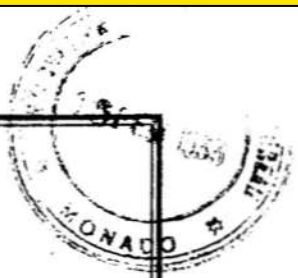

THE POLAR RECORD

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President Mention in Bulletin, calling special attention to those articles of Hydrographic interest which have not already been mentioned. J.S.M. 24.2.33

Director [illegible] 24/2/33 [illegible]

Director Long 25/2/33 - accord -

Secretary-General [illegible]

Assistant-Secretary [illegible]

Technical-Assistant done [illegible] 6. III. 33

Technical-Assistant [illegible]

Translator


KSG

H. G. W.

Regretting you, because your years were splendid
Beyond a brilliance we shall ever know,
We, whom your fineness stirred, who saw you go
Smiling, as one who by the gods stood friended—

What shall we say to those whose hearts unmended
Are poignant-sad, with all fair hope laid low?
Speak praise? No glory of an afterglow
Can compensate for brave clear sunshine ended.

What comfort, but to say we envy you,
As when we saw you start, adventure-glad,
Your face towards the stars that guard the north.

You loved your fated way. We envy you
The life of swift fulfilment that you had:
The tragic fitness of your passing forth.

F. E. C.

FOREWORD

As this issue clearly shows, the past year has seen the inauguration of a very remarkable effort in international co-operation in the polar regions. The Polar Year for the investigation of meteorology and allied sciences has run half its course; and in spite of the universal financial stringency, and the consequent slenderness of official resources, an imposing number of Polar Year expeditions is now at work in the Arctic regions. The descriptions of their work may sound tedious or abstruse to the layman, but he may rest assured that when all the results are collected, co-ordinated and analysed, they may yet affect him very closely in matters of his daily life. Their effect upon wireless transmission and air transport will possibly carry a more direct appeal to him than the origin of "depressions over Iceland," but other, and possibly more useful, repercussions may arise from this concerted attack upon the air and its ways.

All these expeditions, whether public or private, official or unofficial, will have the good wishes of those interested in polar affairs.

We have pleasure in drawing the attention of readers to the announcement in the *London Gazette* of November 4, that H.M. The King had graciously approved the award of the Polar Medal to the members of the British Arctic Air Route Expedition. As explained in an article in these pages, this is the first time that a medal for Arctic service has been awarded for nearly sixty years.

We tender our congratulations not only to the recipients of the Medal, but also to all the expeditions, forerunners to this one, which have, since the War, marked the revival of British interest in the Arctic, and have, in a sense, led up to the greater effort under the leadership of Mr Watkins. There have been nearly twenty expeditions, largely of University men, to the Arctic in the last ten years, and the hundred or so members of these parties form a fine nucleus of experience for the future. We are pleased to record the recent formation by these men of an Arctic Club, the main object of which will be to give members an opportunity of meeting once a year, either in Oxford or Cambridge, to renew friendship, and meet newcomers. We hope to give full details in our next issue.

The difficulties which expeditions have had in raising the comparatively small funds required have been kept in mind by those who are raising a memorial to Mr Watkins, as the Appeal printed in this issue shows. It

is a satisfaction to be able to report that the subscriptions to the Fund have now reached the sum of £1300.

As forecast in a former issue of *The Polar Record*, plans for the new building of the Scott Polar Research Institute have been prepared by Sir Herbert Baker, F.R.I.B.A., and laid before a Syndicate of the University. They are completely successful in solving the problem of adequate space, together with dignity of appearance, but unfortunately the Building Fund is not sufficient to erect all three storeys of the approved plan. Appeals in the press, and elsewhere, for an extra £2000 to enable the plans to be executed in full, have been made. If unsuccessful, it is feared that the Syndicate will be compelled to erect two storeys only of the building. Such a compromise would be exceedingly unfortunate, since it would not only affect the efficiency of the Institute, but would do less than justice to the architect's original dignified plan.

It is a pleasure to record that H.M. the King of Norway has conferred the Order of St Olaf on Dr Hugh Robert Mill in recognition of the help he has given to Norwegian polar explorers.

OBITUARY

By the death of Henry George Watkins at the age of twenty-five, there has passed an explorer of the first rank, just as the world at large was beginning to realise that in polar exploration, as in other walks of life, there may occasionally arise a figure, which, in spite of youth, leaps to the forefront as of right.

Yet it is rare to find in polar chronicles such a combination of daring with caution, of wisdom with youth, and of modesty with leadership as was the case in the person of the young man always known to his companions as "Gino." Full recognition of his genius for the work he undertook is to be read in the press references to him after his death, and the same genius is evident between the lines of the official account of his last expedition, *Northern Lights*, written by four of his companions on that venture. Implicit in its pages is the feeling of his fellows that, though the plans of their leader were sometimes so bold as to excite question, they would always feel safe provided he was with them to carry them out.

On account of his youth, and his long absences from England, there are but few who can count themselves fortunate enough to have been familiar with his clear cut features, his alert mind, his shy manner, and his spirit of eagerness in whatever he undertook. To the rest of the world he must remain a rather mythical figure, but even so all must join in the great regret that death has come upon one who had accomplished so much, yet who promised so much more.

By a strange fate, one of Watkins' two companions in his famous boat journey, Captain Percy Lemon, died within a month or so of his leader. He was an officer of the Royal Corps of Signals, and was responsible in Watkins' absence for the administration of the Headquarters in East Greenland.

We also record with regret the death, in New Zealand, of Mr H. T. Ferrar, the geologist of Captain Scott's *Discovery* Expedition from 1901–4. It fell to him to be the first to disclose the structure of the Ross Sea Sector of the Antarctic, and he never lost interest either in the region or in the men who followed in his footsteps.

Mention must be made in these pages of the well-known traveller and geologist, Professor J. W. Gregory, who, in company with Sir Martin Conway and Professor Garwood, made an important journey in Spitsbergen in the early days of his career; and of Admiral Umberto Cagni, who was second-in-command of the Duke of Abruzzi's *Stella Polare* Expedition of 1899–1900. Besides the loss of Dr H. K. E. Kruger and Mr R. A. Bjare referred to elsewhere in this issue, we have to record the death of Dr Lebedev, a geophysicist at the Soviet station on Novaya Zemlya, who lost his life in a snow-storm.

ARCTIC REGIONS

SVALBARD, FRANZ JOSEF LAND, AND RUSSIAN ARCTIC REGIONS

Soviet Union Expeditions, 1931.

The following summary of the steady work done in this sector of the Arctic by Soviet Expeditions, taken from a number of sources, records the results obtained in the last two years.

The results of two reconnaissance flights over Sverdrup Island on July 28 and August 8, 1931, have now been received by the Arctic Institute, Leningrad, and are published in *The Bulletin* of the Arctic Institute, No. 4, 1932.

The observations were made by Mr Lappo, from the Dornier-Wal aeroplane *Komseverput III*, on one of several flights for the purpose of investigating ice-conditions over the Kara Sea in the navigation period of 1931.

Special attention was paid to the character of Sverdrup Island, some 60 miles to the north of Dickson Island. The island is from 2 to 3 miles in diameter, and appears to be due to the silt discharged by the Ob and Yenisei rivers.

The unusual ice conditions in the north during the summer of 1931 are well illustrated by the activities of a hunting expedition on board the *Leningradgostorg*, commanded by Captain N. Vorotilov.

The expedition left Murmansk on August 1, and reached the Kara Sea on August 4 by way of the Matochkin Strait, after which, the ice conditions being favourable, the ship proceeded in a northerly direction, following the east coast of Novaya Zemlya. A bank 7 ft. in its shallowest portion was discovered off this coast in 76° 19′ 5″ N., 68° 42′ E., and the expedition reports the area between Ice Haven and Cape Bismarck to be dangerous for navigation anywhere within 3 miles of the coast.

Franz Josef Land was reached by way of Cape Zhelaniya and the Oranskie Islands, a pause of thirteen days having been made in the pack-ice for hunting; the expedition entered Allen Young Sound on August 19, and found it free from ice, although Aberdare Channel was still blocked. A call was made at Calm Bay on August 20, and the same day the May, Etheridge, Newton and Algar Islands were visited. On August 21 the party arrived at Hayes Island, reaching Cape Chads on Prince

George Land, later the same day, by way of Markham Sound. Here pack-ice was again encountered. After a halt of two days for hunting the *Leningradgostorg* proceeded through Nightingale Sound to the Barents Sea, skirting the south coast of Prince George Land, and finding Cambridge Strait free from ice, passed through it, and followed the coast of Alexandra Land as far as Cape Nimrod. Observations made in this region by Captain Vorotilov revealed the presence of numerous banks near the north coast of Alexandra Land, and the west coast of Armitage Peninsula. Two bays, with promise of good anchorage, on the south coast of the peninsula, as well as a small island between Armitage Peninsula and Prince George Land, were discovered. The *Leningradgostorg*, having remained in this locality till September 4, returned to Cape Zhelaniya, Novaya Zemlya, by way of Cambridge Strait and Cape Grant. Seven days, October 7–13, were spent in coasting the shores of Novaya Zemlya from the Oranskie Islands to Cape Alexis, this area being entirely free from ice. On October 13 a course was set for the Murmansk coast, and the expedition reached Port Vladimir on October 19.

A piece of whale blubber, dug up by a Yamal Samoyede near the River Benuieuo which flows into Ob Bay, has recently been sent to the First State University at Moscow for identification. It was found in the frozen ground at a depth of about 3 ft. On hearing of this interesting find the Zoological Institute of the Academy of Science sent a member of its staff, V. S. Adrianov, to the Yamal Peninsula to make investigations, and another specimen of the same kind was discovered. Single bones of Quaternary whales have previously been dug up in this locality, but the finding of the flesh is of rare occurrence.

Voyages, often at considerable risk, were carried out by several ice-breakers during the winter of 1931–32, and details of these have now been received, having been published in *The Bulletin*, No. 6, 1932.

In December 1931, the ice-breaker *Lenin* was sent to the relief of the *Malyguin*, which had run aground on a bank near Vaigatch Island, arriving there on December 4. The work of relief was carried out successfully, in spite of the limited amount of daylight, and the *Malyguin* returned safely to Archangel. The *Lenin*, however, was caught in the ice in Varnek Bay, being unable to break a way through owing to a shortage of coal; and finally the ice-breaker *Krassin*, commanded by Captain Ponomarev, was dispatched, on February 6, to its relief.

The *Krassin* met with the first ice on March 2 in Long. 47° E. in the

form of brash and pancake-ice, continuous hummock-ice being seen to the east. Between Long. 53° and 54° E. the expedition passed through an area of almost solid ice, and finally, on March 8 in Lat. 69° 37′ N., Long. 57° 30′ E., when only about 28 miles from the position of the *Lenin*, the *Krassin* became completely blocked, the situation being rendered more difficult by a high wind and very low temperatures. On March 11, however, after blasting operations, the ice-breaker was at last able to continue the journey, and join the *Lenin* on March 12. The return journey of the two ice-breakers was equally arduous. Finally the thickness of the pack-ice compelled them to halt, and wait for better conditions in order to save fuel, and they remained in the ice till May 12. At last, between May 16 and 18 the pack began to loosen, and large areas of open water appeared. The *Krassin*, with the *Lenin* in tow, arrived at Murmansk on May 19.

Scientific work was carried out during the voyage of the *Krassin*, under the direction of Dr Tchetchulin of the Arctic Institute, who made hydrological observations, assisted by Mrs I. N. Kelareva. Meteorological and glaciological observations were made by V. J. Arnold-Alabiev of the Hydro-Meteorological Committee.

Soviet Union Expeditions, 1932.

The *Sibiriakov* Expedition, which was planned under the auspices of the Arctic Institute, Leningrad, holds the distinction of being the first to negotiate the North-East Passage between Europe and Asia in one season; the previous expeditions to make the passage, those of Nordenskiöld in 1878–79, Vilkitski in 1913–15 and Amundsen in 1918–20, having passed two or even three seasons in the ice. We can only publish a brief account of this fine journey, the full details not being available; but it is hoped that this may be supplemented later. The plans for the expedition appeared in *The Polar Record*, No. 4.

The party was led by Professor O. Schmidt, Director of the Arctic Institute, and the personnel included the following:

L. O. Belopolsky, research on hunting.
B. P. Bruks, hydrographer.
J. J. Hackel, surveyor.
A. Th. Laktionov, hydrographer.
L. O. Retovsky, hydro-biological work.
I. L. Rousinova, hydro-biological work.
P. P. Shirshov, geologist.
V. J. Wlodavetz, geologist.

Professor W. J. Wiese was leader of the scientific staff. Besides these, there were other scientists, journalists and photographers, and the party

included three women. An aeroplane was taken, and was in charge of a party of airmen under J. K. Ivanov. Provisions were carried for eighteen months, in case it was found impossible to complete the voyage in one season.

The expedition left Archangel on July 28 on board the ice-breaker *Sibiriakov* (2000 tons), commanded by Captain N. J. Voronin, in company with another party on board the *Rusanov*, bound for Dickson Island; here a fresh supply of coal was obtained, the Kara Sea having been reached by way of Matochkin Strait.

From Dickson Island the expedition proceeded to the Serge Kamenev Islands, to the west of Severnaya Zemlya, where for the last two years a party led by G. A. Uschakov has been at work. After calling at the radio station, a course was set for Cape Molotoff, the most northerly point of Severnaya Zemlya, after which a visit to the New Siberian Islands was planned. Though the circumnavigation of the group was completed, unusually bad ice conditions prevented the carrying out of the latter part of the plan, and the expedition was forced to keep close to the islands of Severnaya Zemlya. The expedition afterwards proceeded to the mouth of the Lena, having reached open water again in the neighbourhood of the Taimyr Peninsula. A visit was paid to the wintering party at the station at Tiksi Bay, after which the expedition left for the Kolyma, escorting two freight steamers. These were left at the Kolyma, hiavng reached their destination safely in spite of the dangerous ice conditions. From here the expedition set an easterly course, and shortly afterwards encountered extremely heavy pack-ice, similar conditions having been met with, in the same region, by Nordenskiöld in 1876. On September 18, in negotiating the pack-ice off Cape Serdze Kamen, a propeller was smashed, and although repairs were carried out at once, almost immediately afterwards it was broken again, and was lost. The party, however, managed to improvise a temporary sail, and with this, and the help of a favourable current, were able to make some progress, till on September 24 the current was lost. The ice-breaker drifted in the ice until open water was reached on October 1, and arrived at Bering Straits in a crippled condition. From here the ice-breaker was taken in tow by the Soviet trawler *Ussuriets*, and the expedition reached Yokohama on November 5, the journey of 3000 miles from the White Sea to Bering Straits having taken nine weeks.

Besides fulfilling the main object of the expedition, which was to demonstrate the practicability of communication by sea, during the summer, between Europe and far Eastern Russia, a full scientific

programme was carried out, including investigations at the mouth of the Lena; geological, hydrological and biological observations were made, and hunting conditions were studied.

