south of the inland ice. It appears from the outside as a continuous mass, which contrasts in a very characteristic manner with the narrow ice-free coast fringes farther north. The information given relative to Hvarf, *viz.* that Herjulfsnæs is situated below it, is in perfect agreement with this determination.

From our journey to Tingmiarmiut I shall in conclusion mention our visit at Auarqat, where we found the whaler gun described in such detail by Graah and Holm. It lay in the grass, near an Eskimo house ruin, and it seemed greatly weathered, at any rate when compared with the hundred years' old design of Graah. In order to save it from complete destruction it was resolved to transport it to Julianehaab, where it will now be put up in the garden of the trading manager and provided with an inscription.

In the afternoon of July 15th we reached Tingmiarmiut, and

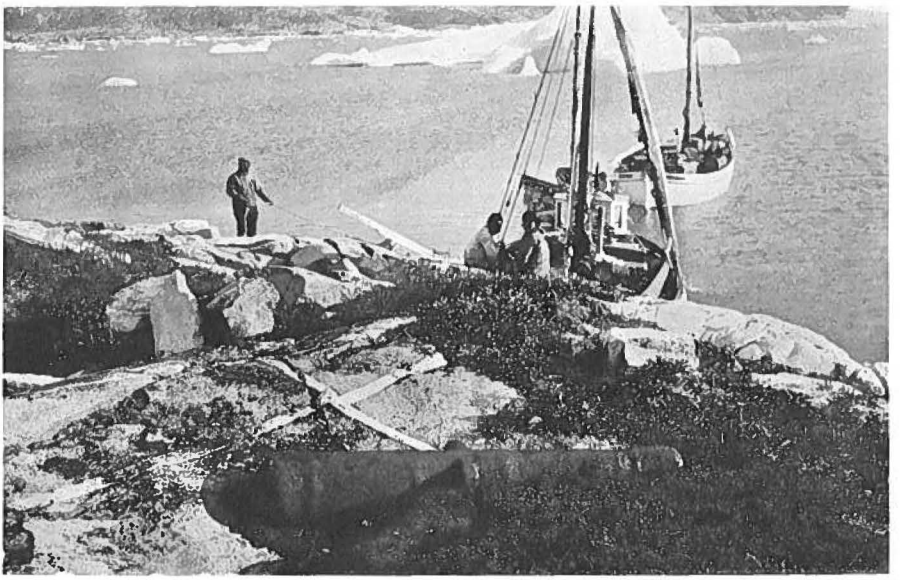

Fig. 33. From Auarqat. The gun as it was when we found it. At the back the "Quarto" and the "Anders Olsen".

during the following days I traversed the waters round the great Tingmiarmiut Ø in order to study the character of the landscape and to look for possible Norse ruins. It proved futile to penetrate into the interior of the fjord owing to the huge masses of ice there. At the Eskimo dwelling place Tingmiarmiut I found a site which I thought might be dated from the Norse period, seeing that it was different in character and seemed older than the Eskimo habitations. The only article which was brought to light by my trial excavations was, however, a small soapstone toy bowl which in the opinion of Dr. Therkel Mathiassen is of Eskimo origin, and I have consequently abandoned my supposition.

This seems to prove that no ruins of indubitably Norse origin have been found north of Lindenows Fjord. On my return journey I called at a number of places where the condition of the ground might be thought to have been rather inviting to the Norsemen *viz.* at Anoritôq, at Qajartalik off Graahs Fjælde and particularly in the fjords nearest the north part of Lindenows Fjord, but the only remains I found were those of Eskimo origin. However, it stands to reason that this should not be taken as a definite statement that Norse sites can not be found in these regions. The ground is, however, far too extensive to be properly investigated in a few weeks, or even a whole summer, all the more as it can only be a case of isolated huts, not of farms with surrounding ground.

Fig. 34. From Lindenows Fjord. View from the mountain at Narssaq over Rolf's ruin and the fjord.

That there cannot have been any actual Norse settlement on the East Coast has been an established fact since the expedition of Holm and Garde, and on my journey I received full confirmation that neither has there been any possibility of such a habitation. It is true that one may, here and there, find valleys with a comparatively fertile vegetation. As a case in point I shall mention a valley behind the dwelling place Auarqat, as well as a few localities in Nanûseq Fjord, north of Lindenows Fjord, partly the valley towards Narssaq (Rolf's ruin), and partly the head of the large cove on the northern side of the fjord facing the western end of the Angnikitsok island. In the latter place, particularly, conditions were such that there might have been a possibility of sheep breeding on a modest scale, but otherwise all the grass-covered spots were so swampy that, if only for that reason, it was impossible to live there. Finally, all localities were presumably only free from snow for such a short time that it would be necessary to collect unproportionally large quantities of pen fodder in order to make sure that the stock could live through the winter.

Nor was it the expectation of finding such Norse farms which attracted me to East Greenland. What interested me was first and foremost the problem of the summer hunting places, and though I found no huts to bear witness to their existence, I think, as briefly explained in the preceding, that I was able to identify the very localities. For that matter no such huts have hitherto been found on the far better explored West Coast to the north of the West Settlement,

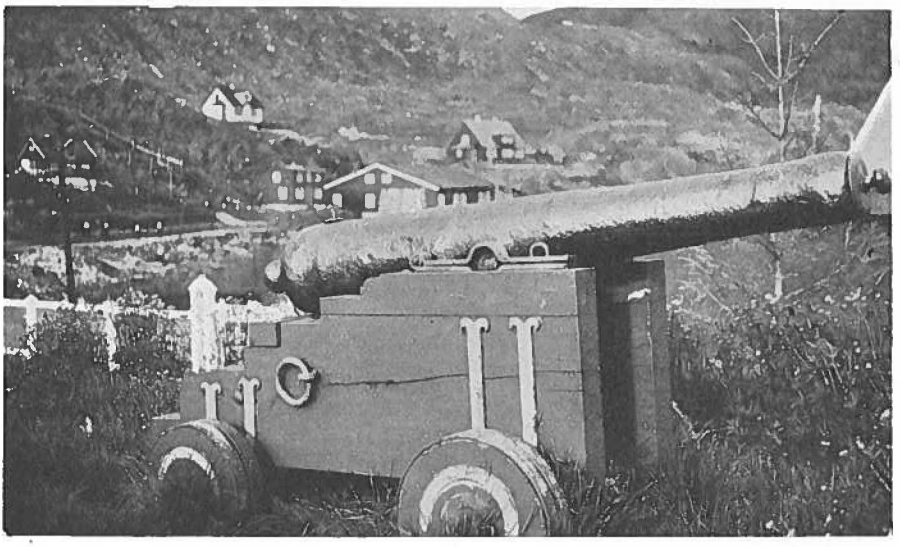

Fig. 35. The Auarqat gun placed in the garden of the manager of the trading post at Julianehaab.

where the Norsemen are known to have camped for the hunting of walrus, and it is not excluded that the ruin at Pilikeq may be such a hunting hut. Furthermore, casual traces can be found of shipwrecked people, outlaws and the like, and there is still a possibility of making such finds along the whole coast as far as Angmagssalik. A methodical investigation, however, is not likely to pay, and so the whole thing must undoubtedly be left to chance.

On July 18th we started on our return journey from Tingmiarmiut, I being the only Dane onboard the "Anders Olsen". At that time the "Dagmar" had not reached its destination, and we received instructions to call at all the depots to give information as to the whereabouts of the expedition. As already mentioned, we also entered some of the most inviting and most ice-free fjords to look for ruins, but in spite of these delays the return journey only took us five days and nights, most of which, it is true, must be spent in sailing. The entrance to Prins Christians Sund we now found entirely free from ice, and we passed through it without any difficulty.

The most extraordinary experience of this journey was perhaps that the whole of Garde's route could be traversed within such a short period and with so few obstacles and dangers."

sign. *Poul Nørlund.*

Postscript.

This seems the most appropriate place to give the account of the Auarqat gun which in itself is rather an interesting one.

Nothing is known for certain of the vessel, which over a hundred

years ago carried this gun to the waters of Greenland. It seems most likely, that a special tragedy may be attached to its appearance on the Greenland ice. The vessel was probably screwed down by the pack-ice the gun rolling overboard and landing on an ice floe. Here it was found by some East Greenland sealers who by means of seal bladders managed to tow it ashore. How long the gun had lain at Auarqat we do not know, but unless it had been kept under a roof, it cannot have been for so very long—perhaps about half a century—as the ornaments on it are very well preserved.

On June 17th, 1829, the place was visited by W. A. Graah, who gives the following description of this event in his "Undersøgelses-Reise til Østkysten af Grønland".

"We knew from a rumour prevailing in those parts that in a place called Karramiut in Auarqat Fjord there was said to be a large piece of iron, which had been described as a gun. As we wished to ascertain this fact we chartered a boat and, accompanied by some of the inhabitants of that place, we went there and found the small gun, the calibre of which we were, however, unable to determine, the barrel being extremely rusty. A woman, whose age I estimated at about forty years, told me that already as a child she had heard of the existence of this gun, which had possibly at one time drifted ashore from a wrecked whaler. After having bored out the barrel and the ignition which were filled out with earth and gravel, I measured its dimensions and loaded and fired it to the great amusement of our Greenlanders. The whole length of the gun was $65^1/_2$ inches."[1])

Then another fifty years elapsed before Auarqat was again visited, this time by the Holm and Garde expedition to the East Coast, and now comes the final act of the history of the gun, the final and the most impressive.

On July 12th the Danish members of the expedition assembled at Auarqat round the small gun. The idea of trying to preserve it for future times suggested itself to us when seeing the ravages of the rust, and we agreed to take it to Julianehaab and set it up there. With the assistance of Dr. Nørlund, a design for a suitable "Rappert" was secured from the Royal Arsenal at Copenhagen, and Mr. Poul Ibsen, manager of the trading post at Julianehaab entrusted the building of it to the two able brothers, the carpenter Pavia Høegh and the smith John Høegh. This work completed, the "Rappert" and the restored gun were set up on a hill in the garden belonging to the trading post (Fig. 35).

On the death of Knud Rasmussen Mr. Ibsen very appropriately let the cannon shoot a salute of three rounds in honour of the great ex-

[1]) See further Graah's design of the gun.

Fig. 36. View from "Tutein's hut" at Narssaq in Lindenows Fjord.

plorer, and on his departure from Greenland, in 1936, he further deposited a sum, which for fifty years to come would make it possible to fire this honorary salute on December 21st, the anniversary of the death of Knud Rasmussen. But this salute will beyond doubt not only be fired for fifty years to come: for as surely as the name of Knud Rasmussen will never die in Greenland, future generations will also after that time keep up this fine tradition.

XII. Eskimo Archæological Investigations.

These investigations have been dealt with by Therkel Mathiassen, Medd. o. Gr. vol. 109 No. 2.

XIII. Fishery Investigations.

By an arrangement made between Knud Rasmussen and the Administration of Greenland the fishery investigations in the summer of 1932 were extended from the Julianehaab district to comprise the most southern part of the East Coast, and thus they became part of the comprehensive scientific work of the 7th Thule Expedition.

The leader of these investigations, cand. mag. Poul Hansen, has

written the following report, which only deals with the work done on the East Coast.

Owing to the limited time at our disposal the investigations only comprised Lindenows and Nanûseq Fjord, and were chiefly carried on with a view to possible economic results.

Report:

"The fishery investigations which comprised Lindenows Fjord and the small Nanûseq fjord to the north of it, were made with the motor-boat "Ûmarigsoq" within the period August 21st and September 4th.

The experiments were undertaken in Lindenows Fjord at the mouth of the northern branch and off Narssaq, and also on the southern side at the entrance to Kûgârmiut, in the small narrow branch which cuts in beside the glacier opposite to Narssaq. In our experiments we made use of long lines for the catching of cod, halibut, sea perch etc., hand lines of the Faroes Type for the catching of cod, and shark lines for the catching of Greenland sharks.

The temperature in the water layers from depths of 200 m to the surface were taken by means of reversing water-bottles.

Lindenows Fjord is an extremely deep fjord, and in many places the great depths extend up to the shore. Thus, between Narssaq and Kangerdlorajik we could not take the bottom with a sounding in 750 m at a distance of about 50 m from the shore, the shore falling quite steeply down to great depths. Off Narssaq and at the entrance to Kûgârmiut there are smaller areas with lower depths, but the bottom is here very uneven with greatly varying depths, and also its condition is very different, partly consisting of rock and partly of clay.

By measuring the temperatures in different water layers from 200 m to the surface the following temperatures were found:

(For comparison three hydrographic stations on the southern West Coast are entered.)

Lindenows Fjord off Narssaq Date: August 21st		Lindenows Fjord off northern branch Date: August 22nd		Tasermiut Fjord Date: August 17th	
Depth:	Temperature:	Depth:	Temperature:	Depth:	Temperature:
0 m	4.93	0 m	5.80	0 m	4.50
10 -	3.00	10 -	2.00	10 -	2.65
25 -	1.87	25 -.	0.29	25 -	2.47
50 -	0.41	50 -	0.95	50 -	1.72
100 -	0.01	100 -	0.03	100 -	1.85
200 -	2.36	200 -	2.10	200 -	0.70

Nanortalik Date: September 21st		Ilua at Augpilagtoq Date: September 11th	
Depth:	Temperature:	Depth:	Temperature:
0 m	4.20	0 m	3.88
10 -	3.32	10 -	3.05
25 -	2.96	25 -	2.80
50 -	2.63	50 -	1.65
100 -	2.30	100 -	1.48
200 -	1.40	200 -	1.60

In Lindenows Fjord the temperature between 25 m and 100 m is much lower than in the other localities; on the other hand, it is higher in 200 m, owing to the warm Irminger current. The temperatures at other times of the year are surely not higher, as we know from former experiences that the temperature of the water layers reaches its maximum in August—September.

The experiments with a long line for the catching of cod and halibut have only yielded very small results. It was difficult to set the lines, as the depths were so great, the bottom uneven and the current very strong. Besides, great care must be taken to prevent the ice, often present in very great quantities, from spoiling the buoys or tearing them loose so that the implements were lost. In order to make the lines take the bottom in the great depths we were obliged to use only one very long buoy line and to attach one end of it ashore. Both buoyline and long line were then set out from the shore, and a stone was attached as a weight at the extreme end of the latter. To set out a line in this manner was only possible where the current was least rapid. In spite of the fact that we only left the lines for two hours at the most because of the sharks, it yet happened very frequently that they were bitten through, and in this manner we lost great quantities of lines and tackle.

The kinds of fish which were caught on the lines were cod, halibut, sea perch, Fabricii grenadier (*Macrura fabricii*; Greenlandic: *imínguaq*), rays (*Raja fyllae*), rocking (*Motella rheinhardtii*) and blue sea cat (*Anarrichos latifrons*). In none of the localities where the experiments were made, were there any large numbers of fish, neither at the great nor at the smaller depths.

Cod were caught at the mouth of the northern branch and at Narssaq; on the south side of the fjord none were caught. In the former locality four cods were caught at two lines (two at each line), and at a line set out at Narssaq two others. The cods were large, being: 87—95—97—99—105 and 114 cm in length, and they were all very

Fig. 37. Southern part of Nanûseq Fjord.

lean. Attempts at fishing with a handline in the said localities and in several places along the south side of the fjord did not yield one cod.

Halibut like cod occurred very sparsely. Three small specimens, 57, 64 and 69 cm in length, were caught off Narssaq at a depth of 800 m. Another line set in the same locality yielded one specimen of 66 cm. All she halibuts were below the minimum size required for fish given in exchange for commodities in West Greenland; besides they were very lean.

Sea perch and more particularly Fabricii grenadier were the fishes, which were most frequently caught on the lines in the deep water. The grenadier apparently goes down to the very deepest parts of the fjord, its food chiefly consisting of bottom organisms. The Greenlanders look upon the grenadier and the sea perch as good food. In the places where we set lines we did not, however, catch any great quantity of these fish. The sea perch is probably more numerous farther towards the interior of the fjord, where it plays a part as food for the seals.

Among the other kinds of fish which were only caught in a few specimens there were no food fish.

The experiments with shark lines yielded much better results than those with ordinary long lines. There seem to be great quantities of sharks, and at depths of from 200 to 500 m 25 and 19 sharks, re-

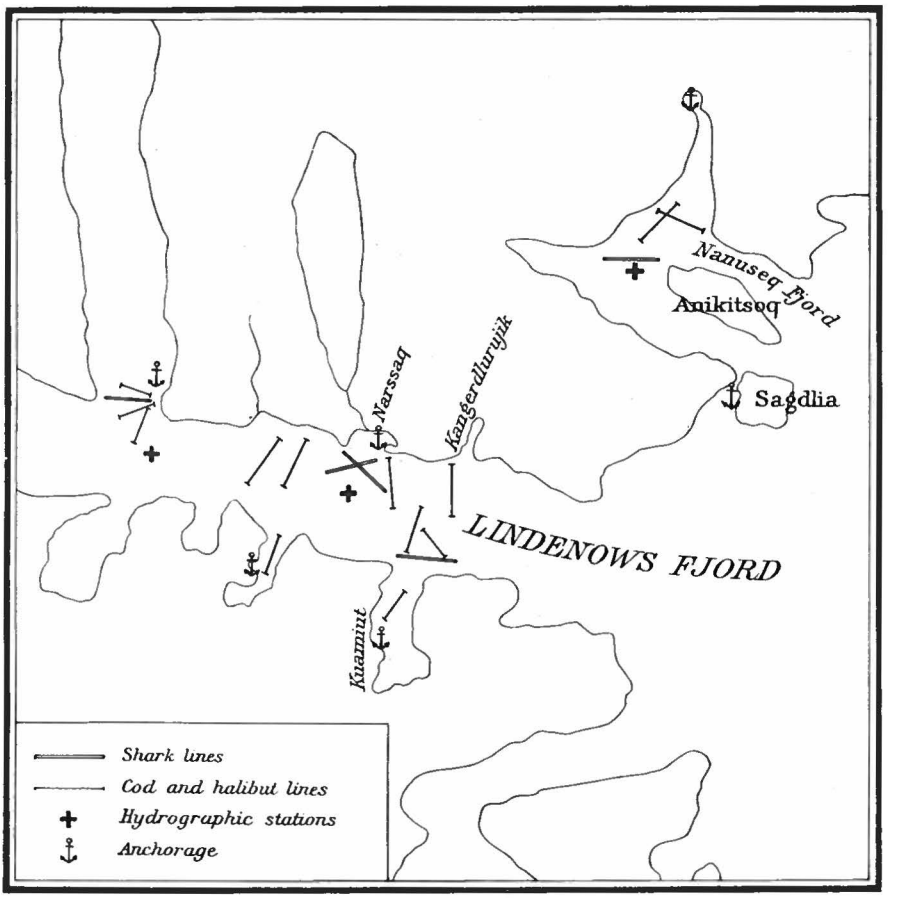

Fig. 38. Sketch shoving the places in Lindenows Fjord and Nanûseq Fjord, where the fishery investigations were undertaken.

spectively, were caught at two settings of lines, the one off the northern branch, the other one off Narssaq. Also off Kûgârmiut shark lines were set, but here the bottom was so uneven that for the greater part the line was placed in too shallow water, and the catch was consequently small, *viz.* three sharks.

The sharks caught had almost all empty stomachs; in some of the stomachs, however, blue sea cat were found and in one a large cod. They were all lean with a very small liver. The average weight of the liver of 18 sharks from Lindenows Fjord was only 13 kg. In comparison it may be stated that the liver of 14 sharks at Sangmissoq was 25 kg and of 15 at Itivdleq 18 kg.

Experiments were also carried out in Nanûseq Fjord with a cod and shark line. The fjord is a threshold fjord with two narrow, rather shallow entrances. Farthest in it forms a basin of 175 m in depth.

Measurings of temperature yielded: ÷ 1.18 at 150 m; ÷ 0.82 at 100 m; ÷ 0.21 at 50 m; + 1.32 at 25 m; + 2.4 at 10 m; + 5.0 at 0 m.

It appears that the water at the bottom has a temperature of less than ÷ 1 and is cold right up to the surface. Thus, there are not many possibilities of finding fish, and our experiments with long lines as well as with hand lines were also utterly without any result. The setting of lines in this fjord is, besides, made difficult by the large icebergs, which always lie locked in here and which float backwards and forwards in the fjord depending upon wind and current.

Sharks are rare here. A line which owing to bad weather was left in the water for two nights and one day only caught two small sharks. Large cods were not caught, in spite of numerous attempts with hand lines and long lines, which were set both near the bottom and farther up in the water. On the other hand, 8 small year-old codlings, 10—15 cm in length, were taken by means of seine nets in quite shallow water. The fact that codlings were found does not necessarily imply the occasional occurrence of cod in Nanûseq Fjord, as they may easily have been carried there by the current as small fry.

In the northern branch of the fjord near the course of the river a quantity of dead specimens of the small silvery fish (*Nansenia Groenlandica*; Greenlandic: *savilissat*) were found on the beach. As in southern West Greenland it undoubtedly comes here in great quantities in the month of June.

After the investigations made, the possibilities of fishing in Lindenows and Nanûseq Fjords can only be termed extremely poor. The stock of the most important food fish in Greenland, *viz.* cod and halibut, seems extremely small. The only fish of which great quantities were found in Lindenows Fjord was the shark which, however, was much leaner than on the West Coast. The natural conditions were not favorable for fishing, the depth almost everywhere in the fjords being very great; the current is very strong, and sometimes the setting of lines is hampered by the ice.

The weather conditions also seem rather unfavourable. While the investigations were in progress, the warm foehn wind and the cold north wind, both blowing out of the fjord, were constantly interchanging with the cold, moist eastern wind blowing into the fjord; the latter is quite open and unsheltered by islands. All winds were frequently of a galelike character.

As to Nanûseq Fjord the temperature of the water in it is so low that the occurrence of food fish is excluded."

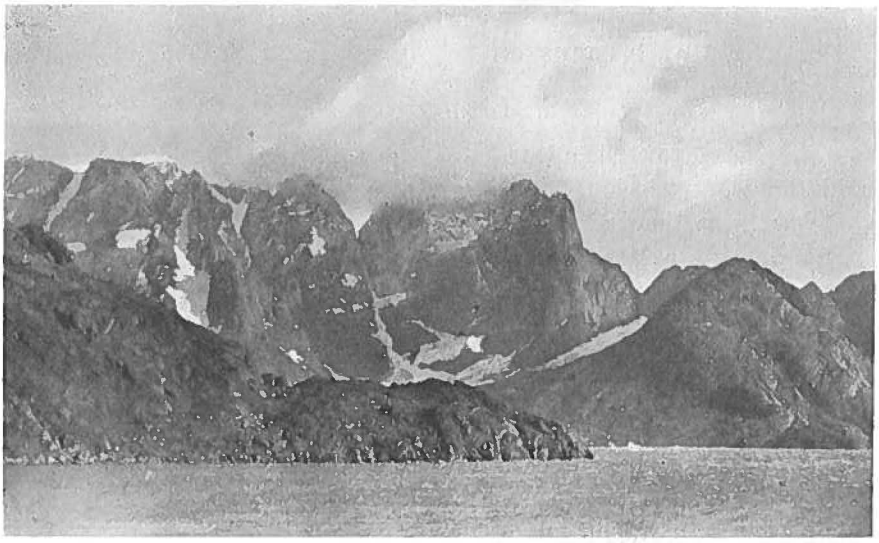

Fig. 39. From Lindenows Fjord. Foehn gale brewing.

Fig. 40. From Lindenows Fjord. Foehn gale begins.

XIV. Knud Rasmussen's Voyages and Special Works.

a. Introduction.

The journey of 1932 opened an entirely new era for Knud Rasmussen in his long and glorious succession of scientific expeditions.

New tasks, new aims, new means.

It was quite strange to see him, the great master of the wide, solitary polar regions, in the midst of all this modern technique, such as a vessel with Diesel engine, aeroplanes, radio-installation, instruments for scientific survey, electrically run cameras etc.

This man who had done wonders with dog teams and sledges as means of transport, with guns and patrons to procure the sustenance of life, with note book and pencil as his only scientific equipment and a few Greenlanders as travelling companions was now, as it were, at a bound placed in an anthill of travelling companions, vessels, motor-boats, kayaks, aeroplanes and technique, a mechanism which was never at rest, which it had cost him great efforts to set going, and which never left him in peace when once the work had begun.

Yes, what a difference between "The great Sledge-journey of 1921—24" and the journey of great technical inventions only ten years later!

The lot of the leader of a modern expedition is not an enviable one, and least of all it can have been so for Knud Rasmussen. No one had been like him behind his dog team and as leader and comrade on the many sledge journeys, nor could anyone be like him at the head of the great number of men and the whole of the comprehensive outfit of a modern expedition.

With infinite patience he submitted to what must have been to him an unaccustomed and galling yoke—always to be merely the one to lead, to observe and supervise, while others "did things", as he said himself. Day after day and night after night he was obliged to remain on the "flag ship of the expedition", his pulse throbbing with longing to get away, to be left in peace so as to be able to fling himself into his own work.

The wireless was, I believe, the heaviest drain on his nerves and strength. Telegrams came and went, interrupting other work, other trains of thought, and frequently requiring an answer at the most inconvenient moment. It went against the grain with him, born leader as he was, to let things determine his course, but with a wireless there was no other way; it could not wait, for perhaps no other connection would be made.

Thus new things and old were constantly at war in many fields during these last two years on the East Coast. On the one hand, he loved

the great results, which thanks to modern technique could be achieved in such a short time; on the other, he found that events moved too fast, that experiences slid by with the speed of an aeroplane, without leaving him time to fix them in memory or on the pages of his diary.

His diaries, more than anything else, bear the impress of the restlessness of these journeys, of the merciless demands made by his position as leader and the lack of leisure hours, when he might be quite alone with his thoughts and his diary. And when bearing in mind what a master Knud Rasmussen was in the art of diary-writing, what treasures he of all people had brought home in his diaries, one fully understands how he must have longed for rest, to get away from it all, out into the wild, into boat and tent—out into his own field of varied interests.

Duty, however, kept him at his post, in spite of the feelings so clearly revealed in the entries of the diary. In 1931 they are particularly full, but then this journey had after all retained somewhat of the old life of travel. The diary of 1932 was written afterwards, that is during the short period at Lindenows Fjord in September, when Knud Rasmussen got a little more rest and peace, after the flights were ended, and the greater part of the expedition had left the East Coast. The diary of 1932 does not consist of entries from day to day, but is rather a collection of small treatises about the most important chapters in the life of the expedition, and it only deals with the time on the East Coast.

Knud Rasmussen has only left a very small diary for the year 1933, a note book in which he jotted down essential points as an aid to memory; without this it is difficult at the present time to elucidate all the phases of the expedition.

The following is an attempt to give a description of all Knud Rasmussen's journeys and all he did in the course of the 7th Thule expedition in 1932, this description being entirely based upon the diaries.

b. Summary of Voyages.

June 2d—12th: Voyage from Copenhagen to Ivigtut with M/S "Disko". On this voyage which he undertook in the company of his secretary, Miss Emmy Langberg, and the hunter Knud Østergaard, the book "Den store Slæderejse" was finished.

June 13th:Boat journey from Ivigtut to Julianehaab with M/B "Quarto".

June 17th—20th (approximately): Boat journey from Julianehaab into Julianehaab Fjord with M/B "Anders Olsen" in order to finish a literary work in peace and quiet.

June 29th—July 5th: Voyage with the "Th. Stauning" via Ivigtut, Godhavn, Umanak to Igdlorssuit.

July 5th: The films' camp at Nûgâtsiaq.

This period Knud Rasmussen spent near the German Film Expedition in the Umanak Fjord. On July 5th he camped together with the German airmen at Igdlorssuit, and on the morning of the 6th the journey was continued in the Geodetic Institute's motor-boat the "Andræ". At Nuliarfik, Knud Rasmussen at last met the leader of the expedition, Dr. Fanck, who in the evening accompanied him to the outpost Nûgâtsiaq which became his permanent quarters until the day of departure, and to which the principal camp of the expedition was soon moved. Together with his secretary Knud Rasmussen was engaged in taking motion pictures, especially such as concerned the scenery and the part played by the Greenlanders, whereas he had no influence on the actual story and the construction of the film. There is no doubt that these days spent in the company of a film expedition greatly furthered the plans which Knud Rasmussen had entertained for many years, *viz.* to make a Greenland film, and he was full of admiration for the many beautiful motion pictures of the Greenland scenery and the Greenlanders, which were shown to him on a later visit to Berlin. During this period Knud Rasmussen undertook several motor-boat journeys to the fjords round Nûgâtsiaq and a flight with the famous German military aviator Udet across the Umiámáko icefjord and the regions along the margin of the inland ice which at that time were utterly unknown.

Knud Rasmussen looked upon this flight as a wonderful experience, and by its means he succeeded in killing a curious old superstition which had prevailed for more than a hundred years in the surrounding dwelling places.

As it happened, their inhabitants went about in constant dread of a wild and strange Eskimo tribe who lived far in the interior of Umiamáko Fjord and only appeared in winter, when the ice began to form on the waters. From Karrat these mystical, unknown beings could be seen driving in dog sledges, but as there was a blood feud between the two peoples, they always fled when meeting anybody. In any case they were unpleasant neighbours, and a certain terror still lurked in all minds, but when Knud Rasmussen reported that he had crossed these strange areas in an aeroplane and found no traces, neither of houses and tents, nor of sites and smoke, the minds of the coast dwellers were again happily set at rest.

In order to see the impression of such a flight on an old Greenlander Knud Rasmussen afterwards induced Udet to fly with a 60—70 years old hunter, and he afterwards gave Knud Rasmussen a glowing description of this experience which to him was utterly fantastic. Though Knud Rasmussen wanted to write down these

impressions, he did not, I think, find time to do so, but I have on a later occasion heard him quote a single one of the graphic descriptions of the old hunter: "I had the feeling that the whole universe stood still under me." One does not expect such expressions from the mouth of an illiterate Greenlander.

In these days Knud Rasmussens thoughts were naturally entirely with the expedition, and he was very happy, when the "Th. Stauning" returned from Thule after a record voyage. He thereupon immediately started on the southward journey.

July 22d—28th: Voyage with the "Th. Stauning" from Nûgâtsiaq to Ivigtut. On the way the vessel called at Ritenbenk, Jakobshavn, Godthaab and Færingerhavn.

July 28th: Flight from Ivigtut to Qagssiarssuk for a conference with the archæologist.
Return flight via Julianehaab.

July 29th: Flight from Ivigtut directly to Julianehaab, where preparations had been commenced for the departure to the East Coast.

August 3d—7th: Voyage with the "Th. Stauning" from Julianehaab via Nanortalik—Prins Christians Sund—Aluk to Skjoldungen to meet the survey-party, and from there to proceed to the base harbour at Imarsivik.

August 8th—11th: Voyage with the "Th. Stauning" from Imarsivik to Angmagssalik and back again in order to fetch Therkel Mathiassen and also petrol for the flying party.

August 15th: Flight in the morning from Imarsivik to Ruinnæsset, at the head of the northern Skjoldungen Fjord in order to confer with Therkel Mathiassen.
Fetched in the evening by an aeroplane and flown back again to Imarsivik.

August 16th—18th: Boat journey with the "Manne" from Imarsivik to Bernstorffs Isfjord and back again. On this journey all the old dwelling places were visited and sketches made for use in later detailed investigations.

August 19th—20th: Voyage with the "Th. Stauning" from Imarsivik to Ruinnæsset, where Therkel Mathiassen's party was taken onboard. In the afternoon of the 19th a visit was made at the Norwegian hunting station to thank the Norwegians for their hospitality and helpfulness towards the expedition last year and again this summer. On the 20th the journey was continued to the base harbour at Tingmiarmiut.

August 21st—22d: Boat journey with the "Manne" round the Tingmiarmiut Fjord in order to visit and measure all the old dwelling places. Together with Therkel Mathiassen special excavations were undertaken of the clover-leaf shaped house sites at Issarnisarmiut.

August 23d—24th: Voyage with the "Th. Stauning" from Tingmiarmiut to Qutdlît and then on the following day to Tâterait.
Boat journey with the "Manne" to Anoritôq Fjord in order to explore the old dwelling places together with Therkel Mathiassen.

August 30th—September 1st: Voyage with the "Th. Stauning" from Tâterait to Dannell's Fjord (30th), Nanûseq (31st) and Narssaq in Lindenows Fjord.

September 2nd: Flight from Lindenows Fjord across the inland ice—Nûk—Nanortalik to Julianehaab. Made preparations there for the conclusion of the expedition and the home journey of the members.

September 6th—8th: Voyage as a guest on board the inspection vessel of the Danish Royal Navy, the "Maagen" from Julianehaab via Sydprøven, Nanortalik, Augpilagtoq, Prins Christians Sund to Narssaq in Lindenows Fjord.
Prepared together with the carpenter Emil Rasmussen and the hunter Knud Østergaard for their wintering in those parts and awaited the finishing of the work of the survey party.

September 9th: Voyage with the "Maagen" from Narssaq to Nanûseq and back again.
Negotiations with the Norwegian sealing station regarding the distribution of the hunting areas.

September 11th—15th: Boat journeys with the "Manne" in Lindenows Fjord in order to explore old hunting camps.

September 18th—20th: Boat journey with the "Gerda" from Lindenows Fjord via Augpilagtoq—Nanortalik to Julianehaab.

October 7th—21st: Boat journeys with the "Dagmar" from Julianehaab to Nanortalik—Frederiksdal — Augpilagtoq — Qarsorsat and back again to Julianehaab.
The chief object of these journeys was to take motion pictures of the kayaking of the Greenlanders. These films were taken at Ikigait.

October 23d: Boat journeys with the "Dagmar" from Julianehaab to Ivigtut, homeward bound.

October 25th—November 5th: Voyage with S/S "London" direct from Ivigtut to Copenhagen.

The preceding summary gives an impression of the number, the variety and the length of the journeys, which Knud Rasmussen undertook in the course of that summer; thus, the distance from Ûmánaq round Kap Farvel to Angmagssalik was about 2500 km. Besides the manner of travelling (with vessel, motor-boat or aeroplane) and the route the summary further indicates the object of the journey. This list should, however, be supplemented with a number of details and facts regarding individual journeys and a more comprehensive view of Knud Rasmussen's general activity, not only as leader of the expedition, but also in his capacity as explorer in the field of archæology and folklore.

Knud Rasmussen had, by personal inspection, in the course of boat journeys, mountain climbing and flying trips acquired a deep-set impression of the natural conditions of Greenland, which had been given life and perspective through old Christian's accounts, Therkel Mathiassen's excavations and the abundant collection of air-photographs.

Much of this extensive knowledge Knud Rasmussen, as mentioned above, stored in his brain, happily confident in his marvellous memory. He looked forwards to write "The Book on Southeast Greenland"—but that unfortunately was not to be.

In the following Knud Rasmussen will be made to speak through his diary, and in order to make the impression as vivid as possible long extracts of it will be rendered word by word. In further illustration of his travels and activity I have, with intervals, added personal memories of talks and adventures together with him.

c. With the "Th. Stauning" to the East Coast.

On July 28th Knud Rasmussen arrived in Ivigtut. He came from the north in the "Th. Stauning", and all preparations for the journey to East Greenland were begun at once. On the 29th Knud Rasmussen himself proceeded by seaplane to Julianehaab, in order to profit by the time before the "Th. Stauning" was to arrive with the flying party, the fuel depot and the special equipment.

In Julianehaab on July 30th Knud Rasmussen had the unpleasant experience of seeing the "Dagmar" come puffing into the harbour with the "Quarto" in tow; the "Dagmar" with a smashed rudder and much outboard damage, and the "Quarto" with its engine stopped. Knud Rasmussen told me later that in his capacity of leader of expeditions he "had seldom experienced anything so surprising and depressing".

It was, however, immediately evident to him that this might easily prove a catastrophe for the survey work, the chief object of the expedition, and he immediately set about turning the tide of events. The departure for the East Coast was put off for a few days; he immediately

sent a messenger by boat to Qarsorsat, where a new motor boat of the "Gerda" type was hired from the fishing master Larsen, and the "Dagmar" was at once put on the slip for thorough repairs, so as to be able to return to the field of work as soon as possible. The second mate of the "Th. Stauning", Frederiksen, was put in charge of the "Dagmar", while Lieut. Wittrup Hansen was transferred to the "Th. Stauning", as he was to return to the field of work as soon as possible.

And then at last everything was ready for the departure to the East Coast. The seaplane had been taken onboard, and in the forenoon of August 3rd the "Th. Stauning" proceeded southwards. In Qarsorsat the new motor-boat, the "Pomasoba" (this rather funny name was made up of the first letters of the christian names of the whole Larsen family: Peter, Olga, Meta, Arne, Søster, Otto, Basse, Anker) and the journey was continued to Nanortalik. Here, owing to bad visibility, it was necessary to remain throughout the 4th, but on the 5th it was again possible to proceed southwards, still in sheltered waters. The weather cleared further on the passage through the impressive Torssukátak channel and out through the characteristic Prins Christians Sund, which was reached without any ice obstacles worth mentioning. Thus the east coast was made with comparative ease, but here there was a heavy swell, which unfortunately caused the vessel to roll so badly that it was feared that the planes of the aircraft which projected 4 metres on either side should be damaged by the seas.

"Find with some difficulty an anchorage in Aluk Sund. Good harbours, but far too deep water. A pouring rain, all bleakness," writes Knud Rasmussen in his diary, thus giving vent to his anoyance at not being able to proceed.

August 6th.

The weather somewhat improved, and the swell subsiding. In the early morning Knud Rasmussen had taken a walk in the mountains in order to get a view of the waters and to linger awhile in the place of memories. Here he completed his journey in 1904, after his first Greenland expedition as a member of Mylius Erichsen's "Literary Expedition". Here he dream this youthful dreams that he might some day also conquer the East Coast, and now at last after so many years he was on the threshold of the fulfilment of his wishes.

When as a young boy he stood on the Aluk rock and looked northwards along the wild and strange coast line of East Greenland, his little rowing boat lay at the foot of the rock and now—the expedition vessel with a seaplane onboard!

This was the development which had taken place within such a comparatively short span of years.

Here also Knud Rasmussen at last saw the Alungmiorssuaq dwelling place—the place which the old hunter of the legend was always longing for when travelling, for in no place was the sunset so beautiful, and at last his heart burst with joy at the sight of it.

Knud Rasmussen writes in his diary:

"A very strange dwelling place. In front of a high, steep rock a rather large house ruin in a very fertile valley, like a ravine, with a river rippling in it—and near it a number of graves . . . . . There was a view of the far-flung, free and constantly shifting sea horizon, and this was what the Aluk man loved so passionately. The empression was one of grandeur, but at the same time of a certain open water "nakedness" and storm-lashed "roundedness"—as if shiny by wear. The roar of the swell dominated everything. It was hard to understand how anyone could get into his kayak from this dwelling place. To say nothing of coming alongside in a women's boat".

At 11 a. m. the vessel weighed anchor and once more headed seawards. The weather was better, without however being particularly favourable.

A plan had been entertained of putting Emil Rasmussen ashore at Tutein's hunting hut in Lindenows Fjord with a few Greenland hunters, but time being now so far advanced that all efforts had to be directed towards the meeting with the survey party, this plan was abandoned. With the exception of the large glaciers there was no ice, but some swell. Knud Rasmussen expressed his anxiety for the seaplane in the following words:

"Now dusk is falling, and Kap Rantzau and Kap Adelaer are barely distinguishable. Off Puissortoq the vessel rolls very badly, and for a while I was a little anxious about the projecting planes. It is now between one and two o'clock in the night, and Erik Rasmussen sleeps soundly, so I myself at last settle down to rest."

On August 7th the diary relates:

"When in the early morning I get out of my cabin, we have already passed Ûmánaq with Griffenfeld-Øen. Right in front of us to the south of Skjoldungen the huge Qutsigsormiut-Kap rose in the sunshine.

