

THE POLAR RECORD

NUMBER 2 : JULY 1931

PRINTED IN GREAT BRITAIN FOR
THE SCOTT POLAR RESEARCH INSTITUTE
CAMBRIDGE : AT THE
UNIVERSITY
PRESS
1931

Price One Shilling

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ANNUAL REPORT
OF
THE SCOTT POLAR RESEARCH INSTITUTE

PRESENTED BY
THE COMMITTEE OF MANAGEMENT TO THE
SENATE OF THE UNIVERSITY

6 JUNE, 1931



The valuable services rendered during the year by Miss W. M. Drake, who has been acting as Assistant to the Director, have enabled the Institute to extend its activities. It has been possible, for instance, to have the building open daily from 2 to 4 P.M. for visitors, and over three hundred people have taken advantage of this arrangement.

The research rooms have been in demand for short periods, but a fuller use will be made of them next year, when the working up of the results of the British Arctic Air Route Expedition (Mr H. G. Watkins, leader) will be carried out in part at the Institute.

In July 1930 the Institute took a prominent share in the British Polar Exhibition, which was held for three weeks in the Central Hall, Westminster. Of the proceeds of this exhibition £200 were given to the Institute, and this has been set aside as the nucleus of a publications fund. In January 1931 several exhibits were lent to the Daily Mail Schoolboys' Exhibition, where a section dealing solely with Scott's Last Expedition was visited by some 70,000 people.

The Committee have for some time felt that it would be appropriate and useful to produce a half-yearly journal which should review polar events for the preceding six months. In view of their slender resources this was perhaps an ambitious aim. The publication of the first number of *The Polar Record* at the beginning of this year has, however, shown that the decision was a wise one. Many letters of appreciation have been received and information for future issues has been promised from all sides, particularly from overseas. Exchanges of publications have been arranged with several societies interested in polar exploration.

The financial situation of the Institute has been much improved during the year by the kindly help of Sir E. Hilton Young. At his suggestion, and with his guidance, an application was made to the Pilgrim Trust, and in February the Trustees informed the Vice-Chancellor that a grant

of £4000 would be made. This timely addition to their resources has enabled the Committee to ask the University to proceed with plans for the erection of a memorial building for the Institute. Although the funds available for carrying on the full activities of the Institute are still inadequate the Committee feel that by the erection of the building the first important step will have been taken towards the realization of the scheme formulated by the founders of the Institute.

The large number of gifts received during the year has shown that the Institute is becoming known and appreciated. It is impossible to give a complete list of these, and a selection only is appended below.

Gifts of books and maps have been received from:

American Geographical Society, New York.		
Arctic Institute, Leningrad.		
British Museum.		
Colonial Office.		
North West Territories and Yukon Branch, Department of the Interior, Canada.		
Department of Marine and Fisheries, Canada.		
Department of the Interior, Washington.		
Department of Terrestrial Magnetism, Washington.		
Explorers' Club, New York.		
Geofysisk Institutt, Bergen.		
Norges Svalbard-og Ishavs-undersøkelser, Oslo.		
Norske Meteorologiske Institutt, Oslo.		
Royal Meteorological Society.		
Helge G. Backlund.	Dr W. Filchner.	Prof. A. Penck.
Prof. O. Baschin.	Prof. L. Gallois.	Dr R. N. Rudmose Brown.
C. B. Bisset.	Prof. Olaf Holtedah.	Dr B. Schulz.
Dr L. Breitfuss.	I. W. Hutchison.	V. Stefansson.
Dr J. Charcot.	W. L. Joerg.	Prof. H. U. Sverdrup.
G. B. N. Creswick.	Bassett Jones.	J. M. Wordie.
Prof. F. Debenham.	W. Meyer.	

Other gifts have been made by:

Major Gretton.	W. E. Hughes.	H. G. Ponting.
Dr H. Guillelard.	F. Mayhew.	Prof. Sheriff.
Prof. W. H. Hobbs.	G. Monkhouse.	J. M. Wordie.

Subscriptions to the Building Fund and to the Library have been received from Mrs H. Bryan, Miss Powell and Miss W. Reeve.

Mrs E. A. Wilson has lent to the Institute, for an indefinite period, a very valuable collection including a large number of Dr E. A. Wilson's Antarctic water-colours and pencil sketches, his polar journey and winter journey note and sketch books, and many other items of interest connected with both of the Antarctic expeditions led by Captain Scott.

OBITUARY

The tragic death of Professor Alfred Wegener has removed a figure as prominent in polar exploration as in geophysics, for he was a member of four major expeditions to Greenland. He took charge of the meteorological work in the expedition under Mylius-Ericksen in 1906-08, and returned again in 1911-13 when he crossed the Greenland ice-cap with Colonel Koch at its widest part. The last two expeditions were his own, a reconnaissance in 1929 for the larger venture of 1930. The circumstances of his death are not yet exactly known for the search for his diaries has been unsuccessful. It is not often that a leader in scientific thought fulfills the rôle of a leader in polar exploration as well, and it is interesting to see the originator of the theory of continental drift returning at the age of fifty to the polar land where he began his life as an explorer. In Professor Wegener the world has certainly lost a stimulating thinker and an accomplished explorer.

We have also to record with regret the deaths, in the latter months of 1930, of two members of the Nares Expedition of 1875-76. Admiral Pelham Aldrich, C.V.O., who died on November 12, was prominent in that expedition as the leader of their western party, which made important discoveries along the north coast of Ellesmere Island and discovered Cape Columbia, its northernmost point. Admiral of the Fleet, Sir William May, G.C.B., G.C.V.O., who died on October 7, was a lieutenant on the *Alert* at the same time, and besides taking part in all the ordinary activities of the expedition did a great deal of relief sledging.

ARCTIC REGIONS

SVALBARD, FRANZ JOSEF LAND AND RUSSIAN ARCTIC REGIONS

Several expeditions have been planned to visit this region during the summer of 1931. In addition to those described below, of which official news has been received, announcements of two more have appeared in the press. Captain Robert Bartlett sailed on May 30 in the *Morrissey* to spend another summer in the Arctic. He intends to visit the east coast of Svalbard, Franz Josef Land and the north of Novaya Zemlya, making collections for the American Museum of Natural History and the New York Botanical Gardens, as well as carrying out such other scientific work as may be possible. Arthur D. Norcross of New York is associated with him in this venture. The *Quest* has been chartered by Professor Ahlmann for a Swedish-Norwegian expedition. A shore party is to be left at Hinlopen Sound for geographical, geological and meteorological work, while the ship visits the islands to the east of North East Land, studying White Island in particular.

Norges Svalbard-og Ishavs-undersøkelser Expeditions to Svalbard, 1930.

We are indebted to the kindness of Dr Adolf Hoel for all the information concerning the Norwegian expeditions.

Two Svalbard expeditions from Norway were at work during the summer of 1930.

A hydrographic expedition, led by Lieutenant Rolf Kjaer, left Norway on May 31 in the Norwegian coast-guard vessel *Michael Sars*. Deep sea soundings were taken to the east and north-west of Bear Island. An automatic tide gauge was set up in Sørhamna (South Harbour) on Bear Island and observations made during a period of 30 days. About 40 oceanographical stations were worked along five sections radiating from Bear Island: Bear Island to Norway; Bear Island westwards; Bear Island to South Cape (Spitsbergen); and two from Bear Island eastwards. The expedition left for Norway on July 10.

A geological expedition of three, Dr Hans Frebald, leader, Olav Staxrud and Jens Erik Werenskiold, left Harstad on July 2 in the coal-steamer *Inger Elisabeth* and arrived in Advent Bay on July 6. From here excursions were made to Festningen, Cape Wijk and Sassen Bay. The expedition left Spitsbergen again on August 19.

Norges Svalbard-og Ishavs-undersøkelser Expedition to East Svalbard and Franz Josef Land, 1930.