An expedition, led by Professor R. Samoilovitch, with the object of erecting meteorological stations at Cape Chelyuskin, left Archangel in mid-July, 1932, on board the ice-breaker *Rusanov*. The ship was commanded by Captain Yerokhin, and the scientific staff included the following:

S. K. DUBRONRAVOV, hydrologist.
N. N. KONDAKOV, hydrologist.
N. N. KOLTCHIN, topographer.
J. J. LWOV, meteorologist.
Mrs ELIZABETH OURVANTZEVA, physician.
V. L. VAGUIN, hydrologist.

Besides these a party to relieve the personnel of the radio station on the Kamenev Islands was as follows:

N. P. DEMME, geographer.
G. J. YOILEV, radio telegraphist.
K. J. ZENKOV, meteorologist.

The expedition called at Dickson Island and whilst waiting for the arrival of a cargo of coal, a trip was made to Sverdrup Island, which was thus visited for the first time. The expedition then proceeded, in company with the *Sibiriakov*, as far as Severnaya Zemlya, where the two expeditions parted. Between Dickson Island and Severnaya Zemlya a new group of islands was discovered in Lat. 75° 08′ N., Long. 82° E., and another island 40 miles away in Lat. 75° 48′ N., Long. 81° 20′ E. At Severnaya Zemlya the *Rusanov* took on board the party, led by G. A. Uschakov, which had been at the station on the Kamenev Islands for the past two years, and the relieving party was left to carry on its work. After leaving the Kamenev Islands the expedition set a course for Schokalsky Strait, near the entrance of which a group of three islands was discovered; a hut was built at Cape Sverdlov, the northerly point of the western entrance to the strait, for the use of the Kamenev Island research party. The expedition then reached Cape Chelyuskin by way of Schokalsky Strait, which was navigated for the first time, and proceeded to erect the new radio stations, consisting of four buildings. At Cape Chelyuskin a cairn was found containing autograph letters left by Amundsen and Sverdrup.

From there the expedition set a course for Einsamkeit (Lonely) Island, but owing to the difficulty of communication with Severnaya Zemlya, was compelled to return to the Kamenev Islands. Here it helped the

wintering party to repair the damage done by a gale experienced after the departure of the ship.

The expedition returned by way of Russian Harbour, Novaya Zemlya, reaching Archangel on September 24. The voyage had lasted fifty-five days, and a distance of 4000 miles was covered. The scientific work of the expedition included oceanographical investigations carried out in the Kara Sea, and the area between Dickson Bay, Severnaya Zemlya and the Taimyr Peninsula; but as yet few of the results are available for publication.

An expedition in the *Knipovitch* (100 tons), a small sailing ship with auxiliary motor, sent out by the Oceanographic Institute and led by Professor N. N. Zubov, was at work in the area between Franz Josef Land and the Murmansk coast during the summer of 1932.

The object of the expedition was to continue the systematic investigations conducted by the Oceanographic Institute since 1900; and the work included hydrology, meteorology and oceanographic work and the charting of various coastlines. Soundings were taken at 400 stations, and observations made as to the variations in the force of the warm current of the Gulf Stream Drift, and its effect on the Arctic ice-fields. It was ascertained that the lower the temperature of the water along the Murmansk coast, where there is a branch of the Gulf Stream Drift, the less ice there will be in the Barents Sea, and to some extent this also holds good in the Kara Sea.

During the course of the voyage the Franz Josef Land archipelago was circumnavigated for the first time in history. Setting a course along the 42 meridian, the expedition reached Gillis Island, which was found to be surrounded by ice; a landing was made, however, at Victoria Island, which was next visited by the ship. Continuing her course along the 42 meridian the *Knipovitch* reached Lat. 82° N., ice conditions being favourable, and then, steering due east, reached the Polar Year radio station at Rudolph Island. Doubling the northern islands of the Franz Josef Land archipelago the ship kept her course in the direction of Cape Zhelaniya, Novaya Zemlya, ice being met with only once, in 80° N., 65° E. A further hydrological section was made from Cape Zhelaniya as far north as Lat. 79°, after which Wiese Island was visited, without encountering any ice on the way. After this the *Knipovitch* returned to Russian Harbour, Novaya Zemlya, leaving later for the village of Polarnoye on the Murmansk coast, which was reached on September 21. The voyage lasted thirty-four days, and a distance of over 3000 miles was covered.

During the summer of 1932 two voyages were made by the ice-breaker *Malyguin* to Franz Josef Land, in order to convey the equipment for the U.S.S.R. Polar Year stations to be established on the archipelago.

The object of the first expedition was to transport the material for the supplementary buildings at the station at Calm Bay, Hooker Island, which has been enlarged for the work in connection with the Polar Year. Those on board the ice-breaker included a gang of workmen and a party to relieve the staff of the station, who had spent the winter there. Very unfavourable ice-conditions were experienced during this voyage. The pack-ice was met with in 77° 11′ N., 52° 05′ E. and later, in Lat. 78° 33′ N., the ice-breaker was jammed in heavy pack, sustaining damage to the rudder. This was only slight, however, and the expedition succeeded in negotiating the ice-belt, Calm Bay being reached by way of Miers Channel. The ice-breaker left Franz Josef Land on July 26, and returned to Archangel.

The *Malyguin* left Archangel on the second voyage on August 15, with the following scientists on board:

N. W. PINEGUIN, geophysicist, leader.
L. S. BORISHANSKY, geophysicist.
Miss DUSHETCHKINA, hydrologist.
Miss LOUPANOVA, geologist.
Two others.

The object of the expedition was to erect Polar Year stations on Rudolph Island, 81° 47′ N.; but scientific work was also carried out, and during oceanographical investigations a warm current was discovered, which was evidently of Atlantic origin, and was believed to be a branch of the Gulf Stream Drift.

Arriving at Calm Bay on August 22 stores were unloaded, and 4 days later the ship left for Rudolph Island, and having visited Teplitz Bay, in Lat. 81° 47′ N., proceeded north, reaching Lat. 82° 27′ N. They then returned to Teplitz Bay by way of Weise Land and Hohenloe Island, arriving on September 26. Here a party of four, consisting of the following:

BALABIN, chief of the radio station.
KUZMIN, meteorologist.
RASCHEPKIN, radio operator.
SOLOVIOV, hunter.

was left to spend the winter, and a course was set to Archangel, a call at the station at Calm Bay being made en route. On September 11 a severe storm was encountered, which reached its height 36 hours later, but no damage resulted, and the expedition reached Archangel on September 16.

A third voyage was projected, to follow immediately upon those recorded above, but no further news has been received as to whether this actually took place.

Plans for an expedition sent out by the U.S.S.R. Association of the Civil Air Fleet were published in *The Bulletin*, No. 6, but as yet no further news of the carrying out of the programme has been received.

The object of the expedition, which was to be led by M. Zelensky, was to make observations for the establishment of an air route from Archangel to Franz Josef Land, particularly with regard to suitable sites for aerodromes. The work was to have been carried out by two parties, one in the area between Ust-Tzilma and Vaigatch Island, and the other on Vaigatch Island itself.

Interesting investigations of some of the islands of Franz Josef Land were made in April, 1932, by a party from the scientific research station at Calm Bay, Hooker Island, where they had spent the winter. The party which consisted of three men, as follows:

IVANCHOUK, geologist.
PEPLOUKHOV, meteorologist.
SEMENOV, mechanic.

left the base on April 10, and proceeded to Wilczek Island, coasting the northern extremities of Hooker Island, Algar Island and Hall Island, where Cape Wiggins was proved to be a low shingly cape, and not a glacier, as stated on most maps. On Hayes Island, which was next visited, it was discovered that the ice-cap only covers the north-west part of the island. Four islands were discovered by the party between Lat. 80° 34′ and 80° 40·5′ N. and Long. 58° 38′ 5″ and 59° 02′ E., the surface of which was covered with a deposit of shells and pebbles, with basaltic outcrops at some elevated points. The largest of the islands, which was also the most southerly, rose to a height of 68 ft., while the highest point of the northern island was 35–40 ft. These two islands were divided by a strait about $1\frac{1}{2}$ miles wide. The other two islands of the group were very small.

The party reached Cape Heller, Wilczek Island, and then, having made a survey of the newly discovered islands, returned to the base, which was reached on April 29, 276 miles having been covered. Bad surface conditions were met with on the return journey, owing to the thaw.

Further light has been thrown on the direction and speed of the Arctic currents by the finding, on April 3, 1932, on the coast of Norway, in

70° 44′ N., 22° 44′ E. of a buoy, one of the 195 bottles and 15 buoys which were thrown overboard in the Nordenskiöld Sea from the schooner *Polar Star*, during the *Yakut* Expedition in 1927, for the purpose of investigating the currents.

As the buoy was thrown overboard on August 25, 1927, in the northern part of Yana Bay, in 72° 41′ N., 135° 42′ E., it must have drifted across the Polar Basin with the ice, and has taken only 4½ years in transit. The appearance of this buoy in Norway confirms once more the existence of a current from east to west in the polar basin north of Eurasia.

An expedition is at work in the area between the mouths of the Khatanga and Anabar rivers, making geophysical investigations, and conducting a scientific research into hunting conditions. The party, which left Leningrad during the summer of 1932, comprises the following:

G. M. KOLIN, a prospector.
A. A. ROMANOV, leader and hunting expert.
An interpreter.
Several workmen.

The expedition, which will also explore Beguitchev and Transfiguration Islands, has been equipped jointly by the Arctic Institute and Komseverput, Ltd., and is expected to last two years.

News of the plans of the Nijni-Petchorsk expedition sent out by the Arctic Institute in July, 1932, has now reached us. The object of the expedition is to make investigations on geology, geomorphology and biology in the region round the Petchora mouth. Observations, with a view to a topographical survey, will also be made. Besides this work the programme includes the mapping of Quaternary deposits, studies of the tundra relief, research on reindeer pastures and problems connected with game.

Two members of the staff of the Arctic Institute, G. V. Gorbatsky, geomorphologist and leader, and V. M. Sdobnikov, biologist, are taking part in this expedition, which is expected to last for 3 to 3½ months.

An expedition, working under the auspices of the Polar Commission of the Academy of Science, conducted botanical and geomorphological investigations in the region between Dudinka on the Yenisei and the Khatanga River. The party, which left Leningrad in May, 1932, was led by A. I. Tolmatchev.

Mention must be made in this issue of *The Polar Record* of the bibliographical work which is being carried on at the Arctic Institute. The

following bibliographies are now in preparation, and should prove valuable guides to the literature of the Russian Arctic regions.

(1) *An Index of Books, Notes and Articles on Novaya Zemlya*, compiled by A. M. BELOV and A. TH. SCHIDLOVSKY, and reviewed by W. J. WIESE. The work contains more than 3000 references, with annotations.

(2) *A Guide to the Russian and Foreign Literature connected with Vaigatch Island, the Northern Shores of Western Siberia, including Cape Chelyuskin, and the Yamal and Tchukotsk Peninsulas*, which is due to appear in 1933.

(3) *A Bibliographical Guide to the Kara Sea and North-East Passage*, to be published jointly by the Arctic Institute and the Hydrological Institute.

(4) *Bibliography of Russian Literature* referring to the fisheries in the Barents Sea, the White Sea, and the Murmansk coast from 1917–31, which has been compiled by V. K. YESSIPOV. This will be published by the State Publishing Office.

Other bibliographies on *Reindeer Rearing in* 1929–31, compiled by V. M. SDOBNIKOV; and on the *Cervidae* family, a continuation of the index by Professor GRÜNER, which ended in 1929. This latter work comprises Russian literature only, and excludes newspaper articles.

Serge Kamenev Islands Research Station, 1930–32.

The party led by G. A. Uschakov, which has been at work on the Serge Kamenev Islands for the past two years, returned to Archangel on September 24, 1932, on board the ice-breaker *Rusanov*. The following brief note on the work done has been compiled from reports in *The Bulletin*, Nos. 6, 7, and 8–10, 1932.

One of the main objects of the expedition was the mapping of the islands, and with this end in view five journeys with dogs, as well as several short trips on ski and on foot, were made by the party during the two years spent at the station.

By means of these journeys it was discovered that Severnaya Zemlya consists of three large islands extending in a general meridional direction, and associated with a large number of smaller islands. The whole group would seem to be comparable in extent to the north island of Novaya Zemlya, but to have considerably more permanent ice, as would be expected from the difference in latitude. The three main islands, and the straits separating them, have now been named as follows, beginning from the southernmost: Bolshevik Island, Schokalsky Strait, October Revolution Island, Red Army Sound, Komsomoletz Island.

The first of these journeys consisted of a short trip to the Soviet Bay district of October Revolution Island, lasting from October 1–10, 1930. It was followed up, in the spring of 1931, by a journey round Komsomoletz Island, during which the most northerly point of the whole group, Cape Molotoff, was named, and its position fixed in Lat. 81° 16′ N., Long. 93° E. This journey lasted 38 days, from April 22 to May 29.

On June 1, 1931, the party made a crossing of October Revolution Island, reaching it from the south through Schokalsky Strait, returning to the base on July 20.

The following year, 1932, two more journeys were made, completing the survey of the islands. A journey to Bolshevik Island was made by dog-sledge during the spring, the party leaving the base on April 14. Bolshevik Island was reached eight days later, by way of Cape Neupokoev and Vilkitski Strait, which was found to be full of pack ice. The recent break up of the ice increased the difficulties of the journey considerably, as it was necessary to find a route over the moving ice, and the party had frequently to carry the equipment and sledges on their backs from floe to floe. Sometimes open water was met with close in to the shore. Mists and snow-storms were a further hindrance to progress, while during the finer intervals the party was compelled to proceed by forced marches to make up time. The journey round Bolshevik Island was completed on May 28, and the base was reached five days later.

The second spring journey was begun on June 2, with the object of conducting an exploration of Jungsturm Bay, which was discovered on the south-west shore of Komsomoletz Island in 1931. During this work a new strait was discovered, dividing the south-west of the island from a new island, Pioneer Island, which was named and mapped by the party. The warm weather, which had now set in, made sledging very difficult during this journey, and the day after the party returned to the base rain set in, rendering all further sledge travel impracticable.

The map of the islands, which has been completed by the party, is on scale 1 : 750,000, and besides the map in stereo-geographical projection, another was compiled in Mercator's projection with a view to navigation. During the two years spent on the islands 36,712 sq. km. have been surveyed by the party. The area of the separate islands is as follows: Komsomoletz Island, 9244 sq. km.; Pioneer Island, 1649 sq. km.; October Revolution Island, 13,992 sq. km.; Bolshevik Island, 11,527 sq. km.; minor islands, 300 sq. km.; making a total of 36,712 sq. km.

