THE POLAR RECORD

NUMBER 10:

JULY 1935

PRINTED IN GREAT BRITAIN FOR
THE SCOTT POLAR RESEARCH INSTITUTE
CAMBRIDGE: AT THE
UNIVERSITY
PRESS

1935

Price Two Shillings

CONTENTS

(*Continued on page* 3 *of wrapper*)

Pages

Use for Bulletin as necessary

President Pp 126-9. As this is all new land & further south than ~~expected~~ at present charted propose reproducing in our Bulletin.

J.T.M.
27.8.35

Director

Director 7 T R 29/8/35 - Accord

Secretary-General [signature]. 29.VIII.35

Assistant-Secretary

Technical-Assistant [signature] done 3.X.35

Technical-Assistant [signature] 30/8/35.

Translator

FORM. Nº 1 - 5-31-10.000 - I. M.

Photograph by Auradon-Fontès, Paris

DR J.-B. CHARCOT

FOREWORD

It is now nearly a year since the new building of the Institute was occupied, and it is very satisfactory to record that the number of visitors has increased steadily throughout the year. The research rooms also have been in constant use; one of them by Dr Fritz Loewe of the Wegener Greenland Expedition 1930–31, a research guest of the University of Cambridge. The increased interest in the Institute has been marked also by a very large number of gifts. These have been acknowledged in the annual report of the Committee of Management, presented to the University and published in the *University Reporter*.

Space does not permit of a reprint of the list of donors in *The Polar Record* and we can express our grateful thanks here only in general terms. There have also been some very kind gifts of money for special purposes.

The financial position of the Institute, however, is far from satisfactory as yet, as the increased number of visitors involves increased expenditure on light and heating, while there has been no corresponding increase of the Endowment Fund.

It is pleasant to welcome home in these pages expeditions which have contributed to our knowledge of the Polar regions. Special mention may be made, therefore, of *Discovery II* and the *William Scoresby* after their long and useful commissions in Antarctic seas. The expedition of Admiral Byrd has also returned safely to civilisation and we look forward to the publication of their geographical results.

A special event of interest in the United States is the recent presentation of the Congressional Medal of Honour to Major-General Greely, who, amongst leaders, must be regarded as the Veteran of Arctic Exploration. Though he never returned to the scenes of his labours in 1883, he has always kept up his interest in the Arctic and has contributed both by speeches and articles to discussions on polar topics.

The subject of our frontispiece is another veteran who can claim both ends of the world as his spheres of action. The work of Dr Charcot dates back to the beginning of the century, and he is still making almost annual trips to Greenland in his now famous ship *Pourquoi pas?* His keen interest in the work of all polar men and his ready help to them on all occasions have endeared him to all nations.

Dr Charcot has evidently more fear of the camera than he has of the rigours of high latitudes, for this was the only recent photograph of him that could be obtained.

ARCTIC REGIONS

SVALBARD, FRANZ JOSEF LAND, AND RUSSIAN ARCTIC REGIONS

Soviet Union Expeditions, 1935.

The following are the principal expeditions planned by the Soviet Union for the season of 1935. Besides these, a large number of smaller parties will carry on with the steady programme of investigation and research which is one of the most cherished schemes of the Soviet Government.

An expedition on board the ice-breaker *Sadko*, led by G. A. Uschakov, and including thirty scientists, will carry out scientific investigations during the summer of 1935. Leaving Murmansk, the ship will visit Spitsbergen, the Greenland Sea, the northern shores of Franz Josef Land, and Severnaya Zemlya (Northern Land or Nicholas II Land).

As an inauguration of the Northern Sea Route for regular mercantile traffic, three cargo steamers will navigate the North-east Passage during the summer of 1935; two of them travelling from Murmansk to Vladivostok, and the third in the opposite direction. Another vessel will leave Murmansk about the same time for the mouth of the Kolyma. The vessels will be assisted in their voyage by the ice-breakers *Krassin*, *Yermak* and *Lütke*.

The Arctic Institute has organised an expedition on board two small vessels for the purpose of investigating currents in the Kara Sea. Scientific work will also be carried out by the supply ships visiting the permanent research stations at Franz Josef Land, Einsamkeit (Lonely) Island, Severnaya Zemlya, Cape Chelyuskin, the New Siberian Islands, the Medvezh (Bear) Islands, and Wrangel Island.

Vodopianov and Liapidevski, two of the pilots who took part in the *Chelyuskin* rescues in 1934, plan to fly from Moscow to Cape Schmidt, opposite Alaska and back, during the summer of 1935, a distance of 25,000 miles. They will use a Soviet-made plane, the P. 5, which was used for the *Chelyuskin* rescues; and the object of the flight will be to ascertain the possibility of establishing an air route on the line covered by them in their flight to the *Chelyuskin* in April, 1934.

The Soviet State Hydrological Institute has issued the following forecast of probable ice conditions during the navigation season of 1935:

(1) *Greenland Sea.* The heavy southerly drift of Arctic pack-ice between Spitsbergen and Greenland, which began in 1934, is expected to make the approach to the Greenland coast even more difficult than in 1934; and for the same reason comparatively unfavourable ice conditions will also be met with off Spitsbergen. The waters of the northern Atlantic were, however, warmer than usual during the winter of 1934–35, and it is hoped that this may lessen the density of the ice drifting south.

(2) *Barents Sea.* Less ice is expected in this region than in previous seasons, and it is predicted that Cape Zhelaniya, in the extreme north of Novaya Zemlya, will be accessible to ordinary vessels at the end of July.

(3) *Kara Sea.* A comparatively ice-free navigation season is expected in this region, and experts predict better ice conditions than have been experienced for several years in the waters between Cape Zhelaniya and Cape Chelyuskin. There will also be less ice in the Chukchis Sea this summer.

Geological Expedition to the Chukchis Peninsula, 1934–35.

During the autumn of 1934, the expedition to the northern part of the Chukchis Peninsula under the leadership of S. V. Obrutchev, was able to carry out a large amount of cartographical survey in Chaun Bay, and the eastern part of the East Siberian Sea east of Cape Shelagski, as a result of which 6000 sq. km. have been mapped. The expedition covered 1300 km. in journeys.

During the winter the party made astronomical observations and the following points were fixed: Cape Shelagski (polar station 9 km. east of the Cape itself); the Pevek settlement in Chaun Bay, and the western extremity of Aian Island. Surveys were also made from this point. It is of interest to note that aero-sledges were used for the first time in the Chukchis district by this expedition. The journey across Chaun Bay from Pevek on the east coast to Aian Island, the determination of the point there and the return journey took only five days in all, from January 4 to 9, 1935.

In mid-January, A. Kovtun, the geodesist of the party, visited the south-western end of the bay, and fixed its position. The whole party then proceeded to the interior of the peninsula to carry out geological work.

Soviet Union Expeditions, 1934.

Biological Expedition to Novaya Zemlya, 1934.

During the summer of 1934 a biological expedition was at work on the Kara coast of Novaya Zemlya, with the object of continuing similar work begun in 1933. The party, which was led by G. S. Slastnikov, ichthyologist, included I. N. Besborodov, mate; P. T. Bolshakov, zoologist, an engineer, and two seamen. The party had the use of M/V *Arctic*, commanded by A. P. Rundan.

In spite of unfavourable ice conditions—Matochkin Shar and the whole coastline were blocked throughout August—the party made observations on land fauna and birds, besides investigating marine life, and taking soundings. Experimental fishing was also carried out.

Olenek-Anabar Expedition, 1934.

An expedition, led by A. A. Romanov, cartographer and hunting expert, left Tiksi Bay at the mouth of the Lena, in April, 1934. Between that date and January, 1935, the party covered 4000 km., using reindeer and canoes as transport, and proceeding on foot, as occasion demanded. Most of the country traversed consisted of tundra, at the edge of the forest zone.

During the journey the party made a detailed study of the social economy of the region, and fifteen nomadic districts and councils and three administrative districts (Bulun, Anabar, and Khatanga) were investigated. The place-names in this region were translated from Yakutian and Dalganian into Russian. Besides this, the nature of the tundra was studied along the entire route, geomorphological observations made, and specimens collected. Botany, ecology and biology were also studied, and observations made of hunting conditions.

Soviet Union Research Stations.

Calm Bay, Hooker Island, Franz Josef Land. It is reported by the chief of the station that two reconnaissance trips from the air were made by the personnel of the Calm Bay Research Station during April, 1935. The first flight was made on April 11–12 by Pilot Volossuk, and the route followed was from Hooker Island to Koettlitz Island, and back to Hooker Island by way of Cape Murray and Northbrook Island. British Channel was observed to be free of ice, but there was a solid ice-field to the south of the route taken by the plane. Open water was seen in

the Victoria Sea, and large ice-fields between Arthur Island and Jackson Island. In the Barents Sea, south of Lat. 79° 45′ N., there was open water and broken-up ice.

The second flight took place on April 19, the same pilot in command. From Hooker Island, Cambridge Strait was visited, and found covered with solid ice. In the Barents Sea open water was observed, the edge of the pack stretching from Cape Ludlow to Cape Grant. Flying across Bell Island from Cape Grant, the plane returned to Hooker Island, by way of Northbrook Island.

Cape Schmidt (*Cape North*), Lat. 69° N., Long. 179° E. On April 19, 1935, an ice reconnaissance trip was made by air from this station, and solid ice was observed between Cape Schmidt and Wrangel Island. At the junction of the ice-fields there was an accumulation of heaped up ice-blocks and the leads were covered with young ice. A second flight was made five days later, and similar conditions were observed between Cape Schmidt and Herald Bank.

Wrangel Island. The outgoing staff of the research station at Wrangel Island reached Vladivostok in the autumn of 1934, after five years spent on the island. They were relieved by a party of sixteen, who wintered on the island, and who include the following:

HAINUK, meteorologist.
KARBOVSKY, meteorologist.
KUTSEVALOV, hydrologist.
VAKULENKO, biologist.
VULFSON, medical officer.

The leader of the party is Semenchuk.

The party reached the island on board the ice-breaker *Krassin.*

Cape Sterlegov, Laptev Land. A new wireless and meteorological station has been established by the Soviet Union at Cape Sterlegov at the mouth of the Lenivaya River in Laptev Land (Lat. 75° N., Long. 89° W. approx.). It had been planned that this station should be erected on Russian Island, in the Nordenskiöld Archipelago, by the crew of the ice-breaker *Malyguin* on her return from conducting the foreign vessels of the Kara Sea Trading Fleet through the ice, but the ice-breaker was prevented from approaching the island by the ice. The station was therefore set up on Cape Sterlegov. The *Malyguin* sustained some damage to her rudder in the ice, and lost one of the blades of her screw, but returned to Archangel safely on September 27, 1934.

Soviet Investigations in Anadyr and the Chukchis Peninsula, 1931–34.

The expedition led by L. A. Portenko, chief zoologist of the Arctic Institute, which had been at work since 1931 in the Anadyr and Chukchis districts of Siberia, returned to Leningrad in October, 1934. Brief mention of the expedition was made in *The Polar Record*, No. 7.

The party began work early in 1931, and, as a result of their investigations, it is now possible for the first time to lay down clearly defined zoo-geographical characteristics of the two districts, and divide them into separate sections. During four seasons of field work, a large collection of birds, mammals and plants have been made, and many photographs taken. The zoo-geographical investigations were carried out on the lines of M. A. Menzier, and based on the detailed study of the distribution of the land fauna in the different landscape sections.

In the summers of 1931 and 1932 journeys were made in the Anadyr district from the Anadyr River in the west eastwards, and along the southern coast of the Chukchis Peninsula up to Cape Ugelen. L. A. Portenko, assisted by P. G. Butenko, took out another party in the summer of 1933, a wintering party having made preliminary investigations during the preceding winter. The party made their headquarters at the research station at Cape Dezhnev, and spent the following winter there. During the summer they studied the surrounding country.

During the winter of 1933–34 it was only possible to make short trips, but in April, 1934, L. A. Portenko made a flight north-west to Cape Wankarem, in a Junker plane, piloted by Ivan Doronin, one of the pilots who took part in the *Chelyuskin* rescues, and they were able to make a direct hypsometrical study of the land of which there were no adequate maps in existence. From Wankarem, L. A. Portenko proceeded to Cape Schmidt (Cape North), and back to Ugelen by dog-sledge. In the summer three long journeys were made: to the Diomede (Ratmanof) Islands, in Bering Strait, to the valley of the Utte-Uim River, and along the Kuluian-Uim River to Lake Kulion. The party also visited Emma Bay on the Chukchis Peninsula.

Norwegian Spitsbergen Expeditions, 1935.

A hydrographic expedition will visit the waters between Spitsbergen and Bear Island during the summer of 1935, and soundings will be taken both there, and off the west coast of Spitsbergen. The expedition is being sent out by the Norges Svalbard-og Ishavs-undersøkelser.

Another expedition, organised by the Norwegian Fisheries and led by Captain Thor Iversen, will be at work in the same region; and will make fishery investigations in addition to the usual hydrographical programme.

A survey party will also visit Spitsbergen this summer. The party will consist of Hans S. Jelstrup, astronomer, and Arne Øverbye, radio assistant, and they plan to carry out determinations of latitude and longitude and take gravimetric measurements on the north-west coast.

Norwegian-Swedish Spitsbergen Expedition, 1934.

This expedition, which was under the joint leadership of Professor H. U. Sverdrup of Bergen, and Professor H. W. Ahlmann of Stockholm, left Norway on June 10, 1934, with the object of carrying out glaciological and meteorological observations in the Cross Bay district of Spitsbergen. The two leaders were assisted by J. Knudsen and H. Olsson.

The party arrived at Longyear City, Advent Bay, on June 16, and the next day reached the Fourteenth of July Glacier, Cross Bay, without encountering any pack-ice. A base was established on the Isachsen Plateau, Cross Bay, a large firn field in Lat. 79° 09′ N., Long. 12° 56′ E., at a height of 850 m. above sea level, and observations were carried out from June 24 until August 16. During the journey up onto the plateau, which was reached on June 23, with seventeen dogs and three sledges, twenty-two bamboo stakes were erected, each 2½ m. long, and complete with flags and numbers. These served as gauges for measuring the melting of the snow and ice and for determination of the movement of the glacier, and they were visited and measured four times during the summer. Two journeys were made up and down the Fourteenth of July Glacier by Professor Ahlmann and his assistant, light sledges drawn by two dogs being used as transport. The rest of the dogs were sent back to Longyear City in charge of dog-drivers who returned to fetch the party on August 18.

During the course of the expedition, Professor Sverdrup made a detailed study of the heat balance between the atmosphere and the snow surface, making use of an instrument which gave hourly determinations of the meteorological elements from the snow surface to 5 m. above it. The instrument was in use from June 26 to August 15, and about 20,000 readings were taken. Meanwhile, Mr Olsson took radiation intensity measurements. Professor Sverdrup also determined the temperature and its variations every day in the firn masses, by means of electrical resistance thermometers.

Professor Ahlmann was able to make a detailed study of ablation processes, by means of an ablatograph designed specially by Dr O. Devik of Norway. The instrument consisted of a recording mechanism fixed on a firm support above the surface of the snow, which registered the subsidence of a float resting on the snow or ice; the float was connected to the recording mechanism by a string. Independent movement of the float was apt to occur, especially in overcast or foggy weather, and it was necessary to ascertain the relation of the float to the snow surface at least twice a day. The ablation was also measured directly two or three times a day by means of a stake stuck into the surface close to the instrument.

The party also made a study of the firnification of snow and the recrystallisation of firn into ice. For this purpose seven pits were dug, five of them 4–5 m. deep.

The results of these investigations, which add considerably to our knowledge of glaciers, will be published in detail in *Geografiska Annaler* (Stockholm) and *Geofysiske Publikasjoner* (Bergen). A preliminary review of them was published in the *Geographical Journal*, in the form of a paper read before the Royal Geographical Society by Professor Ahlmann on April 8, 1935.

Oxford University Arctic Expedition, 1935–36.

This expedition, the main object of which is to make an accurate survey of the north coast of North East Land, Spitsbergen, and to carry out observations on geology, glaciology and meteorology, will leave Tromsö on July 22, on board S/S *Polar*. The party will be led by Mr A. R. Glen, and the rest of the personnel will be as follows:

A. Croft, second-in-command, in charge of dogs.
Dr A. Ballantine, medical officer.
A. R. Dunlop-Mackenzie, ski expert.
Lieut. A. S. T. Godfrey, R.E., surveyor.
R. A. Hamilton, physicist.
D. B. Keith, surveyor, ornithologist.
R. Moss, physicist.
Lieut. A. B. Whatman, R.C.S., in charge of wireless.
J. W. Wright, surveyor.