Further details of the work of the *Bratvaag* expedition, after the discovery of André's camp on White Island, have been obtained. From White Island the *Bratvaag* sailed due east to Victoria Island, which was also visited and investigated, and a course was then set for Cape Grant on the south coast of Franz Josef Land. The expedition worked in Franz Josef Land waters from August 10 to 26 and the following places were visited: Cape Forbes, Cape Stephens, Windy Gully and Cape Flora on Northbrook Island, Camp Ziegler on Alger Island, Bell Island (Eira Harbour), Cape Nansen in Cambridge Bay, and last, Cape Harmsworth, the most westerly point of the archipelago. On the homeward voyage the middle island of King Karl Land was visited.

Throughout the summer ice conditions were extraordinarily favourable and the area between Spitsbergen and Franz Josef Land was entirely ice-free. A little drift ice was encountered south of McClintock Island and north-west of Alexandra Island, where the edge of the pack was met with in 81° N., 42° E. When the expedition was at Alger Island on August 15 the winter ice in Markham Sound had not yet broken up. Throughout the expedition geological, topographical, botanical and zoological work was carried on whenever possible.

Norwegian Fisheries Arctic Hydrographic Expedition, 1930.

Captain Thor Iversen has supplied the following information with regard to this expedition, and informs us that similar investigations have been carried out every year since 1923, except in 1927, the objects of the work being oceanographical as well as fishery research.

In 1930 the expedition chartered the fishing-steamer *Sotra* from Kristiansund and with a crew of twelve started work on April 10. Thor Iversen was in command and with him was the zoologist Einar Koefoed. Five cruises were made during the summer covering the following areas:

April 10-May 16. The waters between Norway and Bear Island Bank.

May 17-June 25. Norway, Bear Island and the west coast of Spitsbergen.

June 26-July 31. The area between Bear Island and Hope Island.

August 1-22. Jan Mayen.

August 23-October 8. Bear Island, the west and north coasts of Spitsbergen and Hope Island.

In all, 241 stations were worked in the Norway and Spitsbergen area, and 52 stations in the Norway and Jan Mayen area.

Norges Svalbard-og Ishavs-undersøkelser Expedition to Bear Island and Spitsbergen, 1931.

The expedition left Tromsø on May 1 in the Norwegian coast-guard ship *Michael Sars* with the object of carrying out hydrographic and oceanographic work in the waters around Bear Island and towards Spitsbergen. The leader is the hydrographer, Lieut. Rolf Kjaer, of the Norwegian Navy, and the ship, formerly under the command of Captain Thommesen, is now commanded by Captain Briseid. There are three other officers on board, who also take part in the hydrographic work. Soundings have been taken east, south and west of Bear Island, and an oceanographic section has already been worked towards Spitsbergen. The work will be continued until the end of June.

Soviet Union Expeditions, 1930.

Further news of the work of expeditions in 1930 has been obtained from the Arctic Institute's *Bulletin*, Nos. 1-2, 3-4 and 5. As far as possible names have been transliterated according to the R.G.S. II system.

The *Beluga* expedition, which left Archangel on August 23, 1930, made its way through the Kara Sea to the Kjellman, or Minin, Islands, which were reached on September 9. Hydrographic, biological and meteorological work was carried out during the voyage. A survey was made of the islands and a trading station was established at which three adults and two children were left for the winter.

A geological expedition to the Kanin Peninsula was made under the leadership of M. B. Edemsky. The coast of Cheshkoi Bay was investigated and a topographical survey was made of the area between the Vijasa and Dvoyniki rivers. The mouths of the Ome, Peshe and Indigi rivers were also explored. The geology of the Indigi river basin was studied by a party under G. P. Sheiko.

A new meteorological station was equipped in 1930 in Gidayam Bay in approximately 71° N., 77° E.

The annual expedition sent out by the Hydrographic Department worked in the White Sea, Matochkin Strait and along the east coast of Novaya Zemlya.

During the summer of 1930 forty-six ships visited the Kara Sea for commercial purposes, cruising as far east as the mouths of the Ob and Yenisei. They were supported by two ice-breakers, the *Lenin* and *Malyguin*, and three aeroplanes, which reported on the state of the ice: in addition, the *Malyguin* acted as a weather bureau and carried out other scientific

work. The ships entered the Kara Sea through Yugorsky Strait, the first of them passing through on July 31. Two ships returned by the north coast of Novaya Zemlya, this being the first time a commercial vessel has taken this route. The last ships left the Kara Sea in the middle of October, and by this time had to make their way through young ice.

An expedition to the Indigirskoi River, led by J. K. Chirikhin and organized by the Academy of Sciences in 1928, returned in 1930. The river had proved navigable as far as its tributary, the Mome, and was remapped up to this point: botanical, geological and zoological collections were also made. Three meteorological stations were established in the positions $71^{\circ} \text{N.}, 149^{\circ} 14' \text{E.}$; $68^{\circ} 24' \text{N.}, 145^{\circ} 26' \text{E.}$; $63^{\circ} 16' \text{N.}, 143^{\circ} 13' \text{E.}$

Since 1927 a scientific research station, with a staff of nine, has been maintained in the New Siberian Islands. An eight-roomed house was erected on Bolshogo Island, in $73^{\circ} 11' \text{N.}, 143^{\circ} 15' \text{E.}$, and equipped with wireless in 1928. N. V. Pinegin was in charge until last year. General scientific work has been carried out in the neighbourhood, including a certain amount of surveying. In particular, Bolshogo and Mali Islands and part of Kotelni Island and the tundra near the Yana river delta have been investigated.

Soviet Union Expeditions, 1931.

The *Bulletin*, No. 5, of the Arctic Institute, Leningrad, gives brief accounts of a number of expeditions planned for the summer of 1931.

The Arctic Institute is sending an expedition under Professor W. J. Wiese to Franz Josef Land to relieve the party at the meteorological station at Calm Bay, Hooker Island. If circumstances permit, the Kamenev Islands station will also be visited. Oceanographical and other scientific work will be carried on throughout the voyage. The first wireless message from the Kamenev Islands station, established by the *Sedov* expedition in 1930, was received on February 26. Besides carrying on the regular work at the station a provision depot has been made on the coast of Severnaya Zemlya, about 37 miles away.

Another expedition, planned for three years, has left to study the natural resources of the Chukotski Peninsula. For the first eighteen months A. M. Mindalevitch will be in charge of the work.

A party of two, V. I. Socoloff (geologist) and G. A. Voytsekhovski (topographer), have left to explore the Kharaulakhski Mountains, south of the Lena delta, with a view to the development of their mineral wealth.

The State Hydrographic Department is continuing its oceanographic and hydrographic work in the Barents Sea.

A trading company is despatching the *Beluga* for exploration work from the Kara Sea to the mouth of the Lena. A certain amount of hydrographical work and surveying will be carried out and it is hoped to establish a trading station on the Taimyr Peninsula.

GREENLAND

Interest in Greenland during the spring of 1931 has been focussed on the relief of the ice-cap stations established in the autumn of 1930 by the German and British expeditions. This is the first time on record that stations at such altitudes have been maintained throughout the winter. The work of both expeditions is being continued this summer, and in addition, Denmark, Norway and the United States will also have parties in the field. Work on a smaller scale will be carried out by two individual ventures: Dr T. G. Longstaff, and his daughter, Miss Sylvia Longstaff, have left for Disko Island and the Jakobshavn neighbourhood, where they hope to continue the ecological work begun 300 miles to the south by the Oxford University expedition of 1928: Miss Louise A. Boyd, who has already spent several seasons in the north, intends to visit Franz Josef Fjord on the east coast for scientific photographic work.

German Expedition, 1930-31.

News has been received from the three stations established during the autumn of 1930.