During these investigations it has been found that Bolshevik Island differs considerably from the map compiled by the Vilkitski Hydrographic Expedition in 1913, the north-eastern point of the island, Cape Ounshlikht (Lat. 79° 26′ N., Long. 100° 35′ E.), being actually situated 35 km. north of the coast line fixed by the Hydrographic Department under whose auspices the Vilkitski expedition was sent out. A crossing was made to the south-west of the island, and geological and biological

investigations carried out. It is reported by the party that Bolshevik Island is composed of slates and granite. The steep eastern coast-line of the northern part of the island slopes gradually towards the sea, becoming a shallow coast of sand and pebble, indented by bays and lagoons. From the foot of the steep banks of this part of the island, a low terrace, 50 m. high, spreads north and north-east. The western coast of the island, facing Schokalsky Strait, consists of slopes up to 400 m. in height, ending abruptly at Cape Wiese, its northern end, and in the south giving place to a terrace, 50 m. in height. The interior of the island consists of rounded hills, the highest of which is about 500 m. Ice covers only about one-fifth of the total area, in the form of ice-caps in the interior. Four of five glaciers reach the sea on the west coast, and numerous traces of recently receded glaciers were found. The flora and fauna were found to be much richer on this island than in other parts of the archipelago.

The eastern coast of October Revolution Island and the southern part of Komsomoletz Island consist of steep cliffs, in contrast to the west coasts, which are much indented, some of the fjords being quite long, the Matusevitch Fjord, which was discovered by the expedition, stretching for about 30 km. The eastern and western coasts of the northern and middle parts of Komsomoletz Island are low. The interior consists of a well-defined dome, which reaches a height of 800 m. towards the east, though not exceeding 250 m. at the west side. There are two terraces on the west side of the island, about 420 m. absolute height. No large rivers were found on these islands, the largest seen being only 20 km. in length. The dome-shaped hills in the centre and north of Komsomoletz Island are none of them more than 250 m. high. The interior of both islands consists of a continuous sheet of ice, covering 80–90 per cent. of the area; the relief corresponds in softened outlines to the slope of the underlying ground, but nunataks were observed at the edges of the ice shield. The ice appears to be receding as a whole, and in some localities there are stagnant glaciers.

The geological results prove the existence of an immense arch of foldings of post-Permian Age on the Taimyr Peninsula, of which Severnaya Zemlya is structurally a part. During the Quaternary epoch Severnaya Zemlya, in common with the Taimyr Peninsula, was covered with continental ice, the movement of the glaciers being westward and north-westward. The present outlines of Severnaya Zemlya are due to faults of Quaternary Age, and the general slope of the land to the west is caused by a series of step faults in a meridional direction. A general

elevation of the land was observed to be taking place, the process being much faster on the eastern side.

Besides the survey work observations were made by the party on magnetism, geology, geomorphology, tides, meteorology, aerology, ice conditions, hunting, zoology, and botany. The work of the party is being continued by N. P. Demme, G. J. Yoilev, and K. J. Zenkov, who relieved G. A. Uschakov's party in the summer of 1932.

Soviet Polar Year Stations, 1932–33.

Work in connection with the International Polar Year is being carried out on a large scale by the U.S.S.R., a network of stations having been established over the country at which meteorological, aerological, and actinometric observations are being carried out, while investigations in atmospheric electricity, the tides and hydro-chemical bacteriology are also being made. A complete meteorological survey of the whole Soviet Union is also being carried out. Work has been in progress since the beginning of August at all the seventy-six stations, of which twenty-nine are newly established.

One of the most important of these stations is situated in the Russian Harbour district of the west coast of Novaya Zemlya, with a sub-station on the ice-cap, where a radio telephone has been installed. The lower station is equipped with a long-wave transmitter, by means of which it is hoped to keep in constant communication with the stations at Matochkin Strait and Cape Zhelaniya. Dog transport will be used, and the stations are also supplied with an aeroplane.

Besides meteorological and aerological work, which is being carried out in accordance with the Polar Year programme, glaciological observations, directed by Dr Wölcken, one of the members of the Wegener Expedition to Greenland, 1930–31, will be made at the ice-cap station, including measurements of the thickness of the ice by seismic methods similar to those used on the Greenland Expedition. A botanical survey will be made at the lower station.

The staff of the two stations includes the following:

M. M. YERMOLAYEV, leader.
ARDEYEV, of the Institute for Northern Nationalities.
KARBASNIKOV, climatologist.
PETERSEN, radio operator.
Dr WÖLCKEN, geophysicist.
ZOUBKOV, botanist.

Other stations on Novaya Zemlya are at Matochkin Strait, Yugo Strait, Cape Zhelaniya, and in Indiga Bay.

The most northerly station in Siberia was established at Cape Chelyuskin, in Lat. 77° 43′ 04″ N., Long. 104° 17′ 01″ E., in the summer of 1932, by the *Rusanov* expedition, which left Archangel on July 28. The party, consisting of:

B. D. GEORGIEVSKY, leader and physician.
G. D. ADLER, geologist.
TH. P. ANTONOV, meteorologist.
V. N. KOSHKIN, hydrologist and geomorphologist.
G. D. RUTILEVSKY, hunting expert.

will be the first to winter in this locality.

Other Siberian stations will be at Dickson Island, Wrangel Island, Verkhoyansk, Bulun, Novo Kolymak, Tiksi Bay (River Lena), and on Cape Wellen (Bering Sea). Also at White Island, the River Khatanga region, on Kotelny Island, and on Cape Nordvig.

In Franz Josef Land, the station at Calm Bay, Hooker Island, has been considerably enlarged with a view to the Polar Year activities, and an aeroplane has been obtained. General ice investigations and aerological observations are being made. The party left Archangel on board the *Malyguin* on July 9, and consists of the following:

J. D. PAPANIN, leader.
B. P. ARCHANGELSKY, wireless engineer.
E. K. FEDOROV, magnetologist.
A. A. GOLUBEV, wireless operator.
I. G. GUTERMAN, aerologist.
A. M. KASSATKIN, actinometrist.
LEONOV, biologist.
J. S. LIBIN. meteorologist.
J. SCHOLZ, geophysicist.
N. A. SHERDEV, second in command.
V. S. STOROZHKO, wireless operator.
A. M. TICHOMIROV, cook.
I. S. VASSILIEV, meteorologist.
W. W. VASSILIEV, meteorologist.
TH. N. ZUEV, carpenter.

A station, the most northerly in the world, has also been established at Rudolph Island, Lat. 81° 47′ N., the personnel and equipment having been transported there by the *Malyguin* during the summer of 1932. The party left at the station for the winter consists of four: a biologist, a meteorologist, a wireless operator and a mechanic.

Cambridge Spitsbergen Expedition, 1932.

An expedition, planned in continuation of the one led by him in 1930, was at work during the summer of 1932, in West Spitsbergen, under the leadership of Mr R. M. Jackson. The object of the expedition was to carry

out a topographical survey of the Stubendorff Mountains, and the east shore of Wijde Bay; to fix the position of Wijde Bay by accurate longitude determinations; and to investigate the upper portions of the branch glaciers on the east side of the Mittag-Leffler Glacier. The personnel of the expedition was as follows:

R. M. JACKSON, St John's, leader and surveyor.
A. D. G. BRAITHWAITE, Gonville and Caius.
H. W. BUXTON, Royal School of Mines, surveyor and geologist.
P. E. FAIRBAIRN, Trinity and Royal School of Mines, geologist.
A. R. GLEN, Balliol, Oxford, surveyor.
J. I. MOORE, St John's.
W. G. WELCHMAN, Sidney Sussex.
P. LAMARTINE YATES, St John's.

The expedition left King's Lynn on June 29, sailing their own boat *Dawn*, a converted Aberdeen fishing smack of about 30 tons, 45 ft. in length, cutter rigged, with auxiliary engine. Owing to engine trouble they were compelled to call first at Aberdeen and then at Bodö on the way to Tromsö, where it had been arranged that supplies should be collected; and at Bodö it was found necessary to install a new engine. This delayed the expedition until July 22, when the voyage was continued. Land was sighted on July 28, and on July 30 the expedition arrived at Petunia Bay, at the north-east end of Ice Fjord; and established their base at the Scottish Spitsbergen Syndicate's hut at the mouth of the Ebba Valley. The first two days were then spent in relaying stores up the Ebba Glacier to the foot of a prominent nunatak, some 4 miles from the coast, which was to be the starting point of the sledging party.

The survey work of the expedition was divided between two parties, a sledge party, and a party operating from the base. The sledge party, consisting of Mr R. M. Jackson, Messrs Fairbairn, Welchman, and Lamartine Yates, made a journey across the highland ice of Garwood Land in a northerly direction to the Lomme Bay Glacier, which flows north from a point just west of Mount Newton, in the Chydenius Range, into Lomme Bay in Hinlopen Strait, and is separated from Wijde Bay on the west by the Stubendorff Mountains. The route taken was by way of the ice-divide on the east side of the Mittag-Leffler Glacier; and, on reaching the Lomme Bay Glacier, the party went down the glacier as far as Mount Irvine. Bad weather was a considerable hindrance to the party. The inland sledge journey lasted twenty-six days, of which thirteen were very misty, and not more than three really fine. Ski-ing conditions, however, were excellent. The temperature was usually a

few degrees below freezing, and on one occasion it fell as low as 14° F. The sledge party arrived back at the base on August 29, having managed to ascertain the extent of the Stubendorff Mountains. Cairns were built and theodolite triangulation carried out, but, owing to the bad weather experienced, all the topographical detail could not be filled in, and therefore this side of the work remains incomplete. A geological survey was also carried out.

The base party operated from the east shore of Wijde Bay, which was reached on foot by way of the Ragnar and Mittag-Leffler Glaciers. The party left the Ebba Valley base on August 4, and arrived at Wijde Bay two days later. This party carried out a theodolite triangulation from Norwegian trigonometrical points round Petunia Bay, down the Mittag-Leffler Glacier to East Fjord, Wijde Bay, and also made a theodolite subtense traverse up Stubendorff Glacier, thus linking up that region with parts more accurately surveyed. In addition they made a plane table survey of the southern portion of East Fjord, Wijde Bay. Unfavourable weather, similar to that experienced by the sledge party, prevented the completion of the survey, but the framework being completed, the detail can be mapped by a later expedition.

The party reached the base on August 21, and the few days which elapsed before the return of the other party were spent round the head of Petunia Bay in survey work, which was much hindered by bad visibility.

The expedition left Petunia Bay on August 30, and having picked up stores at Longyear City, were able to return direct to England. They reached King's Lynn on September 18, after an ocean passage of eighteen days, and a total absence of nearly twelve weeks.

It is hoped that the work may be completed by another expedition in 1933.

Norwegian Hydrographic Expedition, 1932.

This expedition, the plans for which were given in outline in *The Polar Record*, No. 4, duly took place in the summer of 1932, under the auspices of the Norges Svalbard-og Ishavs-undersøkelser.

The object of the expedition was to continue sounding investigations of the fishing banks round Bear Island. The expedition sailed from Vardoe on May 23, in the Fishery Inspection ship, *Fridtjof Nansen*, belonging to the Norwegian Navy. The work was again in charge of Lieut. Rolf Kjaer, who led a similar expedition in 1931. The Captain of the ship,

Commander J. L. Høst, and his officers, also assisted in the work, together with a crew of seventy.

The ship met drift-ice in Lat. 73° and had to force a way through it for several hours until open water was reached on the east side of Bear Island. On account of the drift-ice, the work of sounding had to be started some distance to the west of the island; and during the whole of the time the work was much impeded by drift-ice and unfavourable weather. Norwegian and French trawlers, as well as a Norwegian floating whale factory, the first fishing vessels of the year, were seen in these waters as early as May 28.

On June 1 it was decided to discontinue the sounding operations, which were badly hampered by the ice, and return to Norway to wait till the conditions round Bear Island should improve. The expedition set to work again on June 6, but the weather was still bad, with frequent gales, fog and snow. The work of sounding was carried out between June 10 and 23, exclusively in the quadrangle from S.-W. to N.-W. of the island, nearly as far as South Cape, Spitsbergen, towards the north. A new echo sounding apparatus (*Atlas Lot*) was used for the first time in the Bear Island area, and was found to be very satisfactory, though the work was much hampered by the weather. A determination of the magnetic variation was carried out on Bear Island, and regular meteorological observations were taken.

The expedition returned to Harstad, Norway, on June 25.

Glacier Measurements in Spitsbergen, 1932.

Dr Adolf Hoel has sent us the following information about measurements of glacier motion, made by Mr Alfred Koller, in Spitsbergen, in the summer of 1932. Mr Koller left Norway on July 9, on board a coal steamer going to Advent Bay. At Spitsbergen a motor boat belonging to Mr H. Mercoll, the Mining Inspector of Svalbard, was placed at his disposal, and he was thus enabled to measure the movement of glaciers in Cross Bay, Kings Bay, and Ice Fjord. All the glaciers measured were found to have receded, except the von Post Glacier which had advanced considerably since 1924.

Cambridge Bear Island Expedition, 1932.

An expedition, consisting of Messrs G. C. L. Bertram and David Lack, of the Zoological Laboratories, Cambridge University, was on Bear Island from June 20 to August 10, 1932. The object of the expedition was to make a detailed study of the fauna, and the programme of work appeared in *The Polar Record*, No. 4. Financial assistance was received from the

Royal Geographical Society, and from St John's and Magdalene Colleges, Cambridge.

The party obtained passages in a trawler, which left Hull on June 14, and proceeded direct to Bear Island. The summer proved to be considerably later than usual; snow was lying in many places when the expedition arrived, and most of the lakes were still frozen. It was thus possible to begin the zoological survey before the majority of the smaller animals had emerged. Apart from general collecting, the main work was a study of the animal communities, both land and fresh-water, to discover the reactions of the various animals to physical conditions, to plant life, and to each other.

The party had intended to use one of the houses of the abandoned village of Tunheim as a base, but a welcome, and quite unexpected invitation to use three of their rooms was received from the only other inhabitants of the island, the Norwegian staff of the wireless and meteorological station.

Bear Island is notorious for fog, and of the fifty-two days spent on the island, five had clear skies, while on twenty-two days there was thick fog, with a visibility limited to 30 yards, and the remaining twenty-five days were unsettled. This tended to delay the work; but fortunately it was found possible to prolong the stay on the island longer than had been originally intended, and the party was thus able to complete the survey. A return to Norway was made on the ship which brought the Polish International Polar Year Expedition to the island, and which arrived at Tunheim on August 4, and from Tromsö the passage back to England was completed on another trawler.

British Polar Year Station at Tromsö, 1932–33.

An expedition, directed by Professor E. V. Appleton, will spend a year at Tromsö making special wireless investigations on behalf of the International Scientific Radio Union, and the British Polar Year Committee. At Tromsö, where there is an extended base with both power and telephone circuits, it is hoped to find conditions where the effect of the ultra-violet rays will be at a minimum owing to the high latitude, and where, being within the auroral zone, it may also be possible to make a detailed study of the influence of aurora on wireless transmission.