The swell was running, when we passed through the southern course of Skjoldunge Fjorden and got into dead calm water. The sky is glorious, bright and clear. Not a wind is stirring and nearly all coves are free of ice. The spell of fine weather now seems to have begun—and airmen and photographers are looking forward to getting up in the air.

The "Th. Stauning" is moving gently shorewards through the old Inugssuarmiut of the East Greenlanders, where at one time the con-

jurer Kunigsarfik came by his death together with his family, after Christian had threatened him.

Steep mountains with pointed peaks, deep coves with dead calm water characterize the scenery of the southern fjord. Here and there some ice-bergs are massed together over a shallow. A beautiful day and joyful expectation now that the meeting with the comrades is imminent.

But where are Gabel and his geodetists?

At noon we pass the lovely Dronning Maries Dal with the Norwegian hut, and we set our course straight for Ruinnæs. Here we find a report to the effect that they are scattered all over the Skjoldungen in survey parties and may be expected back this very day.

At Ruinnæs there is some chop-ice from the neighbouring glacier, so we sail a little further out, and the seaplane takes off. Ten minutes afterwards Erik Rasmussen is on the wings. He is going to look for Gabel.

We are greatly excited. This is the first time that the wireless of the aeroplane is to be tested[1]), and it works excellently from the very beginning. After fifteen minutes' flight out over the fjord a motor-boat is reported to be within sight, and the machine lands.

In less than another fifteen minutes the seaplane is again seen, and this time with Gabel onboard.

Great joy at meeting!

Two hours afterwards we are assembled, and it is decided that we are all to go to the new ship's harbour at Imarsivik which Gabel has found.

In the evening about 10 o'clock we are moored in the harbour; the seaplane has arrived long ago and lies anchored in front of Madsens camp."

d. The camp at Imarsivik.

There was not much room onboard the "Th. Stauning" and feverish activity and unrest. Knud Rasmussen consequently moved ashore and did so with great pleasure. In his "somewhat older days" he loved to live alone in his tent with all his own things about him. A long life of travels had taught him, in true Greenland fashion, to keep all his many possessions in small bags and bundles—these are easy to stow away in a little boat or on a sledge though, in return, they are abominably apt to disappear on a large vessel. In these private repositories he had all the trifles which come in so handy as gifts, and are therefore very valuable when travelling among primitive people. It was an interesting experience

[1]) In connection with the mother-ship.

to see Knud Rasmussen going about quietly from bundle to bundle in order to find suitable gifts for friends and visitors. And he loved to give.

As second-in-command I had the privilege of living in a tent beside that of Knud Rasmussen. He was an early riser, and already about 5 o'clock he turned out, made coffee and then called me. Shortly afterwards we were sitting side by side on the edge of his sleeping bag and discussed the work of the day, while swallowing down large cups of boiling hot coffee. We quietly talked things over, instructions were written down and plans of further travelling discussed. Afterwards we made the round of camp and vessel, in order to see how the work of the various parties progressed. They were fine days which we often talked about later.

When everything regarding the expedition was done, and time permitted, Knud Rasmussen loved to take his own small journeys in fjords and among the rocks of the coast. For that purpose he used his little motor-boat the "Manne", and with old Christian Poulsen, the photographer Rimmen or the artist Ernst Hansen as companions he travelled about from dwelling place to dwelling place, as far as he could go. On such occasions he was truly happy, and Christian, who had lived the greater part of his life on that coast, made the dwelling places live again by means of his fascinating accounts. Songs and legends interchanged with accounts of hunting parties, reports of weather conditions and daily life. Some of this appears from the diary or from an article which Knud Rasmussen managed to finish before his death, but the greater part he stored in his wonderful memory, and so it is lost to us for ever.

What is left of purely folkloristic material has been treated by H. Ostermann in Medd. o. Gr. Vol. 109. No 1, and Knud Rasmussen's many measurings of dwelling places which are to be found in Diary II from 1932 have been dealt with by Therkel Mathiassen in Medd. om Gr. vol. 109, No 2.

In the following these travels will be illustrated by some extracts from Diary I.

e. With the "Manne" to Igdluluarssuit.

August 12th.

"The engine of the "Pomasoba" is being repaired by the engineers onboard, and the mechanics of the seaplane are busily at work with it, but late at night it was not yet ready to start.

Visited the small house of the Norwegians.

August 13th.

Up and about at 5 o'clock to inspirit the mechanics who will be ready about ten.

Therkel Mathiassen is to be taken to Ruinnæs in the "Pomasoba". In the evening I receive a wireless message that our mystical ruin looks very peculiar indeed.

Mathiassen took with him Rasmussen, Abia, Ferdinand, Malakias.

Flights are made in the neighbouring fjords and later on to the interior part of Skjoldungen and Bernstorffs Fjord.

At 4,30 p. m. the "Dagmar" arrives. Great joy.

It is observed by the seaplane behind Graahs Havn—and Østergaard and I try in vain to catch up with it in the "Manne". It turns out later on that the captain and Ernst Hansen are both onboard[1]).

August 14th.

Took leave of the "Gerda" and the "Pomasoba", which are going southwards on a survey journey with Madsen, Tegner and Bøgvad—in order not to return.

We try to take photographs of the assembled expedition.

August 15th.

The engine of the "Dagmar" is thoroughly overhauled. The screw which has been bent is replaced by another.

August 16th.

Orqua.

At 5 o'clock in the morning a start is made for Imarsivik tenting camp, Østergaard and Christian making up the party.

On our way we look in vain for a bear trap mentioned by Graah, which is said to have been found on the extreme high point of the continent before the crossing to Nûgârmiut—as it is not, here it is considered hopeless to search further, three or four other localities being mentioned as possibilities. We then proceed to Orqua, the home of Christian's childhood, which is situated below a mountain of medium size at the mouth of a fjord with tall alpine peaks of an elegant shape.

An idyllic dwelling place which has been made to live for me by Christian's oft repeated mention of it. His house still stands there, well preserved and covered with tall grass; blubber is still oozing, wherever we set foot outside the house—thick layers of pujak glistening in the sun—it actually perspires in the warm morning.

There are many such meat pits glistening with blubber—one

[1]) The "Dagmar" had previously visited the north side of the Imarsivik isthmus. Captain Petersen and Ernst Hansen then walked across the isthmus and took the boat round the island into the base harbour.

still sees stones and bones made fast to them to which dogs have been tied.

It is said that it is strong nigeq (ɔ: south (north) wind) place on account of the tall mountains. Good hunting ground for bear. At some distance from the houses hobbling stones which form a large arc.

The dwelling place which is called by the common name of Orqua is divided into two or three dwelling places. See the measurements—Diary II.

Najugtût:

The weather fine and bright—we had better try to get as far as possible at once, and we therefore make haste towards Igdluluarssuit.

We round the Orqua island with rather a strong swell going and for the present make for the dwelling place Najugtût—the "place of the bullheads" due west of Kap Moltke in the interior of a cosy little cove, which is very pleasant after sailing in the swell.

Here two square houses of Therkel's type from the 16th century.

One of these has a house passage debouching into a ravine—a steep ravine, a man with an enemy he does not wish to be surprised by .....

Within the little cove a lake, connected with it by a river; up here the bullheads seem to pass—hence the name: *najugtût.* Sometimes even seals are said to pass up through the river.

There is a good deal of seaweed here, and it is said to be a rich field for collectors of mussels.

The small dwelling place has a very picturesque situation—below the high, steep Kap Moltke—on the outside the huge breakers—inside the quiet waters of the cove. Large blocks of stone with tent rings and abundant grass and mosses.

On some level plateau filled with gravel and pebbles a picturesque play ground for children who as usual have built houses, women's boats and kayaks. . . .

In the warm bright sunshine the dwelling place bears witness to having at one time been inhabited by people who knew how to arrange their existence.

August 17th.

In this part of Igdluluarssuit there are two house ruins—one of the modern type from the 17th century—last perhaps inhabited by Christian with his family—and then a small round one of the type 14th—15th century.

High up on a mountain to which access was very difficult, we found a grave. It is hard to understand how the dead body can have been transported up there.

When we left Imarsivik it had been decided (see Diary II) that we were going to meet the "Dagmar"—Gabel's party—somewhere yesterday. But they did not turn up, and so we broke camp in the early morning to measure the house ruin on the small island Qimisâ.

It proved to be one of the most interesting dwelling places we had ever visited. . . . .

Scattered calf-ice—in a few places, however, very thick chop-ice, which forms a bar outside the islands in a line across Bernstorffs Isfjord.

And in between all this ice a glassy sea. . . . .

It was a knoll—not very high-projecting from the sea, but the centre of a magnificent view towards the open sea and the bar of icebergs at the mouth of Bernstorffs Isfjord.

While we are measuring the houses—eleven in all—(See Diary II) the "Dagmar" passes by — — — shortly afterwards we meet out among the icebergs in the glassy sea.

Besides the usual party Ernst Hansen and Rimmen are on board the "Dagmar".

While the films are being taken of the "Dagmar" sailing through the ice, I go back and finish measuring at Sagdliaruseq and Íkátormiut.

We are to meet in the afternoon in a new fjord near Itorartussaq.

From Igdluluarssuit we then continue in the same fine weather to Ítuvssâlik—an island almost in a line with Qimisâ—which is divided by an Itivssaq (ɔ: pass); hence the name.

Here Ilisímarteq harpooned two brothers out of jealousy.

After a visit at Qeqertarssuaq in order to measure (See Diary II) we return to our comrades who in the meantime have all climbed the mountains, partly to measure, partly to photograph and to draw. . . .

The "Dagmar" at anchor in a small sound debouching into a large Tasiussaq—behind this runs a mountain range towards Bernstorffs Isfjord . . . Here the comrades have made their ascent.

It becomes dark, before they come down. We hope that they will descend the same way; this does not happen. On the contrary, they choose a high steep mountain, which midway passes into a steep glacier.

In the darkness the matches they strike look like bonfires—Ernst H. is stuck in the mountains.

Østergaard and Gabi are sent out to rescue.

In the darkness with a rising moon the landscape which forms the root of Moltkes Fjelde look fantastic in its majestic grandeur.

After three hours' absence—from 22 to 1—Østergaard and Gabi return with the whole party: Gabel, Rimmen, Ernst H., Anders. All well.

August 18th.

In the evening I got a wireless message from the "Stauning", the only one which went through in the regular manner[1]). The following morning the "Dagmar" took the "Manne" in tow, and after having left Wittrup, Møller and Sakæus in a bay on the north side of Moltke, we proceeded round the cape and made measurings on a couple of small islands near Orqua—the water where I have seen the greatest number of seals—and from there we passed on to the large island behind Orqua which Gabel was to ascend.

Here our roads parted. He was to proceed northwards to Umîvik —the rest of us were going down to the "Stauning".

Afterwards we measured the two groups of dwelling places at Orqua (see Diary II).

We see Gabel's party like three little dots on the top of the mountain — — —

On our way to Nûgârmiut we find one of Finn Devold's small hunting huts: $1^1/_2$ by 2 m (for the rest see Diary II).

A motor-boat is sighted ahead; it is Devold. He has such a long start of us that we cannot catch up with him. We both sail through the narrow sound at Imarsivik—Devold passes the "Stauning"—the rest of us get onboard.

7 o'clock at night, and when we hear that all the flights as far as Pikiutdleq are now completed, we immediately start making preparations for breaking up, take everything onboard that is found in the Imarsivik camp and make ready to start next morning. . ."

f. The Great Ruin.

Special mention should be made of Knud Rasmussen's relation to the great ruin on Ruinnæs at the head of Skjoldungen Nordfjord.

As described in the report of the journey of 1931 this group of ruins seemed so peculiar to him that he thought it was an old Norse house, and more particularly that of Thorkel Orrebeinsfostre, there being so many things, among others the whole description of the scenery as given in the saga, which might point in this direction. By the preliminary excavation which Knud Rasmussen himself undertook in 1931, he did not arrive at any definite result. On the contrary, the mystery surrounding the house deepened, seeing that many details regarding the placing and manner of building seemed so decidedly un-Eskimo, whereas all the finds made were of Eskimo origin.

Later on Knud Rasmussen often spoke of this ruin. He felt impelled

[1]) The "Dagmar"s radio was very faint.

to solve the mystery, and could not set his mind at rest, until he had induced Dr. Therkel Mathiassen, an authority on Eskimo archæology, to look at it, and this luckily proved to be possible, as Mathiassen at that time was staying at Angmagssalik.

Therefore, as soon as everything relating to the survey party had been arranged at Imarsivik, Knud Rasmussen made haste to fetch Therkel Mathiassen, and in the days after the excavations had begun at Ruinnæs, he was greatly excited about the result and thrilled with longing to get out there.

In those days he often said to me: "I wonder how Therkel is getting on out there," and a special chapter in the diary is devoted to this subject which will have be given *in extenso*:

The Great Ruin
at the head of Skjoldungen Nordfjord.

"As a matter of course I have all along been very excited about the result of Therkel Mathiassen's excavation of the great ruin at Skjoldungen."

The "Pomasoba" had taken him there on the 13th (of August), and then he had just sent word that it was too dark to see what it really was—but it looked very peculiar.

Owing to a slight engine damage[1]) it had not been possible to get up in the air—and when at last the repairs were finished, the weather was so fine that no time could be spared from the taking of photographs.

August 15th.

Not until the 15th at 8.30 a. m.—before the beginning of the ordinary flights—could the time be found to fly me across. It took fifteen minutes—it was indeed impressive to pass above the peaks, which one had only known from below. The view was glorious on both sides—behind us towards Kap Moltke and in front across Skjoldungen towards Qutsigsormiut; it was very pleasant to fly across the entrance, where the year before we had had the "Himlahav" when after the days of storm we stood in with the "Dagmar".

But it was as if one could not find time to collect the impressions received in the proper way—the place was passed, before one could concentrate one's thoughts and register one's impressions. And while Kap Moltke was still in sight behind us, we had almost passed over the Ruinnæs with a view on to the mountain gap with Dronning Maries Dal and the eternally calving glacier.

We went down some distance outside Ruinnæs, and Malakias

[1]) After the wing flap of the seaplane had been run into.

came to fetch me in Ferdinands kayak. I was told at once that I would in all probability be disappointed at the results of the excavation.

They had all come down to receive me—and while Erik Rasmussen and the mechanic Jørgensen again took to the wings in order to proceed with the photo-flights of the day, we assembled at Therkel's tent for a cup of coffee and a chat.

The mosquito plague was terrible, caused by both ordinary and quite small mosquitos which are the worst of all, because they bite before they can be chased away, and the bites swell so terribly and make the face quite unrecognizable.

As to the ruin which we then visited, see Therkel's report[1]).

He now declares that he has never seen a ruin like it, though the diggings only brought to light Eskimo houses forming a block.

The peculiar manner in which they are built together and more particularly the fact that the houses are connected by a common wall, has house passages running in opposite[2]) directions within the same complex—does not exclude the possibility that the Eskimo houses were originally built on the site or the ruin of a non-Eskimo building...

Even though I did believe, nay, was convinced that this was really a Norse ruin, I never went further than setting forth this as a hypothesis, nor did I say that the culture elements which we found in the course of our diggings last year were of other than Eskimo origin.

There is, however, the difference between Therkel's view and my own—that he does not believe, whereas I still believe, and that in spite of his scepticism he dare not deny that the ruin is so remarkable that there may have been a Norse ruin in this place.

For myself I cannot get away from the impression that the whole of the complex has a non-Eskimo character—no Eskimos build their houses right up against each other in that manner, except when as in the case of Rolf's ruin at Lindenows Fjord there has been a special cause for it—f. i. in already existing remains of walls.

In any case Therkel found the ruin so remarkable that he himself proposed that it should be preserved.

At 6 o'clock the plane came to fetch me, and as great quantities of calf-ice had drifted together in the bight, where we had first landed, I was obliged to row across the fjord in a kayak and go aboard there."

It is no overstatement that Knud Rasmussen was greatly disappointed by the result of the explorations; this breathes through every

[1]) Medd. om Grønl. Vol. 109, No. 2.

[2]) All underlinings made by Knud Rasmussen himself.

line of his diary quoted above. His own words to me on a later occasion were as follows:

"Therkel Mathiassen has spoken, and we must all submit to his decision, but in that ruin there still lurks a mystery, which points towards white man."

The most northerly indisputably Norse ruin on the East Coast is thus still Rolf's ruin at Narssaq in Lindenows Fjord, but the Greenlanders also relate of Norse ruins farther north, and it is not inconceivable that something may turn up one day, though, as Dr. Norlund writes, the finding must undoubtedly be left to chance.

g. Southeast Greenland in former Times and To-day.

However, it was not only archæology which absorbed the interest of Knud Rasmussen. As a matter of fact a question of far more vital importance for him was that of the conditions of life on the East Coast in view of a further Eskimo colonization, and in the introduction to his preliminary account of Southeast Greenland in former times and to-day (see H. Ostermann: Medd. o. Gr. vol. 109 No 1) he writes:

"That which absorbed my personal interest the most was, however, all that the old East-Greenlanders still remembered of the life which at one time was lived on these coasts; further, the economic conditions such as they were in our own day and so also the possibilities of a new settlement."

It was Knud Rasmussen's great wish that the Southeast Coast should once more be inhabited by Greenlanders, and if supported by small outpost depots as e. g. at Auarqat, Tingmiarmiut, Igdluluarssuk (at Bernstorffs Isfjord) and Umîvik he did not doubt that the old direct connection between the Kap Farvel and the Angmagssalik Greenlanders could be reopened. With a schooner—f. inst. from Julianehaab—it would always be possible to navigate these depots from the middle of August until the middle of September.

It goes without saying that Knud Rasmussen considered it necessary first to undertake more detailed investigations of hunting conditions which, in the case of the marine fauna, might in all probability have altered with the changes in the conditions of the ice and perhaps also of the current.

He therefore greatly wished first and foremost to start marine investigation on the Southeast Coast, and as a beginning he had arranged that cand. mag. Poul Hansen, who had for many years been in charge of the fishery investigations on the West Coast, should extend his field of activity to the East Coast, and by preference in the first instance all the way up to the Tingmiarmiut area. The latter part of this programme

Fig. 41. View of the coast from Krumpens Fjord to Bernstorffs Isfjord. At the back to the left Kap Møsting.

was, however, not carried out; only the Lindenows and Nanûseq Fjords were investigated, as it was rather late in the season, before Poul Hansen could disengage himself from the investigations which had been planned on the West Coast.

On a line with this work was also the establishment in Lindenows Fjord of a station for the further investigation of hunting conditions there, in direct continuation of Bendixen's investigations in 1925. Had decisive changes taken place since then?

In the house built by the Bendixen-Expedition in 1925—Tutein's house or hut—Knud Rasmussen installed two members of the expedition: the carpenter Emil Rasmussen (who had formerly wintered at Thule) and the hunter Knud Østergaard (who had formerly wintered in North East Greenland). The house was repaired, and provisions and equipment for about a year were left in it.

It is characteristic of the care and humaneness with which Knud Rasmussen embraced every branch of the work of his expedition and the individual members thereof that during a very busy period, when he was winding up the work on the East Coast and preparing for that on the West Coast, he found time to devote so much of his attention to the two men, who were now preparing for a solitary winter in the Arctic. Knud Rasmussen's stay at Narssaq lasted about ten days—a glorious time for himself, who enjoyed the rest and peace and felt greatly relieved that the photo-flights and, for that matter, the whole of the work had been so succesful, and absolutely an ineradicable memory for Emil Rasmussen and Østergaard, who from it imbibed a zest of life to help them through the winter. During this period Knud Rasmussen also visited the Norwegian hunting station at Nanûseq Fjord and made a kind of gentleman's agreement with them, which should prevent each of the two hunting stations from interfering with the field of the other's works. In the field he wished to live at peace with the Norwegians. The battle of East Greenland was to be fought in one place only, that is before the International Court at the Hague, and it was consequently in perfect concord with Knud Rasmussen's spirit that he—and all the members of his expedition—during the three working years which he spent on the East Coast maintained the most friendly relations with all the Norwegian hunters.

As to the wintering party at Lindenows Fjord, he further found great comfort in the thought that only a short distance parted them from the Norwegian hunting hut (which was even provided with a wireless station). "They are sure to find their way to each other in the course of the winter," Knud Rasmussen said afterwards, and his prophecy was fulfilled.

Knud Rasmussen unfortunately did not succeeded in carrying out

all his plans on the southeastern coast. He was first and foremost interested in investigations of fishing and hunting conditions, but his expectations as regards land hunting were not very high. His most fervid wish for South East Greenland, indeed for the whole of Greenland, was however that the merciless and terrifying war of destruction which is being waged against the seals, and more particularly the young of seals in the breeding grounds in the Arctic Sea, should be forbidden. Then a new and better era would dawn for the hunting population of Greenland, and the deserted coasts would once more come to life on their own accord.

h. Days at Kap Farvel.

The original population of the East Coast had, to a large extent, taken up their permanent abode in the Kap Farvel area, and after the work on the East Coast was ended, this circumstance enabled Knud Rasmussen to continue, in the most natural manner, his folkloristic investigations among the descendants of the old East Greenlanders and also the local hunting population, who for want of animals of capture extended their travels so as to comprise the most southerly part of the East Coast.

After a short visit to Julianehaab, the centre of the district, where the plans for the finishing works on the West Coast were worked out, he again turned south towards the Kap Farvel area in order to continue his folkloristic investigations and to take special photographs, partly ordinary and partly motion pictures.

On these voyages he visited the following dwelling places: Sârdloq, Lichtenau, Sydprøven, Qarsorsat, Nanortalik, Frederiksdal and Augpilagtoq. The longest stays were made in the last-mentioned localities, where comfortable homes were thrown open to him, and where he had the best working conditions possible.

Among the works which during this period interested Knud Rasmussen most of all must be mentioned that of a purely folkloristic-photographic nature, *viz.* cinema pictures showing the Kap Farvel kayakers. The Kap Farvel Greenlanders are justly famed for their wonderful skill, for in the stormy waters of that district only the very ablest kayakers can ply their art. Among the many kayaking proficiencies of the Greenlanders the looping-turn must be considered the most impressive. With the prow of the kayak against very large breakers, the most skillful can turn with a great wave by manipulating the cross axis of the kayak, but this naturally presupposes a very rough sea.

The place indicated by the Greenlanders for this performance was the water off the point at Ikigait, vis-a-vis Frederiksdal, where in a gale waves and swell are said to make a particularly impressive sight.

Consequently, Knud Rasmussen took up his abode in Frederiksdal together with the photographer Rimmen, made an arrangement with able kayakers, who were to keep ready, and then only waited for the gale. However, by one of the caprices of Fate the real gale, and in consequence the very rough sea, failed to materialise, which is a very unusual occurrence at Kap Farvel, where one generally does not have to wait so long for a gale in the month of October. Still, we succeeded in getting some pictures of kayaking performances, though not quite the real thing and no looping turns. Good use was, however, made of the period of waiting by conversing with the population of their conditions generally and their dependence upon the East Coast, and Knud Rasmussen in return told them of the work of the expedition and of its scientific and practical results.

During his stay in Nanortalik, as a guest in the house of the trading manager, Malmqvist, Knud Rasmussen fell ill. It was probably a case of meat ptomaine poisoning and at first looked very serious, so the second-in-command immediately sent for the physician of Julianehaab, but fortunately Knud Rasmussen recovered with surprising rapidity. There is no doubt that the illness was due to the consumption of tainted meat. For all meals Knud Rasmussen had at least ten standing invitations from the Greenlanders, and he never could find it in his heart to refuse. Thus entertainments were prepared by all the Greenland members of the expedition, who naturally regarded it both as an honour and an unforgettable experience to have the beloved Kunúnguaq ɔ: little Knud as a guest in their homes. With the years Knud Rasmussen had greater and greater difficulty in standing all this entertainment, but he knew better than anyone else how these "eating bouts" loosened the tongues of the Greenlanders, and he consequently used the meals as a means to gather new information and patiently put up with the less pleasant effects. In this case, it is true, he recovered very quickly, but for him as well as for us it was nevertheless a hint that the years will leave their impress even upon an iron constitution like his.

For the author who had the privilege of joining Knud Rasmussen on his travels in the southeastern district, these weeks are surrounded by a special glamour, the culmination of an eventful, I may even say an exciting journey. Until the very last we had each of us our own tasks to perform in the course of the day, but in the evenings and when going about in the motor-boat we found time to profit mutually by the hardships experienced in the course of the summer and to plan future journeys, first and foremost those of the following summer.

The expedition was nearing its end, and Knud Rasmussen's return was hastened by a telegram from the Prime Minister, who asked him to join the Danish Delegation to the Hague.

On October 21st Knud Rasmussen was again in Julianehaab, and on the 23rd in the morning he left for Ivigtut in the "Dagmar". The return voyage was to take place in a chartered vessel, S/S "London". With a view to preparing a preliminary report on the expedition, Knud

Fig. 42. Knud Rasmussen ready for his flight from the East to the West Coast.

Rasmussen had expressed the wish that the second-in-command and the leader of the flying group should return by the same vessel, and thanks to the great courtesy of Captain Hansen of the "London" this wish was fulfilled, Knud Rasmussen being installed in the private cabin of the captain. The departure from Ivigtut took place on October 23rd, and the arrival in Copenhagen on November 3rd, after a successful voyage.

XV. Conclusion and Journey Home.

When the violent autumn gales set in at the beginning of October, when the days grew short, and the weather constantly changed, the great outdoor works were seriously checked, and we began to take up more peaceful occupations at or near the inhabited places, all the time awaiting passage accommodation.

Thus, the flying group had taken up their abode at Ivigtut, the survey party at Julianehaab, the geologist in the southern district, and finally Knud Rasmussen's "party", as already mentioned, in the area Nanortalik-Augpilagtoq.

During this period the many collections were carefully examined and packed for sending home, and special geodetic and geological surveys and investigations were carried out until the time of departure.

We have called the 7th Thule Expedition the "Expedition of Many Journeys", and it deserved this name until the very last. Thus we were also, on our homeward journey, scattered in six different vessels.

Vessel	Member of Expedition	Arrival in Copenhagen
M/S "Th. Stauning" leaving Julianehaab on September 8th	Ernst Hansen O. Nielsen Thorkil Petersen, pilot	September 20th
H. M. S. "Hvidbjørnen" leaving Julianehaab on September 11th	G. A. R. Møller C. M. Ramstad	
S/S "London" leaving Ivigtut on October 23rd	Knud Rasmussen C. Gabel-Jørgensen E. Rasmussen	November 5th
S/S "Laura Mærsk" leaving Ivigtut on October 30th	H. C. Hansen L. Jensen C. Jørgensen	November 15th
S/S "Julius Thomsen" leaving Ivigtut on November 4th	R. Bøgvad H. C. Jacobsen C. Madsen H. F. Rimmen	November 15th
S/S "Hans Egede" leaving Julianehaab on November 6th	J. V. Tegner H. Wittrup Hansen Th. Pedersen	November 18th

THE 7TH THULE EXPEDITION
1933

I. Introduction.

The task of the 7th Thule Expedition, 1933, was to continue in a northern direction whence the expedition had stopped in 1932.

The new field of work was to be the distance from Umîvik to Kangerdlugssuaq, in all, a coast stretch of more than 600 km in length with an average breadth of 125 km from the outer coast to the innermost nunataks.

Because of the ample experiences collected in 1932 the programme of the expedition of 1933 could be built on a much more rational basis. In its main features the new expedition, however, closely followed the lines of that of the preceding year. Mapping was to be the principal task which necessitated survey parties with individual motor-boats and easy access to aircraft and mother-ship. Further, as in the preceding year, special investigations were to take place in a number of fields, according to the space available in the mother-ship and the funds which could be procured.

The main base of the expedition was to be in the settlements Julianehaab and Angmagssalik. The survey parties, whose motor-boats lay on the West Coast, were also in 1933 to undertake a boat journey round Kap Farvel and as far as the working area of the expedition, whence in the autumn they were again to return to their starting point, *viz.* Julianehaab. The mother-ship, on the other hand, would set its course directly for Angmagssalik which was to be the meeting place for the whole expedition. Only the transport of the seaplane to Greenland was left, until the question of the mother-ship had been settled.

But though the programme was, in its main features, the same for the two years, the details of this new expedition took quite a different course. The preparations could be begun at such an early date and be made so comprehensive as to benefit all the various fields of investigation. When the difficulties at the start were nevertheless very great, the explanation was the following. Whereas the expenses of the expedition of 1931 were entirely, and those of 1932 partly defrayed by the Thule

Station, Knud Rasmussen must in advance declare this to be impossible in the case of the expedition of 1933. All the more it is cause for admiration that he succeeded in setting up such a large expedition. The work done in the course of the winter by the leaders under Knud Rasmussen himself and the administrator of the Thule Station, Mr. Rudolph Sand, was perfectly unique, and thanks to the sympathy and valuable assistance of the Government and a great number of private individuals and institutions, their efforts were crowned with success. The negotiations which caused the greatest difficulties were those regarding the vessel of the expedition. An attempt was made once more to secure the "Th. Stauning", which had many advantages as mother-ship for the flights. This, however, failed, and after an incredible number of negotiations and voyages of inspection the three-masted motors-chooner the "Nordstjernen" of Marstal was chosen (see "Craft of the Expedition" page 199), but it must naturally undergo great alterations, before it was possible to use it for the purpose of the expedition. The vessel was placed at the disposal of the expedition by the shipowner A. P. Møller.

Unfortunately this vessel could not be used for the transport of the seaplane to Greenland, and after negotiations with the Ministry of Marine it was decided that, as in 1932, the plane was to be freighted to Ivigtut, whence a flight to Angmagssalik could then be made.

Also as regards the survey parties considerable changes and improvements were made. By great goodwill on the part of the Geodetic Institute the survey vessel the "Andræ", with Mr. Janus Sørensen, in command, was placed at our disposal, and further the expedition was provided with fully trained surveyors and modern survey material. Finally, Knud Rasmussen acquired a somewhat larger motor-boat, the M/C "Kivioq" to be used for his own journeys along the coast, this boat being particularly adapted for navigation in the difficult waters between Angmagssalik and Scoresby Sund, and further three motor-boats of the "Manne" type for sailing in the fjords.

In conclusion a films section was added, and it is therefore not to be wondered at that the call for personnel and material was greatly increased. On the other hand, it was the idea to set to work energetically along this coast, where the working time is so short, and where one must consequently have great resources of personnel and technique to prevent the whole of the enterprise from being kept under by the mighty forces of Nature.

Although the preparations, so to say, began on the very day when Knud Rasmussen set foot on Danish ground after his return from the journey of 1932, it was not until on June 21st that he was able to take a view of the new expedition and to make his plan for it known.

II. Plan for the 7th Thule-Expedition 1933.

A. District:

The working district of the expedition extends from Umîvik (approx. 64½° N.) to the northern Angmagssalik district (approx. 67° N.) and connects with the surveys begun in 1932 by Captain Ejnar Mikkelsen in the Kangerdlugssuaq region; this is a stretch in all of some 600 km.

B. Tasks:

1. The principal object of the expedition: survey by means of air-photography.

2. Police inspection of the whole East Coast district from Kap Farvel to the Angmagssalik north district.

3. Special investigation bearing on the East Coast Eskimos' spritual culture, religious conceptions and folk-lore.

4. Geological and glaciological investigations.

5. Fishery investigations.

6. Zoological investigations.

8. Botanical collections.

8. A graphic rendering of the scenery and people of East Greenland by the painter and draughtsman Ernst Hansen.

9. A cinematograph record of East Greenland and the East Greenlanders.

C. Personnel and material.

In all about 66 members take part in the expedition, of whom 15 are Greenlanders; the fleet at the disposal of the party consists of:

The M/Sch. "Nordstjernen" and 1 aeroplane.

1 motor-vessel.

2 large motor-boats.

5 small motor-boats.

D. General plan:

Work is begun at Angmagssalik, though the ice conditions will decide whether it is continued northwards in preference to southwards in the district Angmagssalik-Umîvik.

The glaciologist Milthers is to be conveyed as rapidly as possible to the Skjoldungen area, simultaneously with the laying of a petrol depot for the flying party and fuel oil for the survey boats. Of the latter the "Andræ", with Captain Gabel-Jørgensen, should immediately take up the fixing of control points between Umîvik and

Angmagssalik. The rest of the fleet is, as already mentioned, to be disposed according to the prevailing ice-conditions.

As soon as the aeroplane has arrived at Angmagssalik the air-photography in the southern working district should first be taken up, using Angmagssalik as a base for operations; afterwards the work is to be continued northwards.

(1) The survey work is to be ordered according to instructions worked out at the Geodetic Institute by Professor N. E. Nørlund and Lieut-Col. L. Bruhn, of which the following is nearly in extenso:

The work to be done, *viz.* to map the areas planned for 1933, which are an extension of the areas mapped in 1932, is based on the fact that it is possible, by employing the Institute's Aerokartograph, to draw a map directly from photographs. The photographs of the landscape are made in pairs to form a stereogram and must be controlled by fixed points established by ground survey.

The aim of the air-photography is to make these stereograms. During photography flights the aircraft must follow the routes indicated on the available maps. The height of flight is 4000 m. Photography takes place with the camera axis at right-angles to the line of flight, directed between the wing and the float of the seaplane.

It is very important that the altitude of the aircraft should be kept constant (by the altimeter) and that the horizon is registered on the photographs, since these conditions simplify enormously the later setting operations in the Aerocartograph.

The individual pictures of a stereogram are photographed with a separation of 2 km, which is then the base of the stereo pair. The distance between stereograms (i. e. between the last photograph in the preceding stereogram and the first in the subsequent) shall be 6 km.

Every route shall begin with a stereogram and end with a stereogram. The time intervals between individual exposures are worked out from the aircraft's speed over the ground; they are applied by the photographer with the help of a stop watch.

Routes normally should be laid at a distance of 15 km from the nearest line in the territory to be photographed. Plotting can take place stereoscopically in any stereogram from a distance of 6 times the base, i. e. from 12 km and beyond. Ground lying nearer cannot be plotted stereoscopically; but the machine can nevertheless draw coast-lines by monocular methods at distances between 8 and 12 km from the line of flight.

Since these stereogram-routes will not always give the necessary views into small, narrow fjords, there are also foreseen tail-pic-

ture routes (also at 4000 m). Such routes are along the fjords, and the camera is turned to point astern, exposures being made every 15 km (as approximately indicated on the map). It is also advisable to maintain constant height and register the horizon on these flights.

Photography should only be carried out in clear weather with good visibility. Demands on visibility will be especially great where several routes depend on one another, and the backgrounds of photographs have to be fully exploited.

The fixing of control, points which give the foundation of the later plotting of the air-photographs, must take place in conjunction with the air-photography.

For plotting in the Aerocartograph it is desirable to have at least 4 points per stereogram viz., 3 background points, one near the left-hand edge, one at the centre, one near the right-hand edge and 1 foreground-point. The last should lie near the centre of the photograph (as indicated by a small circle) and normally not below it.

If photographs are available, points are chosen by their aid. It is essential to see that the points really are on both photographs of the stereo-pair. The points should be well defined and indicated, in such a way that their identification is certain, by the personnel in Copenhagen who will be plotting from the photographs.

Since the background only changes a little from one stereogram to another, it is possible to limit the number of background points necessary in any given route.

If photographs are not available, points must be chosen in the field that can be judged with certainty to be identifiable on the photographs; such points could be summits of a marked character, ponds, capes, small islands in lakes, mouths of streams, and suchlike.

At a distance of 15 km from the line of flight, points should be fixed along the coast line as foreground points every 5—10 km. For the background points the following table applies:

Distance from line of flight	Breadth of field of view	Mutual separation of background points less than
30 km	22 km	11 km
40 -	30 -	15 -
50 -	38 -	19 -
60 -	46 -	23 -
70 -	54 -	27 -
80 -	62 -	31 -
90 -	70 -	35 -
100 -	78 -	39 -
etc.		

It is most advantageous for the plotting machine if the background points lie at a constant distance from the line of flight and also determine the maximum distance at which plotting is to take place.

For the tail pictures there must also be foreground and background points, but these can only be water-line points. It is desirable to have 2 foreground points which as far as possible extend over the whole breadth of the picture (breadth of the fjord).

It is of the greatest importance that the points chosen shall be so described, if possible in connection with a sketch or amateur photograph, that their later identification is certain. At the same time the position of the point is intersected on a plane table, or worked out later on a projection at 1:200,000.

In order that there may be the maximum similarity in appearance between the points as viewed by the surveyor and as viewed by the camera it is desirable to choose survey stations as high as possible.

If the air-photographs are to be fully used, the important thing is to determine the distance to ground points, the sharpness of the point being of secondary importance. (It would be adequate, for instance, if it is only possible to fix a round nunatak as background point).

The surveyors should use every opportunity on their journeys to secure knowledge of as much topographic detail as possible, since the facts thus obtained will be of the greatest value during the plotting and drawing of the map. For the same reason it is constantly to be borne in mind that the observations from any station should be as complete as time permits, so that if necessary a map could be worked out at 1:200,000, even with the assistance of only indifferent air-photographs.

It is strongly urged that amateur photographs should be used to illustrate topographic detail (especially in those places not fully viewed from the air) or control points, especially if the photographs are taken from the ends of a suitable base (about 1/60th to 1/100th of the distance to the furthest point). The resulting pictures form a stereogram which, when examined in a sterscope, will give far greater information about the topography than a single picture and simplify questions of identification considerably.

(2) With regard to the police inspection the following extract from the sailing orders of the Ministry of Naval Affairs are reproduced:

The object of the expedition is partly to carry out the policing and inspection service on the coast of Greenland, and partly to support in all possible ways Knud Rasmussen's expedition, in particular as mother-ship for the aeroplane intended to carry out the expedition's air surveys.

As far as the districts round Angmagssalik and Scoresby Sund are concerned, the "Provisional Instructions for the Station and Inspection Service of Greenland" dated May 18th 1931, are to apply for the visit of the ship to such extent as conditions of the East Coast of Greenland permit.

Apart from the districts mentioned the special monopoly regulations do not apply for East Greenland; see Memorandum from the Administration of the Settlement in Greenland of July 5th, 1924.

With reference to the "Provisional Instructions for the Policing and Inspection of Greenland" paragraph 3, final section, it should be noted that Dr. Knud Rasmussen is granted magisterial powers over certain areas in East Greenland, and that the inspection ship is in duty bound to render such assistanceas and where Dr. Rasmussen should require it.

(3) Dr. Knud Rasmussen is anxious to collect material for a record of the East Greenlanders' religious traditions; and so many of the old sagas and songs should be recorded as time permits.

(4) The geological investigations are to take place in the region from Imarsivik (which was the northern boundary of the investigations of 1932) as far north as possible towards Kangerdlugssuaq.

The principal task is to investigate the district's stratigraphy and petrography. Near Kap Gustav Holm there should be an especially thorough search for sedimentary rocks and fossils.

The heads of fjords should be examined for blocks of sedimentary rock.

Any appearance of minerals should be examined, as well as any sign of "in situ" changes of level.

The principal task for the glaciologist is an investigation into the variations in the rapidity of motion of the glaciers within a restricted area, for the purpose of throwing light on the differences between "living" and "dead" ice. Since there is within Skjoldungen Fjord a rich choice of various glacier types subject to identical climatic conditions, and since moreover the distances would permit several glaciers to be simultaneously under observation, the district is well-suited for the work in view.

In the boundary districts of the dead glaciers the sedimentation is to be investigated with special reference to the problem of the diluvial sand in the Danish ice-age deposits. Further, it should be examined how far one can distinguish between ice-edge phenomena at an advancing ice-front and the phenomena at a front of melting ice; and whether from these observations two types of ice-edge lines can be established. Finally the extent should be investigated to which

isolated remnants of ice play a part in the formation of landscape features in those districts previously covered by icefields.

The rate of glacial movement is measured by periodical determinations of position carried out with a photo-theodolite. The general conditions of the surface of the glacier are described, and the sedimentation is examined at natural and excavated sections. Where possible, borings should also be carried out in the ice and investigations into the ablation losses of glacier by comparison with the losses to subglacial streams.