After a call at Advent Bay, Ice Fjord, the ship will proceed to Rijps Bay, North East Land, where the base hut and stores will be landed. They hope to arrive there about the beginning of August. A small party of surveyors will be dropped off North Cape to make a reconnaissance survey in towards the base, afterwards making a detailed survey of the

west half of the north coast, continuing as far as possible to the east. Meanwhile the rest of the party will erect the base, consisting of a three-roomed, double-walled hut, and establish the two winter stations on the West Ice, in the north-west of the island between Lady Franklin Bay and Wahlenberg Bay, to be occupied by two men, who will carry out meteorological and glaciological work on the lines of Wegener's Greenland Expedition, 1930–31. At the base, the two physicists will undertake research into the height of the ionosphere, and various other wireless problems.

The expedition will make a stay of fourteen months in North-East Land; and in the spring of 1936, sledge journeys will be made on the inland ice, using dog transport, with the object of mapping the south and east edges of the ice-cap. The ship will return in the summer of 1936, as soon as ice conditions permit, and the party hope to visit various islands to the east of North East Land, and return to England at the close of the navigation season, in September or October, 1936.

Polish Expedition to Spitsbergen, 1934.

We are now able to publish further details of the Polish expedition, which was at work in the Bell Sound region of Spitzbergen during the summer of 1934; a brief account having already appeared in the last number of *The Polar Record*.

The expedition, the object of which was the exploration of Torell Land, and which was directed by Professor A. B. Dobrowolski and Professor Jean Lugeon of Warsaw, was financed by the Polish Government, the Tatra Mountains Society and by private individuals. The Meteorological, Geological and Geographical Institutes also gave substantial assistance by the loan of instruments and equipment.

The party of seven included geologists and their assistants, radio experts and film photographers.

A base was set up at the beginning of August on a moraine of the Finsterwalder Glacier in Van Keulen Sound, and from there Torell Land was explored as far as Horn Sound, the equipment being carried on man-hauled sledges. Several camps were established on tributary glaciers, including one on the highest part of the Penck Glacier. During the two months spent in the region the party made a photogrammetrical survey of a large part of the Torell Land ice-cap, and many photographs were taken. A large collection of geological specimens was brought back.

EXPLORATION OF THE INTERIOR OF NORTH EAST LAND

BY K. S. SANDFORD

In the last sixty years or so there have been only three successful attempts to investigate the interior of North East Land, and at the moment it remains the least known part of the Spitsbergen Archipelago. The Oxford University Exploration Club's expedition, now organised by A. R. Dunlop-Mackenzie and to be led by A. R. Glen, should do much to fill in the major blanks in our knowledge. The party will be the first of its kind to winter there and will have two ice-cap stations.

The editor of *The Polar Record* has asked me to trace the history of exploration to the point at which Glen's problems will begin. These notes cannot include the history of the plotting of the coast, still incomplete, nor can we consider in any detail incursions made by coastal parties. Suffice it to say that the island was discovered in the early part of the seventeenth century, its coasts were known to skippers and hunters, especially the Russians; Phipps, with Horatio Nelson as one of his midshipmen, was beset off Low Island on its north-western coast, Parry sent a surveying party along its western coast. Picturesque placenames still recall these and many other efforts. References to enterprises along its coasts will be conveniently found in Sir Martin Conway's *No Man's Land*, Professor Rudmose Brown's *Spitsbergen*, and a valuable article on the cartography of the coasts has recently been published by Professor Ahlmann in the *Geografiska Annaler* in 1933. Pride of place from a surveying point of view must be given to the Russo-Swedish Arc-of-Meridian Expedition of 1898–1903.

The first expedition to the interior was led by A. E. Nordenskiöld, who, after wintering somewhat precariously in Mossel Bay, took a considerable party across Hinlopen Strait and along the north coast on the winter ice in the spring of 1873. An attempt on the Pole was intended, but impossible ice conditions led to a change of plan. The party, of which Palander was also a member, followed the north coast of North East Land, but turned away inland west of Cape Leigh Smith, and finally made for home across the high ice of the interior. Their troubles were only just beginning when they left the coast; they met severe cold, blizzards, fog and mist, and unexpected crevasses, including the much debated

ice-canals. Eventually they came down to the head of Wahlenberg Bay, and so continued along the coast-ice, and overland back to a point near Low Island: Palander rowed across to Mossel Bay and the main party was picked up. Thus ended a very remarkable journey which had lasted from April 24 to June 29.

The prevailing impressions, which were unshaken until 1924, seem to have been the difficulty of travel in the interior, the lack of summer thaw, the absence of nunataks. In a word, the island seemed unattractive, unpleasant, difficult to approach and to travel in, and unlikely to provide discoveries commensurate with the trouble and risk.

For many years attempts on the Pole remained the order of the day, and North East Land was not visited. It was not considered worthy of a wintering expedition, and was deemed impossible to attempt with safety in the summer. The tragic fiasco of the Schröder-Stranz expedition, just before the War, tended to confirm the evil reputation that the island had gained; the members of this unfortunate party probably lost their lives in attempting to land over drifting ice, and their tent bag, found by the Merton College expedition in 1923, is the only relic yet found on the mainland of North East Land. Their ship's company also broke up in confusion and with loss of life.

The Merton College expedition, under George Binney, tried conclusions with the problem of landing a sledging party in North East Land in 1923, but pack-ice, drifting coastal ice, and associated difficulties wasted so much time that the attempt had to be abandoned in favour of the highly successful traverse from Hinlopen Strait to Ice Fjord, Western Spitsbergen.

In the following year Binney returned, and after some initial failures, and the grounding of both his ships off Low Island, he landed two sledging parties near the north side of the mouth of Wahlenberg Bay. They started with the impressions that Nordenskiöld had imparted fifty years before, and with the maps just published by De Geer, though the survey for them had been made by the Russo-Swedish parties of 1898–1903. They expected to meet blizzards and difficult conditions, notably crevasses and fogs, and in this they were not mistaken; but they found also an impossible thaw in progress, and it lasted nearly a month. Hauling sledges of the most modern type required an effort not unworthy of the early days of dragging ships' boats on massive baulks of timber and iron over mountainous surfaces of broken ice. The illusion of dry powdery surfaces such as Nordenskiöld had met were rudely shattered.

The two parties spent a considerable number of days in enforced inactivity owing to blizzards. The severe melting and abundant crevasses showed dogs at a disadvantage for this type of work. The dates of sledging were July 22 to August 15.

Every expedition brings back impressions that tend to last for several years and to form the frame of mind in which the next attempt is made. Thus, in 1924, the sledging parties set out with information fifty years old, and in that interval there had crept onto the maps an indication of a long and high "ice-wall" which the party, moving eastwards into the interior, would have to climb. In fact, it did not materialise, a matter of considerable importance at the time, but to-day nobody would experience the hopes and fears associated with it. Similarly the parties sledged for days over surfaces marked as bare rock. Many results of journeys are of this negative type that seem of no importance afterwards. There resulted an impression of the hindrance of summer climatic conditions to travel, and of the doubtful utility of dogs. To this must be added radical changes of view as to the contour of the ice-cap: it emerged that there were really three high ice centres, more than 2000 ft. above sea-level, instead of a common mantle of ice over the whole island. It was clear that the south-west centre was continuous with the great mass of the eastern ice, but the north-western expanse on which the two sledging parties travelled was evidently separated from the eastern ice by a deep valley, the nature of which could not be determined.

While these two sledging parties were in the interior, Binney did a bold thing. He made up a third party, including himself, and endeavoured to land on the east coast and sledge across the island westward to complete the first traverse. The magnitude of this undertaking tends to be overlooked after its accomplishment. In the first place the east coast was known only as an unbroken and precipitous wall of ice, over a hundred miles in length, impossible to scale: moreover, the ice-pack is particularly dangerous here, as heavy polar pack may arrive at short notice, screened in mist or fog, and a ship must escape rapidly along the great ice-cliff unless it can dodge the pack by sailing away from the coast. Even if a landing could be made, therefore, the ship could probably stay only a short time, and might not be able to return. Once landed, a party was committed to crossing the island to some previously arranged point where it could be sure of being picked up, and where winter supplies could be left for it. In view of Nordenskiöld's report of the central part of the island the journey itself presented some elements of

doubt. Binney took the chance, found a rocky point on the east coast, was landed with supplies for the crossing, and set off on his journey westward. After severe difficulties with crevasses, thaw, mist and blizzard, he came down on the south side of Wahlenberg Bay: the other two parties and the emergency dump of rations for the winter were on the north side. As it turned out he made a perfect rendezvous with the ship, and the mouth of the bay was ice-free. One of the outstanding results of the journey, apart from its actual performance, was the realisation of the great size of a central ice depression at the head of Wahlenberg Bay and the zone of shattered ice within it in prolongation of the line of the Bay. In other words, once a party finds itself on the south side of this zone it must continue on that side or retreat to the high part of the eastern ice before it can cross to its northern side.

The 1924 expedition also carried out pioneer work by using a seaplane for a systematic coastal survey, the first in such high latitudes, and considerable lengths of coast and the adjacent ice-cap were successfully photographed. The whole of the activities of this expedition are described in George Binney's book, *With Seaplane and Sledge in the Arctic.*

The interior was left alone until 1931, when a Swedish-Norwegian expedition was taken to Murchison Bay by Professor Ahlmann of Stockholm. An ambitious scientific plan was carried out at the base and along the coast northward, while Ahlmann led a sledging party inland from the south side of Wahlenberg Bay. On the whole, good sledging conditions were met, and the party virtually completed its journey before the thaw set in. They took dogs, and, benefitting by experience gained in 1924, carried light cane couches for their sleeping bags: they thus slept dry during thaw, and the device seems an admirable addition to summer sledging equipment. The dates of the sledging journey were July 2–18.

Ahlmann knew that the depression between western and eastern ice-centres was before him, but it proved to be bare ground from the head of Wahlenberg Bay to Rijps Bay; the north-western ice is therefore shown to be a separate unit. In 1924 a deep rock valley had been seen stretching in this direction and, from the summit of the ice, cloud had been observed rising from it, but there was no reason to suppose that this remarkable rock-bottom valley would be found as a corridor from the north coast to Wahlenberg Bay, and thence to the west coast. Ahlmann's party sledged within reasonable distance of Cape Leigh Smith, and crossed the rock valley on the return journey to Murchison Bay. Other impressions of 1924 were confirmed. This expedition also

carried out much detailed study of the physics and crystallography of the ice-cap. The sledging party travelled 350 km., and lost only two days in camp owing to bad weather, thus averaging 25 km. per marching day: a good record in North East Land. The results are being published in a series of reports in the *Geografiska Annaler*, to be combined in volumes. Volume I was reviewed in the *Geographical Journal*, May, 1934.

The presence of the ice-free rock valley was interpreted by Norwegian hunters as an indication of a bear route across North East Land, and for the first time the interior of the island was turned to organised commercial use. The first wintering in Wahlenberg Bay ended in tragedy, as already recorded in *The Polar Record*, but at the moment a well-organised scheme is operating along the valley, with the hunters' headquarters on the north coast. It is to be expected that these men will have useful observations to add to our knowledge about the geography of the north coast. Captain Olsen and other skippers have in recent years taken a great interest in these questions, and have given us remarkable accounts from which it must be assumed that much of the northern sector, east of the Seven Islands, is in urgent need of revision on the existing maps.

What, then, will be Glen's initial impressions? He knows the ice surface is locally very bad, that the weather is bad by reason of mists and blizzards and thaw, he knows he has a back door to his base via the ice-free valley to Wahlenberg Bay. If he has difficulty in reaching Rijps Bay by sea it is not a matter of great importance if he shifts his base to the head of Wahlenberg Bay, only a few hours' walk from his proposed base, with hunters' shelters at intervals along the route. He knows that dogs can be of the utmost value for fast travelling until the thaw begins next summer, by which time he expects to have completed his long journeys.

His winter stations on the ice-cap will probably find the conditions rather difficult and severe and they must be prepared either for an excess or a serious shortage of freshly compacted snow. One of their trials may be that, in view of their comparative proximity to the base, passage from one to the other should appear simple, even in winter: actually the featureless nature of the ice and lack of landmarks, even in summer daylight, makes it very easy indeed to lose direction. Any route will have to be marked with meticulous thoroughness for it to be safe in winter. The detailed observations which are being planned will make scientific exploration of ice and atmosphere very complete. The spring

of 1936 should give the expedition an opportunity to settle finally the topography, both of ice and rock, along the north and part of the east coast, and south-eastward across the head of Wahlenberg Bay to that mysterious depression in the south east corner of North East Land, reported by Nordenskiöld, which three parties have had in mind, Binney's, the 1924 central party, and Ahlmann's. This supposed depression is almost as vigorously discussed as Nordenskiöld's ice canals: of the latter we now have some idea, the former may prove as non-existent as the great ice-wall which was expected to bar progress in 1924.

Glen goes to North East Land with a wide and varied experience gained in a series of notable achievements in Spitsbergen, and he has some highly experienced companions; from every point of view the expedition seems to be well qualified and well equipped to carry out its programme.

GREENLAND AND JAN MAYEN

The Scientific Results of the German Greenland Expedition Alfred Wegener, 1929 and 1930–31.

Wissenschaftliche Ergebnisse der Deutschen Grönland Expedition Alfred Wegener*, 1929 und 1930–31.** Band I. ***Geschichte der Expedition. By Kurt Wegener. Leipzig: Brockhaus, 1933. Illustrations and maps. Pp. xii + 198. M. 17.30. Band II. ***Seismik.*** By Bernhard Brockamp, Ernst Sorge and Kurt Wölcken. Leipzig: Brockhaus, 1933. Illustrations. Pp. 160. M. 15.50. Band VI. ***Anthropologie und Zoologie.*** By Hermann B. Peters. Leipzig: Brockhaus, 1933. Illustrations and sketch-maps. Pp. viii + 196. M. 17.30.

Three volumes (I, II, VI) of the scientific reports of the *German Greenland Expedition Alfred Wegener* have so far been published.

Vol. I contains an abstract of the aims and the history of the expedition written by Professor Kurt Wegener, their leader after the death of Professor Alfred Wegener, his brother. As the author took part only in the later stages of the expedition, the reader should, however, compare the reports written by other members of the expedition. Transport questions are treated theoretically by Kurt Wegener in "The Problem of Transport"; and also by Schif in "The Air-screw Sledges" in which he describes the first successful utilisation of mechanically driven sledges in polar exploration. Kopp writes on "Radio Telegraphy", showing the influence of polar weather conditions on the propagation of radio waves. Of great scientific interest also is Kurt Wegener's discussion of the measurements of accumulation and ablation between the sea-level and the central station "Eismitte" 250 miles inland, at a height of 10,000 ft.

Vol. II contains the seismic measurements which gave the depth of the ice-cap, with an approximate error of 5 per cent. The seismic records are reproduced in full. Brockamp and Wölcken give the results gained from the edge of the ice-cap to 75 miles inland. The technical difficulties and the sources of error of the reflection method are discussed comprehensively, and the records fully interpreted. They show, at some distance from the margin of the ice-cap an, as yet unexplained, stratification of the deeper ice-layers, and suggest the thickness of the layer of firn above. The thickness of the ice at 75 miles inland was 6000 ft., and the rock floor proved rather uneven. Measurements by Sorge at "Eismitte" were hampered by trouble with the instrument, so the registered

thickness of 6500 ft. may not be entirely accurate, but a depth of over 3000 ft. seems certain.

Vol. VI contains Peters's anthropological and zoological results, from Scoresby Sound, and the study of the physical characteristics of the nearly pure strain of Eskimos at the settlement. Similar research was also carried out on the dogs.

The long-awaited meteorological data of the expedition and especially the results of the two ice-cap stations (Vol. IV, 1) have appeared recently.

F.L.

Dr Charcot's East Greenland Cruise, 1935.

Dr J.-B. Charcot proposes to visit Greenland as usual this summer on board his ship S/S *Pourquoi pas?* The ship has now been thoroughly reconditioned after her difficult voyage in bad weather and ice conditions in 1934.

The chief aim of the party will be to bring back the four scientists left at Angmagssalik in August, 1934, who have been carrying out ethnological and oceanographical work between Scoresby Sound and Angmagssalik during the winter. Further plans depend on the condition of the ice.

The personnel includes two biologists, two physicists, and a geologist and an artist, the two latter being also members of the crew.

Norwegian Expeditions to Greenland, 1935.

Two Norwegian ships will visit East Greenland during the summer of 1935, both leaving Norway at the end of July. Their object will be to carry supplies to the Norwegian stations at Myggbukta in North-east Greenland, and Torgilsbu in South-east Greenland, and relieve the meteorological staff. Several hunters have taken passages on the ship bound for Myggbukta.