The first duty of the western party in the spring of 1931 was the relief of the ice-cap station, known as Eismitte. Transport again proved a big problem and the manner in which the difficulties have been overcome deserves the highest praise. Bad weather delayed the start of the relief party, but finally Weiken, Holzapfel and five Greenlanders were able to leave on April 23. Eismitte was reached on May 7. Up to this time the last news from the ice-cap had been brought back by three Greenlanders at the end of November, 1930. Sorge and Georgi had stated in September that without fresh supplies they could not remain at the central station throughout the winter. Wegener, Loewe and thirteen Greenlanders accordingly left the western station for the ice-cap station on September 21 taking with them 15 sledges and nearly 2 tons of supplies and equipment. Nine Greenlanders turned back early in

October. Persistent bad weather with heavy snow eventually forced the rest of the party to depot a large part of their load about 94 miles inland from the west coast station and three more Greenlanders were sent back with a message that a party should wait for Wegener's return until December 1 at a depot 40 miles from the western edge of the ice-cap. Wegener, Loewe and one Greenlander, Rasmus, continued their way to Eismitte and it is now known that they reached the station on October 30 with 3 sledges and 20 dogs, having had to leave the last of their supplies about 6 miles away. As ordered, a supporting party waited at the depot indicated from November 21 to December 7; Wegener did not return, and it was concluded that he, with the others, had probably decided to remain at the central station for the winter. On the arrival of the relief party at Eismitte in May, Georgi, Sorge and Loewe were found alive and well, but it was learnt with dismay that Wegener and Rasmus had left for the west coast on November 1. They took with them 2 sledges, 17 dogs and 280 lbs. of provisions and hoped to be able to cover about 12 miles a day. The central station was left with sufficient provisions, with careful rationing, for three men until the end of May, 1931.

It will be of very great interest to compare the records of the German and British ice-cap stations: the brief reports so far received indicate that the conditions at the German station were more severe than at the British station 275 miles further south. The snow-fall was heavy and the consequent pressure made the roof of the snow house in which the three men lived sink nearly three inches a month. In November a temperature of -58° F. was recorded and later even -85° F. was reached. Inside the living quarters the temperature fell on two occasions to 14° F. and 5° F. respectively.

After the relief of Eismitte Georgi decided to remain at the station, where he has been since August, 1930, while Sorge returned with Loewe to the west coast in order to organize the search for Wegener. The returning relief party passed Wegener's sledges abandoned 160 miles from the coast, and later saw his skis stuck up in the snow about 117 miles from the coast. The search party, consisting of Sorge, Weiken and five Greenlanders, reported on May 19 that Dr Wegener's body had been discovered buried close to his skis: his diary and note books were missing. No trace of Rasmus could be found beyond signs of a camp site near by.

Dr Kurt Wegener, who has had considerable experience of polar work, in particular in connection with several expeditions in Spitsbergen, has left for Greenland to assume command of the expedition in his brother's place.

Ice conditions in Davis Strait delayed further work in the west for some time on account of the difficulty of transporting supplies from the ship *Hans Egede*. The latest news from the western station reports that Herdemerten, Wölchen and Jülg have explored the neighbourhood up to heights of 6000 ft. On May 31 Sorge, Weiken, Jülg and three Greenlanders left for a five weeks' trip to a depot about 125 miles inland. They proposed to make a trigonometrical survey en route and to continue the search for Rasmus and for Wegener's diaries and note books.

The eastern station, established in the inner part of Scoresby Sound, was in charge of Dr Kopp and with him were Dr Peters, zoologist and Ersting, engineer. Meteorological observations were made daily from October 26, 1930, to May 2, 1931, but at the end of winter supplies ran low and on May 11 the party was forced to abandon the station and return to the Danish settlement in Scoresby Sound: they arrived on May 17 after a difficult journey.

British Arctic Air Route Expedition, 1930-31.

Plans for the winter and spring work of this expedition suffered considerably from abnormal weather conditions. Reports from Angmagsalik in previous years had indicated that one serious gale was to be expected about every twelve years: last winter, however, there was an average of six a month from October to April. On the other hand, temperatures at the base remained higher than expected, and only fell below zero Fahrenheit on two occasions.

The first undertaking this spring was the relief of the ice-cap station, where Courtauld had remained alone from December 5 throughout the winter. The station consisted of a snow house built over a domed tent, 10 ft. in diameter, and with double walls. This was entered by a tunnel 12 ft. long leading up through the floor. On each side of the tunnel short side passages led into two small snow houses intended for stores. A wall 8 ft. high was built round the house: outside these "ramparts" the meteorological instruments were installed: these were read every three hours.

Attempts to communicate with Courtauld by air during the winter had been unsuccessful. One of the aeroplanes was wrecked by a gale on January 4. A flight in the second machine was undertaken on February 8 with too great a load and had to be abandoned. Finally, on February 25, Cozens and Scott flew over the ice-cap but wind conditions prevented accurate navigation and they were unable to locate the station. On

landing near the base camp after a short flight on February 26 the aeroplane was damaged by an ice hummock.

After various delays due to bad weather a sledge party of three, consisting of Scott, Riley and Lindsay, left on March 9 and reached the neighbourhood of the central station on March 26. Unfortunately they arrived immediately after a six days' blizzard, and the resulting snow drifts made search work difficult. The party had relied upon finding some of the flags marking the route and had not taken a time signal set with them: five satisfactory latitude observations were taken with theodolite and sextant, thus checking the compass and sledge-meter course, and a thorough search was made on three clear days, but no flags were visible and no trace of the station could be found. On April 10, with only four days' dog food left, it was decided to return to the base so that a better equipped party could be despatched at once to search for a longer period. The base was reached on April 19.

In the meanwhile one of the aeroplanes had been repaired and a search flight was made on March 26. Wind conditions hindered navigation, the dark shadows of snow drifts made observation extremely difficult and the flight was unsuccessful. Shortly afterwards the plane was damaged in a gale so that both planes were again out of action.

Watkins himself, with Rymill and Chapman, left for the ice-cap on April 21 with provisions for five weeks. Further supplies were to be dropped from one of the aeroplanes immediately it could be used, in order that a prolonged search could be made if necessary. The weather was good and after twelve days' travelling the party were within two miles of the station. A close search both on that day and on the next was prevented by fog, but the sun shone on May 5 and the position of the camp was fixed and found to be $1\frac{1}{2}$ miles north-west of the ice-cap station. The party set off at once and when still half a mile away saw the tattered remains of the Union Jack which marked the site. Courtauld was found to be alive and well, but the station was completely buried except for the ventilator shaft which still projected through the snow.

During his five months' isolation Courtauld's chief difficulty had been the heavy snowfall. A brief spell of fine weather at the beginning of December was followed by strong gales from the north-west with driving snow. First the tunnel exit, then openings through each of the two store house roofs, were snowed up, and finally after March 21 he had not been able to keep an opening free. Temperatures were not so severe as at the German station 275 miles to the north. In January, for instance, the

temperature on one occasion was as high as 20° F. and no exceptionally low temperatures were recorded. Towards the end of February, finer weather was accompanied by lower temperatures; - 50° F. was frequently registered, while the extreme was - 64° F. On February 19, and again on April 14, an extraordinary rushing sound followed by a crash was heard and supposed to be an earthquake: the second of these was also noticed by Scott's relief party returning from the ice-cap. The unsuspected loss of 4 gallons of paraffin from two slightly punctured tins led to a shortage of fuel, and candles also came to an end, so that for the last part of the time Courtauld was without light and only had sufficient fuel to melt drinking water. His experiments with uncooked food are interesting: a mixture of oatmeal, cocoa and snow is reported excellent, and pemmican and margarine satisfying.

The ice-cap station was closed down and Watkins' party made a rapid five days' journey back to the base which they reached early on May 11.

Every effort had been made to repair one of the Moth aeroplanes and on May 2 a flight was made by D'Aeth and Riley to support Watkins' party: owing to mist, visibility was poor and the flight was abandoned after penetrating inland for 70 miles.