(5) The plans for the fishery investigations are as follows:

I. To examine the species of fish, their quantities and age groups in the expedition's district.

In shallow water (as far as 150 m in depth) eelseine, hand lines and jig are to be used and in open water a ring trawl (Stramin bag) is to be towed to depths of about 300 m.

II. To supplement the investigations made by the "Danish Committee for Fishery Investigations and the Study of the Sea" as to the cod-fish larva's wandering between Iceland and Greenland; and to continue the work already established for several years (hitherto only on the west coast) of marking the cod of the Greenland coast in order to discover the movements of the adult fish.

III. To investigate the quantity of food for the fish on the sea bottom quantitatively as well as qualitatively. For this the Danish Petersen's grab is to be used so that a fully modern method is employed. This investigation will be of special value, since it supplements similar work done further north on the same coast in 1931—32. Further cand. mag. Poul M. Hansen's work is to be continued from last year.

As a part of this investigation an attempt has been made to call the attention of the Danish Commission for Fishery Investigations to valuations, and it is expected that the research ship the "Dana" will be able to carry out supplementary observations between Angmagssalik and Iceland.

IV. To investigate the breeding conditions of certain animals by means of maturity charts to show the conditions for spawning. To collect this material Stramin and Plankton nets are used as well as an instrument never previously employed in the arctic, viz. Dr. Mortensen's detritus collector. The collections are to be made in cooperation with Dr. Lauge Koch's zoologist on dates to be fixed by wireless intercommunication, so that a comparison can be later drawn.

V. To follow the movements of plankton and fish-larva, and as part of the generally comprehensive plan of hydrographic in-

vestigation in the northern arctic sea, a large number of water-samples are to be collected in the course of the summer to determine salinity, pH values, etc: at the same time as temperature measurements are made.

VI. At the same time the whole technique of the investigations will be able to make an important contribution to the knowledge of the sea bottom conditions along the coast e. g. depths and geological composition, as well as the currents.

(6) The zoological work (apart from fishery research) will be undertaken by mag. scient. Marie Jørgensen by means of the Berlèse funnel; this will provide information about the lower animal life in the soil, and give results which can be compared with similar researches in Iceland and Northeast Greenland. As soon as a thorough knowledge of the distribution of individual animals is obtained, it may be possible to form an idea of their immigration paths. Further collections will be made of terrestrial and fresh-water animals.

Conservator Møhl-Hansen will try to travel as much in the district as ice-conditions permit and collect as much ornithological material as possible during these journeys: observations are to be made at the same time on mammals and insects collected.

(7) The botanical collections are to be made during their journeys by mag. scient R. Bøgvad and mag. scient. Marie Jørgensen when their other work permits it.

(8) Throughout all these years during which I have travelled in the Arctic, I have had an intense desire to make, together with creative artists, my own contribution to a record of the arctic life and nature in words, colours and drawings.

It is my opinion that the time has now come to take this matter up for a more rational treatment, and I believe that several years of cooperation with the painter, lithographer and draughtsman Ernst Hansen have led me to find the man who should be brought to this great task.

(9) The film of East Greenland. The many expeditions during the last generation to Greenland have created in Denmark a lively interest in the nature and people of the country. The enthusiasm with which ordinary people have followed the scientific work which so many men in so many ways have carried out, seems to me to justify the making of a film which, based on an intimate knowledge of the country and the people, will attempt to give a picture of life

in Greenland. To this end I have worked out a film scenario which is to be performed in the Angmagssalik district under the direction of Dr. Dalsheim, with the assistance of Emmy Langberg and Pastor Peter Rosing.

Dr. Dalsheim's work is well known in this country; he has specialised in the taking of primitive peoples, and it is therefore my opinion that not only in cooperation with the two assistant directors already mentioned, but also supported by two distinguished assistant photographers, he will be in a position to achieve the aim defined for him in the manuscript.

The expedition which is preparing this programme of work has been greeted with extraordinarily great interest; it has especial reason to be grateful to the Prime Minister, Mr. Stauning; to the War and Marine Ministries, the Geodetic Institute, the Administration of Greenland, the Cryolite Mines and Trading Co., and the Øresund Chemical manufacturies. The available means are, besides the contribution of the State in material and personnel, to be supplied by the Ny Carlsberg Fund, the Tuborg Fund, the Rask-Ørsted Fund, Lauritz Andersen's Fund and, by no means the least, the contributions of many firms and private persons who in advancing cash have made possible the realisation of the expedition.

The expedition's film is to be financed by the Palladium Co. through its directors Svend Nielsen and Lau Lauritzen.

The surveyors, who in various groups have already sailed in the Royal Greenland Company's ships, are now in Julianehaab ready to begin on the long motor-boat journey from there to Angmagssalik.

The aeroplane is onboard H. M. S. "Hvidbjørnen", at present bound for Ivigtut. From there it will fly to its operating district in the Angmagssalik region.

The motor-cutter, the "Kivioq" (of the type of a North Sea Danish fishing "cutter") sails on the 21st of this month with 8 members of the expedition to Reykjavik, where there will be a meeting with the expedition ship "Nordstjernen", which carries the remainder of the party and should sail from Copenhagen on the 23rd of this month."

Copenhagen, 21st June 1933.

sign. KNUD RASMUSSEN.

III. Personnel of the Expedition.

Leader: KNUD RASMUSSEN.

Members of the expedition:

Name	Position (academic degree)	Member as:
Survey works:		
a. *Geodetists:*		
Gabel-Jørgensen, C. C. A.	Captain (R. I.) of the Geodetic Institute of Copenhagen	Cartographer, leader of the geodetic works and second-in-command.
Pedersen, N. Th.	Officiant, Geod. Inst.	Cartographer
Spender, M. A.	Civil engineer, B. A. (Oxford)	Carthographer
Larsson, C. C. L.	Assistant topographer at the Geodetic Institute of Copenhagen	Cartographer
Wittrup Hansen, H. I. E.	Lieut. R. N.	Skipper of M/B "Dagmar" and wireless operator
Sørensen, I. V. G.	Deck Officer R. N. (Søminemester)	Skipper of M/B "Andræ" and wireless operator
Thorlund Nielsen, J.	.....	Engineer on M/B "Dagmar"
Greenlanders permanently engaged:		
Kleist, Jacob (Jakuaraq)	Kivfaq at Julianehaab	Assistant at surveys
Kleist, Augustinus	Kivfaq at Nanortalik	Assistant at surveys
Hansen, Carolus	Kivfaq at Nanortalik	Assistant at surveys
Lennert, Nicolaj	Fisherman at Holsteinsborg	Assistant at surveys
Larsen, Mathias	Fisherman at Holsteinsborg	Assistant at surveys
Silassen, Augustinus	Hunter at Nanortalik	Assistant at surveys
Kleist, Gudmund	Hunter at Nanortalik	Assistant at surveys
b. *Flying party:*		
Rasmussen, E.	Lieut. R. N. (aviator)	First pilot
Grønbech, S. E. B.	Lieut. R. N. (aviator)	Aviator and second-in-command on M/Sch "Nordstjernen"
Nielsen, O.	Lieut. of the Reserve (R. A.)	Photographer

Name	Position (academic degree)	Member as:
Jacobsen, H. C.	Lieut. of the Reserve (R. I.).....	Photographer
Hansen, H. C.....	Cartographer at the Geodetic Institute	Photo-technician
Alexandersen, K. J. C. ..	Flight mechanic.....	Flight mechanic
Jorgensen, C. E. L.	Flight mechanic	Flight mechanic and wireless operator
Crew of M/Sch. "Nordstjernen":		
Vedel, A. H.	Commander, R. N.....	Captain
Rasmussen, E.	See under survey works	
Grønbech, S. E. B.....	— — — —	
Pedersen, P. M.	Skipper at the Thule station.....	Ice pilot, chief of the watch
Christensen, C. J. A. H...	Engineer, R. N.	Chief engineer
Winter, P. C. C.	Civil engineer, Lieut. R. E.	Wireless operator and leader of the wireless service
Petersen, C. H.	A. B. Seaman, quartermaster	Cargo master, accountant inspector of deck work
Bentsen, P.....	Medical student	Ship's physician and physician of the expedition
Pedersen, B.....	Baker	Steward
Mariners:		
No 5835 Villadsen, H. H.	.....	Engineer
No 5954 Hansen, S. O .	.....	Cook
No 6306 Hansen, A. B. C.	.....	Attendant
Deck crew:		
No 9546 Glad, E. A. B..	.....	Able-bodied seaman
No 9675 Pedersen, E. ..	.....	Able-bodied seaman
No 9682 Nielsen, H. V...	.....	Able-bodied seaman
No 9716 Dedenroth, E.G.	.....	Able-bodied seaman
No 9425 Bruun, P.	.....	Able-bodied seaman
No 9597 Fjelde, P. H. ..	.....	Able-bodied seaman
Ethnography and Folklore:		
Rasmussen, Knud	Dr. phil. & jur. h. c.	Leader
Andreassen, Karl (Kârale)	Chief catechist at the dwelling place Kùngmiut	Assistant; also took part in the film, as actor and interpreter

Name	Position (academic agree)	Member as
Poulsen, Christian (Autdârutâ)	Former chief hunter from Umîvik on the East Coast; now a resident of Frederiksdal	Local authority
Geological investigations:		
Bøgvad, S. R. F.	Mag. scient.	Leader of geological investigations
Østergaard, H.	Fisherman and hunter	Skipper of M/B "Inge"
Glaciological investigations:		
Milthers, K.	Mag. scient.	Leader of glaciological investigations
Mortensen, E.	Civil engineer	Skipper of M/B "Manne"
Fishery investigations:		
Bertelsen, E.	Stud. mag.	Leader of fishery investigations
Friis, K.	Fisherman	Assistant; also A. B. Seaman onboard the "Kivioq"
Crew of M/C "Kivioq":		
Tegner, I. V.	Lieut. Cdr. R. N.	Skipper of M/C "Kivioq"
Christiansen, N.	Mate	First mate and wireless operator
Olsen, J.	Mate	Second mate; for a time skipper of the geologists' boat
Pedersen, Th.	Mecanic	Engineer on M/C "Kivioq"
Zoological and botanical investigations:		
Jørgensen, Marie	Mag. scient.	Zoologist
Møhl-Hansen, U.	Conservator at the Zoological Museum of Copenhagen	Ornithologist
Artist:		
Hansen, Ernst	Painter, draughtsman	Illustrator
Films party:		
Dalsheim, Fr.	Rechtsanwalt, Dr. jur.	Instructor
Scheib, H.	Photographer	1. Films photographer
Traut, W.	Photographer and instructor of sports	2. Films photographer

Name	Position (academic agree)	Member as
Langberg, Emmy.....	Secretary	Stage manager and accountant
Wieser, E.	.....	Assistant
Nielsen, E.....	Assistant at A/S Palladium	Assistant
Rasmussen, E.	Carpenter.....	Carpenter and skipper of motor-boat
Madsen, A.....	Student (engine constructor)	Skipper of motor-boat
Further for a short period:		
Rosing, P.	Pastor at the Angmagssalik settlement.....	Interpreter
Thomsen, Magdalene (Lone).....	Accountant at the Thule station	On short voyages of inspection for supply service

The following Greenlanders were temporarily engaged:

from Angmagssalik:

Aviaja (Rosing), Ebba, Elisa, Erik, Gundine, Hans, Jens Emil, Josef, Lazarus, Louise, Maren (Navarana), Monica (from the house of Aron), Nathalie, Salo (head catechist), Simojak, Thomas, Tibo,

from Kap Dan:

Abia, Amalia, Anda, Anton, Ebbe Jorsuvan, Emanuel, Enok, Georg, Jonas, Klaus, Lars, Manasse, Marius, Nuka, Peter, Peter Mathæus (and his son), Salomon, Sermioq, Ulrik (Samo), William,

from Kûngmiut:

Adam, Amanda, Anders, Andrea, Ane Johanne, Âri, Ârip nulia, Bianco, Debora, Efinea, Elisa (Kâralip pania), Eugenia, Frederik, Isak, Ivan, Jakob, Johanne, Johanne (Kâralip nulia), Juditte, Karina, Karoline, Karolus, Kristian, Kristine, Lauritz, Lea, little Johanne, Majolika, Martin, Moses, Nikolaj, Ordâvia, Pakagtoq, Perpetua, Rudolf, Titus, Ulrik Getiansen, Valde,

from Sermilik:

Ejnar, Louis, Mathias, Paulus, Thalita,

from Sermiligâq:

Alma, Gudrun, Henning, Hansigne, Igdut, Kithora, Mads, Mersanti, Nana, Nathan, Odin, Olga, Sofus,

from Utorqarmiut:

Berthel, Rasmus.

Total of members of the expedition:
47 Danes
1 Englishman
4 Germans
10 Greenlanders (permanently engaged).
Total: 62 permanent members

to which must be added:
96 Greenlanders from the Angmagssalik district temporarily engaged by the various work parties,

and finally about:
15 Greenlanders from the Julianehaab district (Kap Farvel area) temporarily engaged by the geodetist, the geologist and the films-group.
Total: 111 temporarily engaged Greenlanders.

IV. Voyages to Greenland.

This expedition, like that of the preceding year, was destined to be the "Expedition of Many Journeys".

Thus, the journey to Greenland took place in six different vessels and by widely different routes.

The following is a short summary of all the journeys to Greenland, with supplementary remarks as to the individual voyages.

Summary of journeys.

Date of Departure from Copenhagen	Vessel	Member of expedition	Route	Arrival	
				Place	Date
April 8th	S/S "Gertrud Rask"	Janus Sørensen	direct	Egedesminde	April 24th
April 23th	S/S "Julius Thomsen"	Wittrup Hansen Thorlund Nielsen	direct	Ivigtut	Maj 6th
Maj 24th	M/S "Disko"	Gabel-Jørgensen Larsson N. Th. Pedersen Spender	direct	Godthaab	June 4th
June 16th	H.M.S. "Hvidbjørnen"	Erik Rasmussen C. Jørgensen (with the seaplane)	via Reykjavik	Ivigtut	July 4th

Date of Departure from Copenhagen	Vessel	Member of expedition	Route	Arrival	
				Place	Date
June 22nd	M/C "Kivioq"	Tegner Christiansen } crew Th. Pedersen } crew Jens Olsen } crew Friis } crew Møhl-Hansen Mortensen Madsen From *Reykjavik:* Knud Rasmussen & Fr. Dalsheim while Mortensen and Madsen were transferred to the "Nordstjernen"	via Tværaa and Reykjavik	Angmagssalik	July 13th
June 24th	M/Sch. "Nordstjernen"	Besides the crew: Knud Rasmussen E. Bertelsen R. Bøgvad Fr. Dalsheim Ernst Hansen K. Milthers Erik Nielsen H. Scheib W. Traut E. Wieser of the *flying group* Alexandersen H. C. Hansen H. C. Jacobsen C. Jørgensen O. Nielsen From *Reykjavik* further: Marie Jørgensen Emmy Langberg A. Madsen H. Mortensen	via Reykjavik	Angmagssalik	July 12th
June 26th	S/S "Bruarfoss"	Marie Jørgensen, (continued from Reykjavik by the "Nordstjernen")	via Scotland	Reykjavik	July 6th

All these voyages passed without incident; a few only will be briefly described in the following.

The voyage of the "Nordstjernen" to Angmagssalik.

The departure of Knud Rasmussen together with the greater part of the expedition onboard the "Nordstjernen" was naturally the chief event of the voyages out.

This departure took place from "Nordre Toldbod" on June 24th at 11 o'clock; the Prime Minister, Mr. Stauning, made a short address to Knud Rasmussen, expressing best wishes for the work of the summer.

To leave the coasts of Denmark behind was, however, easier said than done, for engine trouble in Øresund caused a delay of another couple of days, the "Nordstjernen" only getting out of the Sound on the 26th; and on 27th a short stay was made at Frederikshavn.

And then the journey began.

The rest and peace onboard were extremely welcome after all the feverish activity of the last days of preparation, and Knud Rasmussen writes in his diary:

June 27th.

"Called at Frederikshavn in order to land Tuxham's fitter. Got a supply of fresh fruit. A fine, large Norwegian sealer passed by us, dipping the flag.

"Then the journey is resumed, at first at a great speed—7—8 miles to the coasts of Norway; then almost incessantly contrary winds—3—4—5 miles' speed, but spend our time in pleasant comradeship in the large mess room."

July 7th.

"In the early morning arrival in Reykjavik."

No more is heard of the passage up.

In Reykjavik Knud Rasmussen had the pleasure to meet his friend General Balbo, two great expeditions crossing each other's routes in this place.

"How poor we looked beside this dazzling display of technique", Knud Rasmussen said on a later occasion. "And the resources it has at its disposal!" he added with a sigh, when looking out over the magnificent flotilla of 24 seaplanes which lay rocking on the waters of the harbour of Reykjavik.

This meeting was, however, only of short duration. Both hurried on, but contacts had been made which were destined to be of great importance far into the future.

Already on the morning of July 8th, Knud Rasmussen continued the journey to Angmagssalik in the "Kivioq" (see the report given below).

The "Nordstjernen" left Reykjavik on July 9th at 2 p. m. and was very successful in getting through the ice, so that already three days afterwards, on July 12th at 01,20 p. m. it lay safely moored in the harbour of Angmagssalik.

The passage out was at an end.

The voyage of the "Kivioq" to Angmagssalik.

In spite of its being so small, the "Kivioq" was the typical "deep water sailer", so none doubted that it would cross the Northern Atlantic without any difficulty. Still, we followed the small craft with great interest on its unusual passage, and I leave it to Lieut. Cdr. Tegner to give a short and graphic description of the whole of the passage from Toldboden to Angmagssalik:

"On June 22nd we let go from the Toldboden.

It was with happy expectations that we—eight members of the expedition—stood out of the harbour, joyful that we had at last got so far as to be clear of the preparations.

But however happy our expectations, we quite realized that it was not going to be a pleasure trip, and before we had left the Sound the sea gods demanded their due. However, nothing could be done but to take life as it came in a good spirit, and this we all did.

The following morning we passed the Scaw and waved our last good-bye to the old country, and then we proceeded on our journey, fine weather interchanging with less fine, past Lindesnæs and Fair Isle to Tværaa, where we arrived on June 27th at 10 a. m. The first part of the journey had been very successful, although we had had rather bad weather for about two hours off the Shetlands, and we were happy in our good little vessel which had fully proved to answer our expectations. Still, it was pleasant to stretch our cramped legs during our short stay in Tværaa and perhaps still more to get real hot food, which we had not seen to any large extent during the last few days.

On the following day at 10.40 hrs. we continued our journey to Reykjavik in the finest weather which we had had until then. The journey passed smoothly and without surprises of any kind, though we might perhaps have wished the wind from a somewhat different quarter, and we arrived in the harbour of Reykjavik on July 1st at about 11 a. m.

In Reykjavik we stayed till July 8th, waiting for the remainder of the expedition which was to arrive in the "Nordstjernen", and we spent our time in repairing several minor damages and making sundry improvements. Besides we had the grand experience of seeing General Balbo's air squadron arrive and settle down in the harbour—an impressive sight!

Fig. 43. Kayakers from Kap Dan (at Angmagssalik) on their way across the field-ice.

On July 8th at 01.30 hrs. we left Reykjavik, and now we had the leader of the expedition, Knud Rasmussen, and the films instructor, Dr. Dalsheim onboard, in place of the civil engineer Mortensen and the student Madsen who had been transferred to the "Nordstjernen".

This was the last stage of our voyage to Greenland, and at the start it looked as it were going to be a record journey; we went full speed ahead with a tail wind, and land was sighted a little more than two days after we had left Reykjavik.

However, our happy expectations were not fulfilled, for we entered the ice between Erik den Rødes Ø and Kap Dan, and before we knew where we were, we were stuck and realized that it would take some time before we would be able to slip through. Owing to a slight damage to our antenna we had, as bad luck would have it, missed a very important ice report from Angmagssalik; if we had received this report, it would have saved us much strenuous work.

The days which followed were very fatiguing for all onboard. The ice was often so closely packed that we could not see the water, which we should sail in, and as we would leave no chance untried, we worked so hard that one day passed into the other without rest. Every one of us had his work to attend to—whether a turn at the wheel or the wielding of a boat hook, or only to lie on our stomachs across the stern to see

that the screw did not get into too close touch with the ice, for if it had been damaged, it would have been a catastrophe for our further progress.

For days we worked slowly and not even safely in a southern direction along the shore, and our good little vessel must suffer many blows, but beyond some of the paint being scraped off it was not really damaged. Not until July 12th did we round Kap Dan, and then at last we got into touch with the Greenlanders from the dwelling place there.

They came running to us across the ice at full speed with their kayaks on their heads; if there was a crack between the ice floes they got into the kayaks and rushed into the water. In the twinkling of an eye they had got onto the next floe and ran on. It was an experience to see them, and we felt that we had at last attained our goal—we were in Greenland. Before long our crew was increased by 14—16 men. After the first greetings—which in parenthesis cost us the greater part of our rye-bread—we continued on our journey into the Angmagssalik Fjord. I do not think there ever have been so many people dancing about on the ice, as there were on this occasion, pushing and using their boat hooks in order to get room on the ice, and never have people worked harder or in such high spirits. This last stage of our journey was indeed festive, and we will never forget it. At last, in the early morning of July 13th we let go our anchor in a comparatively ice-free cove behind the Kap Dan country and went to bed—that night we all dreamt of ice.

In the afternoon of the same day we reached the settlement, where we met the "Nordstjernen", which had had a more successful passage".

For the West Coast parties the passage out was followed by the voyage to Angmagssalik where, as already mentioned, the entire expedition was first assembled. This voyage will be dealt with under "Geodetic Operations", which is the first of the short reports on the individual fields of investigation. These reports will be given by the leaders of the various branches of the expedition, except in such cases where their results have already been treated in special papers in the present work.

V. Geodetic Operations.

a. Introduction.

The great variety of experiences gathered in the course of the survey work of 1932, in connection with the fact that all the surveyors were professionally trained and the instruments entirely modern, all

this in many ways changed the whole working method and brought about a surprising improvement of the results.

Within the same period the geodetists provided a far more solid and more comprehensive material; indeed, they even found time to revise the work of the past year, the result being a collected, fairly homogeneous system of control points, extending from Kangerdlugssuaq to Lindenows Fjord, in all a distance of about 1200 km.

The changes were greatest as regards the fixing of control points. Here we very nearly reached perfection in the measurements and general arrangement of the work, and also from the point of view of the work done—area measured per day—the achievements of the four geodetists in 1933 is, I think, somewhat of a record.

Less changes were made as regards the flying party, the most important being that the films were now of the right kind, so that the photographs were of a very high quality, clear and sharply defined in details even at distances of up to 100 km.

Similar to the preceding year the work was arranged according to directions given by the Geodetic Institute of Copenhagen; these instructions are rendered in "Plan for the Expedition" (page 136).

In the following a short report will be given of the journeys, the work and the results.

b. Boat-Journeys of the Survey Parties.

Preparations.

As appears from the chapter on "Voyages to Greenland", the boat crews of the survey parties were the first to start. Whereas Wittrup Hansen and Thorlund Nielsen went straight to Julianehaab in order to make the "Dagmar" ready for the voyage, Janus Sørensen's journey took a somewhat more unusual course.

After his arrival in Egedesminde, on April 24th, he put up a wireless station in that settlement and then left for Holsteinsborg to rig out the "Andræ" and to put up another wireless station in this settlement.

Having finished his work there he again proceeded northwards in the "Andræ", this time for Jakobshavn, where he arrived on May 20th. Here the third wireless station was put up, and on May 23rd the "Andræ" was once more able to proceed southwards with full speed to Julianehaab and to the meeting with the geodetists.

An uncommonly fine start!

From Jakobshavn to Angmagssalik! From Knud Rasmussen's birth place to the centre of his last great field of work is a sea voyage of about 2300 km. A considerable distance for a motor-boat, and an able performance on the part of its crew.

On May 27th the "Andræ" left Holsteinsborg after having spent the days May 25th—26th in completing its fuel supply and a thorough overhauling of the engine. Only from then did it actually make part of the 7th Thule Expedition of 1933.

On this southward journey the "Andræ", on June 1st at 10 p. m., had reached as far as about 10 miles north of Frederikshaab where, however, the waters were blocked with ice, so that progress was stopped, and the boat must seek shelter at Ravns Storø. From here it was possible to establish a wireless communication with M/S "Disko" which just at that time happened to be in the same waters with the geodetists onboard, and the leader of this party instructed the "Andræ" to try and meet it in Godthaab for which the "Disko" was at that time heading.

The geodetists were to have been landed in Julianehaab, but also this was prevented by the ice-field. An attempt was then made to penetrate as far as Ivigtut, but it failed, and the course was laid for Godthaab, where the meeting with the "Andræ" took place on June 4th.

This was naturally a serious set back, not least because we had a far greater quantity of supplies, than the "Andræ" itself could freight to Julianehaab. Here, however, luck favoured us. The inspection vessel, the "Maagen" with Lieut. Cdr. Kofoed-Hansen R. N. in command, happened to be in the same waters, and he readily promised to freight our supplies to Julianehaab which consisted of 20 drums of fuel and about 60 packages of survey tackle.

On June 10th the "Andræ" left Godthaab, and after a good passage and without encountering ice obstacles worth mentioning arrived in Julianehaab on June 14th *via* Færingerhavn, Frederikshaab and Ivigtut. On June 17th the "Maagen" arrived with our supplies, and now we were all, with everything complete, assembled at Julianehaab.

Already on May 12th the crew of the "Dagmar" had arrived from Ivigtut and had at once commenced rigging the boat. This proved to be a very difficult and complicated task, and again this year the engine was extremely troublesome. The difficulties in fact were so great that the "Andræ" must at last tow the "Dagmar" to Ivigtut, where the engineering experts both of the "Disko" and of the Ivigtut settlement joined in thoroughly overhauling the machinery. Here at last we succeeded to have everything straight and to obtain such a testimonial of seaworthiness, both for engine and boat that we dared to take the "Dagmar" along on the very difficult trip to the East Coast. Finally, on June 27th, both boats again arrived in Julianehaab, the "Dagmar" this time being driven by its own engine, and after a few minor repairs it was at last possible to report the boat entirely ready to start, but this was only after a rigging period of 47 days in all.

A difficult and, not least, an extremely time-wasting start.

The survey parties used the whole of this period for various mapping works and special measurings in and around Julianehaab; these works will be mentioned in detail later on.

The Voyage from Julianehaab to Angmagssalik.

On June 30th at 10.25 a. m. the "Andræ" and the "Dagmar" headed south with Angmagssalik as their destination.

The chief Administrator, Mr. Svane, from Godthaab, and Mr. Ibsen, manager of the trading station at Julianehaab, accompanied us in the M/B "Holbøll". This year there were three boats leaving the Julianehaab harbour, followed by the good wishes of the population and their hearty greetings to Knud Rasmussen whom they would thus not have the privilege to see at the start.

In the evening Nanortalik was reached.

On July 1st four Greenlanders were engaged as a permanent crew of the boats and to assist at the survey work on the East Coast. Tidal boards were set up and levelled; also observations of the water level were commenced, which were to be continued throughout the summer.

On July 2nd we proceeded to Frederiksdal, where Christian Poulsen was taken onboard, and then we continued to Augpilagtoq, where we arrived at 2.20 p. m. in a very strong southwestern gale with sudden gusts of wind of a sinister character and strength.

The weather had been glorious until then. We encountered a good deal of ice-obstacles immediately north of Nanortalik, but in these southern regions the ice was very scattered.

On July 3rd we were obliged to lie still with storm and rain.

On July 4th the weather cleared, and at 4. a. m. we started from Augpilagtoq and passed out through Prins Christians Sund.

It was for all of us an unforgettable day.

The weather was the most beautiful imaginable, and without encountering any ice obstacles worth mentioning we reached the East Coast and at 5.25 p. a. anchored at Narssaq, where we were received by the two hunters, Emil Rasmussen and Knud Østergaard, who had wintered there. They had spent a good, though stormy winter and were very fit, but because of the ice they had not been able to escape from the fjord with the "Manne" and go down to Augpilagtoq, as had been originally intended.

Thus we had got in at Narssaq on the very day when the ice was for the first time sufficiently scattered to allow us to pass.

In the course of the morning of July 5th the Narssaq hut was made ready for the establishment of a depot, and Rasmussen and Østergaard

Fig. 44. Topo-photo of the island of Sagdlia between Lindenows Fjord and Nanûseq Fjord. The picture shows the ice situation on July 11th 1933. The masses of field-ice could not be forced with a motor-boat. In the ice to the right the little island "Sneglen" (o: the "snail").

joined the crews of the "Andræ" and the "Dagmar", and so once more became part of the expedition.

At 9.30 a. m. the boats stood out of the fjord in order to visit the Norwegian station at Nanûseq, and here we took leave of M/B "Holboll". The boat carried a good deal of our empty packings back to Augpilagtoq as well as our mail for Denmark, and so Mr. Svane once more rendered us valuable service.

But now our luck was at an end for the time being.

During our further passage in a northerly direction towards Kap Walløe we met such heavy masses of ice that we were obliged to turn back, and we then went into port on the south side of Nanûseq Fjord, a harbour which we called "Mannes harbour", after our motor boat.

During the night, however, the ice situation changed considerably for the worse.

On the morning of July 6th the whole of Nanûseq Fjord was blocked with pack-ice, and all navigation became impossible. Our harbour was, however, good and nearly free from ice. We made a fine detail map of it, which was later on presented to Knud Rasmussen as a gift to his son.

Fig. 45. The "Andræ", "Dagmar" and "Kivioq" locked into the pack-ice south of Bernstorffs Isfjord.

From July 6th—11th we lay ice-bound in Nanûseq Fjord. We spent our time doing survey work and made frequent trips into the mountains in order to look out for the ice.

On July 12th we finally managed to get back to Lindenows Fjord which was a much more suitable district for survey work. There was much ice in the fjord, though not more closely packed than that a motor boat might slip through. On the 14th and 15th several attempts were made to force the barrier of ice, but these failing, we went into port on the north side of Kap Hvitfeldt. Again an excellently protected and ice-free harbour.

On July 16th we at last succeeded in getting out; the ice now yielded so much land water that the voyage north passed smoothly. In the evening we reached as far as Kap Tordenskjold, and on the 17th in the evening we anchored in a harbour on the southwestern point of Uvdlorssiutit Ø south of Tingmiarmiut Fjord.

On July 19th at 1 p. m. we arrived at the Norwegian station on the northern side of Langenæs off Imarsivik, where we met the "Kivioq", which by wireless had been instructed to go there with petrol for our aviators. After a couple of pleasant hours spent in the company of Finn Devold and his comrades all the three boats continued in a northerly direction with the "Kivioq" as ice pilot. There was much and thick ice

to get through, which caused many detours and many time-wasting manoeuvres. In particular it was very difficult to penetrate the belt of pack-ice and glacier ice south of Bernstorffs Isfjord, and to go forward within the bank of icebergs which was our only possibility. These hours spent among the large drifting collossi of ice with their whirlpools of water and ice blocks are among our most unpleasant memories from that summer. We anchored for the night out in the ice to the southeast of Krumpens Fjord.

In the early morning of July 20th we continued northwards in clear, calm weather. The ice was somewhat more scattered, and everywhere a number of seals were to be seen on the ice. We succeeded in getting out of the ice off Umîvik, and then we shaped our course directly for Angmagssalik. It was strange after the many quiet weeks in the land water again to be out in the long ground swell.

On July 21st in the morning we managed to slip through the ice-belt off the Orssuluviaq peak, and here we were received by Knud Rasmussen and a number of our comrades who had sailed out in boats to meet us. At 8 p. m. we lay safely moored in the Angmagssalik harbour, beside the "Nordstjernen".

And so at last we had reached our field of work.

Voyages in the Angmagssalik District.

Immediately on our arrival in Angmagssalik a great deal of work had to be started, and at the same time my many duties as second-in-command began to call me. Consequently, I could not at the start take part in the survey works, which however were attended to in the best possible manner by Spender, Pedersen and Larsson. They started with a photogrammetric survey of the site of the settlement and were then transferred to the localities, where the principal surveys were to be undertaken, Pedersen and Larsson in the Angmagssalik Fjord and Spender at Kap Dan.

While this was going on, the "Andræ" was set ashore for repairs, having suffered damage by running aground on a subterranean skerry, and for a few days the "Dagmar" was placed at the disposal of Knud Rasmussen for a reconnaissance trip round the Angmagssalik island.

Not until the morning of the 29th the two boats were ready to start for the localities where the fixing of control points was to begin.

Two survey parties were formed, *viz*:

The "Andræ" party: Gabel-Jørgensen—Spender.

The "Dagmar" party: Pedersen—Larsson,

and the areas which they were going to survey were Sermilik Fjord and Angmagssalik Fjord, respectively. By means of a daily wireless com-

Fig. 46. The Angmagssalik settlement, viewed from the air. Top right the Kulusuk island.

munication the two parties would be able to keep in touch with each other and with the progress of the work, and while the operations were going on, orders could be given for future working districts.

On August 7th the parties were ready to start. As we had a spell of particularly fine weather, and the expedition vessel the "Nordstjernen" had left for Mikis Fjord, it was decided that the "Dagmar" should start at once for Kangerdlugssuaq in order to determine points of control from north to south along the difficult coast stretch as far as Kangerdlugssuatsiaq.

This coast is one of the most inhospitable in Greenland. In some places the peaks rise perpendicularly out of the sea, in others the inland ice passes right into the sea in large, greatly productive glaciers, and there being no skerry fence along that stretch, there is nothing of any kind to take shelter behind.

Fortunately there were some islands, which lay scattered at a distance of up to 10 km from the shore, ant these lent themselves excellently to the setting up of surveying instruments. It is practically impossible to get on to the actual land, either because of the glacier ice or the steep, inaccessible mountains.

The "Dagmar" party, however, solved the task set to perfection, being favoured by unusually fine weather and a calm sea, which made it possible to land on these entirely unprotected islands. In the days August 10th—26th we completed the survey of the stretch from Kangerdlugssuaq to Kangerdlugssuatsiaq. A continuous line of polygons had been laid from islet to islet, and on the basis of this, systems of control point had been established, which were sufficient to fix the air-photographs.

The area to be measured during the remainder of August and the early half of September ($^{28}/_{8}$—$^{16}/_{9}$) was that between Kangerdlugssuatsiaq and Angmagssalik Fjord, an entirely different task, seeing that the alpine, deeply incised Angmagssalik district requires a great number of operations in order to include all the main lines of the land.

The task of the "Andræ" party was to map the stretch from Sermilik Fjord to Umivik, and this piece of survey work was completed in the period August 18th—September 4th. However, only fifteen stations were measured, the weather being extremely sleety during the latter half of August; ten of the twenty-two days of the period were rainy, stormy or foggy days, so that it was quite impossible to do any survey-work whatsoever. This stretch was, for that matter, the most easily surveyed part of the Southeast Coast, the land forms being all low with a good skerry fence to protect them and many excellent harbours.

As soon as the party had concluded its operations here, it proceeded hurriedly northwards and began the survey of Sermiligâq Fjord, so as to be able to complete the determination of points, in collaboration

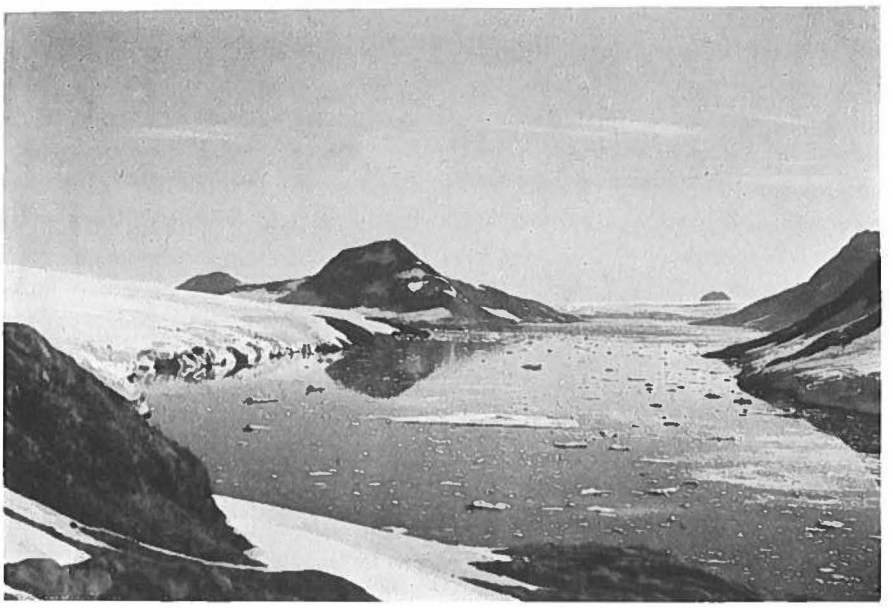

Fig. 47. From the Umîvik area. View in a southern direction through Qagssertöq. In the background the Umîvik peak above the glacier ice.

with the "Dagmar" party. The task was successfully carried out in the period 8th—13th September, and this was the end of the measurings in the working field of 1933. A continuous system of control points had been made from Kangerdlugssuaq to Umîvik, thus connecting up the measurings of 1932.

Return Voyage from Angmagssalik to Julianehaab.

The time had come to lay our course for home. Gales and snow would soon put a stop to all further surveys. As it was very desirable to bear out the system of control points measured in 1932, which could easily be done with our present experiences and our generally improved technique, I picked out a series of stations, among others all the key stations of the net, in which supplementary determinations of points were to be made according to the Jensen base method, as well as complete determinations of astronomical positions; finally terrestric-photogrammetric pictures should be taken. The district was further divided into two working fields, the "Andræ" party taking the distance from Umîvik to Tingmiarmiut Fjord (both inclusive) and the "Dagmar" party the remainder down to Lindenows Fjord.

On September 15th the "Andræ" and on the 19th the "Dagmar" departed from Angmagssalik in a southern direction, and this was our good-bye to the expedition.

The survey work unfortunately progressed rather slowly; the weather was very uncertain, storm and rain interchanging. The programme must gradually be restricted to comprise the very most necessary stations only. On September 21st the boats met at Skjoldungen and, on the 28th, at Narssaq in Lindenows Fjord, and then the "Andræ" party had measured 11 and the "Dagmar" party 6 stations; everything considered, this was sufficient and in any case a very considerable strengthening of the system of control points.

Our work on the East Coast now being ended, the boats again sailed into Prins Christians Sund on September 29th, and after short stays at Augpilagtoq and Frederiksdal we arrived in Nanortalik on September 30th.

Here various works were undertaken. The geodetists supplemented the tide gaugings with special observations and levelling, and by the wish of the Administration of Greenland Janus Sørensen erected the wireless of the "Dagmar" in the house of the manager of the trading station; this wireless was in the future to be used as the Nanortalik radio.

On October 3rd the "Dagmar" and on October 4th the "Andræ" arrived in Julianehaab.

This short summary of the summer voyages and operations by no means gives an adequate idea of the variety of the voyages and the number of surveys made. For further illustration of the movements and activity of the survey parties a list will be given below, briefly summarizing from day to day: measuring days, sailing days, bad weather days; this list, though very short, gives an impression of the progress and distribution of the work.

The numbers given are the numbers of the stations. Those beginning with 6 lie within the area 66°—69° N. lat.
7 - — - — 63°—66° N. lat.
8 - — - — 60°—63° N. lat.