A Norwegian hydrographical expedition which left Norway on May 7, 1935, will be at work in Davis Strait until September. The hydrographic party, which is under the command of Commander Rolf von Krogh, and sent out by the Norges Svalbard-og Ishavs-undersøkelser, have the use of M/V *Korsvik*, a steamer fitted out for fishing. Echo-sounding will be carried out whenever possible during the trip, and daily meteorological reports will be sent to the Norwegian Meteorological Institute at Oslo.

Danish Oceanographical Work in the Greenland Seas, 1935.

News has been received from Captain Alf. Trolle that his ship M/V *Thor* under the command of Captain Gjessing will be sent on an oceanographical cruise to the Iceland and Greenland Seas during the summer of 1935.

Besides carrying out hydrographical investigations the party on board hope to study fishing conditions off the coast of Greenland. The work will begin on May 1st, and the party, which includes Dr S. Nielsen and Mr E. Bertelsen, will return at the end of August.

Danish Archaeological Research in Greenland, 1935.

With the successful termination of his work in the Julianehaab district of West Greenland last summer, Dr T. Mathiassen has for the present brought his work in Greenland to a close. Two of his assistants on previous expeditions will, however, carry on similar investigations during the next few seasons.

Mr Erik Holtved, who was Dr Mathiassen's assistant on his last two expeditions, will leave Denmark in July, 1935, for Thule, North-west Greenland, where he intends to spend two years making archaeological, anthropological and ethnological studies among the Cape York Eskimos. Dr Helge Larsen proposes to join the British expedition to East Greenland, and make excavations in the Kangerdlugssuak district.

British Expedition to East Greenland, 1935–36.

A small British expedition, under the leadership of Mr L. R. Wager and Mr A. Courtauld, will be at work along the Blosseville Coast and Kangerdlugssuak region of East Greenland during the year, 1935–36, leaving England in July, 1935. The party will include: Dr Chambers, W. A. Deer, geologist, Dr Fountain, Dr H. Larsen, Mr J. L. Longland, Mr E. Munck and Dr H. G. Wager, brother of the leader of the expedition, Mrs Courtauld, Mrs Longland, Mrs H. G. Wager and Mrs L. R. Wager.

The first objective of the expedition will be the new mountains discovered from the air by the late Mr H. G. Watkins during the British Arctic Air Route Expedition, 1930–31; and a party of six will be landed from M/V *Quest* at a point some 60 miles from the highest peak, and an attempt made to reach it. While the climbers are thus occupied, the two Danish archaeologists, and Mr Deer, the English geologist, will be at work in the Kangerdlugssuak region. Towards the end of August, Mr L. R. Wager's party of seven will be landed at Kangerdlugssuak, where they will winter in the huts erected by Captain Ejnar Mikkelsen in 1932, but not as yet used. The main work of this party will be geological and botanical. It is hoped that two families of Eskimos from Angmagssalik may accompany the expedition, and spend the winter with them. They will thus become familiar with a stretch of coast, where

formerly their ancestors lived, and which is apparently a rich hunting ground. Mr and Mrs Courtauld and Mr and Mrs Longland will return at the end of the summer.

Professor Steinböck's Research in West Greenland, 1935.

Professor Otto Steinböck, of the Zoological Institute, Innsbruck University, will visit West Greenland during the summer of 1935, in order to carry out biological research in Disko Bay.

The work will be a continuation of similar investigations made when Professor Steinböck, accompanied by Professor E. Reisinger, of Cologne University, visited Greenland in 1926. On this preliminary expedition the party made a special study of salt-water and fresh-water fauna, and discovered 175 species of turbellaria, about 110 of which were new to science. A study of the new acoelous turbellaria found suggested that many-celled fauna (metazoa) do not develop from colonies of one-celled fauna according to the Gastraea theory of Haeckel, but directly from protozoa with many nuclei. This summer Professor Steinböck hopes to confirm this theory by ontogenetic examinations of the primitive turbellaria found in Disko Bay. Hydrobiological work will also be carried out, as Professor Steinböck wishes to make a comparison of the fresh-water fauna of Greenland with that of the glacial streams in the Alps. He also hopes to make preliminary studies on the question whether life survived on nunataks during the glacial period, or whether the whole existing fauna has migrated to Greenland since the glacial period; the pre-glacial fauna having died out.

This research has the support of the Grønlands Styrelse and the Austrian Ministry of Public Instruction.

Italian Mountaineering Expedition to Scoresby Sound, East Greenland, 1934.

The following full account of this expedition has been received from Count Leonardo Bonzi. A brief report appeared in *The Polar Record*, No. 9.

The original plan of the expedition had been to explore the mountain ranges inland from the Blosseville coast, but this was prevented by the exceptionally bad ice conditions which prevailed during the season of 1934, and the party decided to carry out a similar programme inland from the unexplored south coast of Scoresby Sound.

The expedition—which consisted of Count Leonardo Bonzi, Signor Franco Figari, Avv. L. Gasparotto, Count L. Martinoni, and Marquis

Gherardo Sommi Picenardi—left Italy on July 17, with provisions for three months, and reached Iceland on July 27. They left Isafjordur, Iceland, on board M/V *Njall* (37 tons) on August 1. The first ice was met with on August 2 in Lat. 67° 35′ N., Long. 26° 40′ W., and the next day, after an attempt to penetrate the thick pack-ice, the ship was forced to turn back to the open sea. Attempts to make for the Greenland coast were made on August 4 and 5, but without success, although Cape Beaupré was only 20 miles away. The expedition then abandoned all hope of reaching the Blosseville coast, and made for the Eskimo settlement at Scoresby Sound, which was reached on August 18, after a difficult passage. On August 14 the rudder of the *Njall* was broken in the ice, and a halt for repairs enabled two members of the expedition to explore the interior of the Manby Peninsula. Repairs having been carried out, with the assistance of the crew of S/S *Pourquoi pas?*, the expedition left Rosenvinge Bay on August 22, and reached the south side of Scoresby Sound, at a small bay about 6 miles west of Cape Brewster, Lat. 70° 09′ N., Long. 22° 18′ W., which seemed to promise good anchorage for the ship. The coast at this point presented an almost straight line, with glaciers and mountains dropping sheer to the sea. Continuing west, the party reached the face of a large glacier in Lat. 70° 08′ N., Long. 23° 05′ W., later named the Milan Glacier, and landed there while the ship returned to the anchorage already selected.

A base camp was made at a height of 400 m., and the expedition having divided into two parties, spent the next five days in a thorough exploration of the Milan Glacier and its surroundings.

It was found that the Milan Glacier joins another glacier which descends in a north-easterly–south-westerly direction and unites with a third large glacier, entering the sea on the east coast opposite the Dunholm Islands. At the junction of the Milan Glacier there is a hill, Milan Hill, which rises to a height of 755 m. To the west, Balestreri Peak, Brescia Hill and Gilberti Peak lead to further glaciers towards Cape Stevenson. To the east a small glacier leads to a rocky nunatak, Rome Hill (890 m.), to the north-west of which is a mountain group formed of five basalt massifs, the highest of which (1280 m.), climbed by a party on August 24, was named Punta Roma. The cirque to the east of Rome Hill is bounded on the west by Punta Roma, on the south by the highest mountain of the group, the Peak of the Italians, and on the east by a chain of lower mountains, the highest of which was called Club Alpino Italiano Peak. From this point two large glaciers descend to the sea, one northwards

to Scoresby Sound, and the other, after skirting the buttresses of Club Alpino Italiano Peak, to the east coast between Cape Brewster and the Dunholm Islands.

On August 26, Bonzi, Sommi and Martinoni made an ascent of Milan Hill, and the next day Bonzi and Figari climbed Rome Hill, crossed the cirque and reached a hill of about 920 m. They then climbed Club Alpino Italiano Peak, estimated at about 1435 m. The same day another party reached the summit of the Peak of the Italians (1925 m.) after a difficult ascent in stormy weather. Brescia Hill, Gilberti Peak (1210 m.) and Balestreri Peak (1710 m.) were also climbed. The Brescia and Genova Glaciers, situated to the west of Brescia Hill, were also explored. The former reaches the sea in Scoresby Sound, and the latter flows in a westerly direction, parallel to the coast, at an average height of 800 m. towards the mountains behind Cape Stevenson.

On August 26 bad weather set in, which lasted for 13 days. On August 29, after three days in camp, the party set out for the coast to keep their appointment with the ship, which was now due to pick them up. The journey down the glacier was carried out with considerable difficulty, as the visibility was bad, and the crevasses were hidden by fresh snow; which also impeded the sledges. The party had marked the route by red flags, however, and in due course they reached the coast. The ship had meanwhile been caught in heavy pack-ice, and the party had an anxious wait for relief, in bad weather; flooded tents and shortage of food adding to their discomforts. They were not picked up until September 7, over a week after the appointed date. During a halt of three days at Cape Brewster a little exploration was carried out, after which the party returned to Iceland en route for Italy.

Meteor Expedition, 1934.

An expedition, on board the research ship *Meteor* and organised by the Deutsche Seewarte, carried out oceanographical work in the waters between Iceland, Jan Mayen and Norway from October 1 to November 16, 1934. Special attention was paid to the East Greenland current.

Other Work in Greenland.

Captain Ejnar Mikkelsen will make a visit of inspection of the East Coast of Greenland during the summer of 1935, on board the supply-ship *Godthaab*. Other visitors to Greenland will be Mr H. O'B. Hayward, leader of an Oxford expedition, which will do survey work in West

Greenland; and Mr R. Orcutt, who will continue his photographic work begun in the Canadian Arctic last year.

Mr Aage Roussell, who is researching in Norsemen remains, will make excavations in the Julianehaab district, and Mr Rockwell Kent will carry on his artistic work in North-west Greenland. An English author, Lieut.-Col. the Rev. R. J. Morris, is also visiting the country.

Miss P. W. Bowen-Colthurst and Miss Delavoye will visit the West coast on board S/S *Disko*, with the object of studying birds, taking special interest in the migratory species and collecting specimens.

ICELAND

Icelandic Expedition to Vatnajökull, 1935.

In the middle of May, two Icelanders, Mr J. Áskelsson, who had accompanied Dr Niels Nielsen to the same region last year, and Dr Trausti Einarsson, visited Vatnajökull to investigate the crater discovered during the Danish-Icelandic expeditions to the ice-cap after the *Jökullhlaup* at the end of March, 1934.

The two men experienced perfect weather for the whole journey and were able to reach the crater, part of which they found still active, steaming and ejecting boiling water and a good deal of vapour, although the force was found to have abated greatly since last year. As a result of the fine weather on the ice-cap, a fair amount of survey work was carried out, and several nunataks in the vicinity were connected up with the old Danish survey. One of these nunataks, Graenafjall, which had never before been visited by scientists, was found to be 150 m. high; and on its slopes about a dozen species of plants were found, most of them of an arctic nature, as well as some moss and lichen.

Mr Tryggvi Magnússon's Expedition to Langjökull, 1935.

Mr Tryggvi Magnússon, accompanied by Messrs Þórarin Arnórsson and Gudmundur Sveinsson, spent a few days on the Langjökull ice-cap in the spring of 1935; and made a traverse of the ice-cap from Þórisdalur in the south-west to Hvítávatn towards the east.

The party left Reykjavik on April 18, and travelled by car as far as the foot of Ármannsfell, beyond Þingvellir, where they transferred their equipment, which weighed about 200 lb., to ponies. They rode as far as Bjarnarfell, at the beginning of the valley of Þórisdalur, where snow was plentiful. They sent back the ponies from this point, and pushed forward on skis to the south-west shore of the lake in the valley, where they camped for the night.

The next day they started off in a snow-storm for the Klakkur nunatak, which was reached after four and a half hours; and at 10 p.m. camped on the ice-cap at an altitude of 4000 ft., at a point about 10 km. due west of Skriðufell near Hvítávatn. The distance covered was 25 km., and the party had been travelling for eleven hours over an uphill route, hauling their sledge. On camping, the temperature was found to be

22 degrees below zero (C.), and during the night 14 degrees of frost was recorded in the tent, the lowest temperature met with during the trip. At this point, and at various other places during the traverse of the ice-cap, the party tested the depth of the previous winter's snowfall, which was found to be about 70 cm.

On April 20, the party proceeded to the summit of Skriðufell in clear weather, and were also able to explore the glaciers at either side of the mountain. Travelling on this part of the ice-cap was easy, as most of the crevasses were bridged, and the weather remained favourable. The temperature during the day was 12 degrees of frost in the shade, but was from 20 to 25 degrees in the sun, and the party were able to sunbathe before starting the return journey to Þórisdalur. They started back at midday the same day, and by midnight had reached a point some 8 km. north-east of their destination, where they camped. The next day a sail was rigged, and the party reached Þórisdalur in a short time, thanks to a favourable wind. A rapid thaw had set in in the valley, and they were forced to wade through soft snow and slush as far as Bjarnarfell, where they made their last camp. The next day they arrived at Þingvellir where a car had been ordered to meet them, and convey them to Reykjavik.

The total distance from Þórisdalur to Skriðufell was 33 km. according to the sledge meter. During the short stay on the ice-cap, the party saw the footprints of a fox which had evidently come from Karlsdráttur, at the foot of Skriðufell, and was heading for Hagavatn. This, with a visit from a raven, was the only sign of life seen on the ice-cap. Good weather was met with during the entire trip except for one snow-storm on the 19th. Mr Magnússon plans to take another party to Langjökull later in the summer.

Other Expeditions in Iceland.

News has also been received of several other expeditions to be at work during the summer of 1935, but as the detailed plans for these are not yet available, it is impossible to refer to them except in brief.

An Austrian expedition, consisting of Professor Franz Stefan, Professor Franz Nusser and Dr Rudolf Jonas, intend to spend a month or so on Vatnajökull carrying out scientific work.

An Italian expedition led by Dr A. P. Pollenghi of Trieste will also visit Vatnajökull this summer. The party left Reykjavik on May 21 for Núpstaður, and intended to be about a month on the ice-cap.

Oxford University Ellesmere Land Expedition, 1934–35.

Brief wireless messages, sent off from Thule, North-west Greenland, have been received from the Oxford University Ellesmere Land Expedition since October, when the rather more detailed reports brought back by the ship on her return to civilisation reached England. All has gone well with the expedition during the winter and all the party are fit. It will be remembered that the party were unable to land and make their base on Ellesmere Land as they had hoped, and had taken up winter quarters at Etah (Lat. 78° N.) on the Greenland side of Smith Sound.

The party spent the winter hunting and laying depots for the main journeys, in spite of an almost continuous strong wind which kept the mouth of the fjord open, and cleared the snow from the land, thus preventing much sledge travel for either purpose. Several boat excursions were made, one to the entrance of Kane Basin to lay a food depot, though unfortunately the pack-ice prevented the party from going farther north. Walrus hunting was carried on until the fjord froze, but, in general, game was very scarce; there were few seals or walrus and no land game. The dogs were fed on the walrus caught, and on dried fish bought at the Greenland ports on the way north, thus saving the pemmican for the main journeys. Of the seventy-one dogs originally bought, forty-seven survived the winter, some of the twenty-four deaths being due to food poisoning from dried shark.

During the winter the temperature never dropped below −35° F. The wireless reception from Ottawa was reported to be uncertain owing to atmospherics, but London National and Regional were excellent. The Eskimo families who accompanied the expedition spent the winter making clothes and sledges, the material for the latter having been brought from England, in preparation for the journeys north.

After several attempts to reach Robertson Bay or Thule by way of the inland ice, which were unsuccessful owing to blizzards, Dr Humphreys and Mr Haig-Thomas left Etah on January 28, with two Eskimos, and travelling partly on the sea-ice, mostly at night and without a moon, reached Thule on February 3. Here they laid in a further supply of native equipment, and managed to catch the earlier of the two mails

to Europe. The auroral displays are described as particularly fine on this journey.

As soon as conditions permitted, the expedition, divided into three parts, set out to make the main journeys. Mr Moore and Mr Stallworthy penetrated unexplored Grant Land and discovered a new range of mountains, estimated at 10,000 ft., north of the United States Range. Mr Shackleton and Mr Bentham carried out survey and geological work along the Ellesmere Land coast, and also covered new ground; while the leader of the expedition and Mr Haig-Thomas explored Grinnell Land, where they also discovered new mountains.

The party have now all returned to Etah, where they await the ship. They hope to reach England before the end of the summer. A full account of the activities of the expedition up till their arrival at Etah was published in *The Polar Record*, No. 9.

Captain Bartlett's Cruise to the Canadian Arctic, 1935.