The party, which left England on July 9, consists of the following scientists: Professor E. V. Appleton, F.R.S., King's College, London, leader, and Mr R. N. Naismith, Radio Research Board Station, both of whom returned to England at the end of the summer; Mr G. Builder,

King's College, London, and Mr W. C. Brown, Radio Research Board, who will remain for the whole year.

The party reached Tromsö on July 15, and proceeded to establish a station at Simarik, on the small island of Ringvasso, 12 miles distant, and to install 10 tons of special instruments; preliminary arrangements had been made by Dr Watson-Watt, Director of the Radio Research Station, who visited the site earlier in the year. The base at Simarik is the transmitting station, while the main receiving station is at Tromsö.

Special methods are being used for measuring the concentration of electricity in the Kennelly-Heaviside layer, and measurements will also be made of the upper atmospheric electricity, and ionised layers. Routine observations on signals from long and short wave stations in America and Europe will be made by the wireless operators. As a result of these and other investigations it is hoped to establish a radio route through the ether 130 miles above the North Pole, in the Appleton layer, discovered by Professor Appleton, which has been found to be the best region for transmission of wireless messages over great distances. This route is much the quickest of any known, but up to the present time has given less satisfactory results than those passing through more temperate regions.

Polar Year Stations in the Svalbard Sector of the Arctic, 1932–33.

The Polish Polar Year Expedition arrived at Bear Island on August 4, 1932; and through the kindness of the Norwegians the party have been given accommodation at the wireless station at Tunheim in the north of the island.

An expedition from Sweden, led by Dr F. Lindholm, is now at work in Spitsbergen, having left Stockholm on July 11, 1932. A main station, equipped with instruments for observations on meteorology, magnetism, aerology, aurora, and cosmic radiation, has been established at the Svea coal mine, and there will also be a subsidiary meteorological station at a high altitude on one of the neighbouring mountains. Special arrangements are being made for observations on the height of the aurora.

Work in Finland, in connection with the Polar Year scheme, is being carried out at the permanent observatory at Södankyla, and also at Petsamo in 31° 13′ E., 69° 32′ N., where a first-class meteorological station has been equipped. Observations will be made in meteorology, magnetism, telluric currents, atmospheric electricity, and radiation.

In Norway, work is being carried out at Bodö, Bossekop and Hammerfest.

GREENLAND

Danish Three Year Expedition to East Greenland, 1931–34.

It had been hoped that a full report of the work of this expedition might be published in this issue of *The Polar Record*, but owing to the absence from Denmark of Dr Lauge Koch this is not possible. A detailed account of the expedition will, it is hoped, appear in the next number. Meanwhile, the following brief note has been compiled from the scanty information published in the press.

An important branch of the work carried out by this expedition has been a survey from the air, the three 3-seater Heinkel aeroplanes having flown over 24,000 miles while engaged on this task. The object of these flights was to investigate hitherto unknown parts of the ice-cap; to carry out extensive mapping of the ice-free coastal districts; and to explore the eastern coast from the air. During these flights it was discovered that the western slopes of the East Greenland mountain belt, where the expedition expected to find large ice-free areas, were covered with snow, with only a few isolated rocks visible. It was also found that the land between the ice-cap and the coast was much narrower than had been expected. Observations were also made on the grazing grounds of musk-oxen, which proved to be much less extensive in this region than had been previously supposed.

An important result of the expedition was the finding of about 5000 fossils of lepidosirens and sclerodermi in Franz Josef Fjord, a discovery which may be of great value in providing the necessary link between two stages in evolution. The fossils were discovered in a bay where some catastrophe, killing the animals in vast numbers, had apparently occurred in prehistoric times.

At the close of the expedition Dr Koch flew from Greenland to Reykjavik, eighty of his party making the same journey by ship. The remaining twenty members of the expedition were left behind at three stations in Greenland to continue work during the winter.

Dr Knud Rasmussen's Expedition, 1932.

An expedition, led by Dr Knud Rasmussen, was at work in South-East Greenland during the summer of 1932, and the country between Cape Farewell and Umivik was systematically explored. This stretch of coast,

though only 380 miles in length, has a coastline of many thousands of miles, owing to the number of fjords.

The expedition consisted of sixty-two members, including twenty-five Greenlanders, and besides the ship, had the use of motor boats and a seaplane. Astronomical measurements were made in exactly the same place as those made by Colonel Jenner in 1922, and the results appear to confirm the theory that Greenland is moving annually about 20 metres westward, though many more observations will be required before systematic errors can be eliminated.

Captain Ejnar Mikkelsen's Expedition to East Greenland, 1932.

Captain Ejnar Mikkelsen has kindly sent us the following news of his expedition, which was at work in East Greenland during the summer of 1932.

The expedition, which was planned under the auspices of the Scoresbysund Committee, had as its object the scientific exploration of the Blosseville Coast, and a continuation of the work of the British Arctic Air Route Expedition in the Kangerdlugsuak region. It left Copenhagen early in July; M.V. *Sokongen* was chartered, with a crew of eight men, and the party, which was led by Captain Ejnar Mikkelsen, consisted of the following:

TYGE BØCHER, botanist.
M. DEGERBØL, zoologist.
MØHL HANSEN, assistant zoologist.
JENS JENSEN, geologist.
CH. LARSSEN, topographer.
SVEN MIKKELSEN, artist.
M. SPENDER, topographer.
L. R. WAGER, geologist.
H. WAGER, assistant geologist.

After a stormy crossing Cape Dalton was reached on July 10, after negotiating heavy pack-ice near the land. From Cape Dalton the expedition proceeded slowly along the coast, reaching Cape Stephenson on July 22. During this part of the voyage they were fortunate enough to meet with very good ice-conditions, with almost continual sunshine, and only very occasional fog. At Cape Stephenson, however, all further progress was stopped for the time being by a mass of pack-ice which was prevented from breaking up or drifting away by a large number of icebergs aground on a submarine ridge. After two days spent in trying to find a way round this obstruction, the expedition entered a fjord east of Cape Ravn, where the ship remained at anchor until August 2, when

conditions improved slightly, and the voyage was continued, though heavy seas and the presence of ice hindered progress considerably. A call was made at Mikis Fjord, where six or seven days were spent in erecting huts, and in scientific work. On August 9 the expedition arrived at Kangerdlugsuak, and a good anchorage was found in a small inlet. Work was carried on here until August 20, when the ship visited the head of the fjord, after which the lateness of the season made it necessary for the expedition to proceed on its way, storms and unsettled weather making it dangerous to remain at Kangerdlugsuak. Accordingly, on August 22 the ship's party left for Mikis Fjord, while another party started for the same destination overland, leaving six men with two motor boats at Kangerdlugsuak for further exploration.

On August 30, the whole expedition having rejoined the ship, an attempt was made to explore the interior of Mikis Fjord, but this was prevented by heavy seas and violent rain, which forced the ship to remain at anchor until September 1, when the expedition proceeded southward to Lake Fjord, the base of the British Expedition, which was reached only a few days after Mr Watkins had been drowned. No pack-ice was met with between Mikis Fjord and Lake Fjord, though a large number of icebergs was seen. Captain Mikkelsen very kindly gave all possible assistance to the remaining members of Mr Watkins' expedition, and then proceeded to Angmagssalik. After a short stay at Angmagssalik, the expedition returned to Denmark, reaching Copenhagen on September 12.

An important work carried out by this expedition was the establishment of a chain of huts, stretching from Kangerdlugsuak to Angmagssalik, for the use of the Greenlanders. These huts were built at Mikis Fjord, where the hunting is extremely good, and at Lake Fjord, and together with the hut already in existence at Nualik, about 60 miles south of Kangerdlugsuak, form a line of stations not more than 60 miles apart. Large quantities of provisions and fuel have been left at these huts, and it is hoped that by providing this certainty of accommodation, the Greenlanders will be enabled to travel from one colony to another with a greater degree of safety than in the past. In consequence of the rapid growth of the population of Angmagssalik it is now essential for the hunters of this district to go farther afield in search of food, and this provision of accommodation is one of the measures being taken by the Danish Government for their assistance. A hut has also been erected midway between Cape Dalton and Kangerdlugsuak, on the site of one built by the Amdrup Expedition.

The scientific work of the expedition was carried out according to plan, and a survey was made of the Blosseville Coast, as far inland as the ice-cap. Measurements by photogrammetry were carried out by Mr M. Spender and Mr Ch. Larssen in the Kangerdlugsuak region, as a preparation for a detailed map. Surveys were also made in the district behind the coastal mountains, which were here about 3300 m. high, and this region was found to consist chiefly of ice-cap, broken by a few nunataks. The geologists made a geological map of the coast, paying special attention to the Kangerdlugsuak district, and a large collection of geological specimens was brought back. Special journeys to the inland ice were made by this party, and it was found that all the glaciers along the coast were receding.

Meanwhile the zoologists of the expedition carried out investigations on the land and marine fauna of the Kangerdlugsuak district, with a particular view to hunting conditions and the prospects of a future Eskimo settlement in the neighbourhood. The Kangerdlugsuak fjord was found to be the breeding ground of several species of seal, as well as narwhal, while many bears were seen, both at Kangerdlugsuak and in the pack-ice off other parts of the coast. Other work included botanical investigations; dredging for algae, which were found to occur in vast quantities at Kangerdlugsuak; and archaeological work on ancient Eskimo ruins along the coast.

Mr Watkins' Expedition to East Greenland, 1932–33.

This expedition was planned by the late Mr H. G. Watkins as a continuation of his work in 1930–31, when observations were made on the practicability of establishing an Arctic Air Route. The present expedition, however, is on a much smaller scale, and consisted only of the leader and three others, all members of his last expedition:

J. R. Rymill, surveyor.
F. Spencer Chapman, ornithologist and photographer.
Q. Riley, meteorologist.

After the tragic death of the leader on August 20, these three decided to carry on the expedition, with Mr J. R. Rymill as leader.

The expedition is partly financed by Pan-American Airways, and the Trans-American Air Lines is also interested. The data obtained will, however, be available to all responsible flying companies in Europe. Assistance has also been received from the Royal Geographical Society, and from the Air Ministry.

Mr Watkins and his companions left Copenhagen on July 14, and travelled to Angmagssalik, in South-East Greenland, on board the *Gertrud Rask*, the Danish Government ship which visits the settlement every year. After a week spent unloading stores, they set out for their base at Lake Fjord, about 100 miles north of Angmagssalik. They had expected to carry out this part of the journey in two 20 ft. motor boats brought for this purpose, but the pack-ice was open, and the *Gertrud Rask* was able to transport them the whole way, and land them at Lake Fjord on August 9. Lake Fjord is a short inlet, at the upper end of which is a long inland lake, and it was chosen as the base for the expedition as it is protected from the frequent blizzards of this region by a belt of mountains about 60 miles wide between the ice-cap and the sea, and the smooth ice of the lake seems to offer a suitable site for a station on a trans-Greenland Air Route.

On arrival, a hut was built of stone and earth, after the Eskimo pattern. The expedition had taken with them very little in the way of building material, in order to save weight and the consequent transport difficulty, and their plan was to adopt the Eskimo manner of life, as far as possible, as regards both food and accommodation during the year's work. Having, therefore, established their base, the party started regular hunting and fishing, in order to lay in a stock of food for the winter. They expected this work to take about a month, after which they proposed to prepare for their journeys on to the ice-cap.

On August 20, Mr Watkins left the base at about 8 a.m., in his kayak, to hunt in the north arm of the fjord, where seal were plentiful near a large glacier. Meanwhile, two other members of the party were surveying in a motor boat on the opposite side of the fjord, where they remained until about 2.45 p.m., when they went over to the other side, and started to cross the arm of the fjord where Mr Watkins had been hunting. They had seen nothing of him during the morning. They had occasionally heard ice-bergs calf or roll over, but this sound was so usual that they had hardly noticed it; but at about 11 a.m., when still on the south side of the fjord, they had heard a loud crash from the direction of the point where the north arm joins the main fjord.

At 3 p.m., when halfway across the arm of the fjord, the surveying party noticed a seal-skin hunting bladder among the ice, and on going closer found to their dismay that a kayak was there as well, full of water. The paddle was found floating 100 yards to the south-east. The party at once proceeded to search the fjord, going all round it close to the shore,

as well as shouting, and using field glasses from the mast-head. Then, close to the very active glacier at the head of the fjord, Mr Watkins' trousers and kayak belt were found on a floe only 150–200 ft. distant from the glacier wall. These had sunk about 1–2 inches into the ice, indicating that they had been there for some hours. Having failed to find their leader, the party returned to the base, hoping that Mr Watkins might have lost his kayak, but on reaching the land had returned on foot over the hills. On reaching the base, they found that he had not come back. The whole party then searched the fjord unavailingly, and two of them walked back to the base across the glacier, and along the mountains, in a last faint hope that Mr Watkins might have tried to return on foot by that route, and perhaps have collapsed on the way. The search was continued the next day, but no further traces were found.

It has been presumed that Mr Watkins was overtaken by cramp and drowned, though the rest of the party, and others, can only make faint conjectures as to how the accident occurred which made him take to the water.

The three remaining members will carry on the expedition, and adhere to the original plans as far as is possible. A depôt of man- and dog-food will be made at the head of the Kangerdlugsuatsiak Fjord for use in April, 1933, when it is planned that two of the party, Mr Rymill and Mr Chapman, will make a journey by sledge to Mount Forel, with the object of reaching the summit. It will be recalled that a party during the last expedition was forced to return when within 500 ft. of the top. Mapping will be carried out in this region, and the party will return to the base by another route. It is hoped that a long sledge journey, as far as Kangerdlugsuak, will be made some time in 1933, and the inside limit of the coastal mountain belt fixed. Scoresby Sound will not be visited, as originally planned, since that would mean leaving the meteorologist of the expedition alone at the base for a considerable time, and impair meteorological observations. The party hopes, however, to make yet another journey on to the ice-cap north of the base, before returning in August, 1933.

Norwegian Expedition to East Greenland, 1932.

The plans for this expedition, which was sent out by the Norges Svalbard-og Ishavs-undersøkelser during the summer of 1932, were given in *The Polar Record*, No. 4. We are now able to publish a full account of the expedition, through the kindness of Dr Adolf Hoel.

The expedition left Norway on July 15 on board M.S. *Polarbjørn*, which had been fitted out with a new 360 h.p. Polar Diesel engine, and a new 300 watt wireless set. The leader of the expedition was Mr Anders K. Orvin, who was also the geologist of the party. Commander Rolf von Krogh was in charge of the hydrography, and the rest of the personnel was as follows:

Flight-Lieut. SIGURD AAGENAES, air pilot, Oslo.
SIGURD AANDSTAD, botanist.
THOR ASKHEIM, topographer.
MAX BUNDERMANN, aerial surveyor.
ANTON JAKHELLN, oceanographer.
HANS S. JELSTRUP, astronomer.
PAUL LØYNING, Zoological Museum, Oslo, zoologist.
SØREN RICHTER, archaeologist.
WILHELM SOLHEIM, topographer.
Lieut. ERIK STORM, Norwegian Navy, air pilot.
There were also eleven assistants, one painter, and two journalists.