Date	June		July	
	"Andræ" party	"Dagmar" party	"Andræ" party	"Dagmar" party
1	...	...	levelling	levelling
2	...	...	sailing	sailing
3	...	...	rain, wind	rain, wind
4	...	...	sailing	sailing
5	...	...	sailing	sailing
6	...	...	8772	8772
7	...	...	ice-bound	ice-bound
8	...	...	astronomical observations	ice-bound

Date	June		July	
	"Andræ" party	"Dagmar" party	"Andræ" party	"Dagmar" party
9	...	...	measuring of sea	measuring of 8773 harbour
10	...	...	ice-bound, rain	ice-bound, rain
11	...	...	ice-bound	ice-bound
12	...	...	8774, ice observations	8773
13	...	...	8776	8775
14	...	...	sailing	8777—8778
15	...	...	ice-bound	8779
16	8104—8105	8103	sailing	sailing
17	8102	8101—8109	sailing	sailing
18	sailing	rigging	sailing	sailing
19	8113—8125	8101	sailing	sailing
20	sailing	8113	sailing	sailing
21	sailing & depot work	sailing	arr. Angmagssalik	arr. Angmagssalik
22	8122—8125	8122, 8124, 8125	7850	7851, 7852, 7853
23	sailing	8124—8115	7867	7852
24	rain	rain	7854	7852—7853
25	rain	rain	7879	sailing
26	rain	rain	sailing	7868
27	sailing	sailing	depot work	waiting for boat
28	levelling	8110	7885	waiting for boat
29	depot work	depot work	7887	sailing
30	sailing	sailing	7887	fog
31	...	...	rain, fog	rain, fog

Date	August		September	
	"Andræ" party	"Dagmar" party	"Andræ" party	"Dagmar" party
1	rain	rain	rain, wind	rain
2	rain, fog	7884	rain	rain
3	6799	7886	7899	7918
4	6805	7888	7934	7920
5	rain	7890, 7892, 7894	rain, sailing	astronomical observations
6	rain	sailing	sailing	6720
7	rain	sailing	fog	7914
8	fog clouds	sailing	sailing	7916
9	7909	sailing	reconnoitring, sailing	7936
10	7911	6701	7935	6722
11	7917 (drizzle)	6702	7937	7940
12	7999 (drizzle)	6703	7939	7942
13	rain	6704	7889	7944

Date	August		September	
	"Andræ" party	"Dagmar" party	"Andræ" party	"Dagmar" party
14	sailing	6705—6706	rain	rain, storm
15	7921	sailing	sailing	7946
16	7923—7925	sailing	sailing	7948
17	7927	6713	NW 8, snow	engine attention
18	7929	sailing	7739	engine attention
19	7931—7938	sailing	7709—7769	sailing
20	7932	6714	rain, sailing	rain, sailing
21	rain	6715	rain, sailing	rain, sailing
22	rain	6716	rain, 7721—7726	rain, sailing
23	rain	6717	7729, 7763, 7770	8750
24	7928—7926	6718	8811	8750
25	7741	sailing	8811, stiff breeze	8766, gale
26	sailing	6719	8701	8755
27	7924	sailing	sailing	8767
28	7922	7865	sailing	8767—8744
29	rain, sailing	7910, harbour measuring	sailing	sailing
30	rain	7916 (drizzle)	sailing, arrival Nanortalik	sailing, arrival Nanortalik
31	rain	sailing		

Concluding Operations.

In Julianehaab the geodetists went ashore and were quartered there. The crew of the "Dagmar" commenced laying up the boat for the winter, whereas the "Andræ" was to return to its winter shelter in Holsteinsborg, so that its voyage was not yet ended.

On October 7th the "Andræ" left Julianehaab, followed by our best wishes for a happy journey. We were in the midst of a very difficult spell of weather, and the voyage from Frederikshaab to Holsteinsborg was a severe fight against southeastern storms and thick weather with snow, in the course of which it was i. a. necessary to lie hove-to for about two days and nights at the mouth of Søndre Strømfjord. Not until October 16th at 7 p. m. did the "Andræ" arrive in Holsteinsborg, after having covered in all 5243 miles in the course of that summer.

There were still various tasks which awaited the geodetists in Julianehaab.

In the first place we were to finish the survey of the settlement at Julianehaab. Secondly a self-registering tide gauge should be set up in the Julianehaab harbour, and thirdly all our material was to be made ready for shipping to Denmark. In conclusion, some special determinations of astronomical longitudes and latitudes were made to the sun, in

order to investigate the exactitude of such determinations and to establish the personal equation of the parties during the surveys.

On October 14th the four geodetists left for home in the "Gertrud Rask", arriving in Copenhagen on October 28th.

The work of the summer was at an end.

c. Determination of Control Points.

As already mentioned the instruments and equipment which were at the disposal of the two survey parties in 1933 were very modern and handy.

The method of surveying a station was consequently quite different from that of last year. Besides a main station, 1—2 or 3 secondary stations were intersected. At each station the base was measured; also determinations of astronomical positions and azimuth determinations (to the sun) were made at each main station, whenever the weather permitted. And, finally, pairs of photographs were taken of the ground by means of the photo-theodolite, this being so to say the finishing touch, as it fixed the air-photographs with absolute certainty.

The programme to be carried out at each station was consequently very full and extensive, and as a rule these operations occupied the greater part of the day.

The most important part of the instruments belonging to each of the two survey groups were two Base sets consisting of:

2. Little Wild
4. Stands with sighting targets
2. Subtense bars
2. Plane tables
3. Sliding rules

1. Photo-Theodolite; one of the parties used plates (Zeiss), the other films (Wild). Further: watches, barometers, thermometers, pairs of binoculars etc.

A complete camping outfit for each party.

For both groups were also taken as reserve:

2. 13.5 cm universal Instruments Wanschaff with stands
1. 4-valve short-wave receiver.

As receiver for the time signal service the permanent station receivers of the boats were used.

The comparison of chronometres took place by means of the wireless of the boats. The Nauen ONOGO signal went through on the megaphone.

The chronometres were controlled and the rates calculated by the eye and ear method. Time signals were taken at least twice within the twenty-four hours.

Summary of Observations in 1933.

Areas	Determination of control points				Number of bases	Astronomical determinations of position			Number of photo plates
	Trig. St.	Nat. fix.	Photo points	Coast points		complete determination	In part determination	Azimuth	
Aluk-Umîvik (both incl)...	24	25	222	395	31	8	6	3	148
Umîvik-Kangerdlugssuaq (not incl)	70	90	824	1120	85	22	4	13	621
In all: East Greenland 1933 .	94	115	1046	1515	116	30	10	16	769[1])
In all: azimuth determinations	..	..	..	..	..	..	..	*56*	..
Julianehaab district 1933..	12	20	69	107	15	1	—	1	138
Total: 1933	106	135	1115	1622	131	31	10	57	907

[1]) All taken by the two photographers Larsson and Spender.

Some remarks.

It is matter of course that summer operations, like those carried out by the survey parties in 1933, could not be completed without being favoured by luck and without valuable assistance from many quarters and in many fields.

In particular mention should be made of our Greenland assistants, who throughout the summer worked efficiently and with never failing loyalty both in the mountains and at sea.

When trying to estimate the work done it should be borne in mind that surveys were only a link in the multifarious activities of the expedition, and that the individual groups had to adapt themselves to each other and render support.

Thus it was a great help for the surveyors that Knud Rasmussen let the "Kivioq" lay out fuel depots for us at Umîvik, Skjoldungen and Tingmiarmiut. In return, we helped him by placing the boats of the survey parties at his disposal on various occasions, and we likewise found time to assist other parties with the laying out of depots, fetching members who had suffered shipwreck or other misfortunes and the like.

In one respect only the work of the summer was a great disappointment to us, and that was the bad weather. If we should succeed in carrying

Fig. 48.

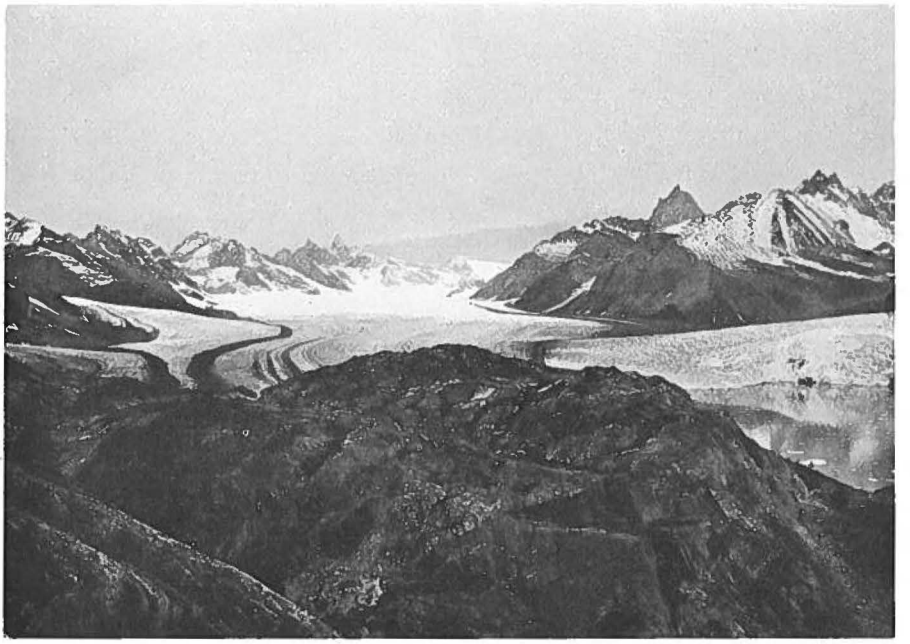

Fig. 49. These two pictures shows topo-photo plates in pairs taken from Trig. St. 6722 in Sermiligâq Fjord. The pointed peak to the right is "Rytterknægten" (2020 m high).

out our main object, we must use every minute at our disposal, and so we were obliged to abandon many special observations, investigations and reconnoitring voyages.

d. Flights.

As the seaplane could not be transported to Angmagssalik onboard the "Nordstjernen", and as the Ministry of Marine would not sanction a direct flight from Iceland to Greenland, there was no other way than to transport the plane to the Julianehaab district and thence to the working field of the expedition.

The transport took place in the inspection vessel, the "Hvidbjørnen", which arrived in Ivigtut on July 4th. It was only accompanied by the most necessary personnel, namely, the chief aviator Lieut. Erik Rasmussen R. N., and the mechanic C. Jørgensen, whereas the remainder of the flying party went directly with the "Nordstjernen" to Angmagssalik.

The aircraft was the same as last year, viz. H. M. II No 84.

Its equipment for the flight in Greenland shall be given in detail:

The following particulars of the normal equipment of the plane had been omitted:

Guns for the pilot and the observer with the appertaining rings,
outside and inside lighting,
main compass,
light generator,
standard wireless receiver

whereas the following had been installed:

1. Camera "Eagle III" with appertaining ring, accumulator and generator
1. Ascania far-distance compass
— variometer
1. Smith speedometer
1. Air thermometer (on Bb.'s petrol tank)
1. S.O.S. lighting plant
1. Telefunken direction finder without frame antenna
Altitude and speed computers

Besides the plane carried the following equipment:

1. Flint (1 hail and 1 rifle barrel) with 75 shots for each barrel
3. Knapsacks with provisions for 3 men for a fortnight (the knapsacks lashed to the fusilage immediately behind the third seat)

The knapsacks contained:

1. Medicine chest
1. Petrol primus with matches

1. Set of cooking utensils
3. Oil cloth sleeping blankets
3. Mugs
3. Spoons and forks
42. Tins of sardines
9. Tins of pemmican
9. Tins of oat-meal
1/4 kg tea
1. Tin of salt
1/2 bottle of brandy
2,8 kg chocolate (non-thirst producing)
2. Tin openers
3. Sets of glacier irons (Steigeisen).

Wireless equipment.

A long-wave station consists of the Telefunken transmitter S 284 T. which is a directed transmitter, normally used in the H. M. II type. The strength of the antenna about 70 watt. Wave radius 300—1300 m CW, ICW, Telephone.

The receiver is the Telefunken direction finder without frame, and as contrasted with the transmitter it is only battery-driven. The wave radius is 400—1600, and the receiver is constructed with a strong amplifier (3 stages HF, detector, 3 stages LF); there are instruments to control the anode and battery tension.

Transmitter and receiver alike have an aerial wire 70 m in length.

A short-wave transmitter (manuf. Danish Radio), wave radius about 20—65 m. The anode strength is obtained from 4 Hellesen anode batteries, whereas the filament current is taken from the camera accumulator (12 volt) by means of a resistance which reduces the tension to 4 volt.

The emergency transmitter would in a given case be used in 41.5 m from the "full" hour to ten minutes over the full hour, once per hour. Greenland Zonetid (45° W. long.).

Compasses:

2 compasses had been installed for the use of the pilot:

1. Ludolph compass and
1. Ascania far-distance compass.

Both of the compasses were corrected in the air by means of the sun, and the deviations found proved upon the whole to be in very good agreement.

On August 22nd the far-distance compass was damaged and could thenceforward not be used.

The Forewarmerconstruction for the carburator functioned very well and at a height of 4000 m, where the average temperature is ÷ 12° C, it could keep the air through the induction pipe at about + 10° C.

Camera.

Also in 1933 we used an "Eagle III", built in at the bottom of the third seat. The camera had been sent to London where the mechanism had been subjected to thorough alterations and improvements so that it now functioned very well.

The lighting on the instruments was, however, still a weak point, and the heat belts on the outside of the camera body seem to have been awkwardly placed. Besides, they caught fire on one of the first flights and were destroyed, but fortunately the camera functioned very well without them.

Flights.

On July 7th the mounting of the seaplane was finished, and the first trial flight could take place at Ivigtut.

In the period 8th—21st July a number of wireless experiments could bemade from the air, in communication with the wireless stations of Julianehaab, Ivigtut and the "Hvidbjørnen".

On July 18th a wireless communication was received that the petrol depot at Skjoldungen had been laid out near the Norwegian station opposite to Imarsivik, and everything was made ready for the flight from Ivigtut to Angmagssalik.

On July 22nd this flight took place.

The stations reported that there was a cloud cover at a height of about 2000 m, and from the early morning Ivigtut was enveloped in fog. When this fog lifted, it took off in the direction of Brede Fjord and farther at a height of 3100 m directly across the inland ice, the course being laid for Ikermiut. South of this line the fog was lying, but at the head of Mogens Heinesens Fjord the air was clear, and here the aviator descended and followed the coast as far as Skjoldungen, where a landing was made at the Norwegian station after a flight of 4 hrs. 10 mins.

After petrol refill the plane passed along the shore as far as Angmagssalik, where after a flight of 2 hrs. and 30 mins. it landed on a small mere—Basissøen—a few kilometres north of the settlement. The mere had been reconnoitred by Lieut. Grønbech R. N. and was pointed out to the flyers by means of bonfires.

Later in the day it proved possible to land off the settlement, and soon the "84" lay safely moored in the harbour near the "Nordstjernen", ready for the summer photo-flights.

Fig. 50. Basissøen (ɔ: "base-lake")—where the seaplane landed—at the head of Tasîssaq, which at that time (July 23rd) was quite filled with ice. On the horizon the Kulusuk island.

Summary of Flights.

	Period	Number of days	Number of flying days	Number of flights	Flying time hrs. mins.	Number of kilometres
West Coast						
Base: Ivigtut	$^{7}/_{7}$-$^{21}/_{7}$	15	6	8	7—00	1050
Ivigtut-Angmagssalik	$^{22}/_{7}$	1	1	3	6—40	1000
East Coast						
Base: Angmagssalik	$^{23-28}/_{7}$	6	3	4	6—40	1000
Sailing: Angmagssalik-Ikerasaussaq	$^{29}/_{7}$	1	..	..	..	..
Base: Adingat	$^{30}/_{7}$-$^{16}/_{8}$	18	8	15	36—35	5487
Sailing: Adingat—Mikis Fjord	$^{17-18}/_{8}$	2	..	..	..	..
Base: Mikis Fjord	$^{19}/_{8}$-$^{7}/_{9}$	20	8	13	39—15	5888
Total: East Coast	$^{23}/_{7}$-$^{7}/_{9}$	47	19	32	82—30	12375
Total: Greenland	$^{7}/_{7}$-$^{7}/_{9}$	63	26	43	96—10	14425

The coast stretch Pikiutdleq—Kap Daussy: 750 km.
Photo-routes flown: 3200 km approximately.

Fig. 51. Air-photo from about 4000 m height. View across Schweizerland. Top left in background the Ingolf peak barely visible.

Fig. 52. Air-photo from about 4000 m height. Angmagssalik district. View over the area close to east of Tasîssârssik Fjord. In the background Schweizerland.

Commentaries on the Summer Flights.

The flights and more particularly the photo-flights naturally show the advantages of building upon experiences made the previous year. Thus the aeroplane reached its working field in time and also left it in time. The summer passed without accidents of any kind, and as to the results they far surpass those of 1932 and anything that might have been expected.

By moving our base to Mikis Fjord we succeeded in photo-flying the whole of the unknown district northeast of Kangerdlugssuaq, all the way up to Kap Daussy and in to the inland ice.

In order to be able to photo-fly the last stretch from Kap Daussy to Scoresby Sund it was, however, necessary to have another base farther north. The expedition made an effort to fly the plane there, but the attempt unfortunately proved unsuccessful, owing to several unlucky cases of coincidence.

Thus the "Kivioq" on its northern trip on August 21st stayed for a while at Hurry Bugt (Inlet), the only ice-free place in the neighbourhood of Scoresby Sund. The idea was that it should act as a base for the aircraft, but most unfortunately the wireless communication with the "Kivioq" failed entirely during this period, so that the plane received no ice report and consequently could not start.

Serviceable flying bases had been found in d'Aunay Bugt, Knightons Bugt and Turner Sund by means of reconnoitring from the air. The "Nordstjernen" with the plane onboard tried in the days 17th—18th August to penetrate as far as d'Aunay Bugt, but wind and current were so unfavorable that the vessel, which only possessed an inferior engine, could not advance and was consequently obliged to turn halfway.

On the return voyage of the "Kivioq" an attempt was made to direct it into d'Aunay Bugt, but then the weather began to be troublesome, and fog and low-hanging clouds made all attempts at flying impossible. Therefore, the "Kivioq" was obliged to continue to Mikis Fjord, and the attempt to photograph the gap in "the north front", as tradition had named it, was finally abandoned.

The very last attempt was made by the laying out of a fuel depot at Hurry Bugt; this was done by the Greenlanders from the Scoresby Sund settlement, but weather conditions being contrary and flying impossible, also this attempt must be abandoned.

One good flying day only, and the photo-routes still lacking would have been overflown.

One only—but we did not get it.

Air-Photography.

The Geodetic Institute had prepared a map with all the desired photo-routes worked into it.

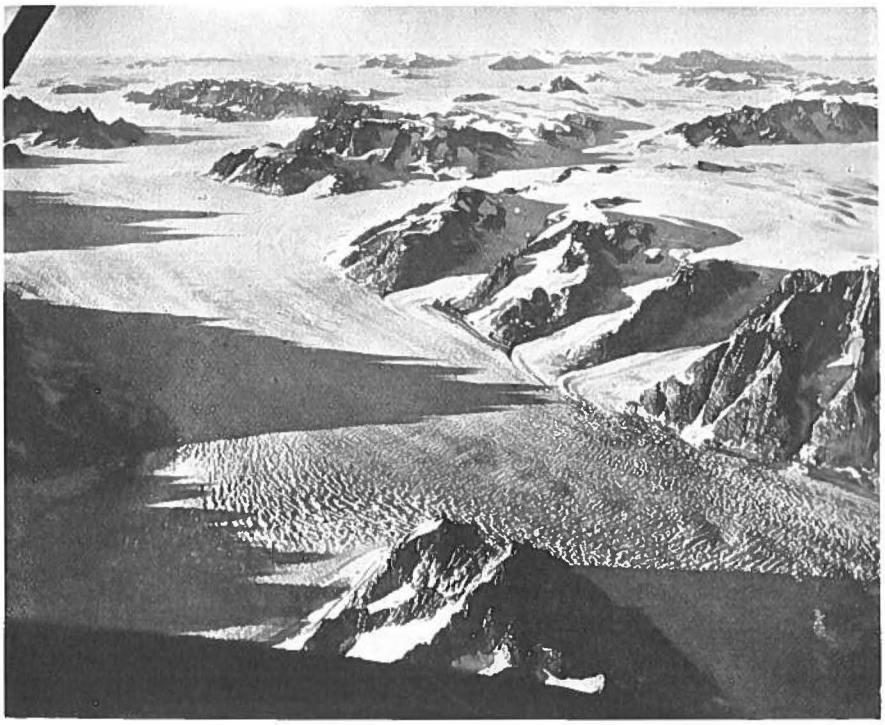

Fig. 53. Air-photo from about 4000 m height. View of Knud Rasmussens Land with Fredensborg Gletscher in foreground.

Fig. 54. Air-photo from about 4000 m height. View of Knud Rasmussens Land with the Sorgenfri Gletscher and top right the Christian d. IV's Gletscher. In centre the 1600 m high peak Pyramiden.

Fig. 55. Air-photo from about 4000 m height. View of Knud Rasmussens Land with Christian d. IV's Gletcher. Top right Watkins Bjærge with the highest peak of the Arctic area: Gunbjørns Fjæld.

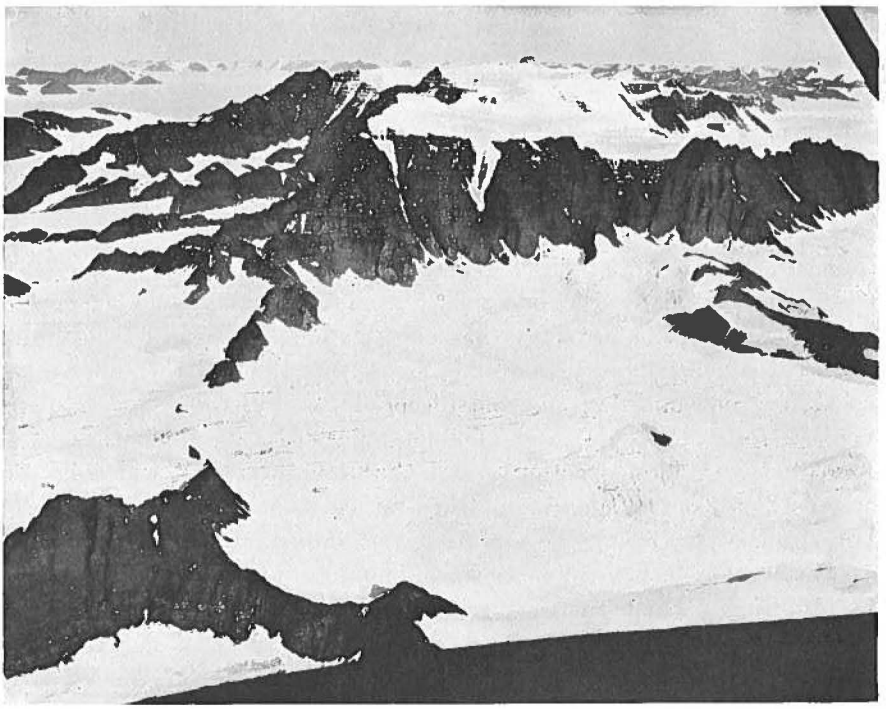

Fig. 56. Air-photo from about 4000 m height. Gunbjørns Fjæld.

These routes were in the main followed very closely, but new discoveries on the ground naturally made it necessary to abandon some of them and to include others.

On the map page 185 all the routes flown are given.

A special interest was attached to the bringing home of air-photos of the large, hitherto unknown area northeast of Kangerdlugssuaq, an area which i. a. contains the largest glacier of the world, *viz.* Christian d. IV's Gletcher, and the highest mountain area of the northern arctic regions, Watkins Bjærge, the highest peaks of which lie more than 3500 m above the surface of the sea, the highest—Gunbjørns Fjæld—being about 3700 m high.

On the strength of these air-photos the Geodetic Institute has succeeded in procuring a map of the whole district—Knud Rasmussens Land. It proved on our return that the geologists of the Ejnar Mikkelsen Expedition—Spender and Larsson—in 1932 had established such a system of points at Kangerdlugssuaq and Kap Ravn that it was possible, by means of the series of photos, to "bridge over" the whole of the 100²km large "basin" between these groups of points (See [1]) Geographical Journal, vol. LXXXVI No 4, October 1935, N. E. Nørlund and Michael Spender: Some Methods and Procedure developed during recent Expeditionary Surveys in South-East Greenland, page 327, and [2]) vol. LXXXVIII No 3, Sept. 1936, Augustine Courtauld: A Journey in Rasmussen Land, pages 193—195).

The film employed this year was the Agfa-pancromatic film which yielded perfectly excellent pictures, the result of the summer's work in this respect being the best possible. In all, about 950 pictures were taken (in pairs and single).

As in 1932 all the films were developed in the dark room on the mother-vessel, and the work was carried out in the best possible manner by the photo-technician H. C. Hansen from the Geodetic Institut.

Conclusion of Flights.

August 29th was the last day for photographing, and as it had proved impossible to provide a base farther north, this practically also meant the conclusion of the mapping flights. For that matter, the coming period had not one day suitable for photography, the weather being overcast, foggy or rainy, and on September 6th the expedition communicated with the inspection vessel, the "Hvidbjørnen", which lay off the West Coast of Greenland and asked for assistance in fetching the sea-plane from Mikis Fjord. This request was immediately complied with.

On September 8th the "84" was demounted and taken on board the "Hvidbjørnen" which then returned to Reykjavik, where it arrived on September 9th.

Fig. 57. Air-photo from about 4000 m height. Knud Rasmussens Land with Watkins Bjærge. View over the "dendrit" area.

Fig. 58. Air-photo from about 4000 m height. Knud Rasmussens Land with Watkins Bjærge. View over a beautiful party of the mountains. Top left Gunbjørns Fjæld.

From Reykjavik the aircraft was taken onboard S/S "Island", being packed in a special manner for this voyage.

Already on September 21st the "Island" was in Copenhagen. It had been an uncommonly good "flying" summer with a quick passage to Greenland and back again, a good working period and good results for air-photography.

e. Wireless and Meteorological Service.

As in 1932 a special wireless, meteorological and security service had been established on account of the flights; the leader of this service was, as in the preceding year, Lieut. P. C. C. Winther R. A.

Wireless service.

The following crafts of the expedition were provided with wireless stations, *vtz.* the "Nordstjernen", the "Kivioq", the "Dagmar", the "Andræ" and the seaplane "84".

The wireless Equipment of the "Nordstjernen".

In order to keep up the wireless communication between vessel and aircraft the vessel was provided with:

— M. P. Pedersen lamp transmitter I. C. W. and C. W. Antenna energy about 400 watt, wave radius 400—1100 m.

— M. P. Pedersen ship's receiver; (1 detector with low frequency); wave radius 135—7500 m.

Besides, the vessel provided with:

— direction finder C.W. and telephony about 300 watt antenna energy, wave radius 130—210 m.

— Spark transmitter (emergency transmitter), about 300 Watt antenna energy, wave length 600 m.

— Lamp transmitter C.W., 5 watt antenna energy, wave radius 28—51 m.

— Direction finder with frame; wave length 400—1300 m.

— Short wave receiver, wave length 13—75 m.

The current to the radio installation was supplied by a 110 v. dynamo, which was driven by a 4-cylinder Citroën motor-car engine. Besides there were an accumulator battery of 110 v. and about 100 ampere hours.

It should be borne in mind that the "Nordstjernen" during all the flights lay at anchor with its main and winch engine stopped. If one of these engines was kept going, the receiver which was not sprung was subject to such strong shaking that receiving was made difficult, and the signals of the aircraft could not be read at a distance of more than about 100 km.

The motor-boats
were all three supplied with a Reuter transmitting and receiving station from the firm "Elektromekano" in Copenhagen.

As to the wireless equipment of the aircraft see page 169.

The Wireless Communication
between mother-ship and aircraft functioned very well in 1933. The amplified receiving apparatus which made part of the equipment gave a hearing range of up to 100—150 km according to circumstances. The "Nordstjernen" on the other hand heard the aircraft at all distances, the longest being 350 km. The plane was then at a height of 2000 m.

In order to have a wireless installation which might function effectively under all conditions during the flights in Greenland, it was necessary to be able to dispose of a short-wave and a long-wave transmitter and receiver, both in the aircraft and at the base.

In this connection it may be mentioned that Col. Lindbergh during his flights in Greenland in 1933 had an excellent short-wave (54 m) wireless communication with his carrier-ship, both across the inland ice (1300 km) and along the coast (700 km). The short-wave transmitter of the carrier-ship was given at 100 Watt.

The security service of 1933 had been established in exactly the same manner as that of the previous year.

The communication during all flights was kept up by the mother-vessel, and while the flights took place, both wireless stations transmitted at a distance of 530 m. The signals of the seaplane on flights over long distances were only heard at great altitudes.

In order to obtain a greater range, experiments were made onboard the "Nordstjernen" with a balloon antenna. A pilot balloon with a net buoyancy of about 1100 gram was kept moored by means of a ca. 70 m long phosphor bronze wire which was used as an antenna. In quiet weather and with a velocity of the wind of up to 4 seconds good results were obtained. The aircraft thus at the same distance reported: only faintly audible signal (antenna of the vessel), "powerful signals" (balloon antenna). Our balloon was however not of sufficient mechanic strength, and the experiments could not be carried through.

The wireless communication between mother-vessel and motor-boats took place almost exclusively in wave length 180.

Within certain periods this communication was very difficult, the East Coast being generally a very awkward "wireless" coast. The helte ring action of the mountains is very considerable, and in deeply incised fjords with high walls along the sides no communication is obtained at great wave lengths, while such communication is possible with quite short-wave lengths. If one wants to make sure of one's connection,

great care must be shown in the choice of harbour; and it has further proved to be absolutely necessary to have fully trained operators as workers of the wireless apparatus. The communication with the "Kivioq" and the "Dagmar" very often failed owing to the lack of such fully trained operators, whereas the "Andræ" and its extremely capable operator Janus Sørensen practically throughout this summer had the best possible connection both with mother-vessel and the neighbouring wireless stations. Indeed, they nearly always had a connection with the Godhavn wireless, where the "Andræ" used a wave length of 50 m and Godhavn one of 1700 (distance approx. 900 km). In September the "Andræ" finally established an excellent communication of 180 m with its sister boat the "Graah", which was lying at Holsteinsborg (a distance of about 700 km). The only wireless station in Greenland with which the "Andræ" was not in communication during the summer of 1933 was that of Scoresby Sund.

Meteorological Service.

This kind of service was only organized when longer flights were imminent, as e. g. before the flight from Ivigtut to Angmagssalik, but not for the photo-flights.

One difficulty was that the wireless stations of Greenland still used the old weather codes—indeed, even two different codes for five stations—and these codes only give little information of the weather conditions of the place in question. The Norwegian wireless stations in East Greenland, on the other hand, use the far better new weather code, which was a great help for us.

A Dutch expedition at Angmagssalik lent us a number of pilot balloons to determine the height of clouds, a quick and cheap way to find out from the surface whether photography could be undertaken at a given height.

However, the use we could make of these balloons on the East Coast is minimal, the weather as a rule being either cloudy, so that it is possible to see directly from the mountains how low the cloud cover is, or else entirely free from clouds, so that air-photography is possible.

Weather Conditions.

Again in 1933 it proved that weather conditions in Greenland generally speaking lend themselves extremely well to flying during the months of July and August.

The photo-flights which were undertaken at heights of 4000 m were, on the other hand, not particularly favoured by the weather in 1933. Thus for comparison it may be said that in 1932, when only 31 days were spent on the East Coast, the number of days on which air-photography

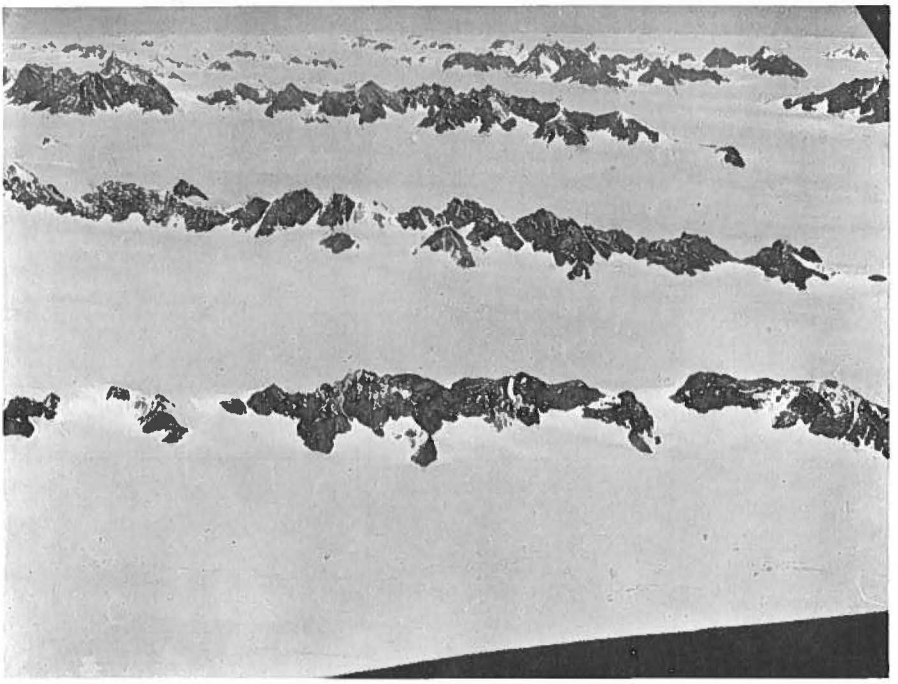

Fig. 59. Air-photo from about 4000 m height. From Kronprins Frederiks Land on the border of the inland ice.

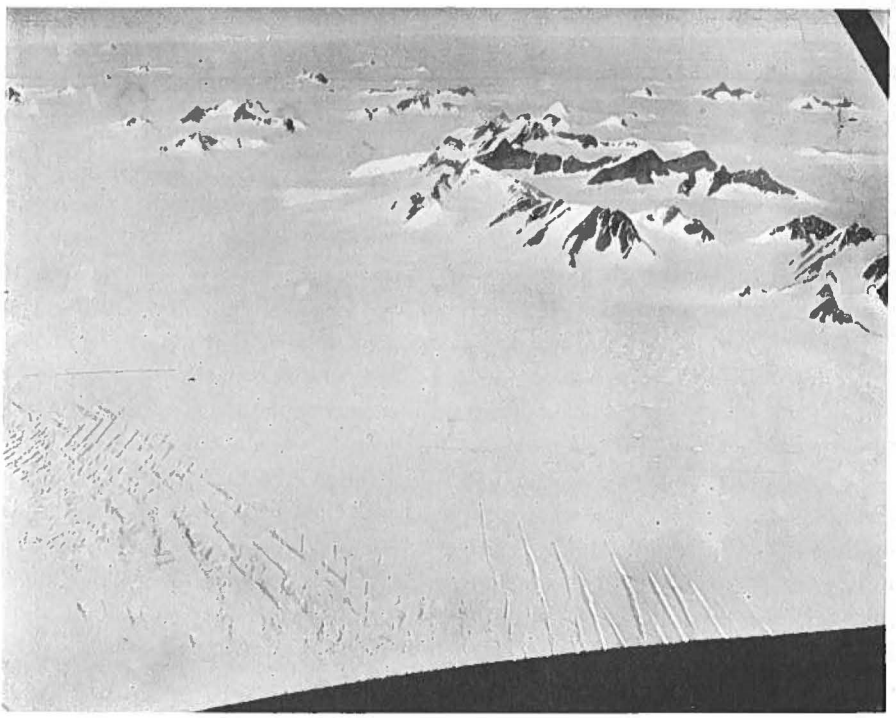

Fig. 60. Air-photo from about 4000 m height. From Kronprins Frederiks Land quite near the inland ice.

could be carried out was 19, as against the same number within a period of 47 days in 1933.

No great wind forces were measured and very little coast fog.

On some of the flights the aircraft was seriously handicapped by descending air currents between 3000—4000 m.

To illustrate this, a single example will be given, namely from the morning of August 19th, when photo-route 120 x—120 Ax (northeast of Kangerdlugssuaq) was flown:

Altimeter	Time from departure	Temperature of air
0 m	0 mins.	..
1000 -	6.5 -	+ 6°5
2000 -	15 -	+ 0°5
3000 -	28 -	— 3°5
3500 -	41.5 -	..
3600 -	48 -	..
3700 -	1 hr 04 mins	— 7°
3800 -	1 - 13 -	— 8°
3900 -	1 - 17 -	..
4100 -	1 - 35 -	— 11°

The time of ascent which is here 1 hrs 35 mins should normally only be about 40 mins. In the afternoon the time of ascent to 4000 m was again normal on the route 119 A_2—that is on very nearly the same surface as 120 Ax.

f. Geodetic Operations on the West Coast.

It had originally been the intention that the two boats of the survey parties should start from Julianehaab about June 10th, in order to commence the mapping of the area from Kap Farvel to Aluk or Lindenows Fjord, Augpilagtoq being used as a base station. From here it would have been possible to keep an eye on ice conditions along the East Coast, so as to be able to commence the northward journey at the most favourable opportunity; further, and this was naturally the chief consideration, it would have been possible to complete a system of points which was sufficient for the fixing of air-photos over the whole of this area.

This plan was, however, completely frustrated by many untoward circumstances. Owing to ice obstacles the "Disko" was prevented from calling at Julianehaab, and consequently the "Andræ" and the geodetists only arrived in Julianehaab on June 16th. Here there was a further delay, because the "Dagmar" had an engine stop, which lasted so long that it became necessary to tow the boat to Ivigtut, and this caused the geodetists to stop at Julianehaab until June 30th.

It was therefore natural that the survey work should begin at Julianehaab, and the following was successfully completed:

Mapping:

1. Photogrammetric mapping of the Julianehaab settlement; scale: 1:10,000 and in continuation of this:
2. Photogrammetric mapping of the whole of the outer part of the Julianehaab Fjord; scale 1:100.000, to be used for a navigation map of the outer fjord.

The greater part of these measurings were carried out by Spender and Larsson, whereas the measuring of the base, the net of bases and the two trigonometric stations were undertaken by Gabel-Jørgensen and Th. Pedersen.

g. Tide gauging.

Immediately after our arrival in Julianehaab a tidal board was set up in the harbour there, with a view to a determination of the mean water level, also in other places, and these observations were carried on from June 28th to October 9th.

In the course of the summer a self-registerring gauge, lent by the Royal Geographical Society in London, was installed in the same harbour for the further determination of the mean water level, and this instrument was active from October 10th 1933 to June 30th 1934.

The whole of this material has been dealt with by J. Egedal, Government Meteorologist in Medd. o. Gr. vol. 107.

h. The results.

While the results of the expedition have all been, or will be published in Medd. o. Gr. by those in charge of that particular branch of work, the geodetic material naturally was handed over to the Geodetic Institute of Copenhagen to be kept there for further treatment and publication.

The comprehensive geodetic works of the 7th Thule Expedition will, first and foremost, result in a series of new maps of the whole stretch from Kap Daussy in the north to Lindenows Fjord in the south, in all, a coast area of about 1300 km in length. From the available results of the survey parties it is already possible to complete the map of the whole area from Kap Daussy to Umîvik. As to the remaining coast area, the distance from Umîvik to Lindenows Fjord (inclusive), a sufficient system of points is at hand, but it will be necessary to procure some supplementary air-photos.

The area measured (from the ground and the air) vas

in 1932 in all about 35.000 km² for three surveyors and one airplane,
- 1933 — — 80.000 - - four — — — .

There is also reason to call special attention to the tidal observations made in the course of the expedition. On the one hand, they are a very much required continuation of older observations, and on the other, by the modern, rational methods adopted, they form the basis of newer and much more exact observations.

Unfortunately it was not granted to Knud Rasmussen to complete his work along the southeastern coast. He had intended to help to start—though not to take part in—one more summer expedition, first and foremost with the object of supplying the missing maps of the northern coast as far as Scoresby Sund, but also to supply various gaps which might appear when dealing with the remainder of the material.