Captain Robert Bartlett will visit the Canadian Arctic as usual this summer on board his schooner *Effie M. Morrissey*; and left New York on June 25 for an unknown destination, his objects being mainly exploration and hunting. Eight or nine undergraduates have joined him for the trip.

Hubbard Alaskan Expeditions, 1935–36.

It is stated in the press that Father Bernard Hubbard will lead another expedition, this time to south-eastern Alaska, in the summer of 1935. In October the party will proceed to King Island in Bering Strait, where they will spend the winter, returning in the spring of 1936. Anthropological work will be carried out on the island, where the natives are stated to be the purest type of Eskimo extant, and are believed to be descended from the original cliff-dwellers of America.

Canadian Government Arctic Patrols, 1935.

The Hudson's Bay Company's supply ship will make her annual voyage to the stations in the Canadian Arctic in 1935. The expedition sailed from Montreal on July 13 on board S/S *Nascopie*. The distance to be covered, and the time occupied by the patrol, will be slightly less than in 1934, but the administrative and scientific work to be undertaken will be more extensive than in any previous year. During the trip the ship will make twenty-three calls and distribute supplies for thirty-one posts, covering approximately 10,000 miles. As in previous

years, Major D. L. McKeand is officer-in-charge of the expedition, and the personnel will include:

Dr C. C. BIRCHARD, medical officer.
W. J. BROWN, entomologist.
Commander C. T. BEARD, R.C.N., Director of Naval Reserves.
D. LEACHMAN, anthropologist.
C. H. NEY, surveyor.
D. A. NICHOLS, geologist.
Dr I. M. RABINOWITCH, medical officer.

W. M. McLean is acting as secretary to the expedition, as well as studying the postal requirements of the areas visited, while the Hon. W. G. Martin has joined the party as historian.

The expedition will make its first call at Cartwright on the Labrador coast, where mail and supplies for Frenchman's Island, David Inlet, Makkevik, Hopedale, Nain and Hebron will be landed. The next call will be at Port Burwell, where a R.C.M.P. detachment is located. Supplies will be transferred to a motor ship for delivery at the fur-trading posts and missionary stations in Ungava Bay. After touching at Lake Harbour, the expedition will visit for inspection and administrative purposes Wakeham Bay, Sugluk West and Cape Wolstenholme on Hudson Strait, and Cape Smith in Hudson Bay. At Port Harrison a site will be selected for the R.C.M.P. barracks, and materials landed for the construction of the buildings. Crossing Hudson Bay, the patrol will call at Churchill, where a supply of dried buffalo meat and green hides from the Department of the Interior herd in Buffalo National Park at Wainwright, Alberta, will be taken on for distribution among the needy Eskimos. The patrol will call at Chesterfield, delivering supplies for the posts at Chesterfield and Baker Lake, Southampton Island, Cape Dorset, Lake Harbour and Port Burwell before leaving the strait for the far north. Craig Harbour, on Ellesmere Island, the most northerly Government post in Canada, will be the next post of call. Turning southward the patrol will then call at Dundas Harbour on Devon Island, Pond Inlet, River Clyde and Pangnirtung on Baffin Island. Port Burwell and Cartwright will again be visited, and the *Nascopie* is expected to reach Halifax about September 26.

Mr Leachman, the anthropologist of the expedition, will leave the party at Port Burwell in order to conduct excavations on the Button and adjacent islands. This year's Arctic Patrol is expected to be productive of much valuable information relative to the condition of the Eskimos in the districts visited. Fur-bearing animals and other forms of wild

life on which the Eskimos depend will be the subject of particular study. A special investigation of health problems will also be made.

American Expedition to the Yukon, 1935.

An expedition has been organised, and will be at work this summer, under the leadership of Mr Walter A. Wood, of the American Geographical Society, to the Yukon territory. Among the objects of the expedition is an experimental photogrammetrical survey in the little-known region lying between Kluane Lake and the International Boundary. The expedition is under the auspices of the American Geographical Society, and the party includes:

Mrs Harrison Eustis.
Joseph Fobes.
Hans Führer.
Miss Adeline Hazard.
I. Peace Hazard.
Mr Harrison Wood.
Mrs Walter A. Wood.

American National Geographic Society Yukon Expedition, 1935.

An expedition, led by Mr Bradford Washburn, and sent out by the American National Geographic Society, was at work in the Yukon during the spring and summer of 1935; and at the beginning of March a successful first flight was made across the St Elias Range on the Canada-Alaska border in approximately Lat. 61° N., Long. 141° W.

After reconnaissance flights, the plane took off from Carcross in the Yukon Territory, on March 10, with Pilot R. Randall, Mr Robert Bates, and the leader of the expedition, on board. The plane was a Fairchild monoplane, and was in the air seven hours at an altitude of 18,000 ft. The average temperature was 15 degrees below zero, and the weather conditions perfect.

After flying across the maze of mountains between Carcross and the Alsek Mountains, the party first made a reconnaissance flight to determine whether it would be possible for a party on foot to cross the St Elias Range to the Pacific side in the course of their survey work on the three great unexplored glaciers south of Mt. Hubbard. A route was discovered, which, though it will involve some 80 miles of dog-sledging from the present base, seemed safe and feasible. The plane then headed north, following the course of the huge Hubbard Glacier for 50 miles to Mt. Logan. Before Mr Washburn's discovery it was not known that this glacier extended more than 30 miles from the coast. Then, turning

eastwards, the upper Seward Glacier was crossed, and the party obtained the first photographs ever taken of Mts. Cook, Vancouver, Logan and St Elias from this angle. At this point, the plane attained its maximum altitude of nearly 19,000 ft., and the party were obliged to descend on account of the lack of oxygen and the intense cold. On completing the photographic work a circle was made to the east round the northern end of Mt. Logan, and, skirting King Peak, the Ogilvie Glacier was reached. The party had hoped to return by way of Kluane Lake and Mount Lucania, but a heavy north-east gale, encountered soon after leaving the Ogilvie Glacier, forced them to turn back and make for their base east of Mt. Hubbard. A trip was later made to Kluane for the dog team, which was brought back to the camp, 50 miles away, by plane.

The party have made their base camp on a newly discovered glacier, 130 miles west of Carcross, and from there two and a half months will be spent in exploration and survey work. The plane will now be sent home, and the expedition will concentrate upon ground work.

Transfer of Reindeer Herds into Canada, 1929–35.

The reindeer herd, which for the last five years has been driven east from Alaska towards the Mackenzie River for consignment to the Canadian Government, has at last reached its destination, and the animals have been settled in the Reservation of 6600 sq. miles between the Mackenzie River delta and Cape Bathurst.

The trek, which has been one of the most arduous journeys of recent years, began in December, 1929, when the herd left Kotzebue Sound, in Western Alaska, in the charge of Messrs R. T. and A. E. Porsild, Mr A. Bahr, and three families of Lapp herders. Eskimo assistance was also obtained at intervals *en route*. When the reindeer started on their journey, they were expected to reach Canada at the end of three years at most. The herd then numbered 3000, and 2370 head arrived at the Canadian side of the Mackenzie River five years later, but it is estimated that few of these were the original animals. Numbers of fawns were born on the way, and the long halts for the fawning season in the spring were one of the causes of the delay in reaching Canada.

The wolves were a great menace to the herd during their journey. Hunting in packs of four to twelve, they usually attacked during a blizzard, and one winter 150 to 200 reindeer were accounted for in this way. The animals would also take fright and scatter and would sometimes run 30 or 40 miles before they could be recovered. Caribou also caused

a certain amount of trouble to the herders, as they would stampede through the herd, taking the reindeer with them, entailing several days' hard work before the missing animals could be rounded up again. A great many reindeer were lost off the coast when they got stranded on a large piece of ice, which broke off and carried them out to sea.

The work of herding was arduous. The men took 24-hour shifts, and had to ski round the herd continually to keep them together. Very often they were away as much as six days rounding up strays. The chief herders were two Eskimos, Tom and Peter Wood.

In September, 1932, the herd were some 400 miles from the Mackenzie, and in May, 1933, they arrived at Blow River, about 30 miles from their destination. January of the next year found them at Richards Island, on the eastern delta of the river, with the end of their journey in sight, but they stampeded westwards to Shingle Point in a blizzard, and the long halt for the fawning season made it necessary to wait until autumn before attempting the passage of the delta, which is 100 miles across, at that point. The crossing was not as bad as had been feared, however; Mr D. Crowley gave assistance from the Canadian side, and staked a route across. It was feared that winds might remove the snow, making the river surface too slippery for the animals to negotiate; and supplies of moss were deposited at the islands in case the animals should get stranded in midstream. But the other side was reached without undue difficulty, and the five years' trek was over.

Mr Bahr, who has been described as "the best reindeer man in the world", was sent to Alaska in 1898 to teach reindeer husbandry to the Eskimos, soon after the animals were first imported from Siberia.

Mr Manning's Work on Southampton Island, 1933–35.

Mr T. H. Manning, who has spent the last two years on Southampton Island, carrying out archaeological, ornithological and survey work, has now returned to England.

Mr Manning reached the island on board the Hudson's Bay Company's supply boat, S/S *Nascopie*, and landed at Coral Harbour in South Bay, where there is a trading post, on August 18, 1933. He spent the autumn familiarising himself with the country, collecting specimens, and doing some preliminary surveying. In December he went to Cape Low in the extreme south of the island; while the first two months of 1934 were spent in short trips inland, and seal hunting with the Eskimos. In March, 1934, Mr Manning visited Roes Welcome, which divides the

island from the mainland, and the next month went round Bell Peninsula, in the east. June was spent at Bay of God's Mercy, which was reached by sledge, where there is a large goose colony, and ornithological work was done; to be followed by archaeological work during the autumn, when two house ruins were excavated. Mr Manning returned from Bay of God's Mercy to Coral Harbour by boat in company with some Eskimos, and walked back to retrieve his four dogs and sledge later in the autumn. He returned by sledge by way of Roes Welcome and York Bay, in the north. During the winter of 1934–35 Mr Manning twice reached Fox Channel, which separates Southampton Island from Baffin Island, but was unable to follow the coast owing to the ice, which kept breaking away, and to the perpendicular cliffs. In March, 1935, a visit was paid to Cape Munn in the extreme north, and the next month he set out on his 500 miles sledge journey back to civilisation. Travelling via Chesterfield with his team of four dogs, he in due course reached Churchill, and returned to England.

During his stay on Southampton Island, Mr Manning managed to make a survey of most of the island, though owing to failure to get time signals, no longitudes were fixed in Bay of God's Mercy or Roes Welcome. Bird specimens and a few rocks and fossils were collected for the British Museum, and archaeological specimens which were presented to the Canadian National Museum. Mr Manning wishes to express his thanks to the Royal Geographical Society, the Hudson Bay Company, the Canadian Department of the Interior, the white residents on the islands, and the Eskimos, for their help in carrying out his work. He is now planning another expedition to the same region, to last several years, and to consist of four or five men besides himself.

Mr Irwin's Journey across Arctic Canada, 1933–35.

News of an enterprising sledge journey made by a young American has recently appeared in the press.

The young man, David Irwin, volunteered, in 1933, to accompany the reindeer herd which was then on its way from Alaska to Canada to form a basis of food supply for the Eskimos; but he is believed to have found the slow progress of the herd too monotonous, and he left the party at Aklavik to make a lone prospecting journey to King William Island and Boothia. Travelling by way of Great Bear Lake, he reached a point near the Magnetic Pole, in July, 1934, with exhausted dogs after a hard journey. He had expected to be able to "live off the land", but game

was scarce, and he and his dogs appear to have existed on a meagre diet of fish, caught laboriously in streams. From Boothia, Irwin started south towards civilisation again, but again lack of food nearly led to disaster. The team grew so weak that Irwin had to haul the sledge himself, alongside the dogs, in spite of blood poisoning, which incapacitated one arm. At Cockburn Bay the ice gave way under his sledge and he was left stranded without adequate clothes, firearms or means of warmth. He lived on raw dog meat until he became ill with a kind of poisoning from tainted meat and had to lie up for two days. He then pushed on and reached an Eskimo settlement, where he was nursed for six months, until he was found by some Back River Eskimos from Baker Lake. He was taken by them to the post at Baker Lake to recover from his privations, after which he continued his journey to Churchill by dog sledge. The spring was a month early, resulting in an early break-up of the ice, and many thawed areas, which had to be negotiated, causing delay and some danger. The waters of the rivers north of Churchill were flowing over the ice and he experienced constant south-west winds. Mr Irwin's journey in all covered some 2000 miles.

American Anthropological Expeditions to Alaska, 1926–34.

Recognising the importance of more intensive studies, and that particularly from the point of view of physical anthropology and archaeology, in Western Alaska, Doctor A. Hrdlička, Curator, Division of Physical Anthropology, U.S. National Museum, Smithsonian Institution, has since 1926 initiated a series of expeditions, the object of which is to obtain all possible evidence on the Asiatic immigrations into the American continent.

Such immigrations are indicated by all the substantial studies on the American Indian; and upon a visit to the regions where the two continents approach most closely together, they are seen to have been inevitable, after man had reached north-easternmost Asia.

The explorations to date consist of six expeditions under the leadership of Doctor Hrdlička, besides several under other members of the staff of the U.S. National Museum (Henry B. Collins jr., P. Dale Stewart). The work accomplished so far consists of a general anthropological and archaeological survey of the western coasts of Alaska from Point Barrow to Cooks Inlet, of the islands in the Bering Sea, and along the three principal western rivers of the territory, namely the Yukon, the Kuskokwim, and the Nushagak. These surveys included studies of the remaining

full-blood Indians and Eskimos of the region, the collection of skeletal remains, and the excavation of such old sites as appeared to be of most promise.

For the last three years Doctor Hrdlička has conducted excavations of a large pre-Russian site on Kodiak Island; in addition to which in 1932 he carried out a survey of the whole island, resulting in the location of a large number of old sites, the existence of most of which had hitherto not been suspected.

The combined results of the above explorations are of considerable importance. They consist of anthropometric and medical studies on the living full-blood remnants of the natives; in the obtaining of very large collections of both skeletal and archaeological materials; and in the recognition that the earlier migrants to America, far from being crude savages, brought with them astonishingly rich and artistic cultures.

In 1934 the excavations on Kodiak Island were conducted with the assistance of a number of college students, who received field instruction as well as a course of lectures.

The work will proceed. It has opened a vast new region, particularly to archaeology. It has already led to material modifications of some of the previously held views on American origins, and promises more for the future.

The first results of these researches have been published in *The Anthropological Survey in Alaska* (46th Ann. Rep. Bur. Am. Ethnol., Wash., 1930); in the Smithsonian Exploration volumes for 1926–34; and in the *American Journal of Physical Anthropology* (1933, XVIII, 93–135). A summary of the conclusions that so far it was possible to draw from this work appeared under the title of *The Coming of Man from Asia in the Light of Recent Discoveries* (Proc. Am. Phil. Soc., Phila., 1932, LXXI, 393–402).

Bunnell-Geist Bering Sea Expeditions and the Alaska College Expeditions to St Lawrence Island, 1926–34.

We are now able to give a brief account of the first flight from Alaska to St Lawrence Island, Bering Strait, which was made in the summer of 1934. For the last eight years, since 1926, archaeological investigations have been carried out by the Bunnell-Geist Bering Sea Expeditions and the Alaska College Expeditions to St Lawrence Island, and the present expedition was with the object of carrying on their work.

The trip by air to the island has always been regarded as a hazardous

undertaking, owing to the prevalence of fog over the Bering Sea at certain times of the year, and the sudden changes of weather frequently met with in this locality. Besides being exposed to the Bering Sea storms, St Lawrence Island is subject to violent northerly storms which sweep through Bering Strait, and expend their full force on the coast.

The 1934 expedition made a first attempt to fly to the island on July 15, but were forced by fog to return after a three-hour flight. A second, successful, attempt was made two days later. The plane, which was furnished with pontoons, took off from Port Safety, near Nome, Alaska, complete with four passengers and the equipment, and an hour and a half later reached the north-east coast of the island, which was covered in thick fog, though the three peaks at North-east Cape were visible above. Flying inland from east to west to the south of these peaks, the main island was found to be comparatively free from fog and the Kukulgit Mountains, on the north coast of the island, were reached. The peak Mt. Atok, estimated at 2070 ft. in 1933, was found to be by no means the largest of the group; on the north and south slopes of the range extensive lava flows were observed, as well as a small blue-green lake in the crater of an extinct volcano. Although forced down by lowering fog, the party were unable to effect a landing on the beach at Savoonga, midway between North-east Cape and North-west Cape on the north coast, owing to heavy breakers; and flying over Mt. Tapphook (approx. 1200 ft.) they made for North-west Cape, and made a successful landing on a large lake behind it, just south of Sevuokok (Gambell). The party report that the lake is large enough to accommodate almost any kind of amphibian, flying boat or pontoon ship, in any weather, as it is well protected. Furthermore, the island is dotted with lakes which could be used by smaller craft, while a lagoon, 50 miles long, in the south of the island, might serve as an emergency landing for even large planes.