The report that Scott's sledge party had been unable to find the ice-cap station aroused considerable anxiety in England, and the chief supporters of the expedition, acting on their own initiative, decided to send a high powered aeroplane to reinforce the Moths and support Watkins' search party. For this purpose they secured the services of Captain Ahrenberg, of the Swedish Aero-Transport Company. Accompanied by M. Malmo, mechanic, and M. Ljungland, wireless operator, Ahrenberg left Malmo on April 29: flying by way of Bergen, the Faroe Islands and Reykjavik, he reached Angmagsalik on the evening of May 3. Thus it came about that the first stages of the proposed air route to Canada were flown at very short notice and with complete success. On May 7 Ahrenberg, with D'Aeth as observer, flew inland over the ice-cap and after travelling for 120 miles saw to the south the returning sledge party of four. As it turned out Watkins' party were in no need of the provisions dropped for them, but Ahrenberg's brilliant flight did tell the world of Courtauld's safety four days earlier than it would otherwise have been known.

Three spring journeys had been intended, but the plans of all three underwent alteration. A surveying trip to the north was arranged to continue the work begun in the autumn. Stephenson, Chapman and Wager left on March 13 for Kangerdlugsuak Fiord by an inland route:

they travelled up the eastern edge of the ice-cap in order to survey the inner side of the coastal mountains. It was expected that the journey to the fiord would take a month: a large depot of supplies had been left there in the autumn, and it was intended to spend the second month mapping a large range of mountains to the north of the fiord. This range had been sighted from the air last autumn and was reported to be about 12,000 ft. in height. Another month was allowed for the return trip. Unfortunately, bad weather and a resulting shortage of food forced the party to return after covering only 90 miles. Out of the 28 days away, travelling was possible on 13 days: the mountains were visible on only three days and for most of the time there was a visibility of about 200 yards.

A fresh start was made on May 6, the party this time consisting of Stephenson, Wager and Bingham. To reach Kangerdlugsuak Fiord was no longer possible, but it was hoped to reach and climb Mt Forel and to make as extensive a survey as possible of the surrounding country. Mt Forel was discovered by De Quervain in 1912, when he sighted it from a distance of 70 miles and estimated its height as 11,200 ft. Sixteen days after leaving the base the party reached the foot of the mountain, and a few days were spent in reconnaissance work. The summit was found to consist of an ice-dome which capped a rock wall of about 1600 ft. rising up from a glacier below. The ice-dome proved to be much steeper than had at first been thought, so that the attempt to reach the summit had to be abandoned. The height of the mountain was estimated as 11,500 ft.: Stephenson's party climbed to 10,880 ft., which is 1200 ft. higher than Petermann Peak, previously the highest mountain ascended in the Arctic. Several days were spent surveying in the neighbourhood and a two days' sledge journey was made to the north-west of Mt Forel. An excellent view was obtained of the mountains to the north from the top of a nunatak, at a height of 10,500 ft.: they formed a wide coastal belt, stretching inland for 90 miles, with many high peaks and ranges: one peak, which was named after De Quervain, appeared to be even higher than Mt Forel. On May 30 the journey south was started and the base was reached after twelve days' travelling.

Two other sledge journeys were planned for April and May, but unusual ice conditions have delayed them both. The work was to include a running survey of the coast for 150 miles to the south and also a detailed survey of Sermilik Fiord, a wide inlet about 50 miles long and from 10 to 15 miles wide, a little to the north-east of the base camp.

University of Michigan Expedition, 1930-31.

Professor W. H. Hobbs has received brief messages from the two meteorological stations which were established on the west coast last summer.

The northern station ($72^{\circ} 51' N.$), known as Camp Irving D. Scott, is in charge of William S. Carlson and Max Demorest. It is situated on a small island near Upernivik two miles from the edge of the inland ice. A message dated February 1 reported the immediate start of a six weeks' sledge journey in order to study the glacier outlets to the north as far as Melville Bay. A later sledge trip for about 100 miles on to the ice-cap is also planned.

A message from the southern station at Ivigtut reported that all was well. Cloud and heavy snow had interfered considerably with aerological work during the winter, and few balloons had been sent up.

The aerological work in West Greenland is being supplemented by that of a Norwegian balloon aerologist stationed with a party of hunters at Mackenzie Bay (approx. $73^{\circ} N.$) on the east coast.

Danish Expeditions to East Greenland, 1931.

Our thanks are due to Dr Lauge Koch for information concerning the Danish plans for work in East Greenland. An ambitious programme has been prepared to continue the work of Dr Koch's East Greenland expeditions of 1926-27, 1929 and 1930. The success of these plans is naturally very largely dependent on satisfactory ice conditions. Starting this summer it is hoped to have parties in the field continuously up to the end of the summer of 1934. The chief aims of the work may be summarized as follows:

1. The preparation of a topographical map on the international scale of 1:1,000,000. Special attention will be paid to the eastern boundary of the inland ice.
2. The preparation of geological maps.
3. Zoological, botanical and hydrographical research.
4. The investigation of the possibilities of future Eskimo colonization.

The scheme is being financed by the Carlsbergfondet and the Danish Government.

The *Gustav Holm* and *Godthaab*, equipped with seven motor boats and several other smaller boats, left Copenhagen on June 16 and expect to return at the end of September. Four stations are to be established

this summer of which two will also be equipped for wintering. The wintering stations will be located, one in the northern part of King Oscar Fiord and the second on Clavering Island. The King Oscar Fiord base will be furnished with an eleven-roomed house, wireless equipment and two motor boats. Its permanent staff will be:

G. THORSEN, zoologist.
THORVALD SØRENSEN, botanist.
H. NIELSEN, radio operator.
One Greenlander.

In connection with this station a minor scientific station will be set up in Nathorst Fiord, which will be the headquarters of four men during the autumn and again next spring:

O. SIMONSEN, topographer.
S. O. STENØR, topographer.
A. NOE-NYGAARD, geologist.
One Greenlander.

The Clavering Island base will also have an eleven-roomed house, wireless equipment and a motor boat. Its permanent staff will be:

A. PETERSEN, geologist.
H. LARSEN, archaeologist.
H. PETERSEN, radio operator.
One Greenlander.

Another station for autumn and spring work, subsidiary to the Clavering Island base, will be established at the head of Muskox Fiord with a staff of four:

T. JOHANSEN, topographer.
Dr TEICHERT, geologist.
P. GELTING, botanist.
One Greenlander.

The members of the two smaller stations will winter at the main stations. In order to facilitate communication between these stations and the Danish colony in Scoresby Sound a series of small huts will be built and depots of pemmican and petrol left at certain points. If ice conditions permit a radio station will be established on Hochstetter Foreland and a smaller short-wave transmitter at Denmark Harbour. During the summer of 1931 these two stations will be used by the Danish hunting company Nanok, but in 1932 it is expected that the scientific work will also extend north to this region. During August this year an additional party of four geologists will be at work in Franz Josef Fiord, and another

party of four geologists, under Dr Frebold, will be working in Tyroler Fiord and on Kuhn Island.

Norwegian Expedition to East Greenland, 1930.

We are indebted to Dr Adolf Hoel, the Director of Norges Svalbard-og Ishavs-undersøkelser, for news of the Norwegian work in East Greenland.

The 1930 expedition left Ålesund on July 9 in the *Veslekari*. The scientific staff on board included:

ADOLF HOEL, leader and geologist.

ANDERS K. ORVIN, geologist.

PAUL LØYNING, marine zoologist.

NILS KNABEN, entomologist.

E. SIGGESON, preparator.

JAKOB VAAGE, botanist.

JOHANNES LID, botanist.

P. F. SCHOLANDER, botanist and physician.

Professor V. BEONIO-BROCCHIERI of Pavia University.