I cannot conclude this report of the re-survey of the greater part of southeastern Greenland without remembering the men—four lieutenants of the Danish Royal Navy—who so many years before our time surveyed the country; from the south as far as Angmagssalik W. A. Graah T. V. Garde and Gustav Holm, and for the whole of the northern part G. C. Amdrup. I admire their travelling technique, their perseverance and great daring and in particular Amdrup's boat journey along the Blosseville Kyst of such bad repute. As a geodist by profession I do homage for the survey work which these four men performed.

VI. Inspection and Station Service.

An agreement had been made between the Ministry of Naval Affairs and Knud Rasmussen to the effect that the expedition should procure the vessel, while the Ministry should supply the equipment and the crew. The basis of the collaboration thus started was that the vessel should partly perform inspection service and partly serve as mother-vessel for the expedition and the aircraft. This was expressed in the sailing orders issued to the officer in command, Cdr. A. H. Vedel R. N. which orders ran as follows:

The object of the cruise is partly to perform station and inspection service off the East Coast of Greenland and partly in every possible manner to assist the expedition of Dr. Knud Rasmussen, more particularly as a carrier for the aircraft which is to undertake the air-surveys.

This assistance which was given by the Government through the Ministry of Marine caused Knud Rasmussen the greatest pleasure, and he was no less pleased when the shipowner A. P. Møller, Copenhagen, placed a vessel at his disposal—a three-masted motor schooner, the "Nordstjernen", belonging to the shipping company E. P. Kromann of Marstal.

The ship has been described in detail under XIII "Craft of the Expedition" page 199.

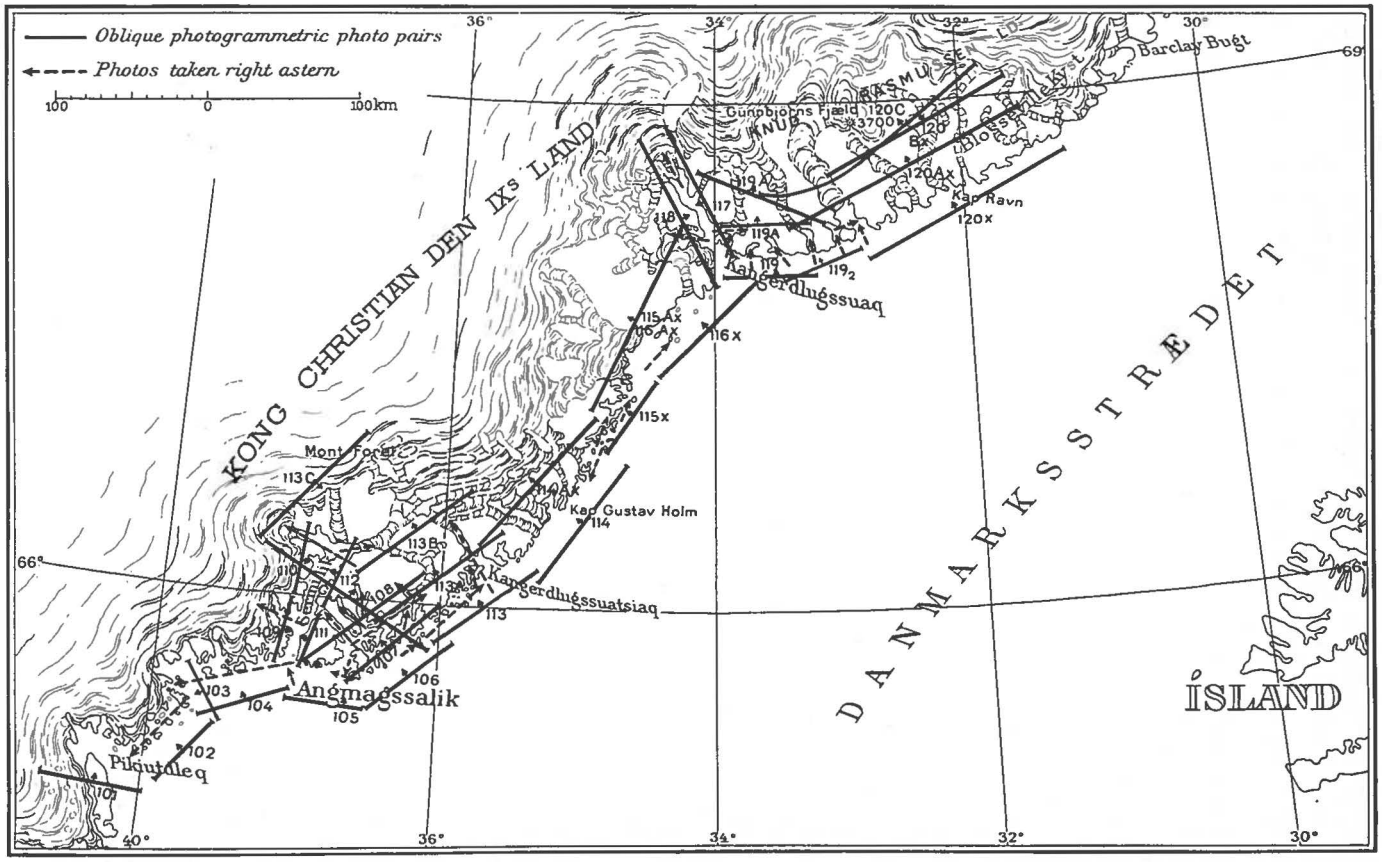

Fig. 61. Map showing the air-photo routes carried out in 1933. Figures indicating number of route.

The very special purpose for which this freighter was to be used naturally necessitated thorough alterations both inside and outside. First and foremost it was necessary to enforce the hull and the stern with a view to navigation in the ice; in the second place it was necessary to build a number of cabins and a mess-room in the hold; finally, a platform must be erected on the deck for the aircraft and hoisting tackle to take it onboard and afterwards to float it. Alle these alterations were made, partly by Erichsen's shipyard in Marstal, and partly by the Naval Shipbuilding Yard of Copenhagen, and on June 24th all was complete and the cargo stowed. The vessel anchored at "Nordre Toldbod", in order to take the leader and the members of the expedition onboard, and the departure, which has been described in chapter IV, took place on June 24th.

The hold of the "Nordstjernen" then contained 100 tons of goods; besides there were 130 barrels of petrol on the deck, and a crew consisting of 17 men, to which must be added a total of 14 members of the expedition.

The following is a summary of Cdr. A. H. Vedel's report on the expedition, especially as regards the station service.

The very different tasks of the cruise—fishery inspection, the acting as carrier for the aircraft and as a point of support in general for the expedition, naturally made very different demands on the movements and action of the vessel.

Thus the fishery inspection demanded much navigation; the assistance which was to be rendered to the aircraft necessitated a permanent basis at an ice-free, well protected anchorage, and finally it was of course the wish of the expedition generally that the vessel should be in the centre of the working field with a view to the supply of electricity, repairs of minor breakdowns of the many motor-boats, the handing out of supplies, provisioning etc.

As it was impossible to fulfill all these obligations at one time, it was decided to attend to what was considered the primary object, *viz.* the aircraft which in its turn could take over some of the fishery inspection on its flights along the coast.

As carrier of the aircraft the "Nordstjernen" proved to be quite satisfactory. In order to find room for the plane, which was placed on a raised platform behind the mainmast, it became necessary to take down the mizen mast, and this was done in Reykjavik on the voyage up to Greenland. When the aircraft stood on the platform, the height of the planes above water level was about 5.75 m, and they projected about 4 m from the ship's side and touched the water, whenever the boat pitched and rolled.

The "Nordstjernen" also proved to be satisfactory as expedition vessel, whereas its motor power was by no means strong enough for the

purpose of fishery inspection, as it was impossible for it to force even minor ice barriers, and its speed, with sea and current against it, was far too small. The inspection service was consequently carried out while sailing along the coast, and partly by means of the small dinghy which was well fitted to go out into the ice to the trawlers observed; further, as already mentioned, the plane was a great help in this respect, as it could overlook large stretches of the coast and report on the vessels found within the territory.

There is no reason to make further comments on the actual journey, beyond stating that the relations between those who took part in it were extremely satisfactory. It had been decided by the Ministry of Naval Affairs that the conscript crew should have their meals separately and all the others together in a large common mess-room. This arrangement turned out to be both satisfactory and practical.

The skipper of the Thule Station, Captain P. M. Pedersen, acted as an ice-pilot onboard the "Nordstjernen", and his great experience, both as an Arctic navigator and as a member of expeditions, was of the utmost value in the many different circumstances and situations arising during the cruise.

VII. Geological Investigations.

See report made by R. Bøgvad in Medd. o. Gr. vol. 107.

VIII. Glaciological Investigations.

See report made by K. Milthers Medd. o. Gr. vol. 107.

IX. Fishery and Marinebiological Investigations.

See report made by E. Bertelsen in Medd. o. Gr. vol. 108, No 3.

X. Zoological Investigations.

See report made by Marie Hammer (née Jørgensen) in Medd. o. Gr. vol. 108 No 2 and the following treatises:

by S. G. Heding in Medd. o. Gr. vol. 108 No 1
- Jens Brændegaard - — — — - 4
and - S. G. Heding and G. Mandahl-Barth - — — — - 5

XI. Botanical Investigations.

See treatises:

by Tyge W. Böcher in Medd. o. Gr. vol. 106 No 2
- Gunnar Seidenfaden in Medd. o. Gr. vol. 106 No 3.

XII. Ornithological Investigations.

It was thought advisable that, also in the field of ornithology, a material of investigation should be procured from the extensive and rarely visited coast of Southeast Greenland, and with this object in view arrangements were made for the participation of U. Møhl-Hansen, conservator of the Zoological Museum of Copenhagen. Møhl-Hansen, who during the whole of the expedition must also take his turn at the work onboard, joined all the voyages of the "Kivioq", and this gave him, on the one hand, an opportunity to navigate the entire distance from Skjoldungen to Scoresby Sund. On the other hand, he only on rare occasions had an opportunity to get ashore, so that his observations and collections in the main are limited to the ice-belt region of the coast.

The material collected was, on the return of the expedition, handed over to the Zoological Museum of Copenhagen and has been dealt with under R. Hørring, Medd. o. Gr. 108, No. 6.

XIII. Hunting Stations in Lindenows Fjord during the Winter 1932—33.

Introduction.

In the year 1900 the last East Greenlanders, a small body of 30 individuals in all, broke up from their dwelling place in the Lindenows Fjord area and moved to Frederiksdal on the West Coast, the great attraction being the trading posts of the Julianehaab district, where the Greenlanders might exchange their catch for the great quantity of useful merchandise offered in a Greenland shop.

With the exception of Angmagssalik the hitherto rather closely populated East Coast now lay desolate for many years, but with the passing of time the constantly decreasing number of seals made a great change in the living conditions of the West Greenlanders, who consequently were obliged to look for new means of livelihood and new hunting areas.

This has also been the case with the Greenlanders in the Kap Farvel district. Here the lack of seals has made itself very strongly

felt, and it is no wonder that the inhabitants have again turned their attention to the deserted East Coast, whence the actual migration of seals start, and from where the old East Greenlanders had so many adventures to relate of their hunting of bear and seal. The preparatory investigations of new sealing areas likely to yield a livelihood were carried out by the "Expedition to the Kap Farvel Region", which was sent out at the initiative of the Greenland Commission of 1925[1]). The objects of the expedition were exclusively of a practical nature, and therefore it was entirely composed of agriculturists and hunters, its main task being to examine the possibilities of keeping domestic animals and hunting in the Kap Farvel and Lindenows Fjord districts, and more particularly with a view to establish a station of support for the Greenlanders in the latter place.

The leader of the expedition was the inspector O. Bendixen, and the hunter Peter Tutein was placed at the head of the hunting party.

The expedition arrived at Lindenows Fjord in the S/S "Gertrud Rask", on August 20th 1925, and it was decided to set up camp in the old dwelling place "Narssaq"—the small plain—at a cove about 20 km from the mouth of the fjord. Here the house was built, which has since then been called "Tutein's hut", and here Tutein and K. Knudsen wintered—both of them old hunters from the East Greenland Company—together with three West Greenland hunters and their families.

The results of the investigations undertaken by the wintering party were briefly communicated by O. Bendixen in "Geografisk Tidsskrift" 1929:

"Conditions for making a livelihood are extremely favourable at Lindenow, in fact incomparably better than anywhere on the West Coast. Owing to various circumstances, however, hunting can only be carried out in the old Eskimo fashion by kayakers, and there is no possibility whatsoever for the establishment of modern stations, neither for sealing nor fox-hunting, and probably not for fishery either."

At the end of June 1926 the wintering party was fetched, and a good deal of provisions, shooting requisites, tools, materials etc. were left for the use of Greenlanders visiting there, while the commission placed the house at the disposal of those who desired to use it.

Nothing, however, came of the permanent station in Lindenows Fjord, which had been proposed by the Greenland commission, but in all subsequent autumns the Greenlanders resorted to the East Coast, where they had a point of support in Tutein's hut, which was of great use to them.

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[1]) See O. Bendixen in Dansk Geografisk Tidsskrift vol. 32 nos 2—3 September 1929: Expeditionen til Kap Farvel Egnen.

In 1932 Knud Rasmussen, as a link in his works of investigation on the Southeast Coast, thought it expedient to re-establish the hunting station at Lindenows Fjord, more particularly in order to find out whether the stock of animals found there and the existing conditions of life had improved—or the reverse. Two of the members of the 1932 expedition, *viz.* the carpenter Emil Rasmussen and the hunter Knud Østergaard, who had formerly been employed by the East Greenland Company, were selected for the carrying out of this task.

In the following the wintering party will report their experiences in the course of the winter:

Wintering in Lindenows Fjord 1932—33.

"After the work of the expedition was ended in 1932, the "Th. Stauning" took us, together with Knud Rasmussen, to Lindenows Fjord where we arrived on September 1st. We anchored at Narssaq, and here we had our first view of our winter home.

In easy weather Narssaq is a beautiful and fertile little spot in the midst of the majestic Lindenows Fjord. A gurgling river runs through the little plain with its abundant vegetation, and its idyllic character is further emphasized by the huge rugged and snow-clad mountains, towering towards north and east, and the large roaring river which in magnificent cascades flings itself into the fjord at the head of the so-called "Peersvig", the harbour creek outside the hut.

"Tutein's hut" is situated on the shore, near the river. It consists of a room in the middle, made entirely of wood, and two other compartments—one on either side—the walls of which are built of turf and stones. When we arrived there, the hut looked very dilapidated, the turf wall having fallen in, and so we had our hands full from the start.

In the course of three days we had finished the unloading of the materials, more particularly wood for the repair of the house, and also our equipment for the wintering, and on September 4th the "Th. Stauning" left for Julianehaab, leaving 10 Greenlanders to assist us in constructing the turf walls.

During the following days we were busily engaged in the various building works, and the weather being favorable, we made such rapid progress that we had nearly, finished when Knud Rasmussen returned to Lindenows Fjord on September 8th, this time in the royal danish navy inspection vessel "Maagen" with Lieut. Cdr. Riis R. N. in command.

The next task awaiting us was the settling of hunting conditions. The Norwegians—four in all—in Nanûseq Fjord had extended their hunting area to the northern side of Lindenows Fjord, and this Knud Rasmussen regarded as an encroachment upon our rights. On the day

Fig. 62. "Tutein's hut" at Narssaq in Lindenows Fjord. After the first winter-snow had fallen.

following his arrival the "Maagen" therefore sailed him across to the Norwegian station, where an amicable agreement was concluded: The Norwegians should keep entirely to Nanûseq Fjord and the area north of it, while the Danes held the whole of Lindenows Fjord, and this arrangement worked satisfactorily throughout the winter.

Knud Rasmussen then settled down with us for a few days in order to await the arrival of the geodetists, who had counted on being there about the middle of the month. During this period of waiting trips were made onboard the "Manne" along the fjord, now clothed in its autumn splendour with the many brown and yellow tinges of the leaves, which contrast so beautifully with the purple and blue of the mountains.

They were glorious days for all of us. Both the "Pomasoba" and the "Gerda" with Lieuts. Madsen & Tegner and the geologist Bøgvad onboard were expected, and when we were all together, there were about twenty men at the fjord, including the many Greenlanders.

The arrival of the "Dagmar" with the remaining members of the survey parties was, however, delayed, and the survey work at Lindenows Fjord being ended, it was thought expedient for the small boats to leave the East Coast as soon as possible. The "Pomasoba" was the first to depart, and in the morning of the 18th the "Gerda" with Knud Rasmussen onboard left for Julianehaab. Our solitude, however, only lasted until the evening, when the "Dagmar" at last arrived, but

on hearing that Knud Rasmussen had left in the morning Gabel-Jørgensen cut his visit short and hurried south.

This was our last farewell to the expedition of 1932.

Later on we were visited by Greenland hunters from Augpilagtoq, and as late as November 24th two kayakers arrived with our Christmas mail. These kayakers had been two days on their way, travelling as hunters generally do in gale and sleet without a tent or special equipment. They only slept one night in our hut, and then started on their journey back to Augpilagtoq. One cannot help admiring these people for their perverance and their kayaking performances.

At last we were quite alone with the long winter before us, and now we were going to live as hunters.

Our hunting area was Lindenows Fjord with its branches and deep valleys, stretching more than 60 km, and in order to be able to get about both in summer and winter we had been provided with the small motor-boat, the "Manne", two Greenland kayaks and a West Greenland sledge and six sledging dogs. These had been brought in the month of July from Umanak Fjord by the "Th. Stauning" on the voyage down from Thule to the field of the expedition.

We started by laying out a number of meat depots, consisting of carcases of sharks, which had been procured for ud by Poul Hansen when going about in the "Ûmarigsoq", the boat of the fishery inspection. At the same time we made a number of wooden fox traps, 50 in all, which were now distributed over the whole of the hunting area together with 10 steel traps, and finally we constructed the little hunting hut in Nanûseq Fjord, where the Narssaq valley debouches.

While all this was going on, the weather remained fine, but after November our hardships began. Storms and snowfalls succeeded one another, and it was by no means an easy task to attend to the fox traps in our little boat. At last it had to be abandoned entirely, not only on account of the weather, but simply because the layer of snow became so thick that neither the foxes nor we could find the traps or get down to them.

And thus the work stopped automatically.

The Christmas month approached. We made ourselves comfortable indoors, sharing our domestic work in the best manner possible and deriving great pleasure from our radio in our spare hours. First and foremost we naturally listened to the wireless news' report from Julianehaab, which unfortunately could only be heard in the darkest months; therefore, we were all the more pleased that the Icelandic station "Utvarp Reykjavik" was so well received, and even though we did not understand the press news, we always listened with the greatest pleasure to the good music and the charming voice of the female speaker.

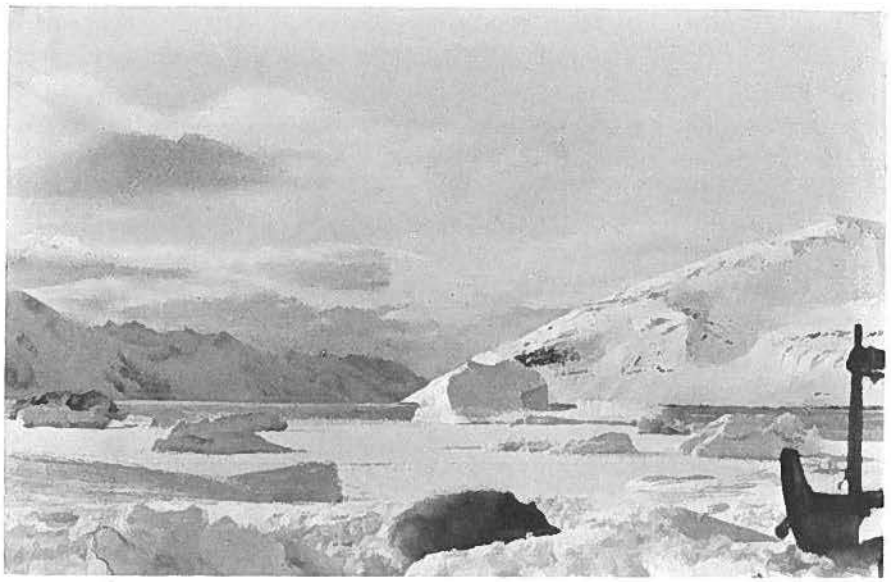

Fig. 63. View from Narssaq in Lindenows Fjord. Midwinter.

Fig. 64. Same view with the ice breaking up. Spring.

On November 27th there was a heavy snowfall ending with a roaring gale, and thus the winter in good earnest closed down on the Lindenows Fjord area.

On December 6th the forerunner of the pack-ice suddenly made its appearance, a small mass of ice which soon disappeared again. The weather was tolerable for December, though with a good deal of snowfall. We still attempted to make our boat journeys, but with little success; we did not catch anything in the few traps, which we are able to find, and on one occasion we were overtaken by a snow storm, so that we were obliged to spend a whole night lying hove-to out in the fjord, unable to find our way back and keeping under the lee of the same ice-berg, until it lightened sufficiently to make the land. That night we were quite certain that we would never get ashore alive, but we did so, and for the remainder of that season we never went out on a long trip with the "Manne", which shortly afterwards was taken ashore.

And now Christmas was at hand, and we made ready for a trip to the camp of the Norwegians, as we had arranged to celebrate Christmas there.

On December 22nd we started off in fine weather, our sledges being loaded with all that was left to us of good things to eat—we knew that the Norwegians had long ago run short of everything, which helps to make a hunter's existence pleasant.

We slowly made our way through the loose snow towards Nanûseq Fjord, but the going became worse and worse, and the snow pelted down. At last we were reluctantly obliged to turn back, and now commenced a hard and dreary wandering through the huge snow-drifts back to out hut.

On the following day the weather improved, and on the 24th it was quite fine, but nevertheless we were chained to our hut, as we realized that it would be impossible to take the sledge through the loose snow. We had already reconciled ourselves to the idea of celebrating Christmas alone, when the door was suddenly flung open by two of the Norwegians, who had managed to get through the snow on their skis.

We had no great difficulty in persuading our guests to stay, and soon we were all busy making preparations for a festive evening. The menu consisted of boiled ham with stewed cabbage, and fruit for dessert, and later we used our last rhum for toddies. But the great event of the evening was the opening of parcels from home with the gifts and the letters.

Our thoughts were all the time with the two Norwegians, who had been left behind in Nanûseq. On December 26th we again put our dogs to the sledges, and by united efforts we at last succeeded in reaching the Norwegian hut, "Thorkilsbu", where there was naturally great joy at

the sight of the four of us, and where we amply made up for our disappointment at Christmas.

The hut was, like the other Norwegian stations on the East Coast, a wooden erection with a common sitting and bedroom, a radio room and a room for provisions, all under one roof; a short distance from that there was a small motor house and a shed to store the catch in.

These four Norwegians were all very good people and pleasant companions, and whenever possible we visited each other or met in the hunting field. We always admired them for their proficiency in sky-ing and more particularly in jumping, and as our skis did not lend themselves to this kind of sport, we each bought a pair of skis from them and set diligently to work at learning their art.

We did not get back until January 7th, when we were again able to continue our assiduous, but unfortunately futile attendance on the most accessible traps in the neighbourhood. On the 20th we ascended the mountains in order to reconnoitre the ice, and then we saw that the field-ice lay far out to sea with a broad landwater within it.

The new ice did not begin to form until February 8th, and a few days afterwards it was broken up again by swell and gales. On February 13th there was a colossal snow-fall, and on February 18th the fjord was filled with pack-ice, with an almost miraculous rapidity; but the following day the current turned, and in the course of the 20th the fjord was again swept clean. On the 25th it was filled once more, and now the pack-ice remained and froze up with the fjord ice, and we looked forward to hunt seal in the ice and also to make some longer trips with the sledge. However, we were sadly disappointed.

The pack and winter-ice, which had frozen together, was very uneven, cut up by currents and in incessant motion owing to the constant current out of the fjord, which in connection with the strong tide and the frequent gales screwed up the ice and made broad belts of open water. Our position was now such that neither by boat nor by sledge were we able to move about on the fjord. No wonder, therefore, that we were not always in the best mood, and moreover we caught very little, the country being always very poor in game; our total catch consisted of 3 white foxes and 1 blue. On May 10th the ice at last passed into the fjord, lying close at the mouth. The "Manne" was immediately launched, and glad to be free once more, and with great expectations we started on our first long journey of 1933. The snow still lay high within the fjord, but we managed to attend to most of the traps, though the result also here was very poor, as we only found 4 foxes, 2 blue and 1 white, and even then their skins were so rancid that we had to throw them away. This was naturally a great disappointment to us, not least because we had trusted to the inner fjord, where things were much more peaceful

than on the outer coast, and where one might consequently expect to find a greater stock of land game. The fact that even our freely exposed meat depots had been left untouched unfortunately seems to point towards there being no stock of foxes worth mentioning in the fjord area.

We just managed to get back from that expedition; then the fjord was again filled with field-ice, which lay there for the remaining part of May and the whole of June, in fact so close that we were utterly unable to leave Narssaq.

We had arranged with Knud Rasmussen that as soon as the ice permitted in the spring, we were to close the station and in the "Manne" to attempt the journey to Julianehaab, where we were to await the arrival of the new expedition. We made several energetic attempts, but nowhere could we find an opening sufficiently large for the small "Manne" to squeeze through, and so we had to stay, where we were.

The month of May was hard to bear, much harder than January, the month of gales. May proved to be the rainy month, with a steady downpour day after day; we had 17 days of rain during that month, and the Norwegians reported a precipitation of 527 mm. The whole plain surrounding the hut was a bottomless swamp, and further all animal life during that month had disappeared from the surface of the earth. There were no seals, no birds, and no fish; indeed we were put to such straits that in order to get fresh provisions, we had to try to catch sea scorpions in the fjord both for breakfast, dinner and supper, and there was no improvement in our fare until about medio June, when at last salmon began to appear.

In June we experienced a Greenland summer in all its beauty, but we were unfortunately unable to enjoy it to the full because of our constant longing to get away. One uneventful day after another passed, and more and more eagerly we watched for a sign of life from the south.

It finally came, but in a manner quite different from what we had expected. On July 3rd a couple of white bears, a female with a large cub, came trudging past our hut. Østergaard happened to be at home, and seeing them from the door he seized his gun and killed them both. We skinned them at once, and now after a long period of scanty fare we had abundance of the most splendid provisions, far more than we ourselves were able to dispose of.

On the following day—July 7th—in the afternoon we were both standing in the hut roasting bear steaks, when through the small window we saw a masthead appearing above the horizon. In a moment we were in the open air, unable to believe our own eyes, when besides the first mast top we saw two more and then one more—but after a little while it was all cleared up, for three large motor-boats came sailing with flying colours through the ice into the harbours.

A glorious sight!

The first of the motor-boats we recognized as the "Dagmar", which had been the last boat to leave us in 1932 and was now the first to visit us in 1933. The second boat was the blue boat used by the geodetists, the "Andræ" from the West Coast, and the third the "Holbøll", which belonged to the chief administrator of the district. The whole flotille was commanded by Capt. Gabel-Jørgensen; Lieut. Wittrup Hansen was again in command of the "Dagmar", and Janus Sørensen as usual skipper of the "Andræ"; finally, the "Holbøll" carried the chief administrator Svane, who accompanied the expedition to the boundary of his district. Besides there was the Danish survey party and the whole of the permanent Greenland crew, so it seemed to us as if a whole town had suddenly made its appearance among us, and they all vied with each other to give us as cordial a welcome as possible.

We enjoyed once more to taste fresh potatoes, jam and white bread, beer in mugs and proper cigars. Our fate for the remainder of the summer was soon settled, as we both jumped at the proposal made by Gabel-Jørgensen on behalf of Dr. Knud Rasmussen, who asked us also this year to take part in the 7th Thule Expedition.

During the evening and night we gladly packed our few belongings and handed over our fox and bear skins to the "Holbøll"; then we made the hut ready for departure and closed the door. Our wintering in Lindenows Fjord was ended.

On July 5th in the morning we took leave of the narrow hut and our lonely life there, and relieved and ready for new adventures we started for the unknown with our comrades from 1932."

Concluding remarks.

The wintering party have not carried out special meteorological observations, but in the log books which were carefully kept from day to day, so many facts have been noted regarding the weather that some of the results ought to be mentioned.

Wind-, weather- and ice conditions. The table below gives a summary of wind and weather conditions in the 10 wintering months.

Number of days with	Sept. 1932	Oct.	Nov.	Dec.	Jan. 1933	Feb.	March	April	May	June
storm	6	9	10	6	10	2	2	0	9	1
calm	17	11	18	19	9	21	19	22	11	17
snow.....	0	5	4	4	3	8	6	1	2	0
rain	4	2	2	0	0	1	0	5	17	6

As it appears, the number of stormy days is very great, 62 in all during the 10 months. Attention should, however, be called to the fact that the Norwegians had been much less inconvenienced by gales, as their hut was much more sheltered, though situated far out on the coast.

The most frequent wind was the so called "northerly" which here blows out of the fjord (*viz.* as western wind). There was rarely a wind from the east, but when it came, it was always very violent. The whole of the autumn and more particularly January are pronouncedly stormy months; then there follow some quiet months: February, March and April, while May in its turn is again a month of gales and more particularly rain, and summer only beguns in June.

All in all, the experiences gathered correspond with the 1925/26 report on Narssaq:

"The climate at Lindenows Fjord is very unstable, with very frequent storms and considerable rain and snowfalls."

As to ice conditions it seems that the pack-ice in 1933 already came before Christmas; it appeared at Narssaq as early as December 6th, an uncommonly early date.

When reconnoitring the ice on January 20th the pack-ice was seen far out at sea with a broad landwater inside, and not until February 18th the ice reached the coast, where it soon became so closely packed that it was impossible to get out again until medio July; this agrees very weel with the experiences made elsewhere of the great quantities of ice along the East Coast as compared with 1932.

The winter ice came on February 8th. Pack-ice and winter ice are only frozen up for a comparatively short time, and the ice is nowhere so strong or remains for so long that one can, with any certainty, trust to sledging.

Hunting conditions.

In the winter 1925—26 Greenland hunters were attached to the stations, which was not the case this time, and so it is difficult to say anything for certain regarding the number of seals to be found there. It has been proved that the seal, in the course of the large autumn migration, penetrate as far as the head of Nord Fjord and on to the glacier ice, but with the beginning of winter these seals again migrate towards the sea.

As to the land game O. Bendixen reports that there were a good deal of foxes in 1925/26, but this statement seems too optimistic for the results of the wintering party of 1932/33.

There was very poor hunting, only 8 foxes in all—5 white and 3 blue—but here it must be remembered that the hunter never derives

the full benefit from the first year, when he has still no real knowledge of conditions of ground and weather.

There is, however, one fact which perhaps even more testifies to the paucity of foxes, and that is that the freely exposed meat depots were left entirely untouched; this would naturally have been quite inconceivable in a good game district.

Only 4 polar bears were observed, two of which were killed; they all came down with the ice.

Hares have not been observed, any more than antlers or other traces of reindeer.

Bird game observed: white-tailed eagle, faucon, guillemot (in great quantities), common gull (only a few brooding), taterat, mallemuk, wild duck (many), eiderduck, long-tailed duck, diver, snow-bunting and bunting.

For fishing condition see the report of cand. mag. Poul M. Hansen pages 101.

In summing up these experiences regarding hunting conditions at Lindenows Fjord, one can subscribe to the conclusion of O. Bendixen that there is no basis whatsoever for the establishment of modern stations for the hunting of seal or foxes, and to this may now be added: and no more for fishing.

When, on the other hand, Bendixen in 1926 was of the opinion that the conditions for obtaining a livelihood were particularly favorable, this unfortunately does not agree with the results obtained in 1933; neither does there appear to be any special foundation for a permanent Greenland settlement, as the conditions of obtaining a livelihood for long periods of the year are too uncertain even for kayakers, whereas the fjord during the migrations of seals yields good hunting conditions, and so would be very useful for the Kap Farvel Greenlanders on their seasonal hunting expeditions. "Tutein's hut" will then be an excellent point of support, and so it ought to be kept up and maintained as a hunting hut for the Greenlanders.

XIV. Craft of the Expedition.

Summary.

M/Sch. "Nordstjernen".

3-masted motor-schooner. Built in 1913 on Z. T. Jacobsens ship yard, Troense. Length 36.6 m, width 10.6 m. Gross register tons 241. Net register tons 187. Carrying capacity about 350 tons. Engine 120 H. P. Tuxham.

M/C. "Kivioq".

Built 1932/33 at the Frederikssund ship-yard.
Size: greatest length: 48 ft. (Danish)
greatest width : 13.5 ft. —
depth : 6.8 ft. —
Material: oak with internal planking of pine.
2 masts and rigged as a hermaphrodite schooner.
Pilot house on the deck, besides a cabin forward with accommodation for 6 men, and aft for 2 men.
Speed: 7.2 (naut.) miles.
Tonnage: 21^{59} gross, 5^{63} net. Hold: 15 m^3.
Engine: 2 cyl. 66/76 eff. H. P. Tuxham raw oil ship's engine.

The motor-cutter which Knud Rasmussen had named the "Kivioq" after the Greenland legendary figure Kivioq (i. e. circumnavigator of the world) is built and fitted up for arctic navigation, also for use on Knud Rasmussens future voyages in Greenland waters.

M/B. "Dagmar".

Built in 1919 at the Strømme ship-yard, Bergen.
Size: greatest length: 35 ft. (English)
greatest width : 10 ft. —
depth : 6 ft. —
Material: Oak with outer planking of pine, interior fittings of teak.
One mast and rigged as a cutter.
Pilot house, cabin and accommodation for 4 men and pantry, but no hold.
Engine: 1 30 H. P. Bolinder raw oil engine. Type: B 7 M 21.
Speed: 7.0 (naut.) miles.

This boat which was named after Mrs. Dagmar Rasmussen was bought for the 6th Thule Expedition in 1931 and has thus taken part in all three voyages along the East Coast.

M/B "C. C. G. Andræ".

Built 1929 in Sakskøbing.
Size: Length : 36.5 ft. (Danish)
Width : 13 ft. —
Draught: 6 ft. —
Material: oak.
Engine : 25 H. P. Kelvin engine.
Enclosed tanks, holding about 1000 kg oil.
Operating radius 800 (naut.) miles.

Speed: 6.2 (naut.) miles.
1 mast + 1 radio mast. Permanent radio transmitter and receiver.
Sleeping accommodation amidships for 4 men, forward for 2 and after for 2 men.
The boat belongs to the Geodetic Institute, Copenhagen.

The aircraft
belonging to the Royal Danish Navy.
3-seater Heinkel Hydro-Monoplane type II.
Length: 11.6 m; span 16.8 m; height 4.6 m.
1 Jaguar engine 460 H. P. (Firm: Armstrong Siddeley Motors Ltd. Coventry, England).
Maximum speed: 210 km per hour.
Cruising speed: 165 km per hour.
Maximum weight: 2650 kg.
Time of ascent to 4000 m with full weight approx. 35 minutes.

M/B "Manne", "Hanne", "Inge", "Lone" and "No Name".

Small, light open fishing boats from Edvard Isachsen at Tromsø, built entirely of oak with coppering in front. They were 18'—6" long, 5'6" broad and 2'—3½" deep, and they were driven by a small 2—4 H. P. Wickman raw oil engine from the firm M. Halderson & Son, Ruttestodnes.

These small vessels had a great carrying capacity, great sea worthiness, required little space, were cheap and easy to work; they could make a speed of 5 miles in the hour, and the Norwegians used them not only for hunting within the skerry fence of the district, but also outside it to connect the various groups of hunters; as a matter of fact the three Englishmen Watkins, Lemon and Courtault, in the autumn of 1931, even performed the great feat of making the journey from Angmagssalik to Nanortalik in a small open boat with an auxiliary engine. This was a piece of sportmanship which Knud Rasmussen, who was himself present at their arrival in Nanortalik, greatly admired, and it further strengthened his belief that also small motor-crafts could be used on the Southeast Coast, which had been considered so formidable.

When in 1932 Knud Rasmussen set out on the 7th Thule Expedition, he took with him, by way of experiment, such a Norwegian fishing boat, which he had ordered from Isachsen at Tromsø, the boat being named the "Manne" after his son.

And the "Manne" stood its test magnificiently throughout the summer, being partly used as a travelling boat for Knud Rasmussen himself, and partly as a travelling boat for the geologist Bøgvad when carrying on his investigations in the Skjoldungen area. At the end of the expedition, the boat was handed over to the wintering party in Lindenows Fjord, and it was still going strong, when the expedition in 1933 returned

to the East Coast. At that time it was not any longer the only one of its kind to be used by the expedition, two sister boats having been brought up there from the Tromsø ship-yard, and the "Nordstjernen", besides its own little dinghy, had on its deck a fourth motor-boat of the same size as the "Manne", *viz.* one of the small boats with an "Atlantic" engine belonging to the Lighthouse Service, the number of small boats now being 5.

The members of the expedition immediately named the two boats the "Hanne" and the "Inge", after the two young daughters of Knud Rasmussen, whereas the boat of the Lighthouse Service was named after Miss Lone Thomsen, the young clerk of the Thule Station, a general favourite with all of us.

These five boats, called by the general name of the "Manne-boats", were navigated by the student A. Madsen, the engineer E. Mortensen, the mate Jens Olsen, the carpenter Emil Rasmussen, the hunter Knud Østergaard and Conscript Egon Petersen from the "Nordstjernen". Throughout the summer they all quietly did their good and valuable work which deserves to be mentioned as one of the many causes contributing to the great results obtained.

It is, however, impossible to go into details as to the multifarious activity of the "Manne-boats". If mention should be made of all the journeys undertaken by them within the field of work, it would be necessary to account for almost every hour, day and night; and a summary of the positions, which only contains one position a day for each vessel, will by no means give an adequate expression of their activity.

Summary of Distances operated by Sea and Air.

M/Sch. "Nordstjernen"		3965	(naut.) miles
M/C "Kivioq"		7130	—
M/B "Dagmar"		3200	—
M/B "Andræ"		5243	—
M/B "Manne"	approx.	2000	—
M/B "Hanne"	approx.	1200	—
M/B "Inge"	approx.	1200	—
M/B "Lone"	approx.	1050	—
The "Nordstjernen"s motor-boat "No Name"	approx.	400	—
		25388	miles or
	approx.	47000	kilometers
The seaplane		14425	kilometers
Total during the summer	approx.	61425	kilometers

XV. Southeast Coast of Greenland.

In the following a brief description will be given of conditions regarding ice, harbours and flying bases along the coast, based upon the experiences made during the three years covered by the expedition. This description more particularly comprises the distance from Prins Christians Sund to Kangerdlugssuaq, the part of the coast especially dealt with by the 7th Thule Expedition.

The airship used was of special importance for the observations. From the air only one is quite able to obtain a full view e. g. of ice conditions. It would have been of great interest, if it had been possible to photograph the coastal waters systematically and with fixed intervals, which would have given us a much more definite idea of the distribution, nature and conditions of the movement of the ice. Unfortunately we could not spare the time for this; the tasks on land being all that could possibly be performed by the one plane at the disposal of the expedition.

From the air the aviator, however, took a number of observations, which are included in the subsequent report based upon the observations made by all the work parties.

Ice conditions.

1931.

For this year we only have observations taken from a boat and within the period August 20th—October 2nd.

The observations made can be summarized as follows:

From Prins Christians Sund to Angmagssalik.

Along the coast only very little pack-ice, but a number of ice-bergs and calf-ice. The ice was nearly everywhere so scattered that sailing by day caused no difficulties. Special conditions concerning currents and wind might, however, cause sounds to be blocked up with calf-ice, or calf-ice in open water to collect in fringes which it was necessary to circumnavigate in motor boats.

The ice might extend as far as 10 (naut.) miles off the shore; for larger ice-bergs as much as up to 20 miles. The melting-off of the ice seems very strong, and this created a very "lively" glacier ice.

1932.

Here observations are at hand from boats, mountains and airship.

From Kap Farvel to Umivik.

July:

Along the whole of the coast great masses of pack-ice of very varying width and density.