The flight took just over three hours, half of which time was spent in reaching the island, and the rest in flying along the north coast, which is about 100 miles in length.

The excavations in 1934 were made at Kukulik, an ancient village 4 miles east of Savoonga.

Pacific Whaling, 1935.

Whalers from Victoria, British Columbia, will operate during the summer of 1935 in the whaling grounds off the Queen Charlotte Islands, with land stations at Rose Harbour and Naden Harbour; and six vessels

will leave Victoria about April 1. The whale-oil output in 1934, and also the production of whale meal, show a substantial increase on that produced in 1933, and experts expect another good season this year.

It is hoped that, before long, methods similar to those used in the Antarctic may be introduced in the North Pacific; and if present plans materialise, factory ships, equipped with their own reduction works, will be added to the Pacific whaling fleet.

Whaling in Newfoundland, 1934.

The Newfoundland Whaling Company obtained a satisfactory total of 418 whales during the 1934 season, which lasted from March until November.

The whaling operations were started at Placentia Bay and continued in the same locality until July 20, when lack of whales and unfavourable weather caused a removal to Grady, Newfoundland, where the work continued until the end of September. Fifty-six whales were dealt with at this station. At Hawkes Harbour, whaling was carried on from July 11 to November 23 and 295 whales secured. During the early part of the season the weather was fine, but later operations were hampered by fog.

Ice Patrols, 1935.

The International Ice Patrol, maintained by the United States Coast Guard Service, and paid for by the fourteen leading maritime nations of the world, started its summer duties at the end of February, 1935. The patrol has carried out its four-month vigil every summer since the loss of the *Titanic* in 1912, when, to prevent the repetition of such a disaster, the Patrol was established by the International Convention for the Safety of Life at Sea, signed in London on January 20, 1914. Since its establishment there has been no loss of life due to the collision of ships with icebergs, while between 1882 and 1890, fourteen vessels were lost and forty seriously damaged as a result of accidents of this kind in the North Atlantic.

Two cutters, the *Pontchartrain* and the *Mendota*, will patrol the Grand Banks this season, to warn ships by radio of the presence and position of icebergs. The cutters will be joined later by the Patrol Boat *General Greene*, in command of Boatswain A. L. Cunningham; the crew of twenty-four men and four officers will include an oceanographer, F. M. Soule, who will make observations on the tides, currents and the weather, and an ice-observer, Lieut. G. V. A. Graves.

The icebergs, when sighted, are kept under observation until they melt on their journey south.

Parasitological Research in the Canadian Arctic.

Research work on parasites among Eskimos and game in the Arctic has been carried out during the last few years by Dr Ivan W. Parnell, of McGill University, in co-operation with the Federal Department of Agriculture, the Imperial Bureau of Agricultural Parasitology and the Quebec Department of Agriculture; and much interesting data has been acquired. The investigations have been made principally in the Eastern Arctic, on the north and west coasts of Quebec, Labrador and Baffin Land.

The preliminary results show that pinworms are very prevalent among Eskimos, and that dogs are heavily parasitised in this region. The same holds good of lemmings and rabbits, while hydatid cysts are common in moose. The examination of caribou, moose, mountain deer and many other animals show that these animals harbour many parasites not only important to themselves, but communicable to domestic animals of the same type. The domestic animals in the province of Quebec are reported to have shown a marked improvement since the commencement of the campaign against parasites in 1930.

ROYAL CANADIAN MOUNTED POLICE

THREE PATROLS MADE IN THE CANADIAN ARCTIC IN 1934

[We publish below, from material very kindly sent us by Major-General MacBrien, the Commissioner of the Force, the accounts of three patrols made by members of the Royal Canadian Mounted Police, stationed in the Canadian Arctic. Although planned solely for administrative purposes, and thus far from geographical intent, these patrols are, we venture to hope, of interest both for their description of travel in this region of the Arctic, and also for the sidelights into the life of the Eskimo, for whose sake the journeys were undertaken.]

Patrol from Tree River to Red Rock Lake and Bathurst Inlet, Coronation Gulf.

This patrol—which was made through comparatively untravelled country, and which was the first police patrol undertaken between the Red Rock Lake district, due east of Great Bear Lake, North-west Territories and Bathurst Inlet—would have been a difficult one under ordinary conditions of spring travel. It was, however, carried out in mid-winter, when travelling conditions were exceptionally severe; and the party covered 700 miles during 37 days.

The object of the patrol, which was led by Sgt. G. T. Makinson, was to inquire into the circumstances of the death of a native woman, Krelerik; the officer-in-charge, with Sgt. Larsen and two dog teams, left Tree River Post, Coronation Gulf, on December 12, 1933, and the evening of the same day arrived at Kugaryuak opposite the Graham Moore Islands, where they met a patrol from Coppermine, consisting of Constable C. E. Wood and interpreter T. Goose, with the native Agavonna, who was acting as guide, and who had recently arrived from the Red Rock Lake district and had reported the death of the native woman to the police. Father Delorande was also at Kugaryuak with a native and accompanied the two patrols. The patrols having combined forces, they set off on December 13, heading inland; while Sgt. Larsen returned to Tree River.

For the first three days the party travelled due south, climbing gradually over tundra, river beds, and piles of rock; and, as the sledges were heavily laden with provisions and dog food to last a month, the going was of necessity slow, and very poor time was made. The party were continually forced to halt to renew the mud and ice on the sledge runners,

as there was very little snow, and they were very often forced to travel over the bare rock. On December 16 they saw the sun for the first time since early November, and had by this time reached the water-shed, and travelling conditions had somewhat improved. They were now following small lakes, joined by short portages; the former provided good travelling, but the latter were invariably rocky, and it was impossible to prevent the mud from being broken off the sledge runners. Up till December 17 the weather had been very cold, and during the next few days the temperature was estimated roughly by the party as 55–60° F. below zero. On December 21 a river, believed to be the Coppermine by the natives, was reached, though the party had no means of verifying this fact, and they travelled along it for some way, seeing signs of caribou, the first met with on the trip; and the next day reached a native camp of five families, where they remained until December 25. The news of the arrival of the patrol travelled from camp to camp, and by the evening of December 23, some 150 natives had arrived, and the officer-in-charge of the patrol had a talk with them through the medium of the interpreter, explaining the game laws and enlightening them as to the duties of the Force. The natives were a splendid type, clean and healthy, dressed in exceptionally fine deerskin clothing. They depend almost entirely upon caribou, of which they have an ample supply, for their livelihood.

On December 25 the patrol moved on to a larger camp, 10 miles away, and the next day an inquest was held on the death of the native woman Krelerik.

The officer-in-charge learnt from the natives at this point that it was possible to make a patrol across country to Bathurst Inlet, and as it was necessary to carry out an investigation regarding the alleged killing of musk-oxen at Burnside River, it was decided to make the trip; a guide was engaged, and the party left for Burnside on December 27. For three days they travelled east and north-east across country, lakes, and rocky portages. On the second day they travelled for part of the way over a large lake, which the natives reported to be a very long one, stating that they had travelled over it for two days, but had never gone to the end. On the third day after dark they arrived at a camp of Bathurst natives, and spent a day with them, drying clothes and making investigations into the illegal killing of musk-oxen. On the following day, having secured the services of another guide, they proceeded in the direction of Bathurst Inlet. January 1 was spent in camp, where they were detained

by a blizzard, but the party arrived at Burnside River on January 2, and travelled over it for about 25 miles, getting into overflow towards dark, which forced them to camp and dry their things. On the following day they cut overland, as it was impossible to proceed farther along this river owing to falls and rapids.

On the evening of January 4 the patrol arrived at the Hudson's Bay Company's post at Bathurst Inlet, where they remained, resting dogs and drying their clothes until the morning of January 7, when they proceeded on to Canalaska post some 50 miles farther north.

The party arrived back at the Tree River post in the evening of January 17, having visited all the trading posts and trappers on the way from Bathurst Inlet, along the sea-ice off the coast. Over 150 natives were seen and talked to during the patrol, which appears to have had a good moral effect, showing among other things how easily accessible the district is to the police. The patrol was a hard one, and the lack of daylight forced the party to travel from before daylight till after dark in order to make mileage. Very low temperatures were experienced, and one dog got badly frostbitten during the journey.

Patrol from Pond Inlet to Home Bay, Baffin Island.

Constable L. A. Austin left Pond Inlet, Baffin Island, on March 16, 1934, accompanied by Ooingoot, an Eskimo, with two sledges and twenty-eight dogs, with the object of ascertaining native conditions along the east coast of Baffin Island as far as Home Bay, and hunting seals at Button Point on the north side of Pond Inlet, if weather conditions permitted.

The patrol arrived at Button Point the same day, and the three following days were spent seal hunting at the edge of the floe. The sixteen seals shot gave the party ample fresh meat for the dogs during their stay, with enough to spare to last them as far as Coutts Inlet. They left Button Point on March 20, having engaged a native dog-driver named Muckie as guide, and having crossed the sea-ice in a southerly direction to the coast, proceeded in a south-easterly direction to Cape Eglinton. About 30 miles south-east of Cape Eglinton, the party struck across the mainland to River Clyde, where they arrived on March 28. Three native camps were visited on the way, at Cape Coutts, Scott Inlet and Cape Eglinton.

Two days were spent at the Hudson's Bay Company's post at River Clyde, resting dogs and repairing the sledges, and Constable Austin,

accompanied by an apprentice of the Hudson's Bay Company, left there on March 31, with fourteen dogs and one sledge, having sent the native Ooingoot, with one dog team and sledge to hunt seals from a native camp situated in the River Clyde Fjord, until the return of the main patrol from Home Bay.

Proceeding in a southerly direction, the patrol crossed the River Clyde Fjord to the mainland, which they crossed to the sea-ice in Isabella Bay, continuing their journey to a native camp situated on an island in Arctic Harbour. Home Bay was reached on April 1, the party having travelled south over the mainland and found the going excellent. Home Bay was left for the return journey in the morning of April 5, and the party retraced the outward trail, stopping for the night at the native camp in Arctic Harbour. The next day was spent in travelling over the neck of land, where they camped, and they arrived at the sea-ice in the River Clyde Fjord in the morning of April 7, and crossed to a native camp approximately 4 miles south of Cape Christian. The next day a visit was paid to the Hudson's Bay Company's post at River Clyde.

The native Ooingoot had shot four seals during the absence of the patrol, and the party had two further days' hunting during a halt at Cape Christian to rest the dogs before returning to Pond Inlet. They left for home on April 11, and having discharged the guide at Button Point on the 17th, arrived at Pond Inlet in the afternoon of April 18.

Constable Austin reported that all natives met with seemed well, though there were a few cases of cataract in the district. The dogs were also in good condition. A few deaths had occurred among the dogs, but this was evidently due to undernourishment and subsequent overfeeding. Seals were plentiful along the coast, though they had been scarce during December and January; and they were still scarce on the ice at that date, due to roughness and deep snow on the ice. Narwhal and walrus were both plentiful, but are little used by the natives for food; and the same applied to fish, which though abundant in Arctic Harbour, Scott Inlet and Coutts Inlet, are not often caught for food, as the only implement in use is a fish spear. Bears were reported to be plentiful in the River Clyde and Coutts Inlet districts; and caribou and foxes were also plentiful. Wolves were very scarce.

Travelling conditions were fair; rough ice and deep snow were encountered between Button Point and Coutts Inlet, the ice having drifted in during the freeze-up the previous autumn. From Coutts Inlet scattered ice was met with, and deep snow during the same part of the journey made it necessary to walk in front of the dogs the greater part of the way.

The surface was excellent from River Clyde to Home Bay, and the weather was perfect throughout the entire trip.

Patrol from Pangnirtung to Lake Harbour, Baffin Island.

The following patrol was made by Corporal McInnes, of the Pangnirtung Detachment of the Force, and was undertaken with the object of escorting the police interpreter from Lake Harbour, back to his own post after undergoing an operation in Pangnirtung Hospital.

The patrol, consisting of the officer-in-charge, two natives and twenty-five dogs in two teams, left Pangnirtung on March 8, 1934. The weather was fair, though, as they were travelling against a strong west wind in a temperature of 21 degrees below zero, it was difficult to avoid frostbite. The first camp was made at a native village, Imegin, on the west coast of Cumberland Sound, where there is a population of twenty-five Eskimos; the journey was continued the next day, the rate of progress slower than before owing to deep snow; and the party camped for the night on the ice. On March 10 the native village of Igloo-tell-ee was reached, and the natives found to be in a state of starvation, having been unable to procure seals since February. The men were away hunting, and the women and children living on a few Arctic hares. Corporal McInnes gave them some food and seal meat, which he could ill afford, and spent the night at the village, continuing the journey next day in clear cold weather. About noon on March 11 they met an Eskimo, Nuk-ah-shoo and his son, seal hunting. The Eskimo told them that his family had had nothing to eat for four days, and were even unable to melt snow for water as they had no seal oil for their lamps. The patrol thought it best to visit this camp, which was a short distance away, to investigate these conditions, and give what help they could. They left them a supply of food, and as Nuk-ah-shoo had a net set through a crack in the ice, and the seal should be coming onto the ice in a few days, it seemed probable that they would get more food before these supplies were exhausted. At the next camp visited, Kimmiksoon, food was not so scarce, and as the patrol needed a supply of dog food to cross the land, where no game would be obtainable, two days were spent hunting at this point.

The party left the sea-ice to make the overland crossing to Frobisher Bay in Lat. 65° 4′ N., Long. 66° 50′ W., and found travelling laborious, as the valley was filled with loose snow. The loads were rearranged, so that the leading sledge would be light to break the trail. Those going ahead found the snow so loose and deep that at times they were com-

From Pangnirtung to Lake Harbour →- - - →-

From Lake Harbour to Pangnirtung —←———←—

pelled to crawl on hands and knees. The next day, March 16, the conditions were better, and the party reached the water-shed and camped over a ridge near a small lake in Lat. 64° 39′ N., Long. 67° 45′ W. (approx.). The valley running from the sea to this point was very narrow, with high, precipitous sides; the ascent was gradual, and the valley ran more or less in a south-westerly direction. The next day the party continued travelling in a south-south-easterly direction. The country for the first part of the day had the appearance of rolling prairie, but later in the day it became more hilly, and as the tops of the hills consisted of small broken rocks, travelling became more difficult as the day advanced; there were also no landmarks and the party, having no compass, had to take the direction from the sun. At noon on March 18, after winding about small hills and avoiding with difficulty the windswept rocks, the party reached a large river, which has its source near Lat. 63° 45′ N., Long. 66° 15′ W., and flows in a west-north-west direction gradually swinging to the north, then turning east reaches the sea at the head of Cumberland Sound, somewhere near Nettiling Fjord. The party crossed the river, after which the country became more hilly, and they had difficulty in finding a route among the rocky hills; until on the evening of March 19 they reached a waterfall, which was recognised by one of the natives, who had been there the year before, as the route to Ward Inlet. The waterfall proved to be one of a series, some of them necessitating the unloading of the sledges and complicated portaging round the falls, but in spite of these delays, Frobisher Bay was reached at Ward Inlet in the afternoon of March 20. The following night was spent at a native village. The living conditions there were not so good as those on Cumberland Gulf, as the natives depend for food on the meat they lay up during the autumn, while during the winter they are busy trapping foxes. This generally results in oil and meat running low during the latter part of the winter. On March 21 the party travelled up Ward Inlet, as far as the Hudson's Bay Company's post, which is situated in a fjord off Frobisher Bay, a few miles to the east of Ward Inlet, and not in the inlet itself, as is marked on some maps. Two days were spent here seal hunting, but game was scarce, and being unable to procure enough meat to last on the long overland crossing to Cumberland Gulf, it was decided to push on to Lake Harbour, and lay in seals for the long land crossing to Cumberland Gulf later in the season when game would be more plentiful. The party left the Hudson's Bay Company's post at Frobisher Bay on March 30, and camped that night at a native camp, beginning the land crossing to Lake Harbour in the morning of the next day, and

camped in stormy weather beside a frozen rapid. On April 1 the party made a start in good weather, which became rapidly worse as the day went on. The storm hid all landmarks, but the interpreter had been that way from Lake Harbour to Frobisher Bay, and was able to act as guide. At noon they reached the watershed, and found their way down the valley leading to Hudson Strait. Although there was a few inches of fresh snow, the mileage for the day was good, and they camped, continuing the journey the next day in less favourable conditions. They arrived at their destination on April 3, after slow going for the last few miles, and stayed there until April 21; the mild weather and deep snow making it impossible to return.