DAGFIN WERENSKIOLD, painter.

Paul Lillenes was in command of the ship which had a crew of eleven, a wireless operator and five assistants. A party of seven fur hunters was also on board, equipped for a two years' stay in East Greenland: seven other hunters were brought back by the expedition.

The *Veslekari* called at Jan Mayen on July 14 and left Lid and one assistant to make a botanical survey of the island. After a very quick passage through the ice Cape Herschel, on Wollaston Foreland, was reached on July 17.

Conditions were extremely favourable and all the main fiords between Clavering Sound and Davy Sound were visited during the summer. Survey work on a scale of 1:100,000 was carried out in Mackenzie Bay, part of Foster Bay, the outer part of Dusén Fiord, and the inner part of Muskox Fiord. Soundings were taken in Clavering Fiord, Granta Fiord, the outer part of Loch Fyne, the outer part of Muskox Fiord, Sofia Sound, the outer part of Segelsallskäpets Fiord and in King Oscar Fiord at Archer Islands. Biological and geological work was carried on at the same time.

Houses for the hunting parties were put ashore at nineteen places in Franz Josef Fiord, Muskox Fiord, the south side of King Oscar Fiord and in Segelsallskäpets Fiord. Short-wave wireless equipment was installed at the Myggbukta station in Mackenzie Bay.

The *Veslekari* left Mackenzie Bay for Jan Mayen on August 20 and after a practically ice-free passage arrived at Ålesund on August 28.

Norwegian Expedition to East Greenland, 1931.

The expedition will sail from Ålesund early in July in the sealer *Polurbjørn*, of 326 gross tons and fitted with a 230 h.p. "Polar" diesel engine. The field of work will lie between Scoresby Sound and Shannon Island, thus adjoining the areas worked in last year. The staff will include:

HANS S. JELSTRUP, astronomer. Geographical Survey of Norway.

Commander ROLF VON KRUGG, hydrographer. Norwegian Navy.

PAUL LØVNING, zoologist.

There will also be a surveyor, a physician and five assistants. The expedition is expected to return at the beginning of September.

ARCTIC CANADA

Canadian Expedition, 1931.

The usual visit of the *Beothic* to the eastern islands of Franklin District will again take place this summer, the expedition being organized by the Department of the Interior through the North West Territories and Yukon Branch. Its aim is to further the administration, exploration, scientific investigation and development of this region, and the work has been carried out with great success since it was first undertaken in 1922.

There are now six permanent stations at points which form centres for administration and from which other work can be carried out. From south to north they are: Lake Harbour, Pangnirtung and Pond Inlet, all three on Baffin Island, Dundas Harbour on Devon Island, Craig Harbour and Bache on Ellesmere Island. There is also a cache at Kane Basin on Rice Strait. These posts are visited every summer, as far as ice conditions permit, and the regularity with which the visits have been made is remarkable. Since the post at Bache was established in 1926 it has only once been impossible to call there, in 1928, and even then supplies were left at the cache at Kane Basin only 25 miles away.

In 1930 an excellent report, *The North West Territories, 1930*, by F. H. Kitto, was published by the Department of the Interior, North West Territories and Yukon Branch: it deals briefly with every aspect of the Canadian Arctic and forms a good introduction to a study of this region. Other reports also published last year by the same department, but dealing with special subjects, include:

Southern Baffin Land, by A. E. Milward.

Conserving Canada's Musk-Oxen, by W. H. B. Hoare.

Yukon, Land of the Klondike, by F. H. Kitto.

The Blue Goose, by J. Dewey Soper.

Keewatin and Northeastern Mackenzie, by G. H. Blanchet.

Williams American Polar Expedition, 1931-33.

This expedition is in part a private venture, but it is also being supported by the Naval Research Laboratory, the Carnegie Institute at Washington, the United States Weather Bureau, and the International Polar Year Commission. The leader, Captain Flandel M. Williams, will be accompanied by:

- Dr H. B. HARRIS, physicist. U.S. Naval Research Laboratory.
- Dr RALPH L. BELKNAP, geologist and glaciologist. University of Michigan.
- CLARENCE R. KALLQUIST, meteorologist, aerologist. U.S. Weather Bureau.
- PAUL C. OSCONYAN, radio engineer.
- JOHN CHARLSON, aviation pilot and photographer.

The ship's crew will include three members of Byrd's Antarctic Expedition, Sverre Strom, 1st officer and ice pilot; George Black, supply officer and A. Gould, boatswain. The expedition is expected to leave New York in July and it is intended to establish the base for two years at Fort Conger, Ellesmere Island. It was here that Greely and his expedition worked in 1882 and 1883 during the First International Polar Year. The new station will form one of those to be maintained throughout the Second Polar Year, and its work will therefore be chiefly concerned with meteorological research, terrestrial magnetism and observations of the aurora. An interesting experiment will be the attempt to take coloured cinematograph records of the aurora. Survey work will also be carried out and two aeroplanes for this purpose are included in the equipment.

Oxford University Exploration Club Hudson Strait Expedition, 1931.

Thanks are due to Mr H. M. Clutterbuck for the information regarding the plans of this expedition. Its personnel is as follows:

- H. M. CLUTTERBUCK, leader.
- C. J. D'AETH, ornithologist.
- C. G. M. BOLTON, geological surveyor.
- R. J. O. BRAV, photographer.
- I. H. COX, geologist.
- D. H. S. DAVIS, zoologist.
- A. K. GREGSON, entomologist.
- H. P. HANHAM, assistant ornithologist.
- A. J. LANGLEY, navigator, meteorologist.
- N. V. POLUNIN, botanist.
- Lieut. M. SINGER, R.E., surveyor.

Leaving England in July the expedition will cross to St John's, Newfoundland, where a sealing schooner has been chartered to convey the party to Akpatok Island in Hudson Strait. The ecological work begun by former Oxford expeditions will thus be carried a step farther west. Although this region is moderately accessible practically no systematic scientific work has been attempted in the past. Akpatok Island is almost entirely unexplored: it is about 60 miles in length and 20 miles in width and lies about 40 miles south of the shipping route through Hudson Strait. It is probable that the schooner will have to seek anchorage in Payne Bay, on the western side of Ungava Bay, while the party is on land. There are no known anchorages near Akpatok Island and Ungava Bay has a bad name, according to reports, for "numerous reefs," "severe and sudden storms," "exceptionally large tides," etc. The expedition will re-embark towards the end of September, and returning via Newfoundland should reach England about the middle of October.

SIR HUBERT WILKINS' SUBMARINE EXPEDITION, 1931

Sir Hubert Wilkins describes the preparations for his submarine expedition, and the scientific work he hopes to be able to accomplish, in his book, *Under the North Pole*. Leaving Spitsbergen in July, it is proposed to travel across the Arctic Sea to Bering Strait, passing the North Pole on the way, thus covering about 3000 miles. The submarine was acquired through the United States Shipping Board and renamed the *Nautilus*. The vessel has been reconditioned and fitted with numerous ingenious devices for ice-work and scientific investigations. Professor Harald U. Sverdrup is chief of the scientific staff and Lieut.-Commander Sloan Danenhower is in charge of the submarine. At the time of writing the submarine is undergoing repairs at Plymouth, having been considerably damaged during a rough voyage across the Atlantic. Plans have therefore been somewhat delayed but the leader hopes that the programme can still be carried through this summer. This method of polar travel is an entirely new departure and news of its success as a means of transport and for scientific work en route is awaited with interest.

ANTARCTIC REGIONS

British-Australian-New Zealand Antarctic Research Expedition, 1930-31.

News of the early stages of the cruise of the *Discovery* during the 1930-31 season appeared in *The Polar Record* for January, 1931. To the list of members of the expedition must be added A. L. Kennedy, physicist, and three names mis-spelt in the early wireless reports should read: Professor Harvey Johnston, senior biologist; W. J. Griggs, chief engineer; W. W. Ingram, medical officer.