Sounds, fjords and narrows frequently greatly blocked, but all in all it has been possible to sail in motor-boats along the coast in the land water.

August—September:

The pack-ice had practically disappeared. Large quantities of ice-bergs and calf-ice, quite as described in the previous year.

Sailing unobstructed almost everywhere.

In the fjords, and more particularly the icefjords, the ice situation is naturally quite dependent upon conditions: direction of wind, tide and calving (shooting out) from the glacier-ice.

1933.

From this year there are a particularly large number of ice reports, partly from the many boat parties, partly from the seaplane and partly from the geodetists, who from the mountains had a wide view of the sea.

From Kap Farvel to Kap Brewster.

July:

Great masses of pack-ice along the coast from Kap Farvel to Angmagssalik (further north not made subject to observations in July).

During the early half of July the boats of the survey parties were thus cut off by the pack-ice outside Lindenows Fjord. The width of the ice was here presumably 10 (naut.) miles. As the ice slacked on July 10th, it was possible to escape towards north in the landwater. Everywhere large but scattered quantities of pack-ice which again became much thicker south of Bernstorffs Isfjord, where sailing was very difficult.

There is a very rapid current out of this, the most richly productive icefjord of Southeast Greenland, where navigators must always show extreme care during their passage. Inside the large bank of ice-bergs—off the mouth of the fjord—there are such violent whirlpools with ice-bergs and calf-ice that navigation is often impossible[1]).

In Pikiutdleq the masses of pack-ice increased in extent and density, until Graah's Øer had been passed. On July 20th at midnight we sailed out into open water south of Inigssalik, and the continous drifting all the way up to Angmagssalik was a proof that neither at sea was there any very large ice belt.

At Kap Dan which as a rule is blocked by the ice there was no field ice visible either.

On July 10th the "Kivioq" went into the ice between Erik den Rødes Ø and Kap Dan. Here the ice was so closely packed that there

[1]) In this connection attention should be paid to the fact that also off Krumpens Fjord there are special conditions of current.

was no water whatsoever in sight all along the horizon. Not until the 12th did the boat manage to get in to Kap Dan, and on the following day to Angmagssalik.

On July 12th the "Nordstjernen", on its way from Reykjavik, passed the first ice-bergs, about 30 (naut.) miles off land due south to east of Kap Dan. After having received a wireless report on the ice from Angmagssalik the vessel headed south about 30 (naut.) miles south of Kap Dan and then continued on a north-westerly course towards the settlement (about 35 (naut.) miles), and along this route it did not meet any ice obstacles of importance.

A theory has been set forth that when making Angmagssalik one should get into the ice north of Kap Dan in order to follow the country towards south and west and with the south-going current pass Kap Dan and then try to get into the land water off the large Angmagssalik Fjord. This theory which the "Kivioq" adopted does not seem to hold good in this case.

August:

Angmagssalik southern district as far as Umîvik.

As in previous years only small quantities of pack-ice were present. There were, however, great quantities of ice-bergs and calf-ice, which were very scattered and lay as far out as the horizon. Off the coast lay the glacier ice, most frequently closely packed in belts or round islands and mouths of fjords, where special current conditions prevail—e. g. at Graah's Øer.

As to the conditions north of Angmagssalik, Colonel Lindbergh—who on August 6th flew down the coast from Clavering Ø to Angmagssalik—reported that he had observed large "patches" of sea-ice drifting along the coast in a southerly direction.

This was fully confirmed by the "Dagmar", the "Kivioq" and the "Nordstjernen" which on August the 8th, 14th and 17th respectively departed from Angmagssalik in a northern direction. In order to circumnavigate these patches of pack-ice the vessel must now and again pass 20 (naut.) miles off the shore.

Ice-bergs were observed up to 20—30 (naut.) miles off the shore.

Also a quantity of calf-ice was met with. Thus the "Kivioq" attempted to penetrate to the "House of the Dead" at Nûgâlik, but this had to be abandoned on account of closely packed glacier-ice.

From Nûgâlik to Kangerdlugssuaq the waters, filled with ice—mainly glacier ice—forced the vessels far out from the shore, but then on this stretch one large productive glacier lies beside the other.

Kangerdlugssuaq was filled with great masses of ice, whereas Mikis Fjord was practically ice-free.

In the period August 17th—24th the "Dagmar" party surveyed the stretch from Kangerdlugssuaq to Sermilik Fjord, and there it met no important ice stretches close to the shore along the belt of islands, but pack-ice was observed in rather a broad belt farther out to sea.

In the period August 19th—28th the "Kivioq" navigated the distance from Mikis Fjord to Scoresby Sund (Hurry Fjord) and back again and met great masses of pack-ice, but nowhere in such quantities as to put actual obstacles in the way of navigation.

This, however, must be regarded as quite abnormally favorable.

September:

Practically no pack-ice was visible along the coast. Only a few large icebergs were left and then with intervals the unevitable calf-ice.

On September 7th the "Nordstjernen" reported the first new ice in Mikis Fjord; this, however, melted in the course of the day.

When on September 23rd the "Nordstjernen" left Angmagssalik *en route* for Reykjavik, the waters were entirely ice-free with only an occasional iceberg.

On the southern boat-trips of the survey parties on the last days in September no ice was observed at sea and on the journey of the "Kivioq" in

October:

(from the 11th—13th) the waters were so ice-free from Angmagssalik to Julianehaab that the boat could go full speed, both night and day. The few large ice-bergs left could easily be observed at night in the moonlight.

Everything considered, ice conditions in the years 1931—33 must presumably be characterized as very favourable, at any rate when comparing them with the conditions described in the numerous reports of the voyages of Graah, Holm and Amdrup, where the "Storis", (o: pack-ice) also in summer, entirely blocked the coast, and the width of the ice was up to 100 (naut.) miles.

Harbours.

In the course of the journeys 1931—33 the many boats of the expedition had the opportunity to visit practically the whole coast from Prins Christians Sund to Kangerdlugssuaq, and in the course of these journeys they found a great number of excellent harbours.

It is perhaps difficult to give an accurate idea of the actual value of the individual harbours, as many of those were visited in easy weather, and besides with masses of ice lying outside them as a kind of shelter; consequently, it is often difficult, not to say impossible, to give informa-

tion as to conditions in case of drifting and heavy sea. In calm weather it has been possible to go so close inshore with the small boats that the anchor has caught hold, but in most cases there has been very little room to swing, and not at all enough in case of unsettled weather conditions.

And last not least, there is a considerable difference between harbours which can be used by small motor-boats, and such as can also take larger vessels.

In the following a distinction is made between:

ship's harbours—suitable for larger vessels

boat harbours—only suitable for motor-boats;

mention will only be made of the harbours which have been used by the craft of the expedition.

Aluk: ship's harbour.

On the S. E. side of the Aluk island an excellent harbour shelters against all winds, because of the winding course which leads into it and the gradually rising bottom.

In the sound round it and in the creeks in the Aluk island several good boat harbours.

Dronning Louises Ø: ship's harbour.

In the sound round the island several good harbours, especially on the N.W. side of the island, which was ice-free within a period (10—15th July) with much ice, both in Lindenows Fjord and out to sea.

Narssaq (Lindenows Fjord): ship's harbour.

In a small bay (off river) on northern side of the fjord, due west of the hunting hut (Tutein's hut). Sheltered from north wind and free of ice, when the fjord can be navigated. Drifting and sea strong with east wind. Within the smaller islands off the coast small craft can anchor.

Nanûseq: ship's harbour.

At the head of Nanûseq Fjord. Serviceable anchorage in S.W. part of the fjord.

"Mannes Havn": ship's harbour.

On the southern side of the mouth of Nanûseq Fjord.

Entrance into the harbour in mid-channel. On the eastern side of the harbour the expedition has built a large cairn, which distinctly

indicates the entrance. Larger vessels may anchor mid channel in about 12—15 m water. On the eastern side some skerries, very close inshore.

Tâterait: ship's harbour.

Southern side of Auarqat Fjord.

Entrance into the harbour mid-channel, between the islets and the continent, and there is a good anchorage behind a headland farthest in on the north side of the harbour. Attention should be paid to skerries at the entrance of the harbour.

Kap Tordenskjold: boat harbour.

Behind the cape, the entrance to the harbour being from the N.E. side. Safe harbour, but the winds from the mountains very violent. Anchor ground good. The entrance narrow and access to the harbour as a rule very difficult, a number of ice-bergs grounding in the bay off the harbour; between these a violent sea and swell.

Qutdlît: ship's harbour.

In a large bay on the S.W. side of the island (see page 55). Most frequently ice-free and a good anchorage, though now and then a heavy swell may set in.

Kap Rantzau: ship's harbour.

Directly N.W. of Kap Rantzau. Good large-sized harbour. Frequently free from ice, though now and then a heavy swell may set in.

Nagtoralik: The sound to the west of the island has been navigated. It gives good shelter, but has not been reconnoitred with a view to harbours.

Uvdlorsiutit: ship's harbour.

Right outside the S.W. point of the island. When entering, the point should not be rounded too closely, as the water is rather foul. After having got well into the bay, one turns star-board and heads into a small, natural, well-protected harbour, formed inside a couple of small islands.

Larger vessels, however, ought to anchor in the bay outside these small islands.

The Tingmiarmiut base island: boat harbour.

In a small creek at the eastern end of the most easterly of the islets due west of Hestesko Ø. On the summit of the island a fairly large cairn. Good and ice-free harbour for smaller craft.

The Tingmiarmiut dwelling place: ship's harbour.
On the southern side of the large Tingmiarmiut Ø, off old dwelling place. Particularly ice-free and well-protected harbour.

Tingmiarmiut Ø (north): ship's harbour.
On the northern side of the island just inside (to the east of) the narrowing, where Nord Sund connects with Ikerasak. Ice-free and well-protected. The great masses of ice in Ikerasak Fjord are frequently packed in front of the mouth of the neck and prevents passage.

Griffenfelds Ø: ship's harbour.
In fjord which extends from the south, right through the island. Free from ice and swell. In several small lateral fjords excellent boat harbours.

Griffenfelds Ø, north: boat harbour.
Small harbour on northern side of harbour called "Ebbas Havn". Dangerous submarine skerry in the middle of the entrance, so navigators should keep close to the rock on the eastern side. The entrance is frequently packed with ice from Qagssertôq Isfjord, and a swell is apt to set in.

Ûmánaq Fjord: ship's harbour.
On the northern side of the fjord behind island inside the mouth of the fjord.
In northern lateral fjord off the valley at Pilerquit also well-protected anchorage.

In Skjoldungen Fjord the expedition has made use of the following harbours:

Caroline Amalies Havn: ship's harbour.
On the south side of the Skjoldungen Sydfjord very well-protected and ice-free harbour. Good anchoring ground, widely branched fjord with many anchorages.

Gletcherlukket: ship's harbour.
In the southern side of the Skjoldungen Sydfjord and some 5 km farther in than Caroline Amalies Havn.
The harbour is part of a sound blocked by a "dead glacier", which from the west slides into the sound. Anchoring conditions unknown.

The Skjoldungen Nordfjord: boat harbour.

Behind the headland on the northern side of the fjord a small creek with an anchorage for smaller vessels. Well-protected and ice-free, but the conditions of ground difficult.

Langenæs: ship's harbour.

Harbour on northern side of Langenæs off Imarsivik. Used as station by the Norwegians (called "Finnsbu"). Good, well-protected harbour, but difficult to enter owing to submarine skerries at the entrance.

Imarsivik: ship's harbour.

Large natural harbour between the Imarsivik island and the continent. As a rule entirely free from ice and not to be reached by the swell.

When entering the harbour one must keep to the western side of the water, as there is a dangerous submarine skerry in the middle. Further, there are in the central part of the bay, immediately facing the deep water, some dangerous submarine skerries. Very deep water, but everything considered an excellent harbour.

Other harbours:

Kap Moltke (south): boat harbour.

On the S.W. side of the Kap Moltke plateau. Small, well-protected ice-free harbour.

Kap Moltke (north): ship's harbour.

On the N.W. side of the Kap Moltke plateau.

The entrance resembling a fjord and the harbour estimated to be very safe. Only visited in easy weather and anchoring conditions unknown.

Igdluluarssuk: ship's harbour.

In new fjord west of Qeqertarssuaq. In creek on southern side of the fjord which was quite ice-free, at such times when there was much ice in the sound outside it.

The harbour which has only been visited in easy weather is estimated to be very safe. As to anchoring conditions nothing is known for certain.

Isfjordsundet: ship's harbour.

The sound behind Sagdliaruseq as far as Bernstorffs Isfjord. Ice-free at a time when the ice was packed closely outside it. Anchoring

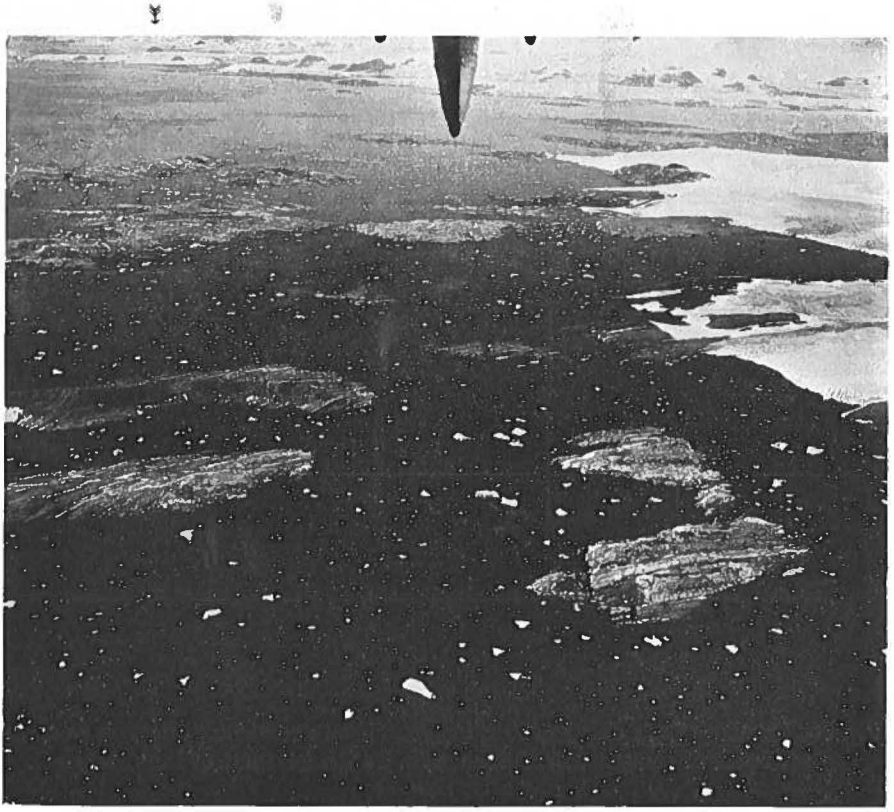

Fig. 65. Air-photo from about 4000 m height. View across the coast from Dannebrogs Ø to Umîvik. Top right: Pikiutdleq. Top left: Kap Löwenørn and the Umîvik peak (¥).

possible in several places. Navigation of the sound possible with motor boat. As to anchoring conditions nothing is known for certain.

Sagdliaruseq: boat harbour.

Small creek on the south side of the island and off the dwelling place Imertît.

The entrance to the harbour only a small opening in the rock. The harbour frequently filled with brash ice, and upon the whole it must be characterized as rather unsatisfactory. On the small plain with the fresh water lake and the many old house ruines are excellent tenting sites. In the sound between the islets and on the eastern point of the Sagdlia island there are smaller boat harbours, which are frequently very difficult of approach, because of the obstacles presented by the calf-ice; consequently, they can only be used as emergency harbours.

Fig. 66. Air-photo from about 4000 m height. View in southwest direction over the southern part of the great fjord, Ikerssuaq. To the left part of Dannebrogs Ø.

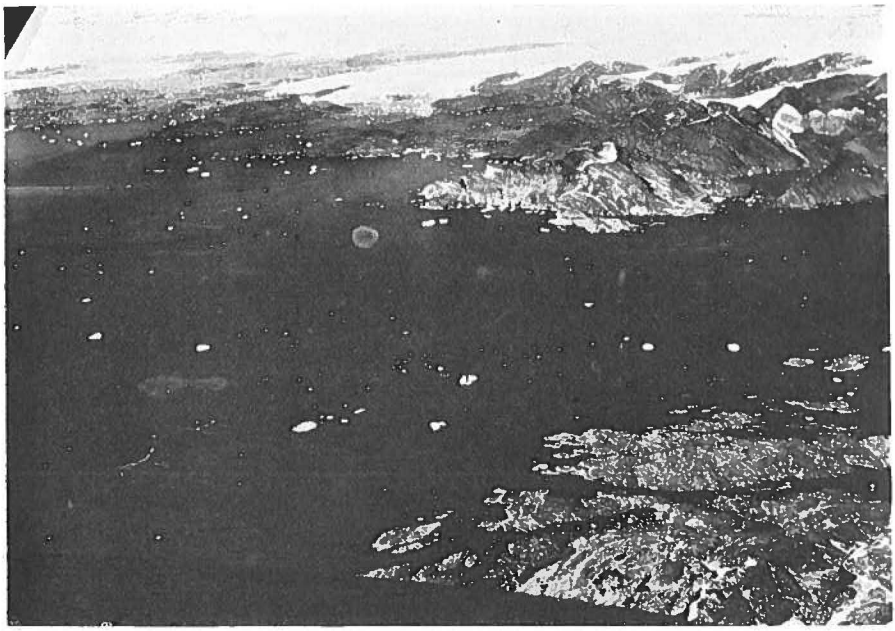

Fig. 67. Air-photo from about 4000 m height. Mouth of Sermilik Fjord.

Fig. 68. Air-photo from about 4000 m height. Section of western side of Sermilik Fjord. In the background Helheim Fjord (right) and the Niflheim country (left).

Umîvik Patsâjuk: boat harbour.

In "mere" communicating with the narrow sound which divides the island and the old dwelling place. Good anchor ground and very little ice (in the month of August).

The Umîvik peak: boat harbour.

In creek on southern side of the peak. Ice-free harbour, but very difficult anchoring conditions, as the bottom slopes very strongly upwards.

As the harbour is rather narrow, it is not possible to swing. In stormy weather the force of the gusts from the mountains are actually of a sinister force.

Umîvik — the Gerners Ø sound: ship's harbour.

In the N.E. part of the sound between the continent and Gerners Ø. Curiously free from ice at the beginning of the month of August. Good anchoring conditions and upon the whole several good harbours here, sheltered behind the island.

At the entrance to the sound from the south there is mid-waters a skerry which just reaches the surface. The sailing out in a northern

Fig. 69. Air-photo from about 4000 m height. The head of Sermilik Fjord with the Midgaardgletscher to the right and outermost part of the Fenrisgletscher to the left. The island left is Âmagâq.

direction is often difficult owing to stoppers of brash-ice in the narrow passages. The southern entrance has always been easily accessible.

Qardlît (Hornemann's Ø): ship's harbour (65°09.5′ N.; 39°42′ W.)[1]). One of the best harbours of the coast, formed by the two arms of the island, extending forkwise from the island in a western direction. It is possible to anchor in about 10 m water, close to some small skerries at the innermost part of the harbour; but apart from that there are several creeks or small bights, in which good anchorage may be found.

Dannebrogs Ø: ship's harbour (65°18′ N.; 39°35′ W.).
In creek midway on S.W. side of island. The harbour divided into two creeks by a smaller tongue of land; excellent anchorage in both places. After entering the harbour one should not turn too quickly to star-board, as there is a skerry inside the southern point of the harbour. Whereas this harbour was ice-free in the month of August, the harbours on the east side of the island were packed with ice.

[1]) The positions in the following taked from the new maps.

Fig. 70. Air-photo from about 4000 m height. Helheim Fjord at the head of Sermilik Fjord. In the background the Skaktfjord and -gletscher, the Fenrisgletscher and Schweizerland.

Sujunikajik: ship's harbour (65°28′ N.; 39°10′ W.).
On the eastern side of the island a skerry fence containing many excellent harbours. Particularly free from ice in the month of August.

The Ikerasârssik Sund: ship's harbour (65°33′ N.; 38°47′ W.).
In the sound between the island of Kitak and the continent a number of good harbours, which are almost free from ice in the month of August. The waters, however, very foul.

Tungujortoq: ship's harbour (65°38′ N.; 38°22′ W.).
Good closed harbour N.E. of the Tungujortoq peak. At the entrance there was, however, on August 11th a great quantity of closely packed calf-ice.

Kap Tycho Brahe: ship's harbour (65°38.5′ N.; 38°14′ W.).
In Torssukátak. Ice-free in August, but the conditions of anchoring unknown.

Fig. 71. Air-photo from about 4000 m height. Interior part of Sermilik Fjord. In the foreground Helheim Fjord.

Johan Petersens Fjord: ship's harbour (65°47.5′ N.; 38°05′ W.).
On the S.E. side of the entrance to the fjord. In sound round small island near the continent good anchoring conditions.

Sermilik Fjord—Tasiussaq: boat harbour (66°10.5′ N.; 37°53′ W.).
In small fjord on the southern side of the greater Tasîssârssik Fjord. Only small quantities of ice in the harbour, in spite of the great masses of ice in Sermilik Fjord.

Sermilik Fjord—Ivnarssuaq: ship's harbour. (66°00.5′ N.; 37°44′W.).
In small fjord cutting in behind the Ivnarssuaq peak. An ice-free and very easily accessible harbour.

Angmagssalik: ship's harbour (66°00′.5 N.; 37°38 W.).
The harbour at the settlement. Well-known; not to be mentioned in detail.

Tasîssaq: ship's harbour (65°38.5′ N.; 37°40′ W.).
Good anchorage at western head of Tasîssaq. Can be used when impossible, on account of the weather, to make fast at the settle-

Fig. 72. Air-photo from about 4000 m height. The Midgaardgletscher at the head of Sermilik Fjord.

ment. The "Nordstjernen" lay here on several occasions, once in a very stiff breeze from N.E. By this wind it is possible to set mooring ashore from forward, and if both anchors are cast aground fairly close to the N.E. shoal, it is possible to draw 60 fathoms, and then it is well fixed. It must, however, be observed that on the way to this anchorage there are a couple of skerries which can be avoided when keeping mid-waters.

Atingat: ship's harbour (65°51′ N.; 37°08′ W.).

At the southern side of the entrance to Ikerasaussaq (opposite to the dwelling place Kûngmiut). An ideal anchorage inside a small island called Griseøen. It is sheltered against most winds, and there is no ice, as a river at the head of the creek forces the current outwards. There is not much room, as anchors are required for making fast. If possible mooring should be made, as the changing waters cause the chain to cross in the hawse.

Fig. 73. Air-photo from about 4000 m height. The head of the Midgaardgletscher— and to the right part of the large glacier plateau: Femstjernen.

Tiparpik: ship's harbour (65°41′ N.; 37°00′ W.).
Good anchorage at head of little fjord, which is most frequently quite free from ice.

Leifs Ø: Small fjords on the northern side (in connnction with Sarfaq and Nordre Ikerasaq) in passing proved to be free from ice; here probably several good harbours.

Tugtilik: ship's harbour (66°20′ N.; 35°00′ W.).
At the head of the N.W. branch of the fjord off "Rejsehus".

Kap Gustav Holm: ship's harbour (66°37.5′ N.; 34°22′ W.).
The harbour lie inside Tasîssaq to the west of the cape.

Kangerdlugssuaq—Skærgaardshalvø: boat harbour (68°10′ N.; 31°44′ W.).
In creeks in front of the southerly hut (Rejsehus).

Fig. 74. Air-photo from about 4000 m height. Head of Angmagssalik Fjord with its two branches: Qingorssuaq and Tasîssârssik.

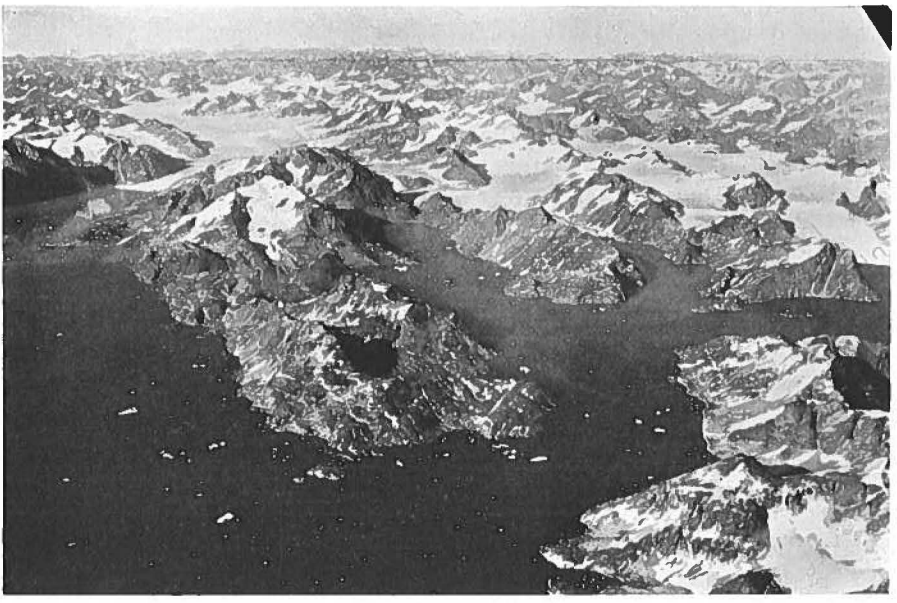

Fig. 75. Air-photo from about 4000 m height. Interior part of Sermiligâq Fjord. In the foreground right Leifs Ø and the Sarfaq sound.

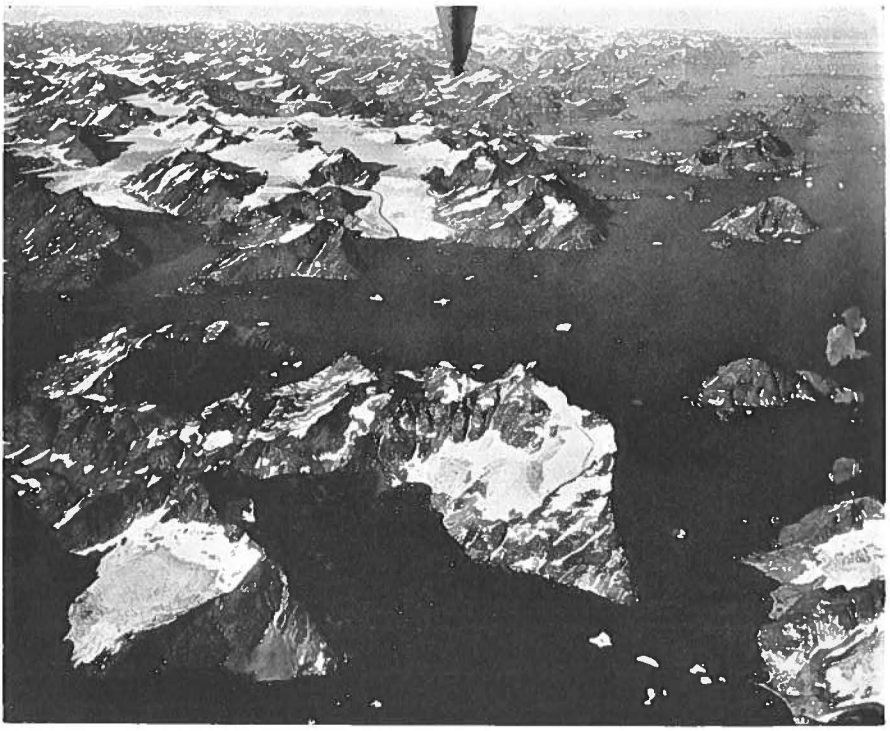

Fig. 76. Air-photo from about 4000 m height. The outer coast from Leifs Ø to Nasigfik (close to south of the southern Steenstrup Gletscher).

Kangerdlugssuaq—Uttentals Sund: ship's harbour (68°11′ N.; 31°42′ W.).
In the sound off northern part of connecting glacier. (Forbindelsesgl.).

Miki's Fjord: ship's harbour.
Western anchorage (68°10′ N.; 31°31′ W.) at delta. Good anchoring ground (clay) in about 20 m water. At times swell. Near the shore a completely provisioned house, built by Ejnar Mikkelsen. Eastern anchorage (68°10′ N.; 31°20′ W.) between delta towards north and edge of glacier towards south. Good anchoring ground (clay) in about 25—40 m water, but the ground steeply sloping in several places. The "Søkongen" lay here in 1932, in a hurricane. No ice in the fjord in August 1932, but some in 1933. Ice-bergs came and went with the tide, causing great inconvenience in both anchorages. The glacier only produces small quantities of ice, but sufficient to incommode the taking off and landing of planes.

d'Aunay Bugt: ship's harbour.
See "Bases" on page 228.

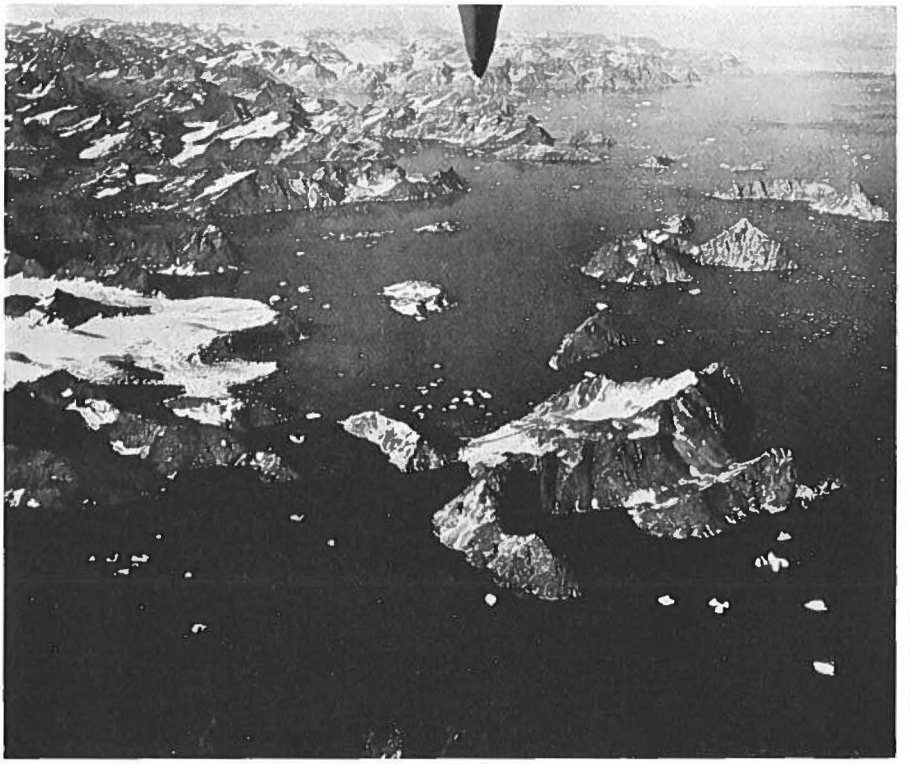

Fig. 77. Air-photo from about 4000 m height. The outer coast from Qûjûtilik to Nasigfik.

Knightons Bugt: ship's harbour.
See "Bases" on page 228.

Turner Sund: ship's harbour.
See "Bases" on page 229.

Flying-Bases.

As it may be of importance for later expeditions to have a summary of the possibilities of bases on the South-East Coast of Greenland and in the Kap Farvel area the sum of the experiences made by the 7th Thule expedition will be given in the following, particularly with a view to the use which can be made of the place as a flying base, and also for the possibilities of emergency landing along the coast.

On the South-East Coast.

In Lindenows Fjord.

The bay at Narssaq on the northern side of the fjord has been used as a flying base during the days September 1st—2nd, 1932.

Fig. 78. Air-photo from about 4000 m height. View of Kangerdlugssuaq. Near the centre of picture Skærgaards Halvø, Uttentals Sund, Kraemers Ø and Watkins Fjord.

The place seems well protected against ice, but taking off and landing is difficult from here, and a swell may set in.

In Nanûseq Fjord.

Used on August 31st as a flying base. Interior part well-protected against swell and at that time no encumbering ice. The wind always blows along the fjord which yields good possibilities of taking off and landing, but there is a danger of sudden violent gusts from the mountains.

In Danells Fjord.

Used on August 29th—30th as a flying base. Cannot be recommended, as the ice conditions are very unfavourable. Taking off and landing, however, undertaken from the fjord immediately within the island of Ilivilik.

At Tâterait.

Interior bay used as a flying base in the days August 24th—29th. Ice conditions good and the place generally well protected. Con-

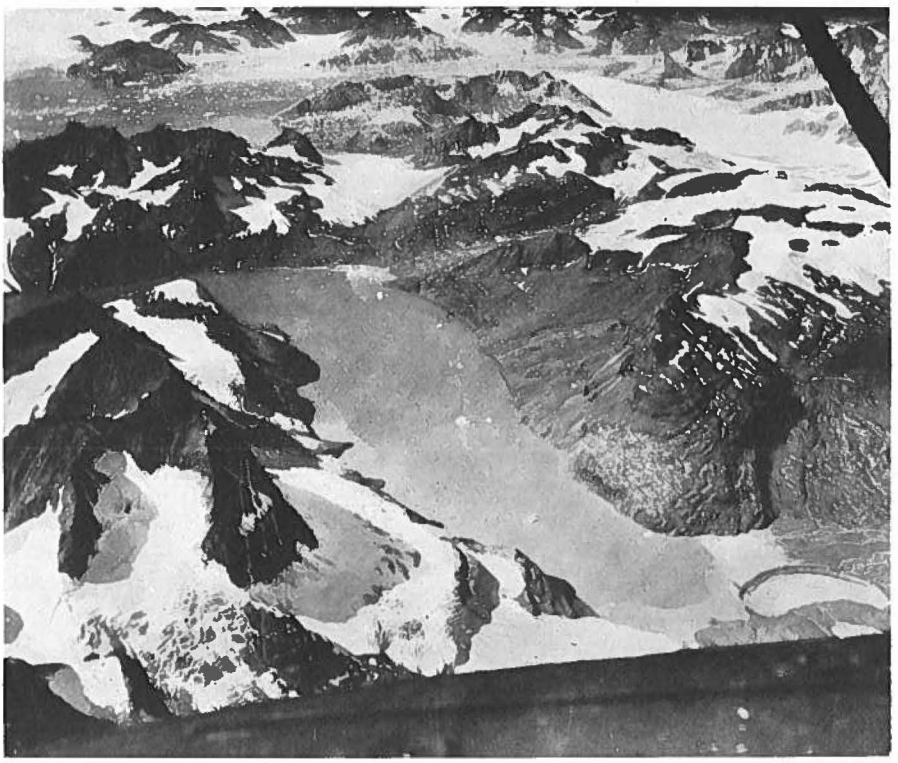

Fig. 79. Air-photo from about 3000 m height. The interior of Mikis Fjord visible.

ditions of accommodation, however, very limited. When descending with an easterly wind it was necessary to pass with low speed, very close to the mountain, and then to glide sidewise down to the surface of the water.

At Qutdlit.

The bay on the south-western side has been attempted as a flying base during the days August 23rd—24th, 1932. Accommodation, anchoring and ice conditions extremely good, but a strong swell may set in, which as a rule makes it impossible to take off and land (se Fig. 14 page 55).

In Tingmiarmiut Fjord.

Possible areas for taking off and landing were found in the bay off the old dwelling place on the south side of the Tingmiarmiut Ø, and also in the bay formed by Hestesko Ø.

Free from swell, but the great masses of glacier-ice to be found in the large fjord can at times cause great inconvenience.

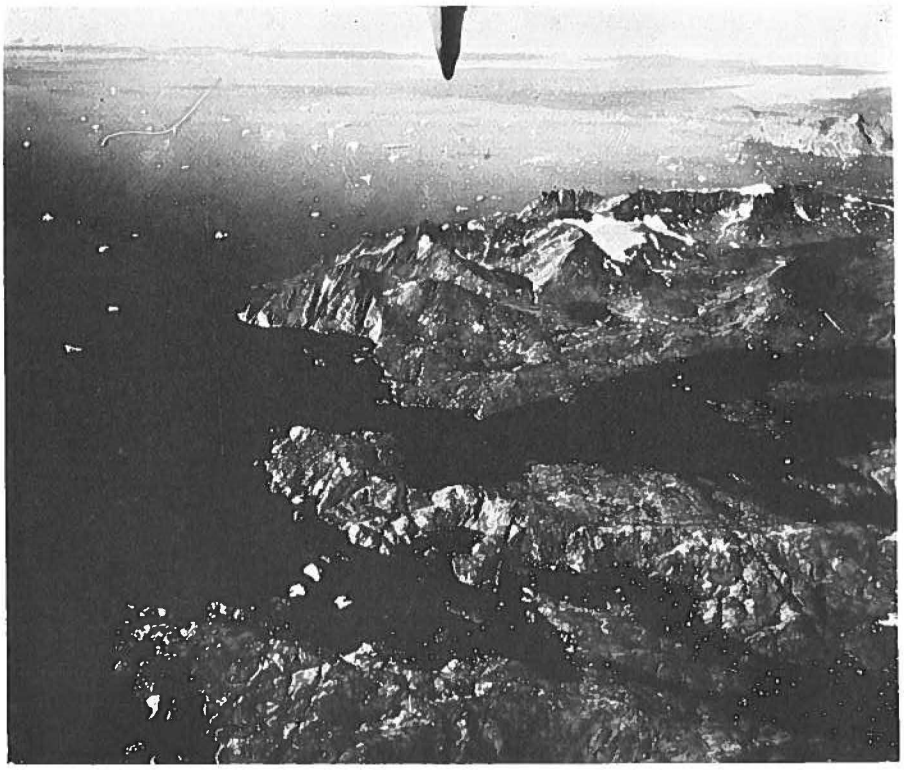

Fig. 80. Air-photo from about 4000 m height. Southern end of Angmagssalik Ø with Tasissaq and mouth of Sermilik Fjord.

At Imarsivik.

Excellent flying base in the bay, which is well protected against swell and ice.

In the fjord just outside (north of Langenæs) the operating possibilities were generally very good.

In the Skjoldungen area.

Everywhere many bays and fjords, where swell cannot set in, and which in the months August—September are practically free from ice, so that there is a possibility for aircraft to operate there.

The distance from Imarsivik to Sermilik Fjord has not been used as a flying base.

The following conditions have been identified by reconnoitring from the air:

Only in Krumpens Fjord is there a possibility of landing, in the sound behind Gerners Ø (at Umîvik) and in the area behind Horne-

Fig. 81.

Fig. 82.

Pair of plates (Air-photos)—from about 4000 m height—for survey work. In the foreground Angmagssalik Fjord and in the background Sermilik Fjord. To the left the sound connecting them: Ikerasagssuaq.

manns Ø, though not until the months of August—September. The other fjords and glaciers are filled with glacier-ice.

The Watkins Expedition it is true, in 1930—31 found bases for two Moth aeroplanes (floats and skis) in a bay immediately west of Sermilik Fjord, but this base was chiefly selected with a view to the comparatively convenient access from there to the inland ice.

In the Angmagssalik district it will practically always be possible to find suitable bases for seaplanes.

At the end of July this year there was some ice in the fjords round Angmagssalik, but in spite of this there were favorable operating conditions in Ikerasaussaq and in the fjord north of it. The north-western part of Ikerasaussaq is generally also ice-free, with much ice in the surrounding waters.

The Tasîssaq bay off the settlement was, on the other hand, filled with great quantities of ice, and only in exceptional cases was it possible to take off and land there in July and the beginning of August. Later in the year the ice disappears entirely from the fjord. North of the head of Tasîssaq there is a large mere, "Storsøen" (Qordlortoq) about 4—5 km long and some 1—2 km broad (65°40′ N. and 37°38′ W.). Flight Lieutenant N. H. D'Aeth R. A. F., first pilot of the Watkins Expedition, says that this mere is in every respect suited for even the largest types of seaplanes and floats; that an aeroplane can land on the beach and that the anchoring ground is good.