Captain Kristoffer Marø was skipper of the *Polarbjørn*, and the crew numbered thirteen. Five men, who intend to winter in Greenland, led by Mr Helge Ingstad, the newly appointed administrator, or *sysselman*, for Eirik Raudes Land, also reached their destination on board the *Polarbjørn*, and, in addition, passages were given to a number of hunters belonging to the *Arktisk Naeringsdrift*, as well as to a journalist, Mr Sigurd Skaun, and to Dr Harald Welde, of the Institute of Technology at Trondheim.

The *Polarbjørn* reached Jan Mayen on July 17, and the Greenland coast just north of Clavering Fjord four days later. During the ensuing month an extensive air survey was carried out with the Lockheed-Vega aeroplane *Qarrtsiluni*. Ten flights were undertaken with a total of 375 flying hours, and a distance of 6000 km. was flown. Photographs numbering about 2100, in 45 series, were taken over the area from the north of Wollaston Foreland to the central part of Traill Island, covering a strip from the coast to the inland-ice. The photographs were taken obliquely at an angle of 20° to the horizon. A large area of country was thus mapped, at least half of which was previously uncharted. Over the greater part of the area a triangulation net has already been constructed, and fixed points furnished through terrestrial photogrammetry. Other survey work was done in the following places: the inner part of Clavering Fjord; Strindberg Peninsula; Gauss Peninsula; and the northern part of Ymer Island (triangulation and stereo-photogrammetry); Muskox Fjord (triangulation and photogrammetry); Germania Harbour; Sabine and Walrus Islands.

Calls were made by the ship at the following fjords: Tyrol Fjord, Granta Fjord, Geologist Fjord, Fleming Inlet, and Nathorst Fjord, none of which had previously been visited by a Norwegian scientific expedition.

During the survey work a second plane, a Spartan, was used mainly for reconnaissance work over the pack-ice, and to prospect for new landing places. The astronomer determined accurately the position of the point on Sabine Island where observations were made by Sabine in 1823, and Copeland in 1869–70, with the object of obtaining the necessary astronomical foundation for the maps. The hydrographical work included the sounding of Clavering Fjord, Loch Fyne and Krogh Sound, between the mainland and Jackson Island, and oceanographic work was carried out from twenty-six stations. Geological and botanical work was done whenever possible, and the detailed geological mapping, based on the new topographic map (1:200,000), was begun. Marine zoological investigations were continued, and collections of mammals and birds were also made. The archaeological work included the excavation of Eskimo ruins in Clavering Fjord, and Muskox Fjord, on Strindberg Peninsula, and at Myggbukta in Mackenzie Bay, in the course of which much new material was collected.

The wintering party erected their headquarters at Antarctic Harbour, where there is also a radio station which has been named Karlsbak.

The expedition left Greenland to return to Aalesund on August 26.

Norwegian Expedition to South-East Greenland, 1932.

A small expedition, planned under the auspices of the Norges Svalbard- og Ishavs-undersøkelser, and led by Dr Gunnar Horn, was at work on the coast of South-East Greenland in the summer of 1932. The party consisted of the following:

Dr GUNNAR HORN, leader and geologist.
Dr JOAKIM DEVOLD, physician, botanist and anthropologist.
Lieut. ERLING KJAER, Norwegian Navy, hydrographer.
BJARE LANDE, wireless operator.

The expedition chartered M.S. *Veslemari* (113 tons), commanded by Captain Monrad Pilskog, with a crew of ten. The vessel has a 90 h.p. engine, and has been fitted out with a new 100 watt wireless equipment.

The ship left Aalesund on August 6, and reached the Greenland coast at Cape Löwenörn on August 16, where another Norwegian expedition ship, S.S. *Polaris*, was met, and Devold, who had been with the *Polaris*, was transferred to the *Veslemari*. The following day the expedition reached Finnsbu, the Norwegian meteorological and radio station in

Heimen Harbour, in Lat. 63° 24′ N., and a supply of coal and oil was left there for the use of future hunting and fishing vessels. From Finnsbu the expedition proceeded to the Trollbotn hunting station, which is just west of Finnsbu, and thence along the coast southwards as far as Lindenow Fjord. In the fjord immediately north of Lindenow, Øyfjorden (Lat. 60° 32′ N.), there is now a Norwegian short wave radio station, Torgilsbu, where regular meteorological observations are made. From Torgilsbu the expedition returned northwards and after visiting a number of fjords reached Finnsbu on September 13. At Grytvika, the third fjord north of Lindenow Fjord, a supply of coal and oil was left.

The scientific work of the expedition included geological observations, and the collecting of botanical specimens. The hydrographer made surveys of some of the harbours, and soundings were taken and observations made in connection with navigation along this part of the coast. A continuous record of the weather was kept, and tidal observations were carried out at Finnsbu over a period of twenty-eight days. A number of ancient Eskimo graves was also examined, and anthropological material collected.

On September 16 the expedition left Greenland, and reached Norway 11 days later.

Other Norwegian Expeditions to East Greenland, 1932.

We are indebted to Dr Adolf Hoel for news of the following Norwegian Expeditions, which were also at work in East Greenland during the summer of 1932.

Peter S. Brandal, shipowner, sent his ship S.S. *Polaris* to convey hunting parties to East Greenland, where they propose to spend the winter. The ship left Aalesund on July 11. One party of four men was landed at Øyfjorden, where a short wave radio station, for the regular transmission of meteorological reports, was erected, and named Torgilsbu. The ship then proceeded to Storfjord (Kangerdlugsuak on Danish maps) in Lat. 68° 10′ N., where two hunters and one radio operator were landed, and a station set up. This station also carried out a regular meteorological programme. The ship returned to Aalesund on September 12. Three scientists accompanied the expedition: Thor Iversen, of the Fishery Board, Bergen; Dr P. F. Scholander, botanist and physician; and Dr J. Devold, botanist and anthropologist. Hydrographical work was carried out, botanical material was collected, and examinations of Eskimo graves were made.

Two wintering expeditions left Tromsö on July 14 on board M.C. *Isbjørn*, and landed hunters on the north side of Clavering Fjord, and from Ardencaple Inlet northwards. A radio station was erected in Peter Bay on the north side of Ardencaple Inlet, in Lat. 75° 20′ N., which will transmit regular meteorological reports. The *Isbjørn* returned to Norway on September 1.

Cambridge Expedition to Vatnajökull, 1932.

An expedition from Cambridge, the plans for which appeared in *The Polar Record*, No. 4, under the heading *Cambridge Iceland Expedition*, was at work on the chief ice-cap of Iceland, Vatnajökull, during the summer of 1932. The party consisted of six members, as follows:

B. B. Roberts, Emmanuel, leader and ornithologist.
F. W. Anderson, University College, Southampton, geologist and zoologist.
J. A. Beckett, Sidney Sussex, surveyor.
P. Falk, King's, botanist.
W. L. S. Fleming, Trinity Hall, geologist.
W. V. Lewis, Gonville and Caius, seismologist and surveyor.

The party left Hull on June 20, on the trawler *Lord Balfour of Burleigh*, having been courteously granted free passages, and landed at Hornafjorður, in south-east Iceland, four days later. The next stage of the journey, along the coast to Staðardalur and up a precipitous route to the ice-cap, was carried out with the help of pony transport. Between Hornafjörður and Staðardalur several wide and swift rivers were crossed, streams of distributary pattern from the ice-sheet being a feature of this part of the coast. At the edge of the ice, at an altitude of 3300 ft., the expedition made their first camp, and the ponies were sent back. This route to the ice-cap has now been named by the Icelanders Kambryggjuvegur (Cambridge Way), as this expedition was the first to make use of it.

One of the objects of the expedition had been the measurement of the thickness of the ice by seismic methods, but a mechanical breakdown of the instrument caused this plan to be abandoned, and the party therefore began their crossing of the ice-cap to Kverkfjöll without further delay. Early in the crossing the party was delayed for four and a half days by a blizzard, and owing to bad weather the journey took fifteen days, although the distance was under 40 miles. On Brúarjökull, a northern lobe of the ice-cap, further obstacles were encountered in the shape of extensive thaw streams, and pools of slush, into which the sledges sank deeply. The chief features of Brúarjökull are the innumerable glacial dirt cones, originated

by volcanic dust blown on to the ice from the north. These, and the crevasses on the edge of the ice, made progress during the last part of the journey very slow, and the party was forced to relay the equipment.

On July 14 a base camp was established on the marginal moraine close to the eastern scarp of Kverkfjöll, and overlooking a small ice-dammed lake. Fifteen days were spent in mapping the country round the base camp, which proved to be a desolate waste of uneven black lava flows and scattered moraines, very different from what appears on the existing maps. Geological and ecological surveys were made in this area, and a number of hot springs were discovered in a gorge near the base camp.

Meanwhile, Mr B. B. Roberts and Mr P. Falk made a journey of some 20 miles to Hvannalindir, an oasis in the lava desert of Odaðahraun, to the north of Vatnajökull. Ecological work was carried out at this and other oases, which were found to be unexpectedly fertile.

Five days of continuous rain and snow delayed the return of the expedition across the ice-cap, the surface of which had been much cut up by the continued thaw, and made it necessary to relay the equipment until the higher ice was reached, some 2 miles from the edge. Fine weather enabled the party to return across Vatnajökull in three days only, and a week was then spent in Staðardalur, a valley stretching from the ice margin to the sea, during which an ecological survey was made, as a basis for comparison with the fauna and flora of the central desert region.

The expedition returned to England via the Westmann Islands, where they were picked up by S.S. Goðafoss, reaching Hull on August 22.

German Expedition to Vatnajökull, 1932.

Two scientists, Dr Helmut Verleger and Dr Max Keil, were at work on Vatnajökull in Iceland during the summer of 1932, the expedition being the outcome of similar investigations in 1929 and 1930.

Reaching Reykjavik in February, 1932, Dr Helmut Verleger joined Dr Max Keil, and they proceeded to Skeiðararjökull, in the south east of Vatnajökull, having taken the coastal steamer to Hornafjörður. The ascent on to the ice was begun on June 17 from Hoffell, the last farmhouse on the route chosen. The ascent was made through Hoffellsdal and Fossdalur, and the equipment, which weighed 440 lb. and included provisions for thirty days, was transported, first by ponies, and then by Icelanders, up to a height of 1100 metres. There a depôt was made, and half the food left, to be collected after an investigation of

Eyabakkajökull, the eastern lobe of the ice-cap. On June 19 the expedition started for Kverkfjöll. The going was slow, owing to the soft surface and the weight of the equipment, and whenever possible the party travelled by night. A dense fog encountered not far from Svinafellsjökull was a further hindrance. On June 22 the party was delayed by a blizzard from the south, and on resuming the journey, fresh obstacles were encountered in the form of thaw streams. Finally, when about 4 km. from Kverkfjöll, a blizzard from the north forced the party to remain in their tents for ninety-five hours, and the consequent shortage of food made it necessary for them to turn back on June 29, without completing their programme. The return was much quicker than the outward journey, in spite of dense fog. After reaching the depôt the party lost their tent in another severe snow-storm, the same which also delayed the Cambridge Expedition for four and a half days, but were able, on July 2, to regain their starting point, the journey having lasted two weeks.

After waiting for the weather to improve, Dr Verleger started on a second crossing of the ice-cap, accompanied by two Icelanders, Helgi Gudmundsson and Hlödver Sigurdsson. On July 21 they reached the moraine between Bruarjökull and Eyabakkajökull, and later the party climbed Snaefell. The ice-cap was re-crossed in extremely bad weather, continual violent storms, rain and perpetual fog. A depôt situated on the Upper Lambatungujökull to the north west of Goðaborg had to be left behind, owing to the impossibility of reaching it. The expedition returned to Hoffell in the evening of July 26, having left all its equipment on the lateral moraine of Mulasker.

The scientific work of the expedition was much hindered by bad weather: in twenty-four days there were seventeen days of fog or storm. The lowest temperature recorded was 5° F. below zero.

Peary Memorial Expedition to Cape York, North-West Greenland, 1932.

A party on board the *Morrissey*, commanded by Captain R. A. Bartlett, visited Cape York during the summer of 1932, with the object of raising a monument to Admiral Peary. Mrs E. Stafford, Admiral Peary's daughter, accompanied the expedition.

The monument, which has been raised at an altitude of 1460 ft., consists of a granite shaft 54 ft. high, resting on a hexagonal base, capped by a 5 ft. pyramid of rustless Monel metal. It was erected under the direction of Dr Ralph Belknap, the leader of the Michigan Expedition to West Greenland, who afterwards rejoined his party on the

Upper Nugssuak Peninsula. Besides the erection of the monument, which was the main object of the expedition, and which was dedicated on August 25, scientific work was carried out by Mr Arthur D. Norcross.

The expedition reports that on the outward journey, although so early in the season, no ice was seen until Melville Bay was reached, and then only near the land. There were not so many bergs as usual. Cape York was reached twenty-nine days after leaving New York, after an unusually mild voyage. The expedition returned to the United States on September 27.

French Polar Year Expedition to East Greenland, 1932–33.

This expedition, the preliminary plans of which were published in *The Polar Record*, No. 4, was at work in the Scoresby Sound region of East Greenland during July and August, 1932, and left a wintering party to carry out observations in connection with the International Polar Year.

The expedition was transported to Greenland in the *Pourquoi Pas?* accompanied by the ice-breaker, *Pollux*, lent by the French Navy, and commanded respectively by Captain Chatton and Captain E. Mailloux. The expedition was led by Dr J.-B. Charcot, and the following scientists were among those taking part:

M. Devaux.
M. P. Drach.
Professor Jean-Louis Faure.
Professor Maurain.
Dr Parat.

France was left on July 3 and on arrival at Scoresby Sound, the hut and aerological station, built during the winter by a Danish carpenter, were found to be in good condition, and new instruments were installed before beginning the Polar Year routine. The station was called after the late President of the French Republic, Paul Doumer, to commemorate his interest in the Polar Year scheme. Certain scientific investigations were carried out before the return of the ships to France. These included a series of measurements of the electric conductivity of the atmosphere, and observations in meteorology and magnetic variation. Glaciological investigations were made by M. Devaux. Biological specimens were collected by Dr Parat and M. P. Drach, and through the kindness of Dr Lauge Koch, who gave directions for finding them, some very interesting fossils were collected at Cape Leslie, on Milne Land, Scoresby Sound. Studies were also made of the plankton, and of the composition

of the sea water. Several hundred photographs have been brought back by the expedition.

Both on the voyage out and on the return journey very little pack-ice was met with, but large icebergs were numerous both inshore and far out to sea. In mid-August there was no pack-ice in Scoresby Sound, but a large number of icebergs. This was noticed particularly during the trip to Cape Leslie, and while in the north-western branch of the fjord more than 400 large icebergs were counted from a hill 200 metres above sea-level.