During the voyage south from Hobart which began on November 22, 1930, an investigation was made of the extent of Mill Rise and a visit paid to Macquarie Island. Between Mill Rise and Macquarie Island, a submarine mound, 6000 ft. high, and presumed to be volcanic, was discovered in $52^{\circ} 14' S.$, $152^{\circ} 48' E.$, rising from a depth of 2000 fathoms. Ice was found much farther north than usual, a number of bergs being seen even in the neighbourhood of Macquarie Island, which is a very rare occurrence. South of this island a submarine ridge was traced for several hundred miles, and in the supposed vicinity of Emerald Island a sounding of 800 fathoms was obtained, but fog and lack of time prevented a close search being made for this doubtful island. At first the *Discovery* was obliged to travel much farther east (approx. $180^{\circ} E.$) than had originally been intended in order to meet the whaling factory *Sir James Clark Ross* for a promised supply of coal. This having been obtained she sailed to the west. A heavy belt of pack prevented a close approach to land but she made her way through, or along the margin of, the ice until on December 29 her position lay to the north of Adélie Land in approximately $64^{\circ} S.$, $158^{\circ} E.$ A very welcome supply of about 50 tons more coal was obtained from the whaler *Kosmos* encountered in this neighbourhood, and the *Discovery* then proceeded south through more open pack into the waters of the D'Urville Sea. A strong south-easterly gale developed into a furious hurricane which lasted several days: the ship was forced back into the pack with which she drifted to the west for about 50 miles, and at times her position became critical. She managed, however, to make her way back to the east and by January 4, 1931, the wind had abated and a landing was effected on King George V Land at Cape Denison. Two days were spent ashore here at the old headquarters of Mawson's 1911 expedition. The hut was intact but was partially filled with an extraordinary development of large

spongy masses of ice crystals. Outside, exposed woodwork showed the effects of snow-blast erosion and in places as much as half an inch had been worn away. Kennedy carried out a series of magnetic observations over a period of 24 hours: comparing his results with those of twenty years ago he found that the South Magnetic Pole had moved 100 miles to the north-west in the interval and was now only about 250 miles distant from Cape Denison.

On January 6 the land party re-embarked and progress to the west was continued. The *Discovery* sailed along the Adélie Land coast in perfect weather and many new features were charted and added to the map of that region. On January 7 in 138° E., near Cape Robert, Campbell and Douglas made a short aeroplane flight to investigate ice conditions to the west. The progress of the ship was barred by a shoal area with innumerable large grounded bergs and consolidated pack. In 1840, both Wilkes and D'Urville reported the existence of an ice barrier north-west of this point but no sign of this was seen. New land, however, was sighted from the plane extending west from Cape Bickerton towards the eastern extremity of Wilkes Land, discovered and named by Captain J. K. Davis in the *Aurora* in 1912.

The *Discovery* made her way round to the north of the ice-jam and after a period of bad weather was able to make steady progress to the west from January 14 to 28. Unfortunately heavy pack prevented a close approach to the land by ship, but whenever possible aeroplane flights were made and on several occasions new portions of the coast line were sighted and approximately charted. Land was thus seen between 60° S. and 67° S. stretching from 128° E. to 121° E. and was named Banzare Land, after the expedition. On January 18, in 64° 30' S., 116° E., Campbell and Mawson made a flight and saw what appeared to be high land extending east and west in about 66° S. Clouds were forming over the land due to a northerly warm moist wind so that the view was somewhat limited. This land was called Sabrina Land, to commemorate Balleny's exploits in 1839. In the charted positions of Budd's High Land, Totten's High Land and North's High Land, which appear on some maps, only pack-ice was seen. Several days of continuous snow-fall prevented further observations at this point.

By January 27 a position of 65° 10' S., 107° E. had been reached, the depth being 300 fathoms. Douglas and Mawson made a flight and rising through two strata of cloud to 5700 ft. obtained a clear view to the south. High ice-covered land, with no rock outcrops, was visible stretching east

and west. The position of this land corroborated Wilkes' report of Knox Land. On re-embarking after this flight the aeroplane was damaged and it was not until a week later that it was again ready for use. The ship continued west through more open pack and was soon sailing through unexplored waters. Late on the evening of January 27 she passed what appeared to be an ice-covered island about 10 miles long, but numerous bergs and heavy pack surrounded it and prevented a close approach for further investigation.

On January 28 the *Discovery* passed by an area of bergs grounded on shoals on the continental shelf. Standing well above them, in $65^{\circ} 9' S.$, $103^{\circ} 15' E.$, was an ice-clad island about 1100 ft. high and with a diameter of 11 miles. This was named Bowman Island, after the Director of the American Geographical Society. It is possible that other islands also exist among the many bergs extending for 100 miles along the eastern side of the Shackleton Barrier. A strong easterly gale rose on January 29 and it was feared that in the thick weather the *Discovery* might be driven on to Termination Tongue, an ice tongue 40 miles long and a few miles wide which formed the northern end of the Shackleton Barrier in 1914. When the weather improved on the next day it was discovered that Termination Tongue no longer existed and Davis Sea, on its former western side, was filled with heavy pack. On account of this, an intended visit to the emperor penguin rookery on Haswell Island, off the coast of Queen Mary Land, had to be abandoned. Numbers of emperor penguins, however, were seen on the floes near by so that would appear that the rookery is still in existence in spite of the closing in of the pack on to the Queen Mary Land coast.

The *Discovery* proceeded to the west, at the northern edge of a belt of heavy pack, keeping roughly along $65^{\circ} S.$ between $88^{\circ} E.$ and $82^{\circ} E.$ Douglas and Campbell made an aerial reconnaissance on February 6 in approximately $84^{\circ} E.$ and reported that the ice extended for at least 30 miles to the south. On the same day the whaler *Falk* and the tramp ship *Lestris* were met with and a further supply of 20 tons of coal was obtained. Two days later, on the morning of February 8, the *Discovery* emerged from the pack-ice into open water in approximately $66^{\circ} S.$, $79^{\circ} E.$ and met two more whalers, the *Tafelberg* and the *Southern Princess* and later in the day she also passed the *Thorshammer*.

West of this point the pack-ice receded to the south. On February 9 in $66^{\circ} 45' S.$, $76^{\circ} E.$, Campbell and Mawson made a flight to 5200 ft. and had a clear view to the south. Bergs were seen aground to the east-south-

east, a little beyond the farthest south point reached by the *Challenger* in 1874. Ice-covered land extended from south-east to south-west on the southern horizon: this was named Princess Elizabeth Land. Heavy pack lay for about 80 miles to the south but to the south-west, about 30 miles away, conditions looked better. Smoke was seen to the west-south-west and on the next morning, February 10, the *Discovery* came alongside the whaler *New Sevilla*. This region of more open pack was evidently favoured by whales, and large numbers of sea leopards were also seen basking on the floes. During the day the ocean floor shallowed rapidly from 1500 fathoms to 250 fathoms. Proceeding south-west on the morning of February 11, the *Discovery* came within sight of land, at a point ($67^{\circ} 43' S.$, $69^{\circ} 20' E.$) where a south to north trending coast turned sharply to the west. Pushing through the intervening pack an expanse of open water was reached and in the lee of a gigantic berg Campbell and Oom took off for an aerial survey. A wide bay extended south to beyond the 69th parallel, while to the east the coast line could be traced as far as Princess Elizabeth Land. The land appeared to be entirely covered by the ice sheet, which rose to 4000 ft. at no great distance from the coast and descended to sea level in a series of undulations ending as floating shelf ice, which extended seawards in places for several miles. The sea of open water, bounded by land to the west and south and by pack to the east and north, was named the MacKenzie Sea, after the *Discovery's* captain. Its existence would seem to be due to strong southerly winds blowing off the high land and driving the pack to the north. The depth of the water varied from 100 to 250 fathoms and the bottom temperature was found to be as low as $28.30^{\circ} F.$