"Basis Søen" (in the valley: Sermilikvejen) used by the 7th Thule Expedition in 1933 is situated some 5 km southwest of "Storsøen". It is about 1200 m long from east to west and some 400 m broad from north to south. The depth of the lake is some 10 m at its deepest, and the bottom slopes gently upwards towards the banks. Can be used for smaller aeroplanes, and the anchoring ground is good. Along the sides of the lake there are mountains from 600—1000 m in height.

Erik d. Rødes Ø—Kangerdlugssuaq.

The fjords along this stretch are nearly all more or less filled with ice even at the most favourable season, and only in a few places the fjords yield protection against swell; consequently, it is not suitable as a flying basis.

Fig. 83. Air-photo from about 4000 m height. View of the edge of the Kangerdlugssuaq Gletscher. In the background (right) the Hutchinsons Plateau.

Within the western arm of Tugtilik Fjord there is a lake, some 4 km long east to west and 1—2 km north to south. This lake was also used by the Watkins Expedition, and Flight Lieutenant D'Aeth used the same words of approval for it as for "Storsøen". This lake was not used by the 7th Thule Expedition.

Along the remaining part of the distance there are no landing possibilities whatsoever.

From Kangerdlugssuaq to Scoresby Sund only Mikis Fjord, mentioned in detail under harbours (p. 220), can be regarded as a really good base.

At Kap Dalton there are in approx. 68°42′ N. and 26°25′ W. two lagoons, which are merely divided from the sea by a narrow strip of land. The expedition only on one occasion navigated the lagoon farthest out (the "Kivioq"), August 26th, 1933; it then yielded a good shelter against swell and was quite free from ice. Here there seems to be a safe boat harbour and perhaps also room for smaller boats. Further, it may be possible to use the lagoon as a taking off and landing place for aeroplanes (se Fig. 85).

Fig. 84. Air-photo from about 4000 m height. In the foreground the Kangerdlugssuaq Gletscher. Behind it the many glaciers from the Nordfjord Plateau. In the background Watkins Bjærge.

Near it is the house built by G. C. Amdrup, which is fully provisioned. Further, the following three places have been identified from the air, being estimated as suitable for flying bases.

d'Aunay Bugt which during the latter half of August was found to be quite free from ice, in direct opposition to the fjords of the neighbourhood. At the head of the fjord there is a small island, and behind it a branch of the fjord cuts in towards northeast. At the head of this fjord arm a river debouches with a delta, and this suggests an anchoring ground which is sufficiently good and of a suitable depth. As the length of the fjord arm is some 4 km and the surroundings rather low, there should be nothing to prevent taking off and landing here.

Knightons Bugt was partly free from ice at the end of August, and in its northern part inside Kap Ewart there was an entirely ice-free harbour. This branch was partly cut off from the bay by a narrow strip of land, extending from the southern bank of the arm.

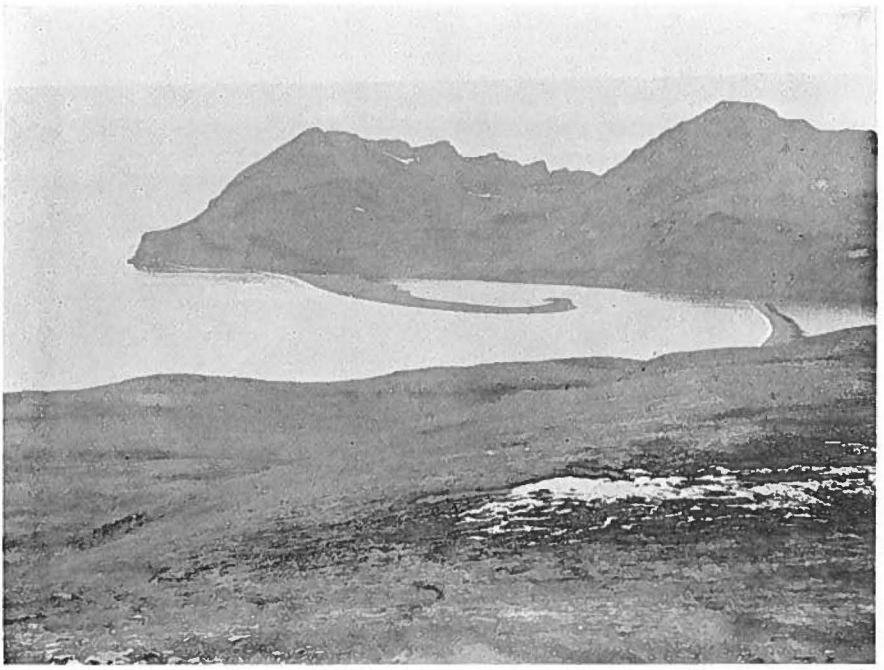

Fig. 85. The lagoons at Kap Dalton, photographed from the north.

Turner Sund inside Turner Ø was at the end of August entirely free from ice and well protected against swell. It is further supposed that the depths permit of anchoring. Here is room for taking off and landing.

The above survey of possibilities of harbours and bases distinctly shows, how great are the differences in the coast to the south and north of Angmagssalik, respectively—the many rich possibilities to the south and the few possibilities to the north of this dividing area.

The summary given above does not in any way lay claim to being complete. Others will be able to find new and good harbours and possibly also a few flying bases, while, on the other hand, some of the places found by the 7th Thule Expedition under different ice and weather conditions may prove less favourable, and perhaps cannot be used at all.

Among the possibilities of emergency landing the chief pilot of the expedition also mentioned landing on the inland ice itself, which—viewed from the air—in many places seems so smooth and even that it must be possible both to land and to take off from there, even farthest out in the marginal zone. However, no attempts have been made to undertake this.

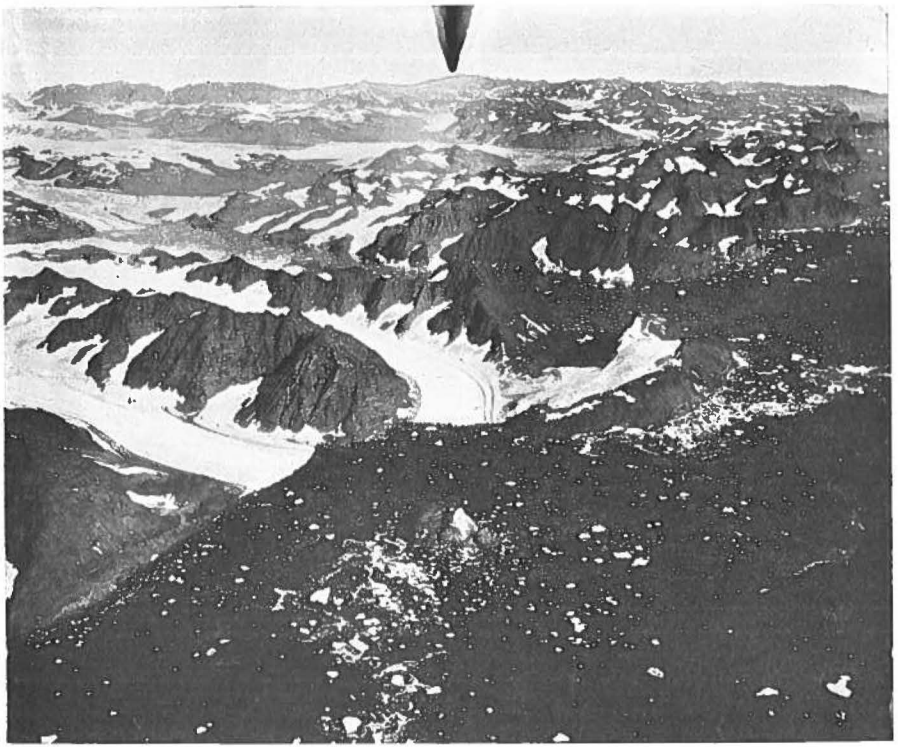

Fig. 86. Air-photo from about 4000 m height. View of the coast east of Kangerdlugssuaq. The small island in foreground is Strom Ø. East of that the round Kap I. C. Jacobsen and behind that Rybergs Fjord. In background (left) Watkins Bjærge.

Harbours and bases in the Kap Farvel area.

Bases being necessary in connection with the works on the South-east Coast in the Kap Farvel area (the Julianehaab district) the chief possibilities in these parts shall be mentioned in conclusion.

Ivigtut.

An excellent air base with modern equipment, supplies of Shell petrol and oil, petrol pumps with hoses etc., buoys for mooring etc. There are good operating possibilities and excellent sheltering conditions.

Julianehaab.

Good base harbour. From the beginning of August good operating possibilities in the fjord off the harbour. Buoy for mooring; petrol pump can be borrowed; good possibilities of accommodation. At the settlement there is a great fresh water lake which, however, is filled with skerries and surrounded by high mountains. With favour-

able winds it is possible to land and take off on the lake, but this can only be recommended in an emergency.

It will always be possible to find fjords along the whole of the distance from Ivigtut round Kap Farvel to Dronning Louises Ø, (excepting in Bredefjord, which is constantly filled with great quantities of glacier-ice) fjords, which are ice-free, well protected against swell and therefore convenient for operations with air craft.

It must, however, be borne in mind that the gusts from the mountains are very violent, and the autumn storms in the deep ravines between the high mountains are of an almost uncanny character.

XVI. Knud Rasmussen's Journeys and Special Works.

a. Introduction.

When on May 24th the geodetists departed with M/S "Disko", Knud Rasmussen accompanied them as far as Elsinore. The leader and second-in-command had here an opportunity to discuss at length some of the many problems which were still unsolved, and here Knud Rasmussen also talked about his own plans for the summer.

What interested him more in this period than anything else were the films operations. He firmly believed that it would be possible to create a Greenland film, even within the very limited period of an arctic summer, and he had an implicit faith in the artistic value of the scenery and the Greenlanders. But at that time he also realized that the leadership of the expedition and the photography of the film would be a task so onerous that he would hardly have time for anything else.

I remember so distinctly the conflict going on within him, and which he realized so clearly on that sunny day in May, when we sailed up through the blue Øresund—the conflict between duty and inclination. How he wished that he could have changed places with us four geodetists who were now on our way with our boats towards the journey round Kap Farvel and along the beautiful, wild mountains and the wonderful, but severe pack-ice.

And I understood him.

Last year he had been the first to leave, and it was something which was in fundamental accordance with his whole being—he who was the born leader of sledge journeys, who loved to be in front, to be the first, when new land was to be explored.

The thought that he, for once, should be one of the last to depart went against the grain in him, and therefore he had seriously thought of leaving in the "Kivioq", that is, to make everything ready for the departure of the main expedition and then himself go up there in the

little boat. There was something of the true spirit of adventure in this—to sail ahead of all the rest in a small craft.

But the preparations, not least with a view to the film, became so incredibly difficult that they bound him to the place and defeated many hopes.

On the one hand, he was proud that he had succeeded in doing everything he had set out to do, proud of the great, well-equipped expedition which had started under his auspices, but on the other hand he was also afraid that the management of the whole of this great enterprise would take so much of his time that he would not be able to devote himself to the study of archæological-folkloristic conditions.

And the event unfortunately surpassed even his most dismal forebodings. From the first to the last day of the expedition he was tied to the "bridge", always fully realizing that this was the duty of a leader under difficult conditions.

He submitted with a perfect patience. He stuck to his task, and not once did he "escape" by himself. All the journeys which he had to undertake in a motor-boat along the coast, were chiefly directed towards other aims, and there was infinitely little time left for his own work.

This was doubtless absolutely contrary to his natural inclination, and it finds its visible expression in his diary, which became so very brief. But if one also reads what is between the lines, one understands that even so the journey was rich in events and adventures. In any case he was pleased with the results and very happy on the day when the film—his last work—could be said to be completed, and when the last meter of film had been run during an enervating fight against the waning summer.

In the following I have attempted to give a complete picture of Knud Rasmussen's personal achievement on the journeys, the film's work and the other works of the expedition, in short, the daily routine as well as days of festival.

And the report has been carried beyond what would otherwise have been the natural termination of the expedition, *viz.* its return to Copenhagen. While in his last field of work Knud Rasmussen contracted the serious illness, which carried him off so soon after the end of the journey, and therefore I have considered it natural to conclude with a few memorial words. I am personally glad to be able to do this as a proof, insignicant in itself, of my strong feeling of admiration and gratitude towards an idolized leader and a beloved friend.

b. Summary of journeys.

June 24th—July 7th: By ship in M/Sch. "Nordstjernen" from Copenhagen to Reykjavik.

July 8th—13th: By boat in M/C "Kivioq" from Reykjavik to Angmagssalik.

July 14th—25th: Stay at Angmagssalik.

July 26th—28th: By boat in M/B "Dagmar". Reconnoitring trip regarding the film, together with Dalsheim, Scheib, Emmy Langberg and Kârale.
Visits to the dwelling places Íkáteq, Igdlitalik and Tiniteqilâq in Sermilik Fjord. Continued through Ikerasagssuaq to Kûngmiut and from there back to Angmagssalik.

July 24th: By ship in M/Sch. "Nordstjernen" from Angmagssalik to Atingat—opposite to Kûngmiut.

July 30th: By motor-boat from Atingat back to Angmagssalik.

July 31st—August 4th: By boat in M/C "Kivioq" from Angmagssalik to Ikerssuaq to take motion-pictures of the pack-ice and the hunting of bladder-nose seals. Visits on August 1st at Sujunikajik, where the great game hunter Robert settled with his family, after leaving Umîvik. August 2nd at Qernertuarssuk, the 3rd at Pikiutdleq. Return to Angmagssalik in the early morning of the 4th; here the preparations for the journey to Scoresby Sund were commenced at once.

August 5th: By boat in M/C "Kivioq" from Angmagssalik to Holm's camp—with goods, provisions and 56 passengers, who were to take part in the film.

August 6th: By boat in M/B "Lone" from Holm's camp to Angmagssalik. (To receive Col. and Mrs. Lindbergh, who had arrived in Angmagssalik by aeroplane.)

August 9th: By boat in M/B "Andræ" from Angmagssalik to Holm's camp.

August 13th: By boat in M/B "Andræ" from Holm's camp to Angmagssalik. (Evening party onboard the "Andræ" in honour of Col. and Mrs. Lindbergh.)

August 14th—September 1st: By boat in M/C "Kivioq" from Angmagssalik via: Holm's camp, Adingat, the Sermiligâq dwelling-place, Tugtilik (Lake Fjord), Kap Gustav Holm, Mikis Fjord, Uttental Sund, Mikis Fjord, Hurry Fjord to the Scoresbysund settlement and Hurry Fjord. Return via Kap Dalton, d'Aunay Bugt, Mikis Fjord, Uttental Sund, Tugtilik Fjord to the films' camp at Tiparpik, where a stay of about a week is made.

September 6th: By boat in M/B "Andræ" from Tiparpik to Kûngmiut and from there to Angmagssalik.

September 6th—October 11th: Stay in or near the Angmagssalik settlement. Within this period, on September 26th, a small reconnoitring trip undertaken by motor-boat in the immediate surroundings of the settlement.

October 12th—15th: By boat in M/C "Kivioq" from Angmagssalik without stop to Augpilagtoq, where a short visit is made. After another short stay at Nanortalik arrival in Julianehaab on October 15th 2. p. m.

October 24th—November 4th: By ship in S/S "Hans Egede" from Julianehaab to Copenhagen.

c. Palos Bridal.

For many years Knud Rasmussen had busied himself with the thought of creating a large, descriptive film (with a plot) from Greenland.

The glorious scenery and the life and activity of the Greenlanders provided excellent films' material, and it seemed as if it were only a question of going ahead and photographing all this wealth of beauty and primitive life.

But when trying to get at the bottom of the matter one soon realizes that there are many difficulties. In order to become a paying concern, a film should contain action—by preference with a love story as the connecting link—and here the difficulties present themselves, the demands of culture being often contrary to those of nature.

This Knud Rasmussen clearly realized.

He hoped to earn money for the carrying out of new plans by means of a film, but at the same time he wanted the pictures to be genuine, so as to show the country, the scenery and the people as they were and—for scientifically folkloristic reasons—by preference as it had all been before the coming of white man.

In Angmagssalik Knud Rasmussen recognized at once the presence of a marvellous material, which lay ready to his hands. Here was a little tribe, still so close to the state of nature that there was a possibility to make a real "Stone Age" film—to recreate the life and doings of a primitive people, as it had been in former times. The inhabitants of Angmagssalik were to be the first, and here experiences should be gathered; then would come the whole of the Thule tribe, and finally the West Coast of Greenland, which holds possibilities of a splendid film, though based upon the present day. Perhaps rather a cavalcade from the times of the Stone Age to those of aeroplanes, where one sees the whole development of the primitive people, as it is seen to-day with its vivid contrast between the skin-clad hunter of the dwelling-place and the artisan of the settlement in his European clothes and with a cottage and garden.

Fig. 87. Camp of the film's party at Tiparpik (65°41′ N. lat and 37°00′ W. long).

As already mentioned, the greatest difficulty for Knud Rasmussen was that the "paying" possibilities of the film had to be taken into account, in order to get anyone to invest capital in it. And so a factor which was at the same time disagreeable and fraught with incalculable effects entered into his plans.

The film should possess qualities which might appeal to the public at large. It was therefore not enough to take one wonderful picture of scenery and folklore after another; all this should be linked together by some plot, a progressive action, which might kindle the imagination and lead to the culmination of adventure, which we all long for.

This was the idea of Knud Rasmussen, when in the spring of 1933 he wrote the manuscript of "Palos Bridal", a simple and beautiful love story, a reflection of life itself, in this case the life of the primitive Greenlanders with jealousy, rivalry and fight for the beloved.

The underlying idea of the film is thus that, at all costs, it should be true to life—in details, in manner of living and scenery. Only native actors were to be used; the Stone Age people should arise once more, the only necessary requirement being that hero and heroine should possess the charm of youth and good looks. In this he proved entirely succesful.

Knud Rasmussen had established communication with the film's expert, Dr. jur. Friedrich Dalsheim from Berlin, the creator of the

beautiful nature films, the "Africa" and the "Bali" ("Der Insel der Dämonen"). Dr. Dalsheim had to the full shown his ability to deal with a primitive people as material for a modern film, but the difficulties connected with the starting of a films' enterprise in Greenland were extremely great. The negotiations with German films' companies fell through, unfortunately at a rather late date, but at the very last moment the "Palladium" of Copenhagen came to the rescue of Knud Rasmussen, so that also this great wish on his part was realized before the start.

Dr. Dalsheim was himself greatly stimulated by the task and by the vivid impression of his meeting with a new people and new land, but at the same time the obstacles were great and manifold. The time for work was short, and besides the weather conditions during the summer of 1933 were unusually unfavourable, so it was really something of a wonder that the enterprise succeeded at all. Further, attention should also be called to the difficulties connected with the accommodation and supply of food for the many Greenlanders, often under very primitive conditions. It was not only a case of the actors, but they also brought their families, and as they were thus for rather lengthy periods staying in localities somewhat poor in game, they considered it a matter of course that Knud Rasmussen should provide them with "their daily bread". The problems in this respect were extremely great and caused great loss of time.

Add to this, the difficulty of keeping all these people together. Being accustomed to freedom, they had always been able to travel, whenever the spirit moved them. The hunting grounds were beckoning, and considerations for the food supplies of the winter forced them to think of hunting. Tumultuous scenes occurred, when one of the leading actors wanted to leave. They then thought that they could propose an old man as a substitute, one who did not need to go hunting any longer, and here naturally great diplomacy must be exercised.

Dr. Dalsheim was greatly impressed by it all, perhaps more than anything else by the genuineness of the scenes and pictures, which was aimed at from the first. Some of the photographs representing Greenland storms were taken after the arrival in Julianehaab. The small outpost Sârdloq, to the southwest of the settlement, was selected for this purpose, and the photographer Traut fulfilled this task in the most admirable manner.

The photography of the most dangerous of all kayaking performances, *viz.* the turning quite round the cross axis of the kayak, was not more successful than it had been last year. For this very high waves are necessary, such waves as only occur during very strong gales or hurricanes—and the films' party did not have the good fortune to experience such weather.

About fifty Greenlanders in all took an active part in the film, and with the families of the performers the number of persons present was about 150.

For the inhabitants of Angmagssalik the summer of 1933 became one of the most eventful and unusual ever experienced. It was admirable how they entered into the spirit of the thing, and no less admirable how they let themselves be tied to places which lay far from their dwelling places and hunting areas.

What attracted and held them there was the wizard Knud Rasmussen.

The patience, the ingenuity, the diplomacy which he must have exercised! His Danish and German collaborators never fully realized the importance of his many and long talks with the Greenlanders, how he had to spend hours and even days in explaining and clearing up misunderstandings. What to us seemed a matter of course was frequently the result of hard work and of his wonderful ability to make the Greenlanders devote themselves to the task at hand.

"Palos Bridal" will remain, not only as Knud Rasmussen's last work, but also as a monument to Greenland culture of very high value and both in plan and execution it reflected great credit on its creators. Dr. Dalsheim, assisted by his able collaborators, fulfilled his task with great efficiency, with courage and never failing energy. When the work was finished, he awarded the palm to Knud Rasmussen, and I heartily agree with him. Still, I think that I cannot conclude my remarks on "Palos Bridal" without expressing thanks in another quarter, where thanks are due, and that is to himself—Friedrich Dalsheim.

He was a man who knew his job; he did to the full the work he had undertaken to do, and he was a good travelling companion.

Those three qualities which are so essential on an expedition, and all of them Dalsheim possessed to the full.

I express my admiration and my gratitude.

d. The Artist Ernst Hansen's Works.

Knud Rasmussen, himself a born artist, naturally regarded art as an essential factor, also of an expedition to Greenland. Its scenery and people are inexhaustible from the point of view of pictoral art, and Knud Rasmussen desired to make the words of his new books live through the lines and coulours of an artist.

For this task he selected the artist Ernst Hansen. He was given entirely free hands, and the result became a wealth of sketches of landscapes and human beings, of birds and animals of the sea, of the life at dwelling places and on expeditions.

After his arrival in Angmagssalik on July 12th in the "Nordstjernen", Ernst Hansen immediately set to work on the many "motifs" offered by the settlement, and later on he moved ashore, taking up his quarters in the house of Mr. Rassow, manager of the trading post. When the expedition moved on to Sermilik Fjord, Ernst Hansen was given the opportunity to live alone in a small dwelling place, surrounded by a wild and grand scenery. On trips in the company of the geodetists and in the "Kivioq" he saw great parts of the district, and also in the films' camp he found abundance of good models for his well-known figure studies.

e. By the "Kivioq" to Scoresby Sund.

The chief object of this journey was to investigate possibilities of bases for the seaplane, with a view to photography of the area between Kap Daussy and Scoresby Sund. For that reason the "Kivioq" carried a large cargo of petrol, and the idea was that it should act as a carrier for the seaplane during this flight, which in fine weather would be completed in one day. Further, Knud Rasmussen himself wished to see the Blosseville Kyst, the stretch of coast which he later intended to complete.

On this trip geologist, ornithologist, marine-biologist and films' photographer would, further, have opportunities to extend their knowledge of a rarely visited part of Greenland.

Extract from Knud Rasmussen's diary:

"August 14th.

Start at 3 a. m. Call at Holm's camp at 4 a. m. Continue and reach the "Nordstjernen" at 10 a. m. Discussion on the affairs of the expedition with the aviators. It is decided that the "Nordstjernen" is to go north on the 16th. The "Kivioq" continues as far as Sermiligâq—a very beautiful dwelling place with mátak and all sorts of good things. Good tent. Sad widow.

August 15th.

Call at Tugtilik (Lake) Fjord. Lunch with the Englishmen[1]). Lindbergh passes[2]). Steenstrup glaciers closely packed with calf-ice. The coast steep, grand and majestic. Anchor off a dead glacier with wintering place. Beautiful light—moon in the wane.

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[1]) Riley, Rymill and Chapman.

[2]) On his flight to Iceland.

Fig. 88. Topo-photo showing the coast from Kap C. Christiansen (Orssuluviaq) to Kap Hegemann.

Fig. 89. Air-photo from about 1000 m height. View of the Nigertussoq glacier.

August 16th.

Well moored in the harbour in fine weather. A grand fjord, cut up with glaciers and with ragged cliffs.

A harbour farther in on the opposite coast, i. e. the northeastern side of Tasîssaq[1]).

Breaking-up at 2 p. m.; sail 2.30. Find a harbour in Tasîssaq II; good when not filled with glacier-ice. To sea from Kap Gustav Holm and meet the "Dagmar" and the "Inge", moored to an ice-floe.

Beautiful weather. The "Inge", with Bøgvad taken on tow, passing along the coast, as close as possible inland.

Go ashore at Sermilik and "Little Isle of Peaks" (Igdlutalik).

Huge mountains on all sides. Bay, sea-bay, but impossible to use the harbours because of calf-ice. Apart from that the waters entirely free from ice, though with scattered icebergs and strips of calf-ice. Vilhelm lively, happy, singing. Relates of the land. From "Long Island" (Orssuluviaq) the mountains in a northern direction became more filled with glaciers.

In a northern direction we see Kap Christiansen.

Tikivît and from Nûgâlik in a northern direction the glacier coast with huge inland mountains, as far as the range of vision. Of the nature of an ice barrier, like south of Kap Melville. Attempt to go in to Nûgâlik,

[1]) In Easter Tasîssaq inside Kap Gustav Holm.

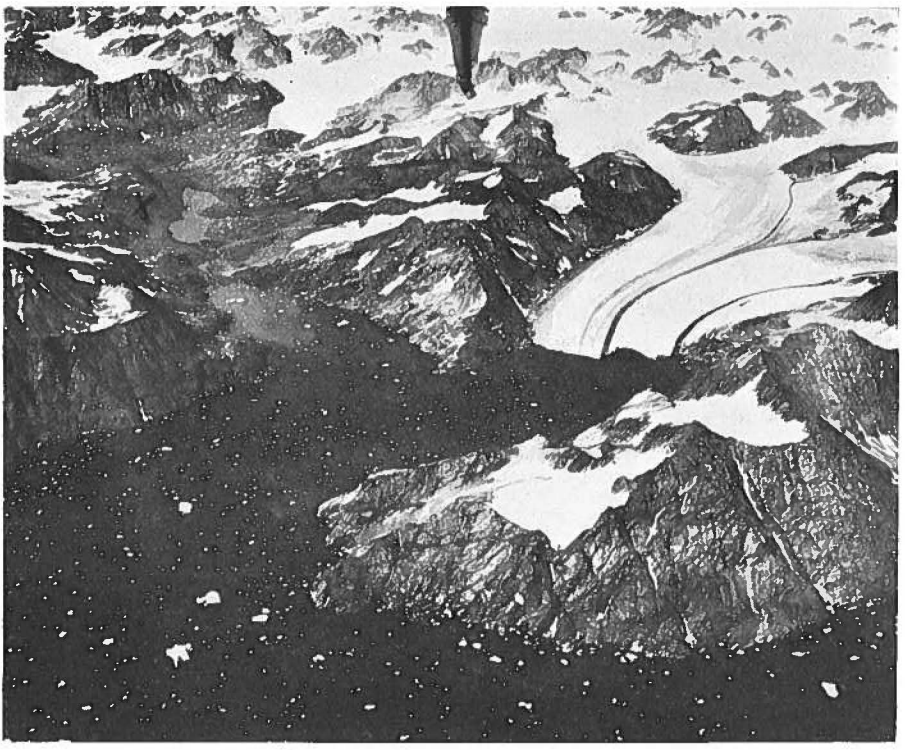

Fig. 90. Air-photo from about 2000 m height. View over the Tugtilik (Lake Fjord). On headland to the left of glacier the Watkins memorial.

but close to the shore the waters foul with an uneven bottom and submarine skerries, one of which we touch. Anchoring abandoned; instead of that Bøgvad goes on a geological cruise with the "Inge".

The chief impression of Nûgâlik is: How little land human beings can do with. All the surroundings ice glaciers.

A beautiful ∧ cliff terminates in a comparatively low naze, where Amdrups famous camping site "The Dead House" is to be found. Dead calm, sun glittering in the brash-ice of the fjord.

Bays and fjords with ice-filled coasts, frequently large icefloes, frozen together. Land for bears.

August 17th.

The "Dagmar" left us yesterday and passed into the neighbourhood (of) Pâtûterajivit in order to survey at "The Cone" (to-morrow morning early).

At 2 a.m. we pass a Norwegian boat, the "Isblomsten", fishing sharks. Somewhat later the "Polaris".

In all, there is a line of 6 Norwegian sealers off the mouth of Kangerdlugssuaq.

Fig. 91. Topo-photo from Trig. St. 6716 Sondre-Aputitèq. The headland to the left is Nûgàlik.

Fig. 92. Topo-photo from Trig. St. 6716. Continuation towards the south of Fig. 91, showing the entrance to Kruuses Fjord.

Fig. 93. Air-photo from about 4000 m height. The outer coast at Deception Ø. In the foreground left a glimpse of the island of Igdlutârajik.

The south coast of Kangerdlugssuaq is comparatively low out at the mouth. The northern coast high, broken, wild, with a few glacier tongues, whereas the south coast is far more divided by glaciers, which remind somewhat of Køge Bugt.

An enormous wall off Mikis Fjord.

The entrance to this very fjord like a huge gateway. Through two steep walls one glides along a comparatively narrow sound, which suddenly widens into a fairly large bay with a sanded beach, a small lagoon, a river and a fertile naze with 5 ruins of Eskimo houses of the small, square type, a few tent rings, meat pits, surprisingly many fox traps + a small and neat playing ground for children.

At the head of Mikis Fjord a glacier with a river and a delta. A great quantity of spotted seal. Here we visit the first of Ejnar Mikkelsens Eskimo houses. Excellently built, with a good depot of provisions, a couple of sledges etc.; only a strange building site.

Arrival at 4 a.m. beautiful weather, sun—Bertelsen dredges. No salmon, but great quantities of small animals.

At 3 p.m. we cross to the skerry fence of Uttental Sund, which teams with small seals, very little shy. We anchor at the bend of the sound near dead glacier. Our kayakers, Vilhelm, Odin and Adam go out hunting.

I go with Bøgvad (and) Østergaard (into the mountains) and have a view of Watkins Fjord, with its wild, jagged, towering cliffs.

August 18th.

The barometer falling; the clouds have contracted, and when we turn to at 5 a.m., it blows in rather strong gusts. But the barometer rising once more, Bøgvad, Østergaard and I set out to look at geology and house ruins. The mouth of Uttental Sund with a strong current and drifting ice with a splendid bank of icebergs outside a typical "Eskimo dwelling-place country".

We find in all 11 house ruins, with the exception of three the pronouncedly square, "second oldest" type from the 15th—16th centuries. They are all built up of the material at hand, and some of them have excellently preserved walls, two metres high, and roofed-in house pasages.

Some of them have house passages facing steep slopes, the so-called "blood vengeance" passages.

The dwelling-place, consisting of 8 houses in all, on the outermost great island nearest Mikis Fjord is particularly remarkable. It lies on a comparatively steep slope facing the open sea—without any kind of shelter. In all of these houses there are surprisingly many fire places, and also many fox traps and graves.

Bertelsen is left behind together with Friis and Adam in one of Mikkelsen's two excellent houses. They have both been visited by bears which have torn off the asphalt roofing and broken several panes. In the putty on one pane there is a distinct impressin of the front teeth of a bear, whereas the claws are visible in the gable and in various places on the wall.

At 9 o'clock we are in Mikis Fjord. It is Tegner's birthday. At 10 o'clock the "Nordstjernen" arrives.

All the flying operations from Pikiutdleq and as far as Nûgâlik have now been completed. It is decided that to-morrow I shall go in the "Kivioq" to Scoresby Sund with petrol.

August 19th.

Departure at 8 p.m. after a first flight and consultation regarding the affairs of the expedition. It is decided that the seaplane, if possible, is to be flown to Iceland, Wittrup (with the "Dagmar" and the survey party) going at the same time with us to the dangerous coast between Kap Edvard Holm and Kap Gustav Holm.

August 20th.

In fine, indeed glorious weather, we sail up along the coast. It is a smiling stretch of land, characterized by sharply outlined capes, which all resemble each other. The mountains of a warm, red basalt colour; it is as though we are sailing along Disko Ø. Completely ice-free coast.

Fig. 94. Air-photo from about 4000 m height. Left the Steenstrup glaciers. To the right Ikerssuaq Fjord and Kap Gustav Holm.

Fig. 95. Air-photo from about 4000 m height. The outer coast at Nordre Aputitêq (the island in the foreground). Near the coast (left): Fladø.

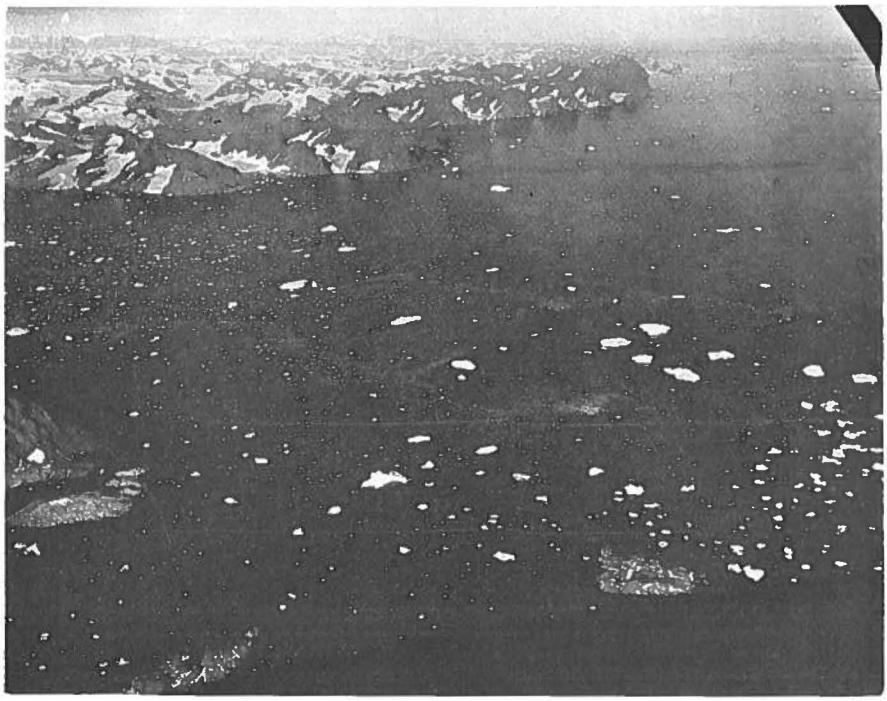

Fig. 96. Air-photo from about 4000 m height. Mouth of Kangerdlugssuaq. In the foreground left: Kap Deichmann.

Off Barclay Bugt we meet with the first fringe of ice, and here at 5 p.m. we meet in the ice the gleaming, white three-master, the "Pourquoi-pas" of Dr. Charcot.

At 8 p.m., just when the sun has set, we meet bear. We are hunting a bearded seal, and then quite accidentally we discover a bear—an old male. As it is too dark to photograph, we keep going until daylight—but then there is a fog, so that the photographing of the bear takes from 8 p.m. till about noon.

August 21st.

The old bear is getting accustomed to the vessel and ends by lying down on an ice-floe, where he immediately falls asleep. However, another bear has appeared—it is being pursued and photographed. It has just devoured a seal, is heavy and tired; crawls on to an ice-floe and falls asleep. Then we start photographing the old bear, which in the course of a few hours gives fine performances of swimming, mounts an ice-floe where it takes up very beautiful positions, cranes its neck, places itself in picturesque attitudes between columns of ice—and is throughout the "filmstruck" bear in which Lau[1]) did not quite believe. .....

[1]) Lau Lauritzen, director of A/S "Palladium".

Then sailing is continued in the fog, which at 5 a.m. terminates like a wall; sail right into the sunshine.

At 9 p.m. Kap Brewster is passed, and at 2 a.m. we are in the middle of the bay off the Scoresby Sund settlement.

August 22nd.

Splendid sailing across the broad fjord, which lies there shining in the light violet tinges of the morning. Here and there strips of ice with a glassy sea. Kap Tobin is passed; no one awake; no one sees us. We can see the settlement, which so greatly resembles Thule with the beautifully painted houses, among which that of the manager with its green roof dominates. They resemble toy houses.

Many kayaks from Kap Tobin visit us.

We are stopped by the ice at the mouth of Rosenkranz[1]) Bugt and attempt the last 1000 m with a boat and kayaks.

We must content ourselves with sending a message in a kayak. At 8 a.m. Høegh, Frederik and Jens Bertelsen arrive in a motor-boat. After having been together for half an hour we continue to Hurry Fjord. Taking two new men with us: Magnus and Julius, both from Kap Tobin.

Arrival in Hurry Fjord at 1 p.m. We immediately find musk oxen: 13 animals which are filmed with surprising (success), as we are able to drive them practically in whatever direction we want.

Especially an old, lame, red-haired bull makes a very strong impression on us. He is huge, with a mane like that of a lion and the legs of a sheep. He energetically courts a black (cow) having shed almost all her hair. Leaps up and creates a disturbance. Among the cows a couple of nice calves are hiding. They are surprisingly little shy.

A series of pictures of various situations are taken. We pass the night in Hurry Fjord.

23rd August.

At 5 a.m. fine, calm weather. A glassy sea. A shark circling round the bear-skins hung out near our vessel. At 6.30 we leave for Kap Hope, which is situated on a comparatively low isthmus— — — 5—6 Mikkelsen houses, with black asphalt roofing, rather resembling an Alaska Eskimo than a Greenland village. Many neatly dressed men and women, some of them very eloquent. Agatha, who is pregnant, greets Janus[2]) with special cordiality. Upon the whole the praise bestowed on him is very high:

> "he often came sledging from the settlement, bringing all sorts of good things; he was beloved and admired by all and seemed to feel well and happy amoung the Eskimos."

[1]) Rosenvinges Bugt.

[2]) Deck-officer (Søminemester) Janus Sørensen R.N. who wintered in Scoresby Sund 1927—28 in order to build a radio station and a seismic station.

At 11 a.m. we make ready to start. At 11,30 an aeroplane is sighted, and shortly afterwards it alights beside us. In it are Lauge Koch, Petersen and Kramme, the famous trio. Koch stands on the plane and looks smart and trim in his white lambskin polar costume.

He tells us that the day before yesterday he was at Kangerdlugssuaq and yesterday at Barclay Bugt, and to-day he is on his way back from the "Godthaab", which lies in Hecla Havn. He has been at Lamberts Land in the "Gustav Holm", and made two flying trips, one to Valmuedalen on Peary Land and one across Nordostrundingen. He reports that also in the north there is more land, than was originally supposed or surveyed.

If we wish, we can leave the petrol which we have brought with us in the "Godthaab", but this is estimated to be too far distant.

Koch had alighted in the midst of great masses of ice, and both landing and visit are filmed. When we had finished, he left again, taking off from the same ice-filled place. It was a very elegant and superior performance, and these sudden appearances and reports from such remote places as Kangerdlugssuaq, Valmuedalen and Nordostrundingen make rather an impressive effect.

We then continued as far as Dumbrava's house at the great river, but there being no musk (oxen) we moved down to where we had been yesterday. We saw once more our old flock, which we again attempted to drive with the assistance of the Greenlanders Magnus, Peter and Jonas (all from these parts) and Odin and Lars, but in vain. Later on Capt. Pedersen and I went ashore and high up into the rather fertile land. Here there was a good deal of vegetation (ask Bøgvad!), and there seemed to be fairly good pasture.

Later on Traut overtook the flock high up in the mountains and took a series of pictures—subsequently also together with Bøgvad.

While Capt. Pedersen and I sat on a stone, surrounded by a huge carpet of whortle-berries, with the dark fjord, smooth as a mirror, and driving masses of ice at our feet—the restful, northern country with the coastal fells along the southern side—tall basalt rocks with white snow in the furrows and, it is said, with many places where eggs of auk and little auk were gathered—our mate came running up to us with a wire from the "Nordstjernen".