The expedition, as a whole, was at work in Scoresby Sound from July 26 to the middle of August, the *Pollux* leaving on August 11, and the *Pourquoi Pas?* ten days later. It had been found possible to assist the large Danish expedition under Dr Lauge Koch by transporting their seaplanes from Iceland to Scoresby Sound, the French expedition being glad to do this as a return for the kindness received from Dr Koch. Dr J.-B. Charcot and Professor Maurain went back to France with the ships, with the intention of returning to Greenland in the summer of 1933 to bring back the Polar Year party.

In further reports received from the wintering party since the return of the ships, it is stated that the winter proper began in September, two weeks sooner than was expected, with unusually severe gales combined with low temperatures. Scoresby Sound was open to ships less than twenty-six days during the summer of 1932, and froze over soon after the departure of the *Pourquoi Pas?*.

The Station Paul Doumer was completely equipped by August 10, and regular observations on meteorology, the conductivity and ionisation of the atmosphere, aerology, and magnetism are being made. The party will also carry out hydrographical, biological, and geological work.

University of Michigan Expedition, 1932–33.

The fifth expedition sent out by Michigan University to Greenland left New York on June 15, having obtained passages in the *Morrissey*, which was bound for Cape York, and commanded, as usual, by Captain R. A. Bartlett. The following news of the expedition, the plans for which were published in *The Polar Record*, No. 4, has reached us through the courtesy of Professor W. H. Hobbs.

The party, in charge of Dr Ralph Belknap, reached its destination, Kraulshaven, a small Eskimo village at the end of the Upper Nugssuak Peninsula in Lat. 74° N. on July 11, and Mr Evans S. Schmeling and Mr H. N. Gardiner were landed; Dr Belknap, however, accompanied the

Morrissey to Cape York, where he superintended the erection of a monument to Admiral Peary. He rejoined his party on August 31, bringing with him lumber from the monument staging for the construction of their winter quarters. Two other members of the expedition, Mr Max Demorest and Mr Karl V. Hansen, sailed from Copenhagen on the *Hans Egede* about August 20, and were expected to arrive at the station at the beginning of October. The station has been set up on the neck of Nugssuak Peninsula, a mile from the ice-cap.

Daily aerological observations, in connection with the International Polar Year, were begun by the party on August 1, and will be continued throughout the year. It is expected that the short wave radio station in charge of Mr Hansen will enable the party to keep in regular communication with the *New York Times*, and an observing station at Michigan University. A long journey by dog sledge on to the ice-cap has been planned by Dr Belknap for the spring of 1933, during which it is hoped that depth soundings of the ice may be made. The party also hopes to study the fronts of the glaciers to the north.

Other Polar Year Stations in the Greenland Sector, 1932–33.

Several parties are at work in connection with the International Polar Year in this sector of the Arctic, and various stations have been established.

News has been received that the Danish Expedition to Thule, North-West Greenland, led by Mr V. Laursen, arrived at its destination on July 8; and a geophysical station has been established in 76° 4′ N., 69° 5′ W. The station, which is situated near the magnetic axis of the earth, is equipped for observations in meteorology, magnetism, aerology, clouds, aurora, and radiation. Besides this, an instrument for observations in cosmic radiation has been lent by Professor A. H. Compton. The Danish party bound for Julianehaab has also arrived, and commenced work.

A Polar Year station has been established at Snaefellsjökull in Iceland at a height of 4920 ft. This is directed by Professor Mercanton, of Lausanne, and Dr Thorkelsson, of Reykjavik, and will be maintained jointly by Denmark and Switzerland. The party arrived at Snaefellsjökull on August 15. In view of the importance of collaboration in work done on both sides of Denmark Strait, a contribution of 10,000 francs has been promised to this expedition by Dr J.-B. Charcot, on behalf of the French Polar Year Commission, in order that the station on Snae-

fellsjökull may be equipped with special instruments similar to those being used by the French party at Scoresby Sound.

It was found impossible, for financial reasons, for Germany to maintain a national Polar Year station as had been hoped, but news has reached us, through the courtesy of the Archiv für Polarforschung, Kiel, that a private expedition has been sent out by that institution. A station has now been established by this party at Arsuk, South-West Greenland, in 61° N'., 48° W., where meteorological and magnetic investigations will be made. Observations on the aurora will be carried out in conjunction with the Danish station at Julianehaab. Some biological collecting will be done. The party, which is led by Dr Max Grotewahl of Kiel, will be increased next spring by a supplementary party of three or four, and the station will function for eleven months. The meteorological work is in charge of Dr Kern of Breslau.

A Dutch expedition in connection with the International Polar Year is at work at Angmagssalik, East Greenland, having left Copenhagen on board S.S. *Gertrud Rask*, on July 14, 1932. Observations will be made in meteorology, magnetism, aerology, aurora, and radio electricity, and the programme of work will include determinations of the height of the Kennelly-Heaviside layer. The leader of the expedition is Dr Van Zuylen.

The Polar Year station established by Austria, on the site of the one occupied during the First Polar Year, 1882–83, is now functioning on Jan Mayen. The party, led by Dr H. Tollner, arrived there in June, 1932, and the expedition has been fortunate in finding accommodation in the permanent Norwegian station, through the kindness of Mr Hesselberg. Meteorological, magnetic, and auroral observations will be made throughout the year.

As announced in *The Polar Record*, No. 4, a party from Holland will make aerological observations, with the help of aeroplanes, near Reykjavik, Iceland. The establishment of this station as a Dutch contribution to the Polar Year is due largely to the initiative of Dr H. G. Cannegieter.

Norwegian Crossing of Greenland, 1931.

A short note on this expedition appeared in *The Polar Record*, No. 3, but at that time no details of the crossing were available. We are now able to publish a fuller account, through the courtesy of Dr Arne Høygaard and Mr Martin Mehren, who made the journey, and who have sent us the following information.

The crossing was planned and carried out jointly by the two men, who had already had several years' experience of polar conditions in Spitsbergen. They started from the Kamarujuk Glacier, in West Greenland, in approximately Lat. 71° 10′ N., on July 6, 1931. An excellent route to the ice-cap had already been prospected by the expedition led by Professor Wegener, whose western base was near the top of the glacier, and the presence of the Germans was of great assistance to the party.

The ascent to the ice-cap was carried out with the help of thirteen Eskimo porters, who transported the equipment, weighing 1200 lb., up to an altitude of 3100 ft., after which they returned. The porters experienced great inconvenience from their skin boots, which got torn on the ice, and had frequently to be mended with rope. Leaving the head of the Kamarujuk Glacier on July 10, the party set a course for the Waltershausen Glacier at the end of the North Fjord in Franz Josef Fjord, where they proposed to descend to the east coast. The journey across the ice-cap was carried out by dog transport, sixteen dogs, in two teams, having been purchased for £2. 10*s*. per dog at Umanak, on the way up the west coast. The weight of the equipment worked out at 80 lb. per dog, and the party had two sledges. Three dogs were lost on the western side of the ice-cap, through falling down crevasses; and thaw streams were also a considerable hindrance to the party. On August 4 they reached the highest point of the ice-cap, 9700 ft., and thereafter conditions improved. From this point they were able to make good progress by hoisting a sail made of an inner tent to take advantage of the constant following wind.

The total length of the journey was 621 miles, and the rate worked out at about 15 miles a day, the journey lasting thirty-eight days. The party started every morning at 3 a.m., to take advantage of the frozen surface, and travelled eight hours only each day, in order to spare the dogs. The sledging rations consisted of: Amundsen pemmican, bacon, biscuits, chocolate, butter and dried fruit. The daily ration for the dogs was 1½ lb. pemmican, and as it was necessary to kill two dogs during the journey, this afforded an extra supply of food, in the form of fresh meat, for the rest of the team.

On August 6, when they had reached Long. 29° 30′ W., the party first sighted the mountains of the east coast, and a course was then set in a more northerly direction in order to find a route down the Waltershausen Glacier. A route for the descent was finally found, by a glacier which the party have named after Dr Adolf Hoel.

During the descent to the east coast difficult conditions were en-

countered in the shape of bad crevasses and thaw streams; and the party was forced to abandon their sledges and the greater part of their equipment, including tent, sleeping bags, cooking utensils, and kerosene, in order to reduce weights, and be in time to catch the ship, M.C. *Polarbjørn*, on the agreed date. Their team of dogs was by now reduced to three, three having been lost down crevasses, and five had to be shot, as bad feet, caused by the sharp surface of the ice, had rendered them unfit for further work. The party therefore proceeded on foot, and arrived at the Norwegian hunting hut on Strindberg Peninsula on August 18. During the last week of the journey, after abandoning the sledges, the party had replaced their skis by crampons, and had found these essential for negotiating conditions in the mountains between the ice-cap and the sea. They wore reindeer coats and trousers made of seal-skin, and found these fully adequate, even when sleeping out on the ice without a tent.

A report of the expedition appeared in Norway in 1931, under the title *Ajungilak eller Grønland på tvers*, which describes technical details of the journey, provisions and outfit, and this pamphlet contains a map of the mountainous country encountered during the descent to the east coast. The eastern limit of the inland ice was found to run 32 to 64 miles farther to the west than had been previously supposed.

The following scientific results have also been published:

(1) Topography: *Norske Geografisk Tidskrift*, vol. IV, No. 1–3, 1932. Editor: Professor OLAF HOLTEDAL, Vinderen pr. Oslo.

(2) Meteorology: ALF MAURSTAD, *Die meteorologischen Beobachtungen wärend Arne Høygaard und Martin Mehrens Durchquering von Grønland* 1931. Geophysiske publicationer, vol. IX, No. 10. Norske Videnskapsakademi (Norwegian Academy of Science), Oslo.

(3) Terrestrial Magnetism: *De Magnetiske Observasjoner på Høygaard og Mehrens Grønlandse espedisjon*, 1931; *Geografisk Tidskrift*, No. 1, 1933. Edited by Professor KROGNESS.

(4) Geology: *Norske Geologisk Tidskrift*, Bind XI, Hefte 3–7. Oslo, 1932.

The party returned to Norway on board M.C. *Polarbjørn*, reaching Aalesund on August 31.

ARCTIC CANADA AND LABRADOR

British Polar Year Expedition to Fort Rae, 1932–33.

The British Polar Year Expedition, which is spending a year at Fort Rae, on the Great Slave Lake, in Lat. 62° 50′ N., started work on the appointed day, August 1. Various reports have been received, the latest dated September 16. We are therefore able to print a detailed account of the procedure at this Polar Year station, and it may serve as an example of the routine which most of the Polar Year stations will probably be following.

An advance party, consisting of Mr J. M. Stagg, the leader, and Mr A. Stephenson, sailed from England on May 14. The other four members of the expedition—Mr W. R. Morgans, Mr P. A. Sheppard, Mr W. A. Grinsted and Mr J. L. Kennedy—followed a week later, and the whole party arrived at Fort Rae on June 15. Great Slave Lake was reached in the first Hudson's Bay Company boat to get through that summer. On arrival at Fort Rae they at once set up the station. Several log-huts were available, both for living accommodation and scientific purposes, though much had to be done to these before they were actually ready for use. Old Fort Rae, which is 17 miles from the present settlement, and was the site of the British Polar Year station in 1882, was visited soon after the arrival of the party, and plans made for laying a cable, in order to connect the two bases by telephone, for auroral photographic work. This was found to be impracticable until the lake should freeze, on account of the deeply indented shore-line. Meanwhile, parties of two have been taking duty at the Old Fort at regular intervals, reaching it by motor boat, a rather hazardous proceeding, owing to the frequency of high winds and the rocky and shallow nature of that arm of the lake.

At first the party experienced uncomfortably high temperatures, 75°–85° F. being recorded during most of August, but later news tells of a steady fall in temperature, with the consequent disappearance of mosquitoes, etc. Fort Rae is one of the coldest places in the world, and 100–110 degrees of frost may be experienced in the winter. It was announced in the last report received from the party, dated September 16, that they were expecting the lake to freeze any day, Great Bear Lake, 200 miles farther north, having already frozen over.

It had previously been hoped that a dog team, to be used as a means of

transport after the freeze up, might be purchased at Fort Rae, but on arriving there it was found that suitable dogs were not easily obtained. Mr Stephenson, therefore, in company with a detachment of the Royal Canadian Mounted Police, made a motor boat journey to Fort Resolution on the south side of the lake, a somewhat dangerous undertaking owing to severe storms encountered both on the way there and on the return; dogs from Hay River, a settlement west of Fort Resolution, were bought and were transported to Fort Rae on board the H.B.C. boat *Liard River*. By arrangement with the local police, Mr Stephenson, who is in charge of the dogs, will go to the Royal Canadian Mounted Police winter-fish camp down the north arm of the lake, to lay in a stock of from 2000 to 3000 big fish, to feed the team during the winter.

The instruments have been found to be satisfactory, and most of them have been recording since the beginning of July, 1932. It is doubtful, however, if many of the meteorographs which have been sent up frequently by balloon are likely to be found, as the country round Rae consists almost entirely of a labyrinth of muskeg swamp. The Indians, however, have been told to bring in any they may find. All other work is reported to be proceeding according to plan.

At first the attention of the party was concentrated chiefly on the auroral displays. They are photographed simultaneously at the Old and the New Forts, and observations are made from 11 p.m. to 2 or 3 a.m. every night. A routine has been evolved for these observations, by which the control photographer at the main base has a local telephone line into the nearby hut. A couple of transformers (borrowed from the wireless receiving sets) are used in the telephone line, and the microphone is arranged to actuate two telephones, one for the "recorder" responsible for noting all the details sent in, the other for a third man in charge of the transmitting set; the latter repeats immediately into the transmitter microphone, all the instructions for exposure of plates; he also ensures during every short lull that all is going well at the other end of the base. The other two of the five men engaged in this procedure are at the sub-station at Old Fort Rae, the one outside manipulating the camera, the other inside the hut attending to the receiver and transmitter; there is no need for a recorder at the sub-station, as all the details are noted at the main station.

Other work at Fort Rae includes pilot balloon ascents, which are being made daily. Meteorological observations have been made every three hours since July 31, and reports are being sent daily to Toronto. Terre-

strial magnetism is also receiving attention, and full records have been secured since the beginning of August. Regular observations are also being made in atmospheric electricity.

A regular schedule of duties has now been worked out for the party, and is as follows for four of the six men, the other two being elsewhere:

(1) Early duty man comes on at 5.45 a.m., is responsible for the 6 a.m. and subsequent meteorological observations during the day, and goes off duty after dinner at 8 p.m.

(2) Late duty man comes on at noon, does his ordinary work (magnetic observing, electrical observing, tending engines or accumulators, developing, charts, carpentry, etc.) and remains on duty to be responsible for the midnight observation, and a constant watch till 3 a.m.

(3) Ordinary duty man from 8 a.m. till 10 p.m.

(4) Spare ordinary duty man who starts with the ordinary duty man at 8 a.m., but keeps auroral watch from 10 p.m. till midnight, while the late duty man who has come on at noon is having a short spell off duty, preparatory to working from midnight till 3 a.m.