The patrol left Lake Harbour on their return to Pangnirtung on April 21, having the assistance of two natives belonging to the station for part of the way. Travelling conditions were much better than they had been on the outward journey, though stormy weather was met with before reaching Frobisher Bay, where the dogs, now in a bad condition, due to shortage of food, were given three days' rest. The journey was continued on April 28. The land crossing to Cumberland Gulf was started on April 29, and in spite of stormy weather, the surface was good and the party were able to pick up their outward trail. They reached the coast again on May 3, and stayed a day at the native village of Kimmiksoon, to rest the dogs before proceeding on the last stage of the journey. Instead of following the coast, it was possible to make a straight line for Pangnirtung across the sea-ice which was still frozen, and, after a night spent on the ice, Pangnirtung was reached on May 6.

This was the first time the police had used this route to Lake Harbour from Pangnirtung, and the following remarks were noted by Corporal McInnes for the guidance of the future patrols. He believes this to be the best route between the two places, and also the shortest, and regrets that he was unable, through bad weather, to build a series of cairns along the route, marking specially the small river which leads into Ward Inlet. On reaching the top of the land, going to Frobisher Bay from Pangnirtung, a future patrol is advised to travel south by west, gradually swinging so that in approximately three days' travel they will be directly south of the starting-point on reaching the top of the land. This route is over flat rolling country until starting to work down into the river bed leading to Ward Inlet. The best date to leave Pangnirtung would be about April 21, as seals are scarce at Frobisher Bay until the latter part of April, after which they should be coming out onto the ice.

The patrol was away sixty days, and covered some 950 miles.

ANTARCTIC REGIONS

British Graham Land Expedition, 1934–37.

As published in *The Polar Record*, No. 9, the British Graham Land Expedition left the Falkland Islands for the south on December 31, 1934; an advance party consisting of Hampton, Bingham and the forty-nine sledge dogs having preceded them on board R/R/S *Discovery II*, which left Port Stanley on December 2. They took with them the plane, a large consignment of fuel oil and part of the stores; and after a preliminary attempt to reach Port Lockroy, which was rendered inaccessible by heavy pack-ice, they were landed at Deception Island and picked up again later, the scientists on board *Discovery II* having meanwhile carried out work in the South Shetland Islands. They finally arrived at Port Lockroy on January 11.

The main party, on board M/Y *Penola*, having re-rigged the ship, left Port Stanley on December 31, but the next morning at 2 a.m., when only 30 miles from Port Stanley, it was discovered that the engines were running out of alignment and the expedition was obliged to return to land to investigate the trouble. Running before a strong southerly wind they reached Port Harriet, an inlet south of Port Stanley, under sail, where it was discovered that the engine beds had moved, endangering the transmission. The party were now faced with two alternatives: to rebuild the engine beds at Port Stanley, which would take six weeks and entail wintering in the Falkland Islands, as they would thus miss the open season on the west coast of Graham Land; or to disconnect the engines and sail south without relying on their aid. The latter course was decided upon, and the ship sailed at once for Port Lockroy, where the necessary time spent in adjusting the engine beds would not be wasted. The expedition left the Falkland Islands once more on January 6. The weather during the voyage was, though variable, exceptionally favourable. The ship was becalmed for a day or so during the passage, but no contrary winds were met with. When east of Cape Horn the expedition had tea on deck on a clear, still and sunny afternoon. Two days later they were running before a north-west wind which at times reached gale force, and the ship, with sails furled right down, made her best speed since leaving London. During the storm the steering gear was

damaged, but an emergency tiller was brought into use, and the ship hove to, while the starboard watch carried out repairs, which were completed within an hour.

The expedition made their expected landfall, in spite of overcast weather, which prevented adequate astronomical observations, on the morning of January 20, when the mist lifted to disclose the steep snow-covered coastline of Smith Island, one of the South Shetland Islands, 15 miles to the south. A few hours later the first iceberg, a large tabular one over 100 ft. high, was passed.

Having passed through Schollaert Channel and De Gerlache Strait, the ship reached Port Lockroy on January 21, and anchored outside some small islands in the centre of the harbour, as the inner part was still blocked by ice. The ice-cliffs in the bay were breaking rapidly, and an anchor watch was necessary to prevent damage from floating ice. Hampton and Bingham had already been landed on one of the small islands by *Discovery II*, and there, and at Deception Island had shot sixty-five seals to serve as fresh meat.

The first job on reaching Port Lockroy was to rig the seaplane for a reconnaissance flight to prospect for a suitable site for the base, and on January 27, after a short trial, Hampton, Ryder and Rymill flew down the coast as far as Beascochea Bay, returning by the direct route outside the islands. They found that the forbidding coastline offered no place where it would be possible to build a base hut, nor harbours to provide anchorage for the ship. At the foot of the coastal mountains there was a thick hard fringe of ice, and the shore was an unbroken line of inaccessible ice-cliffs. A promising place was, however, found in the Argentine Islands, west of Waddington Bay, and about 30 miles south of Port Lockroy, and early the next day Riley, Ryder and Rymill left on board the motor boat, *Stella*, to make a closer examination of the islands, and to take soundings of the channels. The weather was calm, and when they returned to the ship they gave an enthusiastic report of the site chosen. It had been hoped that the expedition might winter farther down the coast, as far south as possible, and if necessary send the ship north for the winter; but it was found that the work of repairing the engine beds would take so long that it would be impossible to do this at Port Lockroy, and then sail south before the winter; while without the necessary repairs the ship would be only reliable for a short voyage in a calm sea. The expedition was transported to the Argentine Islands in two relays, without serious incident, although the ship was held up by

bad weather twice on the second trip. The navigation was far from easy, especially south of Port Lockroy, where there are a great many uncharted reefs and rocks. The channels between the islands and the mainland are liable to be blocked by icebergs, broken-off glaciers and ice-cliffs in the vicinity; although the coast was completely free from pack-ice. Rymill and Hampton went ahead to the Argentine Islands by air, and Riley and Roberts formed another advance party, having sailed to the new base in the *Stella* in order to be on the spot to tow the seaplane into the shelter of the creek on its arrival. When the rest of the party arrived on February 14, they had already laid the foundations of the base hut, which was completed in three weeks, together with dog-stables, a shed, a wireless station and a meat store. The base hut has two storeys, and an enclosed porch in one corner to house the electric generating plant for wireless and lighting. The two rooms are built with double thickness boarding, and insulated by metallic paper being placed between the inner and the outer walls. The lower room, which serves as workshop, kitchen, dining-room and wireless room, is 22 ft. × 15 ft. The sleeping quarters are on the upper floor, while the loft above is used for storing. The hangar adjoins the hut and houses the aeroplane, tractors, sledges and spare parts; a shed at the back of the hangar accommodates equipment and dog food.

The ship was anchored a quarter of a mile down the same channel in a sheltered cove.

Before the onset of winter, the plane had flown some 1300 miles, chiefly on reconnaissance trips. In mid-February, Hampton and Rymill went up to prospect for a sledge route across the interior of Graham Land in this latitude. Owing to ignition trouble they were unable to climb higher than 9000 ft. and were still just below the altitude of the high plateau which forms the interior. Although at first this plateau, which is bounded by sheer cliffs, appeared inaccessible, they managed to discover two possible climbing routes to the summit, though they saw no passes by which sledge journeys could be made eastwards for depot laying. On February 23 another flight was made, this time down the west coast as far as Matha Bay, in the hope of finding better routes across the mountains farther south. They discovered an island in Matha Bay suitable for an advance base from which sledge journeys might be made southwards on the sea-ice. Another important discovery was that Crane Channel, which Wilkins described as a strait extending from the east westwards across Graham Land, the existence of which has since

been doubted, is either an ice-covered strait, or is at least sufficiently low to afford a sledge route across to east Graham Land. As a result of these discoveries there seems every hope that the party may be able to carry out the main object of the expedition, i.e. the exploration of the unknown coast between Charcot Land to the south-west and Luitpold Land to the south-east.

Scientific work has been carried out continuously whenever conditions made it possible, and while at Port Lockroy the biologists were able to study a large colony of Gentoo penguins. In the autumn Stephenson, Roberts and Fleming made two short flights in order to plan the survey and scientific work on the islands. Bertram found a slope of arctic vegetation about four acres in extent, which has given him opportunities for botanical work.

During the winter the ship's engines are being completely overhauled by Millett. The rest of the ship's party will restow gear, dry out and mend sails, overhaul the running gear, besides strengthening the foremast and making a new boat.

The party report plenty of seals and penguins, and during a fortnight on one of the most westerly of the Argentine Islands, eighty of the former were killed to supplement the winter's food supply. The winter is being spent in hard work in preparation for the spring journeys. The temperature has so far been mild, but it is expected that the creek between the ship and the base will freeze before long, permitting the use of the plane which had been laid up until the ice should be strong enough for it to take off from.

The latest news of the party was published in *The Times* on June 21. It gives a description of a motor-boat journey to Beascochea Bay, and it appears that all the party are fit, and preparations going ahead well for the spring.

Byrd Antarctic Expedition II, 1933–35.

Admiral Byrd's second expedition to the Antarctic has now returned to civilisation, having arrived at Dunedin on February 18. In the preceding number of *The Polar Record* the report of the work of the expedition ended with the return of the leader to the base after his sojourn of four and a half months on the Barrier, and the start of the three sledge parties south. We will take up the narrative at this point.

A sledge party, led by P. Siple, and consisting of S. Corey, O. Stancliffe and F. Allen Wade, left Little America for the Edsel Ford Mountains,

Marie Byrd Land, on October 15, equipped with three teams of nine dogs, and rations for 110 days. They planned to follow the trail of a tractor party led by H. June, which had left for the same locality at the end of September, and which actually returned to the base on October 21, six days after the departure of the sledge party, having had a successful trip.

Siple's party made a journey of about 825 miles, apart from extra side trips for scientific investigations. Travelling through Scott Land and Marie Byrd Land, and the Edsel Ford Range, they reached the head of the Bernt Balchen Glacier before turning homeward on December 8; and arrived back at Little America after an arduous journey over soft surfaces on December 30. On reaching the Edsel Ford Mountains, the party separated into groups of two, and proceeded to carry out their scientific work. The biological group—consisting of P. Siple, biologist, and S. Corey, dog driver—turned eastwards and crossed the domed ice-cap of Marie Byrd Land, reaching a point 100 nautical miles north-east of the Fosdick Mountains. Two dozen separate species of moss and lichen, some of which are believed to be new to science, were collected on ice-free peaks during the trip, and the thaw pools on the mountain sides contained microscopic forms of life. The algae found in the Fosdick Mountains also harboured interesting forms of life, and a skua rookery was discovered nearly 100 miles from the sea.

Messrs O. Stancliffe and F. Allen Wade, who constituted the geological section of the party, worked along the foot of the Edsel Ford Range, as far as Saunders Mountain. They found that the mountains were composed for the most part of pink and grey granite of great age and old folded schists, all of which are pierced by dolerite dikes. In the Donald Woodward group of the Edsel Ford Range a deposit of galena was found which is believed to be associated with zinc and copper, suggesting that these mountains are rich in mineral resources. An extinct volcano was discovered in the Fosdick group.

The party had several narrow escapes among crevasses, and S. Corey broke a wrist falling down a mountain side on skis, but all four men returned to the base in good condition, having only lost three dogs.

The geological party led by Quinn A. Blackburn and consisting of Stuart Paine and Richard Russell left Little America on October 16, supported by three dog teams under Captain A. Innes-Taylor and two tractors in charge of E. J. Demas. The plateau party led by Dr E. H. Bramhall and C. G. Morgan left the base at the same time and the two

parties travelled together as far as Lat. 81° 22′ S., Long. 161° 24′ W., where they received a message telling them to return to the assistance of the tractors, which had got into difficulties among crevasses. On reaching the tractors, the two parties escorted them eastwards, but they were again blocked, three days later, at a point 173 miles south of Little America. It was therefore decided to revise the plans for the southern journeys; two members of the plateau party, Dr E. H. Bramhall and C. G. Morgan, elected to stay with the tractors, while the geological party borrowed the two dog drivers of the original plateau party to act as supporting party and lay depots. The geological party also took one of the teams belonging to the plateau party and nine dogs of another team, to make up the support they had lost through the failure of the tractors, and on November 6 left the tractor party. The supporting party of Ronne and Eilefsen, the Norwegian dog drivers, having laid the last depot, returned to the base on November 14.

The geological party reached within 180 miles of the South Pole, and turned back at the head of the Thorne Glacier in the Queen Maud Mountains in approx. Lat. 87° S., Long. 152° 30′ W. They were then at a height of 7000 ft. and virtually on the edge of the polar plateau. They returned on January 13, having been in the field eighty-eight days. The objects of the geological party were less exploratory than for geological investigations, and their chief purpose was to penetrate the partly explored western margin of Marie Byrd Land. At the head of the Thorne Glacier, 212 miles from the South Pole, the party found extensive deposits of coal and fossilised plants, leaves and sections of prehistoric tree trunks from 1 ft. to 18 in. in diameter.

Eastward of the Thorne Glacier, a stream of ice lying between the foothills and the main escarpment of the Queen Maud Mountains, previously identified as the Leverett Glacier, seemed to be part of an intermediate plateau, or 2500 ft. terrace lying between the Ross Ice Barrier and the high polar plateau, and providing a terraced descent for the ice creeping down from the polar plateau onto the lower heights of the Marie Byrd Land plateau. If this interpretation of the report of the party is correct, it appears that at approximately the 145th meridian west, the polar plateau, flowing past and submerging all but the higher peaks of the Queen Maud Range, merges with the high plateau of Marie Byrd Land and continues to the coast through 15 degrees of latitude. The magnitude of the central ice cap is therefore greatly enhanced east of the Leverett Glacier.

The Thorne Glacier, hitherto unexplored, was found to be 120 miles long, placing it next in size to the Beardmore Glacier, the largest in the world. At the point where the party turned back, within 20 miles of the head of the glacier, there were no mountains farther south. The party reports that the Queen Maud Range is made up of superb tabular and dome-shaped masses rising to heights of 10,000 and 15,000 ft. with long glacier valleys. From the summit of a newly discovered peak, about 115 miles up the Thorne Glacier, and about 7000 ft. high, the party were able to verify the supposed north-easterly trend of the range. A steep escarpment roughly followed the 86th parallel for about 70 miles, which was the limit of the party's vision.

The adventures of the tractor party continued until December 13. On December 3 they were reported to have extricated themselves from the crevassed area, and to have reached the plateau extending southward over Marie Byrd Land. They had already had a fresh supply of fuel brought to them by plane, and rations were lasting well. On December 13, when 150 miles east-south-east of Little America, tractor No. 2 broke down with a punctured crankshaft, and had to be abandoned as being beyond repair. The party of five men continued their journey in tractor No. 3, and reached the base safely, a supporting party consisting of Captain A. Innes-Taylor and a dog team having been sent out to assist, if necessary. During the return journey Dr E. H. Bramhall and C. G. Morgan made a series of magnetic measurements and seismic soundings over the tractor route.

The ship *Bear of Oakland*, commanded by Captain R. A. English, arrived at Little America on January 20, having coasted the Great Ice Barrier from Cape Crozier to the West Cape of the Bay of Whales. The Barrier was found to be 12 miles north of the position fixed during the *Terra Nova* survey of 1911, during nearly the whole of its winding length, making its rate of movement half a mile a year. This was the fifth survey of the front of the Barrier since its discovery by Sir James Ross in 1845. Borchgrevinck's survey first showed the retreat; the other two surveys were made by the Scott expeditions, and the rate of movement between the two was estimated at 1000 yards a year. The front of the Barrier was found to have changed greatly since the last survey. The sea-ice first broke up in the Bay of Whales on December 27 and several icebergs drifted from the east to the mouth of the bay.

The loading of the ship was hindered by heavy seas and the breaking ice, which several times drove the ship from her berth alongside the

northern edge of the ice in the Bay of Whales; but the *Jacob Ruppert* arrived on January 25, and the whole expedition left Little America on February 5. Unfortunately, owing to heavy seas and variable ice conditions, it was impossible to embark the tractors. The two ships made a call at Discovery Inlet to embark some live penguins, and then headed north. Dunedin was reached on February 18.

The scientific results of the expedition will, it is hoped, be published in a forthcoming issue. Of particular interest will be the results of the seismic soundings carried out by C. G. Morgan, during the return of the tractor party, and Dr Poulter, in the neighbourhood of the base, including seven points on a 25 miles radius of Little America, which he reached by plane. These soundings may, it is stated, revolutionise the present idea of the Great Ice Barrier as being largely water-borne. It is now suggested that the ice of the Barrier is supported by an anchor on numerous submarine reefs and peaks. A hill rising on the Barrier about 15 miles south of Little America has been identified as an island, the summit of which is 1000 ft. above sea-level, and capped by 400 ft. of ice.