Lack of time and the shortage of coal prevented a longer stay here so the *Discovery* was headed north and then west following the coast line of MacRobertson Land. During the 1929-30 season this coast was ice-bound and the land only seen from the aeroplane at a distance. This season, from $70^{\circ} E.$ to the west, there was practically no pack-ice along the coast. It was found that owing to the extraordinary visibility characteristic of polar regions the land had been charted in 1930 as lying much too far to the north. A careful chart of the MacRobertson Land coast was made as the ship proceeded westwards, and landings were effected at several points. Inland, the ice plateau rose to 4000 ft.: in places, mountain ranges, extending from the coast in a south-west direction, protruded through the ice, with peaks reaching to 5000 and 6000 ft.: rocky headlands were passed along the coast and numbers of islets studded the sea for some

miles off shore. The sea floor was most uneven, with numerous shoals and reefs which made navigation somewhat dangerous. Late on February 14 an easterly gale brought driving snow and gave an anxious time for several days, but when the weather improved the ship made for the land again near 61° E. From the crew's nest the mountain ranges passed on February 14 could be seen on the eastern horizon. The coast immediately to the east consisted of high rocky masses with intervening areas of terraced ice slopes descending steeply to sea level: westward, as far as Kemp Land, there stretched an ice cliff coast line with only minor rock exposures. On the afternoon of February 18 the ship entered an attractive bay; a landing was made on a rocky point named Cape Bruce, and a record was left below a cairn.

The rocks of MacRobertson Land and Princess Elizabeth Land appear to consist entirely of crystalline schists and gneisses, containing a remarkable amount of garnet. All dredgings west of King George V Land gave evidence also of a similar structure for the continental land to the south. The coast of MacRobertson Land was teeming with bird and seal life: mosses and lichens were found on the rocks, and algae and microscopic animal life in the freshwater pools.

By February 19 only about 100 tons of coal remained and attempts to secure further supplies from whalers were without success. Preparations were therefore made for the return voyage. A course was set to pass over the Kerguelen-Heard Island Rise, to continue the series of soundings made during the previous season. A considerable extension of the rise was charted but no sounding was made of less depth than the previously reported 350 fathoms. The *Discovery* then sailed for Hobart and reached port on March 19 after an excellent voyage.

"Norvegia" Expedition, 1930-31.

Exploration and research in the Antarctic were continued with great success during the 1930-31 season by the *Norvegia* expedition. Major Gunnar Isachsen was in command for the major part of the voyage, which consisted of a circumnavigation of the Antarctic continent. The main purpose in view was a rapid survey of the number and distribution of whales, but much other important work was carried out as well.

The *Norvegia* left Cape Town early in October, 1930, and sailing to the south-west past Bouvet Island reached the Greenwich meridian in $57^{\circ} 20' S.$ on October 19. At this point she turned and continued in an easterly direction, following the edge of the pack and keeping for the

most part between 56° and 67° S. The pack-ice in this region was about 200 miles farther south compared with the previous season. On October 28 she was in $56^{\circ} 7' \text{ S.}, 23^{\circ} 39' \text{ E.}$ The whaler *Truls* reported sighting a reef in this position early in 1930, but a sounding of 2606 fathoms by the *Norvegia* disproved its existence.

On November 22, in approximately 105° E. , the *Norvegia* was able to make her way farther south, and by November 30, in 135° E. , she was about 150 miles north of the Wilkes Land coast.

Two days and two nights were spent in a search for the Nimrod Islands, which were reported a century ago in approximately $56^{\circ} 45' \text{ S.}, 158^{\circ} 45' \text{ W.}$ The weather was clear but no sign of land was seen and soundings of over 2000 fathoms were obtained. Shackleton's Expedition of 1907-09 and Scott's Expedition of 1910-13 were also unable to find the islands. On December 28 the reported position of Dougherty Island was reached, in $59^{\circ} 48' \text{ S.}, 118^{\circ} 40' \text{ W.}$ Here again, soundings of over 2000 fathoms were obtained and no land was seen though the weather was favourable. Scott's Expedition of 1901-04 also visited this neighbourhood in clear weather on June 25, 1904, and saw no land and made a sounding of over 2000 fathoms.

The *Norvegia* now set her course south-east for Peter I Island, and reached its vicinity on January 4, 1931. Unfortunately ice conditions prevented her from approaching closer than 36 nautical miles to the island, so that it was not possible to make a landing to leave a hut and provision depot as had been intended.

On January 14 Deception Island was reached and a further supply of coal was obtained.

On January 24, in approximately 20° W. , the *Norvegia* turned south-east and made her way towards the continent. By February 7 she had reached approximately $69^{\circ} 30' \text{ S.}, 26^{\circ} \text{ E.}$, a position off the land between Queen Maud Land and Crown Princess Martha Land discovered by Riiser-Larsen early in 1930. Open pack stretched to the south and a sounding of over 1000 fathoms indicated that the ship was still a considerable distance from land.

It had been arranged that at about this time Captain Riiser-Larsen and Commander Lutzov Holm should join the *Norvegia* from the *Thorshavn* to chart the coast line of this region from the air. It was therefore necessary for the *Norvegia* to turn north without exploring further in order to meet the *Thorshavn* at the appointed place. Illness prevented Lutzov Holm from joining the expedition but Riiser-Larsen

with two sea-planes was transhipped to the *Norvegia* and Riiser-Larsen assumed command. Major Gunnar Isachsen and Mr Eggvin, the oceanographer, joined the *Thorshavn* to return to Norway.

The *Norvegia* returned south immediately to explore the unknown area between Queen Maud Land and Crown Princess Martha Land. During flights on February 16 and 17 Riiser-Larsen discovered and mapped a new stretch of coast between $70^{\circ} 30' \text{ S.}$, $24^{\circ} 15' \text{ E.}$ and $68^{\circ} 40' \text{ S.}$, $33^{\circ} 30' \text{ E.}$ and named it Princess Ragnhild Land. The land resembled Crown Princess Martha Land in that it was flat, with very few nunataks projecting through its ice-covered surface; it was separated from Queen Maud Land by a large bay about 80 miles wide.

On her return voyage to Norway the *Norvegia* called at Bouvet Island on March 15. It had been hoped that a meteorological station could be established here, but it was found that the fierce gales which blow over the island had completely destroyed the hut erected during the previous season. Many large bergs were aground in the shallow water round the island.

The *Thorshavn's* Antarctic cruise was primarily to relieve the floating factories of oil and to allow Consul Lars Christensen to visit his whaling fleet. In the course of the voyage, early in February, the ship reached MacRobertson Land and the area to the east of it. A submarine bank was discovered between $66^{\circ} 40' \text{ S.}$, 75° E. and $67^{\circ} 10' \text{ S.}$, 68° E. and named Fram Bank: the soundings ranged between 410 and 89 fathoms. A whale catcher was despatched to survey the coast line and charted the portion between $68^{\circ} 10' \text{ S.}$, 65° E. and $68^{\circ} 50' \text{ S.}$, 71° E.

Work of the "Discovery II" and the "William Scoresby" in the Weddell Sector, 1930-31.

The *Discovery II* successfully completed the programme briefly described in the January, 1931, number of *The Polar Record*.

During the course of her voyage she was chiefly engaged in oceanographical work, but a survey of the west coast of Graham's Land was also carried out. Peter I Island was visited, and from here the ship worked her way to the west for a considerable distance along the edge of the pack, keeping as far south as possible.

She returned to England again this summer after an absence of eighteen months, arriving at Falmouth on May 31. It is expected that she will leave for a further commission in the autumn.

The *William Scoresby* also successfully carried out her programme of oceanographical research. Her work lay for the most part in the Weddell

Sea, where she cruised along the edge of the pack-ice and was able on one occasion to get within 200 miles of the Caird Coast.