The aviators proposed Turner Sund as a flying base and expressed the wish that we should be there already on Thursday (to-morrow), the "Nordstjernen" at the same time moving its base to d'Aunay Bugt or Barclay.

However, I did not dare to stop over indefinitely because of the fishery investigations and geology, and so I was forced to refuse.

On our way up we had passed this area, partly because there was a fog, so that we could not investigate possible base conditions more

closely, partly because it was necessary for us to go as far as Scoresby Sund in order to get a reliable wireless connection and answers to the reports issued by us.

August 24th.

We spent the night in the same harbour, weighed anchor at 2.30 a.m., put Traut and Møhl ashore at Kap Hope and then at 4 a.m. proceeded to Scoresbysund. At 6 a.m. we were in the same place as on the 21st, and the ice lying very closely packed in the direction of the shore, we remained there and sent our mail in a kayak.

At 11 a.m. a motorboat came out to us with Høegh and his wife, Sejer Abelsen and Jens Berthelsen from H.borg[1]), and the wireless operator Kaldahl. Twelve hours later they went ashore, Peder the skipper, Tegner, Bøgvad and I accompanying them, and we reached the settlement after a rather amusing and rough passage through the ice, which lasted a couple of hours, though the whole distance is hardly 2 km.

A series of festive visits at the houses of Høegh—a fine, large building—Sejer Abelsen, Jens Berthelsen, Arne and Meta Kaldahl and Frederik (Løvsted or Løvgreen?) from Godhavn. Dinner: Bøgvad and I with Høegh; Skipper and Tegner with the Kaldahls.

August 25th.

When about 2 a.m. we wanted to return to the vessel, it proved impossible because of the ice, and we then slept for two hours and made another attempt about 4—5 a.m. This was abandoned, as it proved impossible, and not till about 7 a.m. did we get off, after having had our morning coffee at the settlement.

Yesterday was altogether "French" as regards aperitifs—fine, wonderful Biscuit brandy, Cointreau, Dome etc., indeed, even Absinth aperitifs, and besides the most delicious cigarettes.

At about 10 a.m. we were onboard, and a lunch was quickly arranged for the manager of the settlement and his facetious engineer, whose greatest adventure was that he had been arrested at home[2]) as a coiner.

After having taken a cordial leave we left for Kap Hope, where about 2 o'clock we took Traut and Møhl onboard.

Unfortunately our bear-skins were spoiled by the dogs. Visited Koch's companion Josva, who made an uncommonly intelligent impression and had a fine, sharply cut face.

He had Koch's new map of East Greenland on his wall and besides a detailed map of Greenland.

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[1]) Holsteinsborg.
[2]) In Denmark.

We are stopped by fog and ice out at the mouth of Scoresby Sund. About 8 or 9 p.m. the fog lifts, and we continue.

August 26th.

Hunting conditions:

Common seal in fair quantities throughout the year, in particular from Kap Tobin. The winter period at Kap Hope, where there is no hunting.

Ataq (great seal) formerly in great flocks, particularly in the autumn. Now rare and of no very great importance.

Bearded seal: of common occurrence. However, we could not get hides for soles expect through Frederik.

Bladder nose: of very rare occurrence.

Narwhal, particularly in June—July and not more than 15 for the whole of the population in one season.

Walrus: very common at the beginning, now rare; only one or two in the course of the year.

Foxes. About 200 a year.

The bear passage. Very nearly the same, passing for some distance round Kap Tobin. If the edge of the ice is near Kap Tobin, then a very fine year for bears. If the edge of the ice is farther out, then not so good.

No umiaks, no tents. Only one man has a jacket entirely made of fur. Good large stock of dogs. Lack of tents and boats is due to lack of bladder nose and insufficient numbers of bearded seal. Since arrival nothing caught outside the Mikkelsen houses.

Fish: A few sea-scorpions and polar cods. In a few places, as e. g. at Dumbrava's camp: trout.

Hunting conditions as regards bear and seal said to be very favorable farther into the fjord, where prevailing fine weather has been observed.

The musk oxen, the protection of which is fairly upheld, seem to be increasing rather than decreasing.

Coal of great importance both at Kap Hope and on the northern side of Hurry Fjord. Makes times of hardship endurable.

Birds. Continuous cliffs of little auks and common auks. As far in as known all along the south side of the fjord and farther down. Habitation conditions are here impossible, the country being steep. The country in a southern direction from Kap Brewster low foreland, with a passage at the back—apparently favorable, but with strong and violent winds. Cover of ice uncertain and unstable. Apparently after the few experiences made no ice round the sharp cape.

Fig. 97. Air-photo from about 4000 m height. Outer coast of Knud Rasmussens Land. From left to right: Kivioqs Fjord, Kap Normann, Rosenborg Gletscher, Kap Rink and part of Stephensens Fjord.

Fig. 98. Air-photo from about 4000 m height. Outer coast of Knud Rasmussens Land. Centre of picture: Vedels Fjord and the glacier: Borggraven. Left Kap Johnstrup. In background (left) Watkins Bjærge.

Fig. 99. Air-photo from about 4000 m height. View of Knud Rasmussens Land and Blossevillekysten. Left Kap Grivel, right Kap Savory.

From 7 a.m. to 1 p.m. we lay at Kap Dalton, while Bøgvad collected fossils. The bay is entirely open towards Danmarks Strædet, but there are two lagoons, which may surely serve as harbours for motor-boats and possibly also for smaller vessels.

Possibly also a landing place for aeroplanes.

In the "Kivioq" a good shelter from the outside swell behind the outermost lagoon.

We visited Amdrup's now quite famous depot and found everything in order, as it had been thirty-three years ago. Amdrup had written on the door: "Departure towards the south on July 22nd 1900."

G. Amdrup.

While lying here we received a sad wireless message from Scoresby Sund: Kaldahls little boy had been drowned, perhaps in the new boat which we had brought him as a gift from the Englishmen.

At the same time we received a message from the "Nordstjernen" that an attempt had been made to move the base to d'Aunay Bugt on the 24th, but that they had returned on the 25th.

(Here follows a summary of an exchange of telegrams *via* Scoresby Sund—Reykjavik with the "Nordstjernen"; owing to inferior wireless reception on board the "Kivioq" these telegrams did not get through at the right time, and this caused a good deal of misunderstandings). As the weather is temporarily clearing up, we make for d'Aunay Bugt.

Fig. 100. Air-photo from about 4000 m height. View of Knud Rasmussens Land and Blossevillekysten. Left Kap Savory, right Sorte Bræ.

Fig. 101. Air-photo from about 4000 m height. View of Knud Rasmussens Land and Blossevillekysten. Left Kap Daussy, right: part of Kap Tupinier.

August 27th.

In the course of the evening yesterday we had a wind from north-east, with heavy rain throughout the night. We are, however, lying safely outside a river. The bay not sufficiently deep to be Mikkelsens d'Aunay B. Possibly Amdrup right.

As the weather improves about noon, and the barometer rises slowly, we continue at 8 p.m.

August 28th.

Following the ice-free coast in a southern direction—the coast with steep promontories and comparatively small fjords, excepting the Ryberg and Irminger glaciers, which are deep, but filled with ice—the steep monumental Kap Nansen is passed, which as it were is completely covered with hieroglyphs. Weather clearing up and fine. Arrival Mikis Fjord in the "Nordstjernen" at 6 p.m."

During August 29th a number of important problems are decided upon as to flying, change of base, the return journey etc., and early in the morning of the 30th Knud Rasmussen continues in a southern direction in the "Kivioq". First a visit is made to the fishery investigation party at Uttental Sund, where all is in splendid order; then the journey is continued to Tugtilik Fjord, where the Englishmen in the meantime have made everything ready for their departure, and they accompany the "Kivioq" as far as Angmagssalik.

On September 1st the "Kivioq" arrives at Tiparpik, and Knud Rasmussen is again deep in film work.

f. Days at Angmagssalik.

The auspices under which the Expedition started in Greenland were as favourable as possible. On July 22nd, already, the vessels were gathered in Angmagssalik, all having successfully penetrated the masses of field-ice.

Knud Rasmussen settled in the house of his friends, the Rev. Peter Rosing and his wife, Birte, a childhood friend of Knud Rasmussen's from his birth place, Jacobshavn. They gave him a work room on the ground floor of the rectory, and this room became the headquarters of the expedition, from where the leader and later the second-in-command handled the large enterprise. For days there was a hum of activity in the little building, where people came to report on various happenings, get new orders or discuss affairs regarding the expedition, and Knud Rasmussen found time to hear all they had to say. Though he was up and about early, he never rested until the small hours of the night, and he then loved to take a few friends with him and slip into the kitchen, where

Fig. 102. Air-photo from about 4000 m height. View of Knud Rasmussens Land. Head of Sorte Bræ.

he knew that Mrs. Birte had put some bitbits for him in a cupboard—a piece of boiled seal meat, a little piece of mátak or a bottle of home-brewed beer. Sitting on the kitchen table or on the haybox he would then tell us of people he had met or, as most frequently happened, start a conversation about our relations and friends at home, and then nothing would serve him but that we should hunt for a bit of paper and, to his dictate, write telegrams east and west. Only when alone with him, could one induce him to tell about episodes from his long sledge journeys or discuss his plans for the future.

Those days in Angmagssalik were happy, though strenuous. The work of the expedition progressed, more or less as Knud Rasmussen himself had planned it, though naturally with the small alterations which were necessitated by altered conditions. The daily routine work connected with organizing so many men and so many working parties naturally took a great deal of his time, but without being unjust to anyone, I think I may say that the films' people took by far the greater part. In the very nature of things all their transactions, even to the minutest details, must be referred to Knud Rasmussen himself, not only because he had the power to decide, but also because he alone could really act as an interpreter. Not only from a linguistic, but also from a psychological

point of view he knew, better than anyone else, that he was the only one who could bridge the gap between the instructor and the Greenlanders. In order to regulate the current of intercourse so that he might now and then have a little rest, we hit upon the expedient of putting large bills of "No Admittance" on his door, but in spite of that people, day and night, tried to gain access to the leader by all sorts of wiles and, prohibition or no-prohibition, he received them all and listened to them with never failing patience and kindness.

Or worst of all, when he went for a walk through the settlement, then Greenlanders and members of the expedition all regarded this as a sign that they might freely speak to him. As at a given signal men and women, young and old, crowded round to speak to him, and the result was that he was frequently taken quite out of his way and did not find time to do what he had, in the first place, set out to do.

It was a particularly moving sight to see him, in the midst of all his busy work, finding time to listen to the old Greenlanders, who circumstantially told him of their joys and sorrows and incidentally, in the course of the conversation, they often managed to get in a prayer for some or other thing. He made promises right and left, and he did not forget these promises either.

But as already stated—what took most of his time was the film. Conferences, investigations, rehearsals, supplies of clothing, equipment, perquisites etc. this went on almost through the twenty-four hours, and it was necessary that Knud Rasmussen should take part in it all.

His duties as a leader, however, also required his presence in other places than at the settlement and the films' camp. From the above summary of voyages it appears, how comprehensively he travelled about, and yet the summer of 1933 in that respect was a very uneventful one as compared with the previous year.

He only found time and opportunity to make three longer trips. The object of the first of these, which lasted from July 25th—27th and was made on board M/B "Dagmar", was to find suitable places for photographing and types which lent themselves to the parts of the film. On this journey he was accompanied by Emmy Langberg, Dr. Dalsheim, the photographer Scheib and Kârale. The trip became a triumphal progress for Knud Rasmussen personally. Everywhere he was received with enthusiasm, and when he invited all to a festival, one settlement after another hurriedly broke camp, stowed their umiaks with goods, people and dogs, and set their course for Angmagssalik.

For all of us who had been left behind and who on July 27th had heard the cry "Knud coming!" reverberate through the settlement, this arrival was a unique, an unforgettable event.

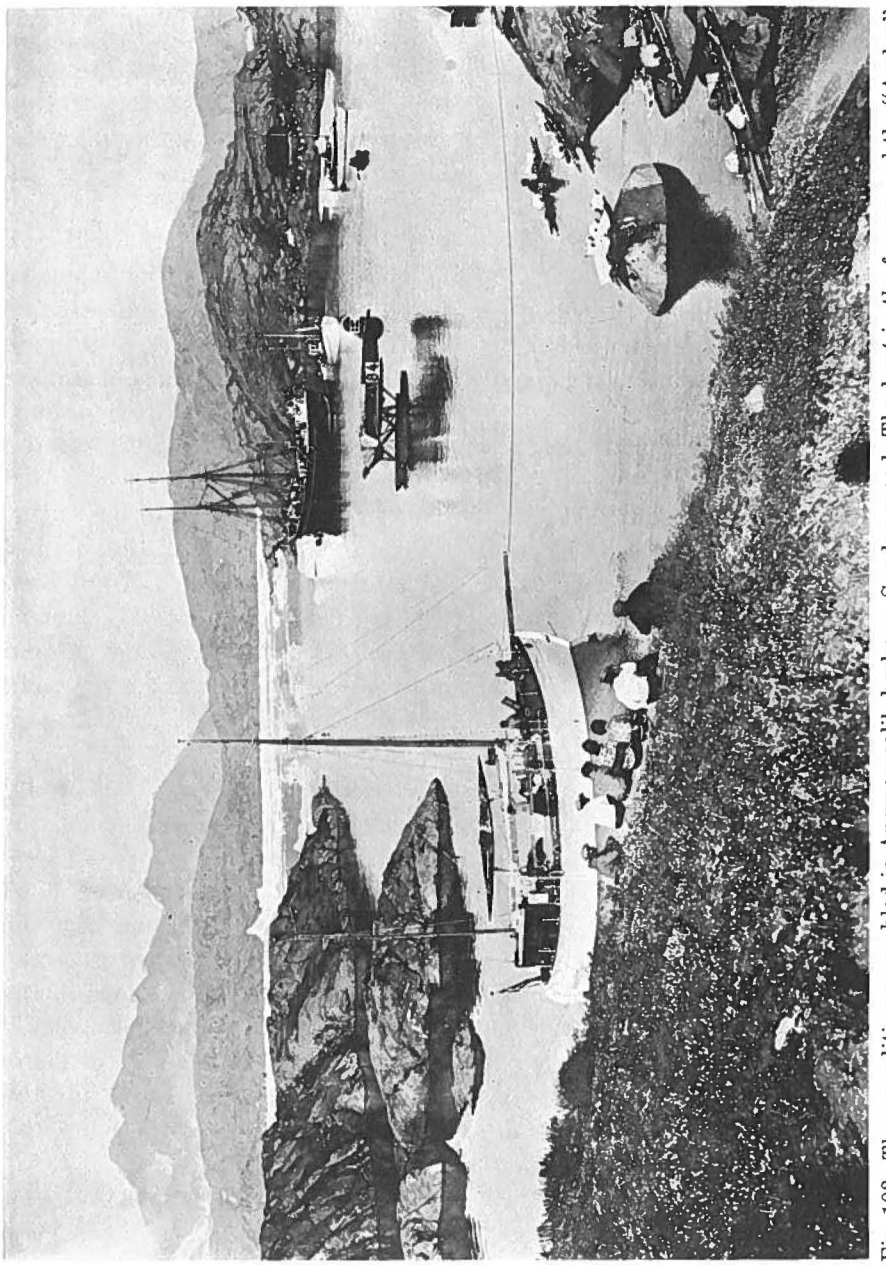

Fig. 103. The expedition assembled in Angmagssalik harbour. Sunday mood. The boat in the foreground the "Andræ". Behind the seaplane from left: the "Nordstjernen", the "Kivioq" and the "Dagmar".

At the head of a flotilla consisting of ten umiaks and about thirty kayaks the "Dagmar" headed into the fjord. Knud Rasmussen stood in the stern of the motor-boat and set the pace through the ice. The sound of the monotonous Greenland singing came back from the mountains, the shrill voices of the women forming a curious contrast to the deep basses of the men.

The whole situation was a picturesque illustration of the life work of Knud Rasmussen—the man who led his people on, singing as it went.

And equally unforgettable was the festival which followed—the great festival, for which practically all the inhabitants of Angmagssalik were assembled on the little, green plain by the headland of the harbour, the picturesque camp with all the umiaks turned over so as to provide shelter for the families. The singing contests, in which also the old women took part, the forceful kayak performances, all in the most glorious sunshine and on a day and night, which were among the loveliest of the whole arctic summer.

The next journey was the trip to the great glacier of Ikerssuaq, in the period July 31st—August 4th. The passage through the ice and the wild, desolate scenery made a very strong impression on Knud Rasmussen. The photographic result of the trip was, unfortunately, not as good as had been expected. It will always be difficult to take motion pictures of the hunting of bladder nose seal; in any case much time and great patience are required—and the expedition did not have so very much of either.

The third and last journey was the trip in the "Kivioq" to Scoresby Sund and back again; a short report has previously been given of this journey.

Among the pleasant events of this period may further be mentioned the visit of Col. and Mrs. Lindbergh on August 6th and again on the 13th, after a short trip to West Greenland. The meeting between the two famous men was very cordial, and at the subsequent dinner in the "Andræ" they expressed the most sincere admiration for each other—the great aviator who had overflown a country, which the man of many journeys had laboriously traversed in boat and with dog sledges, and the great explorer who fully recognized the great achievement of the airman, outside and inside the boundaries of Greenland.

September was the month, when the finishing touch should be put to the work and the members of the expedition start on their home journeys.

Knud Rasmussen had taken leave of the aviators in Mikis Fjord. On September 8th the seaplane left for Reykjavik, and on the 15th the boat of the geodetists headed southward, bound for Julianehaab.

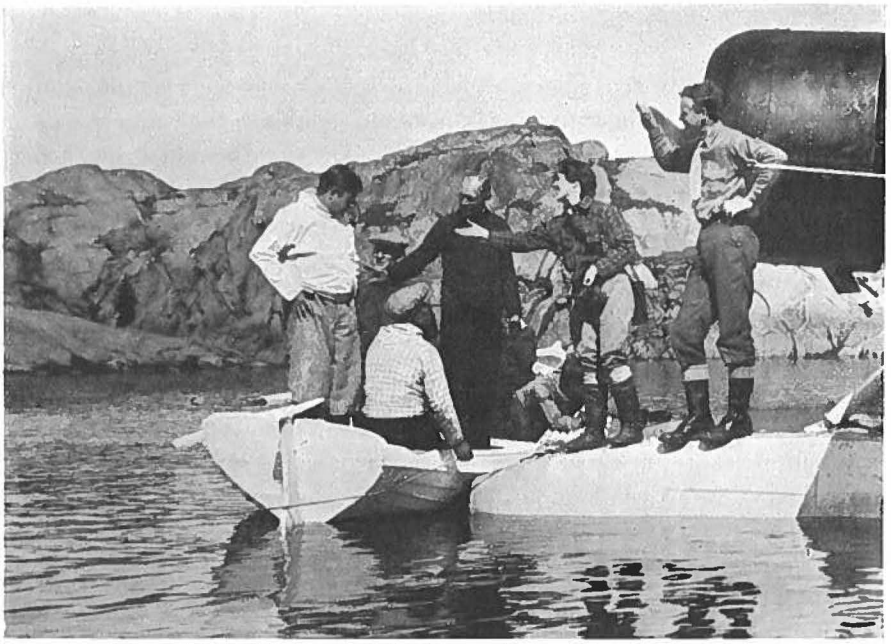

Fig. 104. Col. and Mrs. Lindbergh take leave of Knud Rasmussen in Angmagssalik harbour. From left: Knud Rasmussen, Rassow manager of the trading post, Cdr. Vedel, Mrs. and Col. Lindbergh.

On the last evening before our departure Knud Rasmussen came onboard the "Andræ", together with Kârale and Navarana who took a leading part in the film. On that evening he was entirely the same as formerly—strong, joyous and enthusiastic. In the course of a pleasant evening over a cup of tea, leader and second-in-command discussed the last problems of the expedition and arranged to meet in Julianehaab about October 1st. How vivid is the memory of that evening, and how little we suspected that this was to be our last meeting in Greenland—the three of them: Knud, Kârale and Navarana are now all gone!

After these few hours of rest and warmth Knud Rasmussen again went ashore with his companions and continued the work with the film, which during that period went on by artificial light, so that the hours of the night could be used for furthering the operations.

On September 23rd he stood on the rocky ground near Angmagssalik and waved his good-bye to the "Nordstjernen", which left the harbour with the greater part of the members of the expedition, who were now bound for home.

Besides himself the only persons left were Dalsheim, Scheib, Traut and Bøgvad and the crew of the "Kivioq".

The laborious work with the film went on as before.

g. Knud Rasmussen's last Days in Greenland.

On September 23rd many important scenes were still lacking, before the film could be looked upon as completed. Among other things an outdoor summer festival must be arranged, and Knud Rasmussen, as usual, was the life and soul of the undertaking.

Throughout the whole of that period he must have been ill, though no one paid attention to minor signs of weakness on his part. But at the end of the month he was obliged to give in and go to bed. It was thought that it was only something like the case of poisoning which had struck him down the year before, perhaps also this time as the result of tainted Greenland food.

From his sick-bed in the rectory he still followed the proceedings in the films' camp, and as soon as there was a slight improvement, he got up and once more went about his work. This was on October 2nd, but already on the 4th he was again obliged to go to bed, and only then did his collaborators begin to realize that something serious was the matter. The physician in Julianehaab was consulted by wireless, while the capable young nurse of the settlement, Miss Signe West, took charge, and—like every-one there—she was indefatigable in her care of the patient.

It was naturally as if a dark cloud had descended over the settlement. But the patient himself tried to encourage his surroundings, which was greatly needed, not least because the many Greenlanders had become quite discouraged by the disastrously bad weather and the resulting long period of inactivly and waiting. The consideration which he showed all of these people was perfectly incredible, and it was pathetic to see how they all came creeping up in order to offer him a word of consolation. And to them all he had something to give.

Then at last the film was completed, but only after the first fall of snow.

The physician in Julianehaab, who had been consulted from day to day, gave permission for Knud Rasmussen to be moved, and everything was now made ready for his departure in the "Kivioq". He was wrapped up for the journey, and on a dark night, in a sledge drawn by his friends, he was driven down to the harbour and taken onboard.

A last good-bye to all in Angmagssalik, and on October 12th at 0,30 a.m. the "Kivioq" started on its dangerous voyage towards the south, along the rugged coast of the thousand glaciers. By able and daring seamanship and assisted by the light of the moon, Julianehaab was succeessfully reached on October 15th, and here Knud Rasmussen, by his own wish fully dressed, was helped ashore and up to the house of the able physician Laurent Christensen, who for the remainder of this stay there took over the treatment of the patient.

This stay, however, did not become of long duration. At the initiative of the Administration of Greenland, the S/S "Hans Egede" was directed to Julianehaab, and Knud Rasmussen's voyage home took place in that good old Greenland vessel. On a bleak day with a strong south-western wind, he was carried from the house of the physician down to a waiting motor-boat and taken out to the vessel. By his own wish he walked up the side-ladder, unassisted, and he stood for a moment at the rail, looking towards the mountainous coast of Greenland. Then he lifted his hand for a last wave; a last smile lit up his face—a smile encompassing all his friends in there.

Then he went down to his cabin, and the "Hans Egede" started on its homeward journey.

This was on October 24th.

Back to Denmark.

Onboard the "Hans Egede" everything was done, which it was possible to do with the means at disposal. Captain N. O. Petersen readily gave his cabin to the patient, while the bacteriologist, Dr. Gunnar Krogh-Lund, and the nurse, Miss Kirstine Nielsen from Jakobshavn took charge of the treatment and the nursing.

During the whole of the journey home Knud Rasmussen was confined to bed. The fever would not go down, and he had very little appetite, but in spite of that he was generally in good humour, and never was any patient more lovable or long-suffering.

The journey was favoured by the weather. There were no violent autumn gales at Kap Farvel; it was fine all the way across the Northern Atlantic, and already on November 4th the "Hans Egede" reached Copenhagen.

By his own wish Knud Rasmussen was up and dressed so that he could leave the boat walking—he would not be carried ashore. But he only went as far as the waiting ambulance which drove him to the hospital at Gentofte.

From the very beginning we were all hopeful and believed in his recovery, and fortunately he himself shared our belief. But he made small progress, so we were prepared for a long illness and a still longer convalescence. The patient of course was kept absolutely quiet, and only few outside the family circle were permitted to see him. As second-in-command I was twice granted the opportunity to be with him for a few minutes.

I shall never forget those minutes. My last visit was in the afternoon of December 20th. Knud Rasmussen then looked quite well, but his inactivity worried him, and he actually envied us because we were busy. His last words to me, who was going away for Christmas, were:

"I wish you a very, very happy Christmas. When you come back at new year, you see, I will be up and about. Perhaps I shall have to walk with a stick, but don't let this frighten you—it is only for a time, for I must tell you that the head physician to-day has promised me that I will be well again, and not only that, but so well that I may start out on new journeys."

How wonderful to have such a happy belief in the future—until the very last.

And the next morning before dawn he died.

It was December 21st, an infinitely bleak and grey day.

XVII. Summary of Home Journeys.

The expedition went up by many routes, and by many routes it returned.

From the time when the autumn storms set in, about the middle of September, the home journeys continued throughout the autumn, until the last party reached Copenhagen, on December 10th.

In the following will be given a brief summary of all the passages.

Departure Date Place	Vessel	Member of the Expedition	Route via	Arrival in Copenhagen
Sept. 8th from Mikis Fjord	H.M.S. "Hvidbjornen"	H. C. Hansen	To Reykjavik; arr. Sept. 9th	
		C. Jørgensen (and the seaplane)		
Sept. 23rd from Angmagssalik	The "Nordstjernen"	E. Bertelsen	Reykjavik Sept. 29th—Oct. 3rd and Tværaa Oct. 7th—12th	Oct. 17th
		K. Friis		
		Ernst Hansen		
		H. C. Jacobsen		
		Marie Jørgensen		
		Emmy Langberg (only as far as Reykjavik)		
		A. Madsen		
		K. Milthers		
		E. Mortensen		
		U. Møhl-Hansen		
		E. Nielsen		
		O. Nielsen		
		E. Rasmussen		
		E. Wieser		
		K. Østergaard		

Departure Date Place	Vessel	Member of the Expedition	Route via	Arrival in Copenhagen
Sept. 21st from Reykjavik	M/S "Dronning Alexandrine"	Emmy Langberg H. C. Hansen		Oct. 15th
Oct. 14th from Julianehaab	S/S "Gertrud Rask"	C. Gabel-Jørgensen Chr. Larsson N. Th. Pedersen M. Spender J. Thorlund Nielsen	direct	Oct. 28th
Oct. 24th from Julianehaab	S/S "Hans Egede"	Knud Rasmussen	direct	Nov. 4th
Oct. 31st from Ivigtut	S/S "Julius Thomsen"	Kârale Andreassen R. Bøgvad N. Christiansen Fr. Dalsheim H. Scheib	direct	Nov. 11th
Nov. 1st. from Holsteinsborg	M/S "Disko"	Janus Sørensen	direct	Nov. 30th
Nov. 30th from Julianehaab	S/S "Gertrud Rask"	J. Olsen J. Tegner W. Traut H. Wittrup Hansen	direct	Dec. 10th

XVIII. Concluding remarks.

On December 10th 1933, the 7th Thule Expedition—the expedition which Knud Rasmussen so aptly called "The Expedition of the Thousand Journeys to the Land of the Thousand Glaciers"—was ended.

The summer of 1933 was long and hard to get over, as the weather put such great obstacles in the way of nearly all our investigations, and the late dates of the home journeys are proof of the stubborn will of leader and members of the expedition to stick to their task, until it was finished.

On the other hand, that summer was for all of us a rich and never to be forgotten time, not only because the whole of the programme was carried out, in spite of considerable adversity, and at that without any accident or loss, but also because we were all so happy to work under Knud Rasmussen and from the first to the last shared all the ups and downs of the expedition with good humour and in a true spirit of comradeship.

Knud Rasmussen was glad to know that we were all safely back again, and very pleased with the results. He longed to be able to thank us all, but this was not to be.

In Memoriam.

And then that happened which to all of us seemed an impossibility —Knud Rasmussen was no more.

For us, who had been with him on his last expedition, his death was a terrible blow. Now that the expedition was successfully ended, the time had come, when we should have liked him to enjoy the fruits of his efforts, and all of us had longed to show him what had come of the tasks, he had entrusted us with.

While he was among us, we had always been able to look forward to new tasks. Instead of that it was now, as if for a time we all came to a standstill, and our thoughts naturally went back to the days and years which had passed, and more especially the days of that last summer.

How we treasure all our memories from that time! We are all able to look back on some happy hour with him, when with one word, a pressure of the hand or only a look he said that, which it is good to remember for all times. And in this manner he did, after all, thank us.

But we are left behind, without having been able to thank him for all he did for us. And now it is too late.

We will never forget him. He was light and warmth, wherever he appeared. He had in his nature the "Open! Sesame!" which is only given to those of the great gifts. He stands before us, as he stood in life; we hear his beautiful voice, we see the smile playing about his lips and the strong and warm light of his eyes, and we feel the friendly pressure of his hand.

Knud! We, your comrades from your last expedition make part of the great host which in Denmark, in Greenland, indeed, all over the world will keep alive your achievement.

Your sledge trail from Denmark across Greenland to the outermost expanses of the earth and the loneliest habitation of man is still clearly visible.

It will never vanish.

At the interment of Knud Rasmussen Kârale Andreassen spoke the following words which are rendered literally from his own manuscript. It has been my wish that the report of the 6th and 7th Thule Expedition should terminate with this farewell in the Greenland language—Knud Rasmussen's beautiful mother tongue.

Fig. 105. Onboard the "Andræ" in Angmagssalik Fjord. The last picture of Knud Rasmussen.

Grønland Knud-imut.

asassara ernera Knud, mâna tupigusugtíparma tusarama takorqingnavêrdlunga qimagkingma mássame silarssuaq mána qimavigdlugo qimagkit. taimáitumik qatángutínguatit kalâtdlit quvdlilitingârpatit.

tusarângama ornileringma tikiúnigsat uvanga qatángutínguavitdlo erinigingârtarpavtigit, sâkut tunúkutdlunit tikíkângangma asangningnerit asanarneritdlo tássaugínarpoq. tamána nuánaringârtarpara.

issigissarnerit qungujugtarnerit ila puigúsángilarput, tikiútarigavit asangningnerit asanarneritdlo misigitdlârârput. tamánalo qatángutínguavit qîmasûtigingârtarpât uvangalo anânaussunga tikitdluarqussar pákit.

najorêrdlunga qimalerângangma uvavnut asangningnerit kînavit issivitdlo malungnarsisitarpai, agssavigdlo aulaterissut qatángutínguatit asangningnermit tuningârtarpait. táukútaoq taimatut akissarpâtit.

ila Knud, kînat agssatitdlo sakíminartut sermerssuarma nigdlerneratut mâna ilerput, issitit sakíminartut serqornerput uerqingnavêrdlutik tatdlitit tungivnut aulaterissartut mana nákaivatit kiverqingnavêrdlugit.

ajorqajaqârdle asangningnerit taimatut iligaluarpat, qujanardle asangningnerit asanarneritdlo sermitut ilisángingmat. tamánalo uvanga qatángutínguavitdlo tugpatdlersautigingâsavarput qimagungnerpit kingornagut.

mâna toqugavit puigúsanerpavtigit? ila Knud, toqúngilatit autdláinarputit, taimáitumik puigúsángilavtigit. sermitut nigdlertíkavit avângunartutut ingalásanerpavtigit? ila taimáisángilaq sule pákúkumangârpavtigit ajornaqaordle mâna.

inugpagssuit píngitsoqaratik avqutigssât mâna ikârêrpat taimáitumik uvavtínik inornarsivutit, tamánale pivdlugo qutsavigînartariaqalerpavtigit. qujanaq Knud ilumôrtumik asangnigtumigdlo misigíssuseqartumigdlo ûmateqaravit.

ivdlit mêrángûtdlaravit uvavnik ilisimassariaqartut qavsêrssuit nalussáuput, taimáitumik perorsartarsimavavkit qîatítardlutit kiagútítardlutitdlo. taimaingmat angutíngorputit sapîtsorssuaq, taimáikavitdlo kalâtdlit tusâmasángortípatit.

qáqarssuákut majuarângavit kiagungârtarputit, sermerssuákut ingerdlagângavit qîavdlutitdlo angnikitdliortarputit. qujanardlo ilalârnerit tássaujuarmat, tamána kînavit saimássusiata sarqorínersítáinarpâ.

ilumut uvavnut asangnigtûvutit, taimáikavit qangale nalussaussut pínersumik sarqormersípatit. itsarnitsat kivisitaissut qujanaqissumik kingumut nivdlikartípatit, ilumut suliaqarputit angisôrssuarmik.

Knud silatússuseq Gûtimit tunissutisiat ilumut atordluarpat nipangerpigssat tikitdlugo, qutsavigingârpavkit kalâtdlit nagdligtugarpagssuatit pivdlugit. tunissuterpagssuatit ivdlit kisíngíkitit Gûtip tamaisa kisípai.

suliarpagssuatit nautsorssúngíkitit tamaisa Gûtip nautsorssorpai, taimáitumik nipaitsumik naggateqartípâtit. mâna nipangeraluaravit suliarpagssuatit nipangísángitdlat. qujanarssuaq Knud ilumôrtuínaravit.

Translation:

From Greenland to Knud Rasmussen.

My dear son Knud — it was so strange for me to know that you have left me in order never to see me any more, nay, that you have left this world for ever. By doing so you have caused your dear brethern, the Greenlanders, to shed tears.

Whenever I heard that you were on your way up to me, your little brethren and I awaited you with longing. Whether you came to my West or to my East Coast, your love and your lovableness has ever been the same. It has been a very great joy for me.

The look of your eyes and your smile we can never forget, and your love and your lovableness we have felt, whenever you came to us. Therefore, you have brought such great joy to your little brethren, and I, Greenland — your mother — always bade you welcome.

And when you had visited me and were on the point of leaving me, your love for me was always evident in your face, and the look in your eyes and the wave of your hands showed your great devotion for your litfle brethren, and they waved to you in the same manner.

Yes, Knud, your face which I am so loth to do without, and your hands which I am so loth to let go, are now as cold as the eternal ice. Your eyes which I never can forget are now closed, never to open again: your arms which used to wave towards me are now fallen down in order never to be lifted again.

It would be bad if this also happened to your love. But God be thanked—your love and your lovableness can never become as the eternal ice. This will be a great consolation to me— and your small brethren—now that you have left us.

Now that you are dead, do you then think we should forget you? But, Knud, you are not dead, you are only gone away from us. Therefore, we will not forget you. Now that you have become as cold as the eternal ice, should we then flee you as something frightful? No—that will ne verhappen—we are still longing so fervently, longing to clasp you in our arms. But now that is impossible. The road which some day all human beings, without exception, must take, you have now taken, and therefore we cannot reach you any more, but must be content to say: thank you. Thank you, Knud, because you had a sincere, a loving and a compassionate heart.

While you were a small boy, there were many things about me which ought to be known, but which were entirely unknown. Therefore I took charge of your

education—many times I let you freeze, and many times I let you sweat. Thus you became a great and a courageous man, who made the name of the Greenlanders known.

When you climbed the high mountains you often had to sweat hard, and when you wandered across the eternal ice, you often had to freeze and to suffer. But your patience was always the same. This we often saw in the gentleness of your face.

Yes, you have indeed been an affectionate son to me. In the most beautiful manner you have brought many things into the light of the day which have been unknown for too long; ancient customs which long ago had been buried in the darkness of oblivion you raised once more. And I am so grateful to you for this. You have, indeed, achieved a great work.

Knud, your rich gifts, which were bestowed upon you by God, you have used well, until the very moment when your voice must grow still.

I thank you with all my heart on behalf of the many Greenlanders for whom you felt so warmly, for all your presents which you did not number yourself, but which God has numbered, for your many great works which you did not enumerate yourself, but which God enumerated.

Therefore he gave you a quiet and peaceful end.

And now, though you have ceased to speak, your great work will never be silent. I thank you, Knud, from my very heart. I thank you, because you were true in all your ways.

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Errata:

Pag. 105, Fig. 38: Nanuseq, should be Nanùseq.
Anikitsog, — - Angnikitsoq.
Kangerdlurujik, — - Kangerdlorajik.
Kuamiut, — - Kùgârmiut.

Plate I: 63°57′ N. lat. Qeqertarsuatsuaq, should be Qeqertarssuatsiaq.

Færdig fra Trykkeriet den 17. April 1940.

52° 48° 44° 40° 36° 32° 28° 24° 20°

69°

66°

63°

60°

Scoresby Land
Charcots Land
Kap Brown
Carlsberg Fjord
Nordvestfjord
Liverpool Land
Jameson Land
Renland
SCORESBYSUND
Milne Land
HALL BREDNING
SCORESBY SUND
Danmarks Ø
Kap Brewster
Gaaseland
Gaasefjord
Turner Ø
Kap Dalton
Kap Ewart
Barclay Bugt
d'Aunay Bugt
Storbræ
Johan Petersens Bugt
Sakongens Bugt
Kap Dausey
Sortebræ
Kap Grivel
Kap Vedel
Kap Ravn
Kap Rink
Kap Normann
Kap Garde
Sakongens Ø
Rybergs Fj
C. Jacobsens Fj
Mikis Fj
Kap Hammer
Kangerdlugssuaq
Keglen
ø Nordre Aputitêq
Pâtûtertajivit
Aggas Ø
Sændre Aputitêq
Nûgâlik
Tindholmene
Kialineq (Skrækkensbugt)
Nanertalik
Kap Gustav Holm
Ikerssuaq
K.J.V. Steenstrups Bræer
Tugtilik
Nigerkussoq
Kangerdlugssuatslaq
Stenø
Leifs Ø
Erik den Rødes Ø
Watkins Bjærge
KNUD RASMUSSENS LAND
Blosseville Kyst
Prinsen af Wales Bjærge
Christian d. IVs Fj.
Nansens Fjord
Batbjærg
Kærven
Watkins Fj
Kraemers Ø
Amdrups Fjord
Kronprins Frederiks Bjærge
Mont Forel
Schweizerland
Akiliarsiaq
Umiivik
Angmagssivik
Johan Petersens Fjord
Kangerdlugssuaq
Storø
Leifs Ø
Erik den Rødes Ø
ANGMAGSSALIK
Ikerssuaq
Dannebrogsø
Graahs Øer
Hornemanns Ø
Pikiutdleq
Schumachers Ø
Aagssertôq
Nordbyes Øer
Kap Løvenørn
Gerners Ø
Umîvik
Gyldenlöves Fjord
Krumpens Fjord
Qeqertarsuatsuaq
Kap Mesting
Bernstorffs Isfjord
Sagdliaruseq
Igdluluarssuk
Nûgârfik
Ymarsivik
Skjoldungen
Anarnitsoq
Uivaq
Ûmánaq (Griffenfelds Ø)
Tingmiarmiut
Mogens Heinesens Fjord
Ikermiut
Puissortoq
Kap Cort Adelaer (Kangeq)
Qutdlit
Kap Tordenskjold
Auarqat
Kap Herluf Trolle
Iluileq
Danells Fjord
Pâtussoq
Kûteq
Ingerdlarsiutit
Narsaq
Nanûseq
Lindenows Fjord
Dronning Louises Ø
Aluk
Prins Christians Sund
Augpilagtôq
Tugait
Frederiksdal
Ilua i Pamiagdluk
Sangmissoq
Kap Farvel
Ivigtut
Igaliko
Narssaq
Qaqortoq
Qagssiarssuk
JULIANEHAAB
Qagssimiut
Sagdlit
NANORTALIK
KONG CHRISTIAN DEN IXs LAND
KONG FREDERIK DEN VIs KYST
DANMARKSTRÆDET
ÍSAFJØRDUR
ÍSLAND
Snæfellsnes

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100 0 100 200 300 400 500 km

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