The cosmic ray research carried out by the expedition also promises interesting results, and the meteorological observations included a series of high altitude meteorological soundings made in September, 1934, in temperatures 50–60 degrees below zero. The autogiro was equipped with instruments for making a continuous registration of temperatures, barometric pressures and humidity at different altitudes. Through September these flights were made on every clear day until the machine crashed (see *The Polar Record*, No. 9). The flights were resumed when the major flights of the expedition were over, and one of the planes no longer needed as a stand-by for emergencies.

The use of the wireless on the expedition is also worthy of comment. Each field party was equipped with a transmitting and receiving set and reported to the base at regular intervals—as many as five parties have reported to the base in a single day. When important flights were pending, parties in the field kept the base informed of weather conditions. The planes were in constant communication with the main base and were able to keep field parties informed of crevasses and surface conditions in general in their line of advance.

Terrestrial magnetism studies were made by Dr Bramhall.

Norwegian Discoveries in the Antarctic, 1935.

The following account of the discovery of Ingrid Christensen Land

in the Enderby Sector was compiled from a report sent by the captain of the oil-tanker *Thorshavn* from the South Atlantic on March 11, 1935, to Consul Lars Christensen of Sandefjord and forwarded to us by him.

The tanker *Thorshavn*, which is owned by the Lars Christensen Whaling Company, arrived alongside the factory ship *Solglimt* on February 4, 1935, but bad weather prevented the transfer of the oil cargo, and the ships remained in more or less the same position, until they proceeded south together on February 13, hoping to find shelter to carry on the work. They found thick pack-ice the same day in the lee of some icebergs, and having passed through it, reached a calm open sea on the 17th, and found protection in the lee of a large plateau iceberg. Here the work of transferring the cargo was continued, and was concluded at 10 p.m. on February 18.

On the way south echo soundings showed a marked lessening of the depth of the continental shelf, which, on February 15 and 16, was found to have risen from 4000 to 2715 m. in 21 nautical miles; and to have a moat 350–500 m. deep extending south-east towards the continent. A whale-catcher was sent 25 nautical miles in a westerly direction to ascertain the extent of the ice-field at this point. It reported thick pack-ice as far as could be seen. Soundings and general conditions seemed to suggest the near proximity of the continent, and it was thought best to follow it, and thus avoid the risks of penetrating the ice-field. The ship steered south until 10.30 p.m., when it was stopped by the darkness; and drifted during the night, resuming the course southwards the next day at 3.45 a.m. Echo soundings showed a very uneven sea floor, with depths varying as much as from 1700 m. to 70 m.

The noon observation on February 19 gave the position as Lat. 67° 38′ S., Long. 80° 35′ E., a little before 12, and a barrier edge was seen running south-east. The weather was perfect and the barometer very high and steady, and it was decided to follow the coast. The ship sailed south until 1.45 p.m. when, being 2–3 miles from the barrier, the course was changed to south-south-west. This direction was followed until 2.30, when the ship turned westwards to escape a mass of icebergs.

At 4.43 the ship was in Lat. 68° 1′ S., Long. 80° 10′ E. Later, at 8 p.m., they stopped for repairs to the echo-sounding apparatus and drifted during the night, avoiding the icebergs, which were moving westwards. At 12.20 a.m. on February 20 the position was Lat. 68° 4′ S., Long. 79° 11′ E., and at 3.45 a.m. the depth was found to be 275 m. The course of the ship was as follows: at 4 a.m. west-north-west in order to negotiate

the icebergs; at 5.45 a.m. west-south-west; at 6 a.m. south-west to south; and at 7.35 a.m. south-east, where ice-free land was visible. Echo soundings showed depths of: at 5 a.m., 200 m.; at 6 a.m., 250 m.; at 7 a.m., 320 m.; and at 8 a.m., 140 m. At 9.40 a.m. the ship was 5 nautical miles from an ice-free coast extending to the south-west. The weather was splendid, with light winds from the east. A rowing boat was manned by Captain Klarius Mikkelsen, the captain of the *Thorshavn*, his wife and seven men. The party took provisions for a short stay on shore, and material for building a cairn, and after a difficult passage between rocks and icebergs, reached the land about 10.30 a.m., landing in a small bay between two high promontories.

The land was undulating and rose steeply to a height of about 125 m. On the rocks there was a large Adélie penguin rookery, with half-grown chicks. The rookeries stretched away as far as could be seen, some of them quite large, and the ground was more than a meter thick in yellow guano. No vegetation was seen. Between the two promontories a little valley led to a lake, 30–35 m. above sea-level, from which a stream ran down to the sea. The sea, river and whole coast were free from ice or snow.

The Norwegian flag was hoisted in Lat. 68° 39′ S., Long. 78° 36′ E. on one of the promontories, about 50–60 m. high, with a wide view of the sea, and a cairn was built. The party named their new discovery Ingrid Christensen Land. Some photographs were taken and a collection of rocks made. The land was found to be formed of sedimentary rock, with strata 2–3 m. thick of a harder, dark rock.

The boat returned to the *Thorshavn* at 2 p.m., and two hours later the ship continued south, echo soundings showing a very uneven sea floor, with depths from 35 to 400 m. The land for the first stretch was quite ice-free, and consisted of broken-up peaks of varying heights up to 200 to 300 m., which were named the Vestfold Mts. The yellow colouring of some of the slopes was thought to be due to penguin rookeries. Behind the mountains an ice-cap was seen rising to the south. This stretch of coast terminated in a crevassed glacier; about 9 miles away to seawards there were a few ice-free islands.

For the next 11 miles the coast was dominated by the snow-free Ranvik Mts., discovered and named by the expedition, which were similar in form to the Vestfold Mts., until a glacier was reached, about 10 nautical miles across, and 50–100 m. high, fringed by ice-free skerries. This was followed by some 40 miles of ice-free coasts, rising to the Larsen Mts., and terminating in a barrier, with an ice-cap rising landwards. At the

junction of the ice-free land with the barrier, two large islands were discovered. Most of the mountain slopes were of a yellow colour and were apparently covered with penguin rookeries.

On February 21, at 2.15 a.m., the position given by an observation of the stars was Lat. 68° 49′ S., Long. 77° 10′ E., and two islands were sighted, one S. 1° E. and the other in S. 35° E., a distance of about 4 miles away. At 3.15 a.m. the ship continued along the coast, being obliged at 8 a.m. to steer in a more westerly direction, while the coast had an east-south-easterly trend. At 11 a.m. in Lat. 69° 49′ S., Long. 73° 50′ E. a mountain was sighted, and named Mt. Caroline Mikkelsen. This was the most southerly point observed. From here the barrier coast took a north-north-easterly direction for some distance, and then turned north-north-west. At noon the position was Lat. 69° 11′ S., Long. 74° 20′ E. The ship continued to the north-north-west along the barrier edge, but was stopped at 3 p.m. by pack-ice, which was not cleared until 7 p.m., when the *Thorshavn* continued towards the *Ole Wegger*. At 2.15 two mountains were seen in Lat. 69° 12′ S., Long. 72° 50′ E., and named provisionally the Suevold Mts. From the east all view of these two ice-free peaks is hidden by the inland ice.

The new land was followed for about 275 miles of coast, 65 miles of which was free from snow and ice. Echo soundings were taken continuously during the trip. The long ice-free coastline, and the large number of rookeries, and their thick guano deposits seem to suggest that this part of the Antarctic is accessible every year to ships. The coast has good landing possibilities and good water, while the abundance of penguins and seals seem to solve the food problem. There are sites for huts on flat, protected plains, and material for building. It is quite probable that even better harbours may be found farther along the coast. All these facts may be of the greatest importance for future explorers of the region.

Ellsworth Antarctic Expedition, 1935–36.

It is stated in the press that Mr Lincoln Ellsworth intends to make a renewed attempt to fly over the Antarctic from the Weddell Sea to the Ross Sea in the open season of 1935–36; following much the same route as that laid down for his second attempt at a trans-Atlantic flight last winter. Accounts of his two previous expeditions with this end in view may be found in *The Polar Record*, Nos. 7 and 9.

Mr Ellsworth plans to leave Montevideo on board his ship *Wyatt Earp*

on October 20, 1935, and make for Dundee Island, to the south of Joinville Island, at the north end of the Weddell Sea, and 90 miles north of Snow Hill Island. Here the party, which will include Sir Hubert Wilkins and two Canadian pilots, besides the ships' crew of sixteen, will wait for favourable weather and ice conditions for the flight to the Ross Sea. On arrival at their destination at Little America, the plane party will wireless to the ship which will sail round to the Ross Sea and pick them up.

Mr Ellsworth will be accompanied on the flight by the chief pilot of the expedition, Mr H. Hollick-Kenyon of Winnipeg.

DISCOVERY II: AN APPRECIATION OF THE WORK DONE DURING HER THIRD COMMISSION

BY J. M. WORDIE

The Royal Research ship, *Discovery II*, arrived at St Katherine's Dock, London, on July 4, thus completing her third commission, like the others of twenty months' duration so as to cover two Antarctic summer seasons. The scientific work has this time been in the charge of Dr N. A. Mackintosh, with Mr H. F. P. Herdman as chief hydrologist, and Lieutenant A. L. Nelson, R.N.R., in executive command.

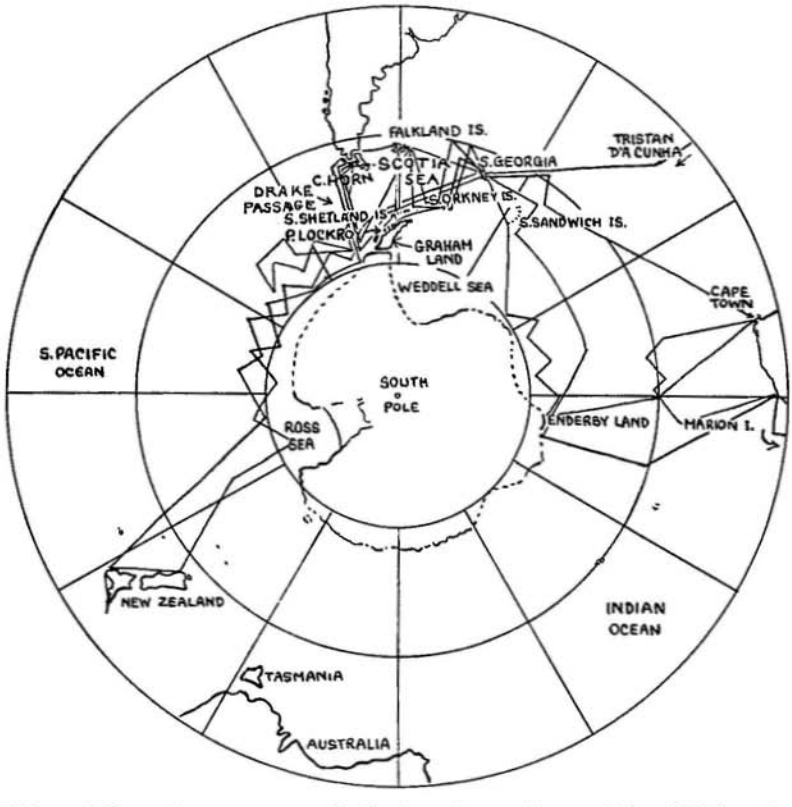
She left the Thames on October 21, 1933, and five weeks later was on the whaling grounds at South Georgia, having made a slight détour to the east in order to call at Tristan da Cunha. Two days were spent at the island; stores and mails were landed, and particular importance attaches to the careful medical examination which was made during this period by the ship's surgeon, Dr Purser, who found the physical standard to be satisfactory. The captain was impressed by the natural politeness of the islanders, the doctor by their cleanliness both in person and in clothing, despite the absence of soap.

A few days only were spent at South Georgia, which was reached on November 28. A line of stations was then made across the Scotia Sea to the South Shetlands, and from there due north in Long. 78° W. to the western opening of the Straits of Magellan. This was part of a considered programme begun on a previous commission in order to make repeated studies in full of the nature of the sea water and of its plant and animal life across the western end of Drake Passage, a sector of the Antarctic where the conditions are not complicated by the presence of submarine banks and island groups. The primary object of the observations is to follow the great seasonal changes in the water movements and so trace the circulation of the marine animals and plants on which the whales and all other Antarctic life are ultimately dependent.

A return was then made to Port Stanley in the Falklands, and stores and fuel were taken on board for crossing the Pacific.

Stanley was left on December 27, 1933, and the passage across to Auckland took five weeks. It was carried out in the following way: the ship would first run down diagonally to the ice-edge, make observations, and then steam north-west for a day and a half, turn sharp left,

and so back to the ice-edge. It was so arranged that two stations were always made at the edge, one in the late evening on arrival and one on the morning following; should the ice-pack be unexpectedly far north the ship would skirt westwards along it till the normal observation time. By this method the stations were properly spaced and also a fragmentary but sufficient knowledge was obtained of the general run of the ice-edge. In this way the ship zigzagged to 150° W., whence a direct line was taken to New Zealand.



Thirty full stations were made during the cruise, and in addition there were nineteen subsidiary "towing" stations. This was a remarkable achievement only made possible by the mutual understanding and efficiency of both scientists and crew. A full station takes from three to four hours; it includes a sounding and the noting of meteorological data; of chief importance are the observations of sea temperature taken at least twenty points between the surface and the bottom—here from

two and a half to three miles deep—and the collection of water samples for chemical analysis from these same points. Concurrently a series of hauls are made, both vertically and horizontally, with nets of varying mesh; those of finest mesh (200 meshes to the linear inch) are designed to collect the microscopic vegetation which constitutes the "pastures" of the ocean, and is as important at sea as on land; those of medium mesh are for the smaller forms of animal life, including young stages of whale food; and the largest for the adult whale food, a prawn some $2\frac{1}{2}$ in. in length—the so-called "krill", which forms the only food of the large rorquals. A towing station is confined to using certain of the nets to keep a check on the intervals between stations, as the distribution of the animal and plant life is sometimes patchy.

The return voyage from New Zealand was begun somewhat earlier than had been planned as it was urgently necessary to go down to the Ross Sea to help Rear-Admiral Byrd. The full account of this episode has already been given by Vice-Admiral Sir Percy Douglas in *The Times* of July 16, 1934. It may be recalled that Byrd's appeal was taken up by *Discovery II* at Auckland on February 9; she left on February 11; on February 14 she was at Dunedin, and making all speed left next day at noon for the South. It was a race against the winter freeze-up in the Ross Sea. Byrd's ship, the *Bear of Oakland*, was steaming north to meet her, and on February 22 they met, and made the transfer of personnel and stores of which Byrd was so much in need. The speed and energy shown by the captain on this occasion deserve the highest praise. The two ships were about twelve hours in company; less than an hour after they parted *Discovery II*'s staff were at work on their first station.

The routine on the return was of the same nature as on the outward voyage—a series of zigzags to and from the ice-edge, so shaped that the north point of each tack should be approximately in the same longitude as the south points of the outward tacks. The season, however, was now late, and a passage in these high southern latitudes was not without risk. At times the ship ran into newly forming ice in the different stages of its growth from scum like soapsuds or smallish disks to the larger "pancake" several feet in diameter. Peter I Island was passed on March 8; and finally the south to north series of stations in about the meridian of 80° W. was repeated, and passing through Magellan Straits *Discovery II* finally reached Port Stanley on March 22, 1934.

By completing the return route of the Pacific cruise she rounded off the second stage of a long-range programme. A close examination of

ice-edge conditions in the Pacific was to be the central feature of the third commission. The first stage had been carried out during the second commission when the Antarctic was circumnavigated, and the positions determined of the two major water boundaries known as the sub-tropical and Antarctic convergences. What was now being studied was the region in the Pacific between the Antarctic convergence and the ice-edge. A particular reason attaches to this work being done. The Pacific has not so far been the scene of any pelagic whaling, and this sector of the Antarctic has accordingly at times been suggested as a possible sanctuary. This, however, raises two problems: whether there is any concentration of whales in the Pacific comparable with that found in the Atlantic, and if this is the case whether the whales there are of interchangeable stock with the Atlantic whales. Answers, it is hoped, will now be given to both these questions.

A few days only were spent at Stanley. The Falklands were left on March 27, and on March 30 the ship passed east of Clarence Island and Elephant Island, where Shackleton's men had wintered in 1916. Thence she made the South Orkneys, and from there took a line of observations northwards along the 44th meridian, reaching South Georgia on April 10. This short cruise provided information on the eastern portion of Drake Passage for comparison with the west, and is part of a series of observations, now nearly complete, which covers the whole of the Scotia Sea, and as much as possible of the Weddell Sea.