The expedition will remain at Fort Rae to conclude the Polar Year observations, returning to England in the early autumn of 1933.

Williams-Maris Expedition to Fort Conger, 1932–34.

As announced in *The Polar Record*, No. 4, it had been planned that a station, to make observations in connection with the International Polar Year, should be established by the United States at Fort Conger, on Ellesmere Island, on the site of the headquarters of the Greeley Expedition in 1882. Public funds were not available, but it was hoped that the scheme might be carried through by private subscription; the necessary support was not forthcoming, however, and the expedition has now been cancelled. Dr H. B. Maris, who was to have been in charge of the scientific staff on the expedition, is now filling a similar post at the International station established at Fairbanks, Alaska.

Canadian Arctic Patrols, 1932.

The annual Eastern Arctic Patrol organised by the Department of the Interior, North-West Territories and Yukon Branch, took place as usual in the summer of 1932, leaving Montreal in mid-July.

The expedition was made in conjunction with the Hudson's Bay Company's annual supply voyage on the Job's Sealfishery Company's steamer *Ungava*, a sister ship to the *Beothic*, which had been used by the

Canadian Government during the past 6 years. The itinerary was to include calls at the six centres of administration in this region of the Arctic: Lake Harbour, Pangnirtung, Pond Inlet (Baffin Island), Dundas (Devon Island), Craig Harbour, and Bache (Ellesmere Island), in addition to other places. The officer in charge was Major D. L. McKeand, M.C., Secretary of the North-West Territories Council.

The voyage occupied 75 days, and covered approximately 9000 miles. Temperatures ranged from 68° to 28° F. The weather was generally fine, although much ice and fog were encountered, owing to the unusual ice conditions prevailing in the more northerly areas visited. The general health and prosperity of the Eskimo was found to be good, and prospects appeared bright for a good fur year. As in former years a brief call was made at Godhavn.

The expedition returned on September 17, having completed its itinerary, with the exception of the call at Bache Peninsula. This station could not be reached, as it was impossible to force the ship through the ice blocking Rice Strait and the entrance to Buchanan Bay in Smith Sound.

Dr H. K. E. Krüger's Expedition to Ellesmere Island, 1930.

News received from the Archiv für Polarforschung, Kiel, where Dr H. K. E. Krüger was a member of the staff, compels us to announce with great regret that all hope of the safe return of Dr Krüger and his companion has had to be abandoned, searches conducted during two successive years having failed to find any trace of the party.

Dr Krüger and Mr R. A. Bjare left the Royal Canadian Mounted Police station at Bache, Ellesmere Island, in the summer of 1930, on what was intended to be a reconnaissance journey for a large expedition in the future. Depôt Point was reached, and certain things were left there to be picked up on the return; since then nothing more has been heard of the party. They had planned to reach the most northerly point of Axel-Heiberg Land, and to return to Bache in the autumn of the same year. Little anxiety was felt at first, as it was known that Dr Krüger was a firm believer in Stefansson's methods, and it was thought that he would easily find a convenient place in which to spend the winter. Nevertheless those who knew that Dr Krüger had been suffering from meat poisoning shortly before starting felt uneasy at their failure to return. He was also believed to have taken insufficient ammunition with him for a continued absence, and he had left his kayak behind at Depôt

Point. It is possible that Smith Sound may have remained open that year, in which case he may have been cut off. Apart from these surmises, no definite conclusion can be reached as to the fate of the party.

When the two men failed to return in 1931, search parties were sent out, but without result. During the winter of 1931–32 the search was continued by the Royal Canadian Mounted Police, but full details have not as yet been received, owing to the fact that the annual patrol boat sent out by the Canadian Government was unable to reach Bache during the summer of 1932.

Canadian Polar Year Stations, 1932–33.

The Polar Year stations in Canada have been planned with a view to providing a chain of observation posts, from 600 to 900 miles apart, connecting stations in Greenland with the United States station at Fairbanks, Alaska. Three expeditions have therefore been sent out: to Cape Hope's Advance, in Hudson Straits, about 600 miles from the nearest station in Greenland; to Chesterfield Inlet, on the west coast of Hudson Bay, 750 miles distant; and to Coppermine, on Coronation Gulf, 800 miles to the west, and just over 900 miles from Fairbanks. The regular meteorological stations in northern Canada are also making special observations. As all these stations, expeditionary and otherwise, are equipped with wireless, they have remained in communication with the outside world.

At Cape Hope's Advance, Lat. 61° 5′ N., Long. 69° 33′ W., observations have been in progress since August 1, the leader of the expedition, Mr J. E. Lilly, having arrived there during July. The station is situated on a fairly high promontory extending out into Hudson Strait, and very high wind velocities are sometimes obtained, the most notable being over 130 m.p.h. for 1 hour, and over 100 m.p.h. for several hours continuously. The temperature averages about 15° below zero in January, while in summer it has been known to exceed 70° F. Rainy days occur frequently in June and August, while fog, with snow, may be expected during any month of the year. Complete surface meteorology, and upper air observations, with pilot balloon ascents twice a day, will be continued throughout the year. Visual aurora observations will be taken at the specified hours, combined with photography whenever possible.

The expedition to Chesterfield Inlet did not reach its destination until August 13, having been forced to wait a considerable time at Churchill, Manitoba, for a tug to take them over the last 300 miles of the journey.

The station has been set up in Lat. 63° 45′ N., Long. 91° 50′ W., 450 miles from the magnetic Pole; it is in charge of Mr F. T. Davies, McGill University, who was with Admiral Byrd in the Antarctic. Other members of the party include:

Professor B. W. CURRIE, University of Saskatchewan.
Mr STUART MCVEIGH, Queen's University, Ontario.
Mr JOHN REA, assistant observer.

Continuous magnetic observations have been made since September 10, and regular meteorological observations since September 15. The auroral programme provides for two sub-stations, about 18 miles apart, connected by radio, to measure the height of the aurora, and there is also a McLennan night spectrograph to obtain photographs of the visible and infra red portions of the spectrum. A complete log will be kept of auroral phenomena, and the approximate intensity measurements with a pocket spectroscope. The meteorological programme includes full surface meteorological observations, pilot balloon ascents twice daily, kite flights as weather permits, and visual signalling meteorograph ascents on international days. A continuous record is being kept of the difference in temperature between the surface, and the top of the radio mast nearly 150 ft. above, special thermocouples being used. The temperature of the air at the 4 ft. level is also being taken, and radiation measurements made. Cloud observations are being carried out according to the programme of the International Cloud Commission. January and February are the coldest months, the temperature averaging 26° or 27° F. below zero and the lowest temperature recorded at Chesterfield Inlet has been 55° F. below zero. In July the average temperature is about 48° F.

The settlement at Chesterfield Inlet consists of a Roman Catholic mission, which includes a hospital; a radio station; the Hudson's Bay Company staff; and the Royal Canadian Mounted Police; and at times a doctor is stationed at the Inlet.

The station at Coppermine, in Lat. 67° 42′ N., Long. 115° 30′ W., is in charge of Mr R. C. Jacobsen, of Toronto University, assisted by Mr R. D. Kinnear, and Mr A. V. Potroff as radio operator. They reached the station at the beginning of August, by air from Fort Norman on the Mackenzie River. The equipment, which was sent by ship, in S.S. *Karise*, from Victoria, B.C., by way of Behring Strait and Point Barrow, arrived on August 17 after a considerable delay, and it was slightly damaged by bad weather encountered during the voyage. After re-fitting, the instruments are now all functioning, and regular observations are being made at the

main station, and also at a kite station set up in an open area about 1 km. to the south.

Coppermine is the most important meteorological station in northern Canada, its situation on the Arctic Ocean midway between the Atlantic and the Pacific making it an excellent place for observations on the influx of polar air from the Arctic. The station itself is at the mouth of the Coppermine River on Coronation Gulf, and is slightly north of the Great Bear Lake. It has been in existence as a meteorological station for two years, and during this time the average temperature in January has been about 30° below zero. The snowfall, however, is slight, while light rainfall occurs in April, and fairly heavy rain in July and August.

The meteorological programme at Coppermine is on the same lines as that at Chesterfield Inlet, but in addition it is hoped that a special study may be made of the cooling effects of the long winter nights, and of the temperature inversions. Moltchanoff Radio Meteorographs are to be used on international days. The auroral programme is nearly the same as at Cape Hope's Advance, visual observations being made at definite hours, and photographs taken as opportunity occurs.

Fort Rae, the British station, is about 300 miles due south of Coppermine, and constitutes a valuable link in the network of stations spread across the Arctic, as it forms a connection between the Canadian stations and the permanent magnetic station at Meanook, Lat. 54° 37′ N., Long. 113° 21′ W., which is the nearest permanent magnetic station to the North Magnetic Pole. Work at Meanook will be in charge of Mr Vestine, of the University of Alberta, assisted by Mr H. E. Cook as magnetic observer. Besides magnetic work, meteorological and auroral observations will be made.

Polar Year Stations in the United States and Alaska, 1932–33.

In connection with the Polar Year, a comprehensive programme of work has been arranged by the United States, the last Congress having voted $30,000 to assist towards American participation in the International scheme. Most of the work is planned to take place in Alaska, and three important stations are now functioning at Point Barrow, at Nome, and at Fairbanks.

Work at Point Barrow, which is situated in Lat. 71° 21′ N., is in charge of Mr C. J. McGregor, who previously spent two years at Nome, Alaska. The programme includes pilot balloon ascents twice daily, magnetic work, and complete surface meteorological observations.

Photographic records of aurora are being made simultaneously at Point Barrow, Fairbanks and Nome; communication between these stations being made possible through the U.S. Signal Corps Radio. The magnetic observations are being carried out in co-operation with the Department of Terrestrial Magnetism, the Carnegie Institute of Washington, and the U.S. Naval Research Laboratory.

At Fairbanks, aeroplane observations take place on International days of the first and second order, and it is expected that these flights will average 5000 to 6000 metres (about 3 miles) in height. It is also hoped to make a few observations at greater heights with radio meteorographs, and thus obtain valuable information as to the seasonal variation in the height of the tropopause, and in the temperature of the stratosphere in this region. The station at Fairbanks, which is situated in the interior of Alaska, near the Arctic Circle and the belt of maximum auroral frequency, was established by various Government Departments, including the Coast and Geodetic Survey, the Naval Department through the Naval Research Laboratories, the War Department through the Signal Corps, the Department of the Interior, and other organisations, including the Carnegie Institution. A five-year plan of auroral work has been made possible by a grant from the Rockefeller Foundation.

Mr F. P. Ulrich, who is in charge of the Sitka Magnetic and Seismological Observatory, directed the erection of the buildings and the installation of the instruments at Fairbanks, after which he handed over to Mr Everett R. Johnson. The regular personnel of the Weather Bureau is carrying out the meteorological work, and the other members of the party are as follows:

C. E. JOHNSON, radio man.
Dr H. B. MARIS, Naval Research Laboratory.
J. N. ROONEY, Carnegie Institution.
K. H. SHERMAN, Carnegie Institution.

The five-year plan of auroral work is being carried out by Professor V. R. Fuller.

The programme at this station, which is the most important of those established by the United States, includes magnetic, atmospheric electric, earth current, radio transmission and auroral observations. In the same vicinity, meteorological observations, including investigations of the upper air, are also in progress.

Special cloud observations are being made at all Réseau Mondial stations in the United States, acting under the instructions of the International Polar Year Commission, on International days of the first,

second and third orders. There are about twenty-five of these stations. In addition, auroral observations, to be entered on star maps, are being carried out at nine selected stations close to the northern border of the United States, and in Alaska at Point Barrow, Nome, Fairbanks, and Juneau. Spectroscopes for detecting the presence of aurora during twilight or moonlight or when the sky is overcast, have been installed at these stations. Observations of nacrous clouds, and at the Alaskan stations, of the blueness of the sky, are taking place at the same time.

Special forms for auroral observations have also been given to ships following routes in high latitudes, and it is expected that from thirty to forty vessels will assist in this way, a large proportion of them in Alaskan waters. All Weather Bureau stations in the United States and Alaska have been asked to record, as far as possible, the occurrence of aurora at 1, 7, 13 and 19 G.M.T.

Transfer of Reindeer Herds into Canada.

News has appeared in the press concerning a large herd of 3000 reindeer, which has been consigned to the Canadian Government, and is to be handed over when it has crossed the Mackenzie River. The herd has been driven across the tundra by a party of drivers, headed by Mr Andrew Bahr, and the journey has already taken three years. When last heard of, in September, 1932, when they were met by Captain Pedersen, master of the trading schooner *Patterson*, the herd had halted about 400 miles from the Mackenzie for the fawning season, and to wait for the freeze up of the streams before continuing the journey.

ANTARCTIC REGIONS

In *The Polar Record*, No. 4, plans for two American Expeditions to the Antarctic, one to be led by Rear-Admiral Byrd and the other by Mr Lincoln Ellsworth, were published, but only in vague terms, no definite official announcements having at that time been made. It is now possible to give further news, by means of information received through the courtesy of the American Geographical Society.

It is now announced that Rear-Admiral Byrd has postponed his proposed Antarctic expedition indefinitely, and has taken up work in connection with the National Economy League.

Ellsworth Antarctic Expedition, 1933–34.

News has appeared in the press to the effect that Mr Lincoln Ellsworth intends to start on his expedition to the Antarctic in the autumn of 1933. He has already bought a ship in Norway, the *Fanefjord*, in which to transport his Lockheed-Vega monoplane to the Ross Sea. The object of the expedition will be to discover the nature of the land between the Ross Sea and the Weddell Sea. A party consisting of Mr Lincoln Ellsworth as navigator, and Mr Bernt Balchen as pilot and wireless operator, will make a flight across the Antarctic continent, and back again, following a course which will take them about 400 miles from the South Pole. The route for the first part of the journey will be much the same as that chosen by Rear-Admiral Byrd for his South Polar flight, but of the 3000 miles to be covered, 2700 will be over entirely unknown country. Pictures will be taken, by means of an automatic camera, every seven seconds during the twenty-four hour flight. In the event of bad weather, the party will land and wait for conditions to improve. This expedition will endeavour to keep in touch with the Norwegian party, led by Captain Riiser-Larsen, which will be at work at the same time in the Weddell Sea region.

The Work of the Discovery II, 1932–33.

As announced in *The Polar Record*, No. 4, the *Discovery* Committee had arranged that the R.R.S. *Discovery II*, after the completion of her routine work in the Scotia Sea in 1932, should circumnavigate the Ant-

arctic continent. This voyage has now been completed, and the results have provided much new information on the hydrology and the distribution of plankton in the Southern Ocean. One of the more important points to be determined was the position of certain lines—known as convergences—where sudden changes occur in both the temperature and the salinity of the water. Two of these lines, the Antarctic Convergence and the Subtropical Convergence, exist in the Southern Ocean. Both form impassable barriers to the majority of planktonic organisms, but except in the South Atlantic sector, their position had not hitherto been ascertained. For this and other reasons, it was decided that the ship in her circumnavigation should work up and down between low latitudes and the edge of the pack-ice, in order to cross and fix the positions of the convergences as often as possible.