She is now at work in South African waters for the winter months and will proceed south again next season.

ANTARCTIC WHALING

The 1930-31 Antarctic whaling season far surpassed that of any previous years. Precise figures have not yet come to hand, but reports show that hunting was good and that the cargoes of oil obtained were larger than ever before. In many cases oil tankers visited the whalers to relieve them of their first cargo and to refuel them for further work. Thus, although the number of whalers at work during the 1930-31 season may not have increased to any great extent compared with the previous season, many of them were able to secure double cargoes.

This increased activity has had the inevitable result of over production. Companies who sold their oil in advance received the usual price of about £25 a ton: less fortunate companies sold their oil at £14 or even £11 a ton. There still remains about 70,000 tons of oil unsold. This supply is more than sufficient for next season's requirements and it was decided, therefore, at a meeting of the Norwegian whaling companies held on March 21, that the whalers should lie up for the 1931-32 season. One large company, the chief buyer of whale oil, has caused dismay in whaling circles by announcing that its requirements for next year only amount to 50,000 tons and that it will despatch its own fleet to the Antarctic to obtain this supply instead of making use of this year's surplus.

THE SECOND POLAR YEAR, 1932-33

By Dr G. C. SIMPSON

In the last number of *The Polar Record* I gave a short account of the plans for a Second Polar Year. A great deal of organizing work has been put into the scheme and Dr la Cour, the President of the International Commission for the Polar Year 1932-33, has devoted practically the whole of his time to the project.

Everywhere men of science have welcomed the scheme with enthusiasm; but the present "industrial blizzard" which is affecting all countries has proved a formidable handicap and made it very difficult for scientists to get definite promises from their governments to provide the necessary funds. In consequence it is not possible to state yet the exact share which each country will take; but all those interested in the polar regions will no doubt like to know the plans which are being considered by the various countries.

It must be remembered that the main work in polar regions will lose a very large proportion of its value unless there is close co-operation and simultaneous intense observing at stations in all parts of the world, for the conditions in polar regions are only significant in so far as they are an integral part of the physics of the earth as a whole. Thus many of the countries which co-operate will not send parties into the polar regions but will expand the geophysical work in their own countries in accordance with the programme laid down by the Polar Year Commission.

Forty-four countries have signified their interest in the work and will take part to a greater or less extent in the scheme of simultaneous observation. The following is a short description of the plans of the countries which are likely to take a leading part in the work.

ARGENTINE. The co-operation of the Argentine will probably take the form of a development of the meteorological and magnetic work at their observatories at the South Orkneys and the despatch of a party to the Antarctic is under consideration.

AUSTRIA. Austria will probably again occupy the huts on Jan Mayen used by them during the First Polar Year, the Danish Government having carried out the necessary repairs.

BELGIUM. It is unlikely that Belgium will be able to send a party into polar regions, but intensive co-operation in the programme, especially in the investigation of the upper air, is contemplated.

BRAZIL. It is proposed to establish an upper air station on the equator and meteorological stations on the islands of Trinidad (Brazil) and Tristan da Cunha.

CANADA. The plans under discussion include the establishment of a special Polar Year station at Chesterfield ($63^{\circ} 45' N.$, $91^{\circ} 50' W.$) to undertake magnetic, auroral and meteorological work; Copper Mine, Aklavik and Fort Simpson for aneroid observation; and Fort Norman, Resolution Island, Cape Hopes Advance and Nottingham as additional synoptic stations.

DENMARK. If sufficient funds are voted by the Rigsdagen Denmark will, in addition to the meteorological and magnetic work now being carried out at Godhavn, establish two magnetic stations at Thule and Godthaab and two mountain stations on the west coast of Greenland. A mountain station in the Färoe Islands is also contemplated.

Denmark will give facilities to other countries to establish stations at Angmagsalik and at Scoresby Sound.

FINLAND. An intensive programme will be carried out at the Finland Arctic station at Sodankylä. The establishment of a station at Petsamo is also under consideration.

FRANCE. The project of the Polar Year has been taken up very seriously in France. The plans under discussion include the establishment of stations at Scoresby Sound, at the Equator, at Kerguelen and at St Paul when a full programme of magnetic, meteorological and aerological work will be carried out. It is understood that Dr Charcot will visit Scoresby Sound with the *Pourquoi-Pas?* during the present summer to make preliminary arrangements. France is taking much interest in the southern hemisphere and M. Wehrlé has prepared a valuable memorandum with the object of encouraging and co-ordinating the work in the south.

GERMANY. As the project of a Second Polar Year was suggested by Admiral Dominik it is only natural that Germany should take a prominent part. Their plans at present include the establishment of a station at Julianhaab in Greenland, and an exceptionally full programme of work at sea. Germany is taking particular interest in the aerological work and the investigation of the upper atmosphere will be an important item in their programme both at Julianhaab and at sea.

GREAT BRITAIN. The Government has asked the Royal Society of London and the Royal Society of Edinburgh to organize the British co-operation during the Polar Year and has promised a contribution of £10,000 towards the expenses, provided that other countries take a fair share in the arrangements, and that the project receives sufficient support generally to ensure its success.

The preliminary plans contemplate the establishment of a station at Fort Rae in Canada where a full programme of meteorological, magnetic, aurora and aerological work will be carried out, and the establishment of a station on Ben Nevis in Scotland mainly devoted to upper air research. Mr J. M. Stagg has already gone to Canada to visit Fort Rae and to make arrangements for the accommodation and equipment of the main party. The possibility of carrying out work at sea is also under consideration.

HOLLAND. The establishment of a magnetic station on the east coast of Greenland is contemplated and it is hoped that it may be possible to carry out there investigation of the upper atmosphere by means of aeroplanes.

ICELAND. The Carnegie Institution of Washington having promised to provide the instruments, a magnetic station will probably be established in Iceland by the Government.

NEW ZEALAND. The establishment of a station on Macquarie Island is under consideration.

NORWAY. A strong Committee has been formed in Norway and their preliminary programme includes the establishment of two magnetic stations at Hammerfest and Kautokeino, and the organization of a network of stations in the south of Norway for aurora observations. Aerological and mountain stations are also proposed.

POLAND. Three programmes have been drawn up: (1) a maximum programme, involving sending a party across the Arctic ocean with a special form of amphibian motor cars; (2) a medium programme, including the establishment of a station in Spitsbergen, and (3) a minimum programme confined to observations in Poland itself. One or other of these programmes is to be selected according to the funds available.

RUSSIA. The whole project of a Second Polar Year has been enthusiastically welcomed by Russia and very full co-operation is assured. It is impossible to give details of the Russian programme here, beyond saying

that is includes twelve magnetic stations, and three aerological stations at which Moltchanoff's new instruments for obtaining the temperature of the upper atmosphere by wireless instruments carried on balloons will be used. The Russian programme is more extensive than that formulated by the International Commission.

SWEDEN. The programme drawn up in Sweden includes the establishment of two stations in Spitsbergen: a low level station for magnetic, meteorological and aurora work and a high level station for meteorological and aerological work.

UNITED STATES OF AMERICA. The energetic co-operation of the United States is assured. The Weather Bureau will extend the work at their stations in Alaska especially at Sitka, Point Barrow, Fairbanks and Nome. It is possible that a station will be established near the North Magnetic Pole by private enterprise. Professor Hobbs is considering the extension of his work in Greenland and the Magnetic Department of the Carnegie Institute, under the energetic direction of Mr Fleming, will help to equip magnetic stations when such help is required.

The above information has been compiled from many sources, and although in most cases the programmes still await the necessary financial means there can be little doubt that, in spite of the difficult financial position, the Second Polar Year will be carried out with success.

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ERRATUM

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Page 8. For $70^{\circ} 24' N.$ read $79^{\circ} 24' N.$