As can be gathered, *Discovery II* spends very little time in port. The work goes on almost continuously, and is on occasion carried on even in the winter months. It was arranged on this occasion that a rest and the refit should take place at Simonstown. She sailed from South Georgia on April 20, and took a curving route down the east side of the Sandwich Group, across the 4000 fathom Sandwich Deep, and so to a point about 100 miles from Enderby Land. Of this period the captain writes that he has never known so much heavy snow and consequent bad visibility. Gales were frequent. Her farthest at this point was in 64° 37′ S., 44° 16′ E., on May 8 among forming ice. She turned north that night and ran a further line of fifteen stations to the Cape, and berthed finally at Simonstown on May 27.

The second season began almost as much under winter conditions as the first in its turn had ended. Such was necessary in both cases, as the programme had been laid down that a comparison was required of summer and winter conditions in the Falklands sector, *Discovery II* sailed from

Capetown, therefore, on August 1, 1934, carried a chain of stations to South Georgia, and as in the previous season made lines in the Scotia Sea, and finally again in 80° W. This bad weather period ended with her arrival at Magellanes in the middle of October; a notable discovery had been the fixing of the positions of greatest concentration of the plankton at different seasons, which goes far to settle an important problem which had not hitherto been solved.

The previous season's work may have appeared both full and varied. The second was equally so. The Pacific was again in the forefront of the programme, but work was now confined to the eastern half. Zigzags were run westwards between 70° W. and 110° W., and a return then made between these same limits of longitude, but at more northern latitudes. The result of this manœuvre has been to provide the East Pacific sector with a network of traverses made in four separate months, and these show the differences in animal and plant concentration and temperature variations with respect not only to latitude, but also to the time of year.

The *Discovery II* was back at Port Stanley on November 24. She was now under orders to assist the British Graham Land Expedition whenever possible, consistent with her own scheme of work in the Falkland Islands Dependencies. Mr Rymill's ship, the *Penola*, rived at Sydney on November 28. On the *Discovery II* many, both officers and crew, had had as many as eight years' experience of the South Shetlands and Graham Land; Rymill's party were new to the work, but given time they will carry their explorations into regions far beyond those which are accessible to the research ship. A good deal of information must therefore have been passed on by the old hands while the ships were in company at Stanley. They were only a short time together, however, and *Discovery II* sailed on December 2 carrying surplus stores for Mr Rymill and also his whole complement of sixty dogs. These were landed at Deception Island six days later, the *Discovery II* being now due for survey work on the Antarctic coasts.

A feature of the Discovery Committee's endeavours has been the charting of the various dependencies of the Falkland Islands. The most complete work has of course been that of Lieut.-Commander Chaplin in South Georgia where the concentration of commercial ships is greatest, and where the coast, the harbours and the approaches have now been sufficiently surveyed for all practical purposes. In addition, running surveys have been made of the South Sandwich Group on the first com-

mission, and of the South Orkneys during the second. The resulting charts are all the work of Lieut. Nelson, who continues to be surveyor as well as captain of the ship. Similar mapping in the South Shetlands has been much more difficult. Each year, however, has seen another small portion put on the map. This season the whole period from December 8, 1934, till January 9, 1935, was devoted to this region, and it appears that the South Shetland running survey is now nearly complete. It must have been extremely difficult work, for the coast is foul throughout, and shocks to the navigator's nerves must have been frequent. Part was done by motor-boat, but at other times the ship herself would approach the land with all hands on the alert—the captain and the watch-keeper on the bridge, an officer and anchoring party forward, and aloft the look-out. On occasion the ship would steam into a bay with the anchor down on a 10-fathom cable, but this safeguard was not possible in narrow ways, as had the anchor taken the bottom the vessel would probably have immediately swung on to the danger.

The survey ended, the *Discovery II* returned to Deception Island and transported the dogs and stores of the Graham Land expedition to Port Lockroy, leaving them there in charge of Surgeon-Lieut. Bingham and Mr Hampton. *Discovery II* did not again meet the *Penola*, which had been detained over a month at the Falklands with engine trouble. Port Lockroy was left on January 19, and two days later came word that Rymill himself had arrived there with his own ship to pick up Bingham, Hampton and the dogs.

Work for Rymill and work for Byrd might make it appear as if the ship had become a maid-of-all-work and common carrier. For a few days in January it looked as if this might once again be the case. Throughout December and January Mr Lincoln Ellsworth and Sir Hubert Wilkins had been making attempts to find a base on one or other side of Graham Land, so as to be able to fly across the Antarctic continent to the Ross Sea. In January Ellsworth's ship, the *Wyatt Earp*, was at Snow Hill in the Weddell Sea. Retreating from there northwards he was caught in the ice, and on January 15 the *Discovery II* received a wireless message asking if she would stand by at Deception Island and receive some of Ellsworth's party by plane in the event of a forced wintering. The alarm was, however, premature, and the season still early, and the *Wyatt Earp* was clear of the ice four days later. The incident is worth mentioning to show the reputation the research ship now holds in the Antarctic seas.

The *Discovery II* was back at South Georgia on January 27. She was now homeward bound, but only after a further run towards Enderby and thence to Capetown. This work was very much the same as that done previously, but carried out earlier in the season. Many ships were about, large factory ships and the smaller catchers. Of most interest, however, was the near presence of the whale marker, *William Scoresby*. The ships never met, but there was frequent talk by wireless. They are working towards the same objective, though by different methods. *Discovery II* has now almost completed exploring the whale's habitat and the life-history of its food supply; the *William Scoresby* has only just begun marking the whales in order to know whence and where they travel, at what speed, and in what numbers.[1] *Discovery II* was first to leave the south, but the *Scoresby* reached London before her, for from Capetown the bigger ship's route took her south-east to Marion Island, and from there northwards through the Indian Ocean and home *via* the Suez Canal. She will be in London for a few months only, as she is already under orders to leave again in the autumn on her fourth commission.

[1] The *William Scoresby*, with Mr G. W. Rayner in charge, succeeded in marking a minimum of 729 whales; and during the same period Mr A. H. Laurie, in a catcher, hired at South Georgia from a whaling company, is estimated to have marked a further 467. Already about 40 of the marks have been recovered, and give an indication of the route which the whales take. It seems evident therefore that a proper form of marking has at last been found, and that this method of investigation will succeed.

ANTARCTIC WHALING

Antarctic Whaling, 1933–34.

The reports and accounts of four whaling companies for the 1933–34 season have now appeared in the press, and in only one case is a deficit reported.

The Rosshavet Company, of Sandefjord, report a credit balance of 131,513 Norwegian kr. after the inclusion of 54,540 kr., brought in from the previous year; and the company's stocks of whale oil are valued at 3,853,907 kr. Operations in the Antarctic during the season under consideration lasted from October 26, 1933, to February 28, 1934, the catch comprising 1117 blue whales, which produced 131,917 barrels of oil, and 72 sperm whales producing 4589 barrels. The average yield of oil per blue whale was 118·1 barrels, against a quota estimate of 115. The factory ship *Sir James Clark Ross* was fitted with an experimental plant on the Fauth system for the production of whale meat meal; and on the basis of the experience gained, a new machine capable of dealing with 40 tons of meat in 24 hours was installed for use during the next season. Experiments for the electrocution of whales were carried out by a catcher, *Star XIV*, belonging to the firm.

The British Viking Whaling Company declared a final dividend of 5 per cent. actual on the ordinary shares, making 10 per cent. for the year, as compared with 12 per cent. for the previous year.

A/S *Laboremus* also made a 5 per cent. distribution, having made a net profit of 219,891 kr., of which 165,500 kr. were allotted to depreciation.

The directors of Havlfangeraksjeselskapet Sydhavet state that the company secured their full quota of blue whales, producing the 115 barrels per whale during the 1933–34 season, and disposed of the whole of this amount at 30*s*. a ton. Their factory ship, *Svend Foyn I*, has been sold to British ship-breakers. The reports show that the tanker *Norbris* made a trading profit of 240,204 kr. which has been transferred to the profit and loss account. The difference between the book value and selling price of the *Svend Foyn I* (523,620 kr.) and the ordinary depreciation on the *Norbris* and catcher fleet (347,065 kr.) total 870,685 kr., which had been written off the property account, leaving a deficit of 713,121 kr.

During the years 1932–33 and 1933–34 when the Norwegian and most of the non-Norwegian companies were operating under an agreement to restrict production, the total output is reported to have been approximately 2,358,047 barrels and 2,456,462 barrels for each year respectively.

Antarctic Whaling, 1934–35.

Whaling in the Antarctic during the season 1934–35 was carried out by a fleet of over twenty factory ships, and about 140 catchers; and reports state that, in spite of bad weather and an unusual amount of fog, the average catch, although not as great as last year, was, nevertheless, up to standard. The total production of whale oil for the season is reported to be in the neighbourhood of 2,400,000 barrels (400,000 tons), valued according to present market prices at about £600,000.

In accordance with the recent agreement by which whaling is restricted to three and a half months instead of six, the Norwegian fleet did not begin operations until December 1, 1934. The other vessels began work as soon as they reached the grounds. The Unilever ships, *Southern Princess* and *Southern Empress* operated farther east than usual, and at the beginning of December were located 1690 miles from Fremantle, and south-east of Kerguelen. They spent the entire season between Long. 70° and 115° E., and report fewer whales than they had expected. For two and a half months the two ships were in the ice-fields, and the sea was beginning to freeze when they sailed north, having reached 67° S. The Norwegian ships report a most successful season. Working due south of the Cape, they found an abundance of whales and the *Thorshammer* obtained 148,000 barrels of oil as compared with 100,000 in the previous season. The South African whaling factory *Tafelberg* reported a catch of 129,000 barrels (21,500 tons) after five months' work. The fact that fewer whales were met with than in previous years by the South African ships was attributed to the bad weather met with. The whales were farther north this season, and the whalers were obliged to work in the open sea, and were hampered by heavy seas, fog and snow.

As a whole, however, the weather during the 1934–35 season was much better than that experienced the previous year; and there were, happily, fewer casualties. In November, 1934, two British catchers belonging to the Unilever fleet were put out of action by damage in the ice. The *Southern Chief* bent a propeller blade when it was struck by a piece of ice; and the vessel had to be towed to Durban by the Norwegian tanker *O. A. Knudsen*, which had answered her S.O.S. The catcher returned to the whaling grounds at the beginning of January. A sister catcher, *Southern Field*, sustained greater damage at the same time. The propeller shaft was broken and the propeller fell off and was lost; and it was only by means of a skilful engineering feat that the vessel could be repaired sufficiently to continue work. Fortunately

the accident happened when the catcher was close to the factory ship, and the disabled boat was towed back to the parent ship, and made fast alongside. The factory ship flooded her tanks on the opposite side, and listed over, half lifting the *Southern Field* out of the water. The catcher's fo'castle tanks were then flooded to raise her stern out of the water. The broken end of the shaft was drawn into the engine room and a spare shaft from the factory ship was hoisted below and fitted in the engine room. A spare propeller was hoisted overboard on tackle and fitted to the end of the new shaft by engineers from dinghies under the stern of the crippled catcher. The vessel was then able to continue work, without further refitting. Two Norwegian whale catchers were caught in a hurricane at the end of March, and were less fortunate. The two vessels *Klem* and *Splint* which belonged to the factory ship *Pioneer* encountered a hurricane on March 26, with tremendous seas running, and storms of sleet and thick snow. They entered a lead in the pack hoping it would afford them some shelter, and soon found the ice closing in around them, while the water froze so rapidly that they were unable to crash their way out, and they were soon fast in the ice. Meanwhile the factory ship hastened to their rescue, but was prevented from approaching them by the ice. The crews attempted to force a passage by means of dynamite, but, owing to the hurricane, this was unsuccessful, and soon after they were forced to abandon the catchers and take to the ice. Both vessels sank within a short time of each other. The factory ship, being still powerless to help them, the crews, numbering about twenty-four men, set out over the pack-ice, and reached the *Pioneer* after a struggle of several hours, but with no loss of life. A fierce hurricane had also caused the whaling fleets a certain amount of anxiety in February, but after March 20 the weather remained fair until the fleets returned about the beginning of April.

The indiscriminate slaughter of whales which has been causing considerable trepidation among experts of late years will now be partly checked by a Convention of the League of Nations, which took effect from January 16, 1935. This Convention forbids the killing and taking of certain species of whales now becoming rare, and prohibits the killing or taking of calves, immature whales or females accompanied by suckling calves. Annual reports on the results of the convention are to be prepared by the International Bureau of Whaling Statistics, Oslo.

It is also reported that the 1935–36 whaling season will be reduced to three and a half months from December 1 to March 31 by both British and Norwegian companies.

NEW ZEALAND ANTARCTIC SOCIETY

In *The Polar Record* for January, 1934, we published an account of the inauguration of the New Zealand Antarctic Society with a brief summary of its objects, and a list of the officers and Council. The chief aim of the Society is to group together all those resident in New Zealand who are interested in the Antarctic, and its exploration; and its activities include the assistance of members of Antarctic expeditions, and the spreading of the knowledge of the Antarctic continent in its every aspect.

We are glad to be able to publish the following extract from the first annual report of the Society, and offer our congratulations to those concerned for the successful launching of the new venture.

The first duty of the Society after its inception was to take part in the welcome at Wellington to Admiral Byrd's Second Antarctic Expedition. The Society also co-operated in affording a reception to Sir Hubert Wilkins and special arrangements were made to give members an opportunity of attending the display of Sir Hubert's film of his expeditions. Although it was not possible to arrange public receptions to other visiting explorers, members of the executive made calls on the commanders of the *Bear of Oakland* of Admiral Byrd's expedition and the *Wyatt Earp* of Mr Lincoln Ellsworth's expedition. During the winter regular functions were arranged, and lectures to the members of the Society were given by Dr W. R. B. Oliver, Captain W. Stuart, Mr C. R. Ford and Mr R. A. Falla. During the year the Society was in regular wireless communication with Admiral Byrd. The projected collection of photographs, and geological, natural history, and other exhibits connected with the Antarctic, has been given a notable start by gifts from Admiral Byrd, which include a collection of geological specimens obtained by the southern sledging party from the Thorne Glacier of the Queen Maud Range: and a promise of photographs and maps.

RECENT POLAR BOOKS

The following books, recently published, have come to our notice:

ARCTIC

BARKER, BERTRAM. *North of '53*. London: Methuen, 1934. 1*s*. 6*d*.

BOYD, LOUISE A. *The Fjord Region of East Greenland*: with contributions by J. Harlen Bretz, O. M. Miller, Walter A. Wood, William B. Drew, Charles B. Hitchcock and John K. Wright. New York: American Geographical Society (Special Publication No. 18), 1935. 10 × 6½ in. Ill. and Map in separate cover. Pp. x + 370. $4.

CHARCOT, JEAN. *Voyage aux Îles Féroë*. Paris: Société d'Éditions Géographiques, 1934. 7 × 5 in. Ill. and Map. Pp. 96.

GLEN, A. R. *Young Men in the Arctic*. London: Faber & Faber. 1935. Pp. 327. 15*s*.

JACKSON, F. G. *The Lure of Unknown Lands*. London: Bell, 1935. 16*s*.

LINDSAY, MARTIN. *Those Greenland Days*. London: Blackwood & Sons, 1935. Cheap Edition, 5*s*.

WILLIAMSON, THAMES. *North after Seals*. London: Routledge, 1935. 6*s*.

ANTARCTIC

MAWSON, Sir DOUGLAS. *The Home of the Blizzard*. Abridged Popular Edition. London: Hodder & Stoughton, 1935. Ill. 35 photographs, 18 diagrams and 3 folding maps. 7*s*. 6*d*.

WHALING

VILLIERS, ALAN. *Whalers of the Midnight Sun*. New York: Charles Scribner's Sons, 1935. $2.

GENERAL

OUTHWAITE, L. *Unrolling the Map*: the Story of Exploration. With Drawings of Ships by Gordon Grant. New York: Hitchcock, 1935. 56 Maps. Pp. xiv + 351. $3.75.

ERRATA

The Polar Record, No. 9. P. 26. Line 30. *For* 20° F. *read* − 20° F.

„ No. 9. P. 50. Lines 31, 32. Delete 'who was a member of the crew of the "Discovery" Committee ships, *Discovery II* and *William Scoresby*.'

„ No. 9. P. 62. Line 31. *For* No. 9 *read* No. 8.

CAMBRIDGE: PRINTED BY WALTER LEWIS, M.A., AT THE UNIVERSITY PRESS