The *Discovery II*, with Mr Dilwyn John in charge of the scientific work, and Captain W. M. Carey, R.N. (retd.), in executive command, left Cape Town on April 8, 1932. She reached the pack-ice in 65° 20′ S., about 70 miles from Enderby Land, and arrived at Fremantle on May 10. From Fremantle two cruises were made to the south on V-shaped courses, with Melbourne as the intermediate port, and on these cruises the vessel reached latitudes of 63° 41½′ S. and 62° S. She arrived at Auckland on July 4.

In New Zealand the ship underwent a refit, and a short time was spent in making biological observations in the neighbourhood of North Island. She left on her long voyage to the Falkland Islands on September 1, making a W-shaped passage, with two visits to high latitudes. She reached 62° 20′ S. in 158° 23′ W., and 63° 57′ S. in 101° 16′ W. Between these two points she steamed as far north as 41° S., but in this latitude was still to the south of the Subtropical Convergence. Shortage of fuel prevented her going farther north to fix its position. The passage was completed *via* the Straits of Magellan, and *Discovery II* arrived at Port Stanley, in the Falkland Islands, on October 9, 1932.

Throughout this long voyage, with its five visits to the Antarctic, a full series of daily observations on the plankton and hydrology were made, and the deep-water echo-sounding machine was continuously in use.

The ship is now again engaged in detailed work in the area of the Dependencies of the Falkland Islands. She will visit the ice-edge to the south of Bouvet Island next spring, and after touching at Cape Town, will make a series of observations during her homeward passage throughout the length of the South Atlantic on its eastern side.

Norwegian Antarctic Expedition, 1933–34.

We are indebted to Captain H. Riiser-Larsen, the leader of the forthcoming Norwegian expedition to the Antarctic, for the following details of his plans.

The object of the expedition is the further exploration of the sector of the Antarctic between Enderby Land and Coats Land (Lat. 50° E. to 30° W.), which was visited by the *Norvegia* Expedition, commanded by Captain Riiser-Larsen, in 1929–31, in order to fill in the gaps between the lands then discovered. A bay about 100 miles wide separates Queen Maud Land from Princess Ragnhild Land, and between the latter and Crown Princess Martha Land there is a further gap of about 700 miles. In addition, Captain Riiser-Larsen hopes to solve the problem of whether there is a channel connecting the Ross Sea with the Weddell Sea: he will also make observations in connection with the Polar Year.

The expedition, consisting of Captain Riiser-Larsen, Hallvard Devold and Olav Kjelbotn, will leave Norway in January, and be landed by a whaler at Enderby Land, with about eighty dogs, in February or March, 1933. If conditions prevent the party from starting westwards immediately, various preliminary sledging journeys will be made during April and May. A hut will be built, where the expedition will spend June, July and the first part of August, during which months cold and blizzards make travelling dangerous. As soon as circumstances permit, the party will start sledging over the sea-ice in a westerly direction along the coast. It will follow the coast round the Weddell Sea, and finally reach Snow Hill Island or Hope Bay in Graham Land. Here the party expects to find a depôt, arrangements having been made for supplies to be left there for it this winter. The expedition will be picked up in Graham Land early in 1934. The party is taking a short-wave radio equipment, specially constructed for the purpose, which will not only enable it to send reports, but will also make it possible for arrangements with the ship to be altered, should a change of plan become necessary. If the expedition is unable to reach the Weddell Sea, it will return to the base, whence sledge journeys will be made in an easterly direction.

The party will travel on the sea-ice fringing the coast, Captain Riiser-Larsen having observed during his reconnaissance flights from the *Norvegia* that the ice is often protected for a considerable distance by a line of stranded bergs on the seaward side; there is thus little danger of the ice breaking up, and he had found the surface, apart from snow-drifts,

very suitable for sledging, whereas the land-ice is badly crevassed, rendering progress difficult and very slow. Captain Riiser-Larsen hopes to cover as much as 60 miles a day with his dog-sledges, under favourable conditions, and travelling east to west the wind will probably be behind him.

Another difficulty of travelling over the land-ice is the absence of animal life, making it essential to carry full rations and food for the dogs. By using the route over the sea-ice, the party hopes to find Weddell seals and penguins, and will thus have to take only a small quantity of provisions. During the *Norvegia* expedition, a large number of seals as well as their breathing holes were observed, and the leader of the expedition is confident that the food problem will present no difficulty.

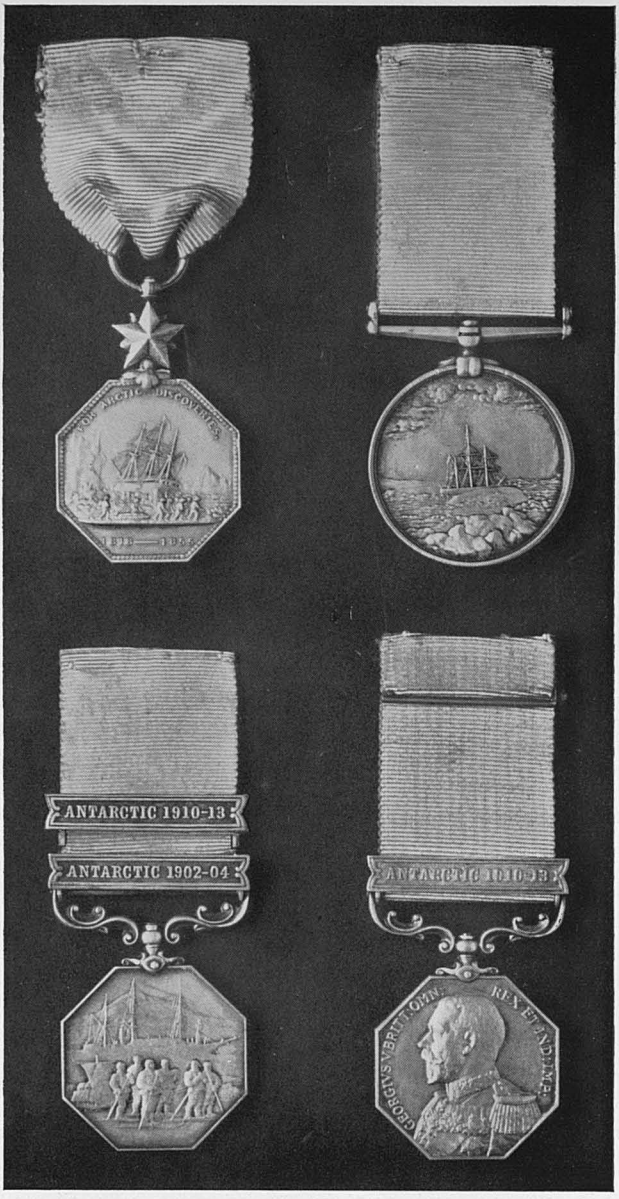
ANTARCTIC WHALING SEASON, 1932–33

We have received the following summary of the present situation in the Whaling Industry from Captain H. K. Salvesen, to whom we are greatly indebted.

Seventeen floating factories, one land station, and about 118 whale catchers are operating this season, and all of these, with the exception of two floating factories and fourteen catchers, are limited as to the number of whales they kill, by the quota agreement, which was described in *The Polar Record*, No. 4.

The floating factories are spread over the area eastward from South Georgia and the Ross Sea. In the eastern part of this area the results have been very successful; but in the western part the yield per whale has been apparently less than in the eastern part, and certainly very much less than in the corresponding period during the three previous seasons.

The whole production has now been sold at prices so low that there is unanimous agreement as to the desirability of continuing the quota system for the following season. As the companies which have not operated are being generously compensated by those which have, the chances of such an agreement are favourable.



THE ARCTIC MEDAL
1855 1876

THE POLAR MEDAL
Reverse Obverse

THE POLAR MEDAL

BY J. M. WORDIE.

The Polar medal, which has just been awarded to the members of Mr Watkins' British Arctic Air Route Expedition (*London Gazette*, November 4, 1932), has a long history behind it, and is perhaps the most interesting of British medals. A medal is now given for either Arctic or Antarctic service, but originally Arctic service only was rewarded. There were two Arctic medals granted last century; the more general Polar medal dates from 1904.

The announcement of the first Arctic medal was made in the *London Gazette* for January 30, 1857, p. 320. The notice reads:

Her Majesty having been graciously pleased to signify Her commands that a Medal be granted to all persons, of every rank and class, who have been engaged in the several expeditions to the Arctic Regions, whether of discovery or search, between the years 1818 and 1855, both inclusive, the Lords Commissioners of the Admiralty hereby give notice of the same.

The Medal will accordingly be awarded as follows:

1st. To the Officers, Seamen, and Marines of Her Majesty's ships and vessels employed on the several voyages to the Arctic Seas, during the specified period, and also to the Officers of the French Navy, and to such Volunteers as accompanied these expeditions:

2ndly. To the Officers, Seamen, and others who were engaged in the expeditions to the Arctic Seas, equipped by the Government and Citizens of the United States:

3rdly. To the Commanders and Crews of the several expeditions which originated in the zeal and humanity of Her Majesty's subjects:

4thly. To persons who have served in the several land expeditions, whether equipped by Her Majesty's Government, by the Hudson's Bay Company, or from private resources.

A list of British ships qualifying for the medal appeared in the *London Gazette* for May 5, 1857, p. 1580, and was repeated again on May 8, 1857, p. 1625. The *Gazette* mentions only the ship and the year in which she was commissioned; but in the list which follows the captain's name has also been added to help identify the expeditions:

1818 *Isabella* (John Ross), 1818 *Alexander* (W. E. Parry), 1818 *Trent* (J. Franklin), 1818 *Dorothea* (D. Buchan), 1819 *Hecla* (W. E. Parry), 1819 *Griper* (M. Liddon), 1821 *Fury* (W. E. Parry), 1821 *Hecla* (G. F. Lyon), 1823 *Griper* (D. C. Clavering), 1824 *Hecla* (W. E. Parry), 1824 *Fury* (H. P. Hoppner), 1824 *Griper* (G. F. Lyon), 1826 *Blossom* (F. W. Beechey), 1827 *Hecla* (W. E. Parry), 1836 *Terror* (G. Back), 1845 *Erebus* (John Franklin), 1845 *Terror* (F. R. M. Crozier), 1848 *Plover* (T. E. L. Moore), 1848 *Enterprise* (James Clark Ross), 1848 *Investigator* (F. J. Bird), 1848 *Herald* (H. Kellett), 1849 *Enterprise* (R. Collinson), 1849 *Investigator* (R. J. Le M. McClure), 1849 *North Star* (J. Saunders), 1850 *Resolute* (H. T. Austin), 1850 *Assistance* (E. Ommanney), 1852 *Rattlesnake* (H. Trollope), 1852 *Assistance* (E. Belcher), 1852

Resolute (H. Kellett), 1852 *North Star* (W. J. S. Pullen), 1853 *Phoenix* (E. A. Inglefield), 1854 *Phoenix* (E. A. Inglefield), 1829 *Victory* (John Ross), 1850 *Lady Franklin* (William Penny), 1850 *Sophia* (A. Stewart).

It will be noticed that all the above sailed as purely Admiralty expeditions with the exception of the last three. The *Victory* was financed privately, but commanded by a naval officer. The *Lady Franklin* and *Sophia* were commanded by whaling captains, but acted under Admiralty orders.

The list as it stands, however, is not complete. No mention is made of the following ships: 1850 *Isabel* (E. A. Inglefield) and 1850 *Felix* (John Ross), both of which were privately financed; 1850 *Pioneer* (Sherard Osborn) and 1850 *Intrepid* (J. Cator), steam tenders to Austin's expedition; 1850 *Prince Albert* (C. C. Forsyth) and 1851 *Prince Albert* (W. W. Kennedy), both sent out privately by Lady Franklin; 1852 *Pioneer* (Sherard Osborn) and 1852 *Intrepid* (L. McClintock), tenders again, but this time to Belcher; 1852 *Talbot* (R. Jenkins) and 1853 *Breadalbane* (W. H. Fauckner), Belcher's transports. It may be presumed that the medal was also issued to all these ships without discrimination. I cannot, however, find any such authority, at least not in the *London Gazette*.

I have also been unable to find any official list specifying the foreign ships and the land expeditions which actually received the medal, but Lord Milford Haven, in his book on *British Naval Medals*, states that it was awarded to the U.S. ships *Advance*, *Rescue*, *Arctic* and *Release*, and that the land expeditions which received the medal were those of Back, Franklin, Richardson and Rae.

Lord Milford Haven also states that the medal was awarded in 1859 to members of the *Fox* expedition under Sir Leopold McClintock.

The medal itself was in silver and octagonal in shape, with Queen Victoria's head on the obverse side: on the reverse is a barque-rigged ship, viewed from the port quarter, heeling to starboard, amongst pack-ice; a sledge party stands in the foreground, and there are icebergs on either side; the legend reads: "For Arctic Discoveries 1818–55." The medal is surmounted by a five-pointed star (the Pole Star), with a ring for suspension by a watered white ribbon $1\frac{1}{2}$ in. in width. Lord Milford Haven states that circular patterns were first prepared, but by the Queen's command the medal was made octagonal. The medal therefore is quite unique, not only in the shape, but also in the method of suspension.

So far as is known no clasps were issued officially. Dr John Rae's medal, which is now on exhibition in the Royal Scottish Museum at Edinburgh,

has, however, five clasps, shaped like half moons, with the dates 1846–47, 1848, 1849, 1850–51, 1853–54, the earliest being on top. These may have been added by Dr Rae himself. The award of the medal was not apparently made on such hard-and-fast lines as would be the case to-day; and the Hudson's Bay Company were entrusted with 187 medals for distribution to Indians and trappers whom the Company had recommended.

The second Arctic medal was authorised in 1876. The original notice in the *London Gazette* for November 28, 1876, p. 6527, is as follows:

> Her Majesty having been graciously pleased to signify Her commands that a Medal be granted to all persons, of every rank and class, who were serving on board Her Majesty's Ships *Alert* and *Discovery* during the Arctic Expedition of 1875–76, and on board the yacht *Pandora*, in her voyage to the Arctic regions in 1876, the Lords Commissioners of the Admiralty hereby give notice of the same.
>
> The Medal will accordingly be awarded as follows:
>
> 1st. To the Officers, Seamen, Marines, and other persons serving on board of Her Majesty's ships *Alert* and *Discovery* between the 17th July, 1875, and the 2nd November, 1876.
>
> 2nd. To the Officers and Crew of the yacht *Pandora* between 3rd June, 1876, and the 2nd November, 1876.

No mention is made of the first cruise of the *Pandora* in 1875, and the wording almost suggests that it was deliberately passed over. A later notice in the *Gazette* (May 8, 1877, p. 3010) might, however, be read as including the 1875 voyage.

In contrast with the earlier medal the second was circular, and suspension was by a bar; the white ribbon was unwatered and $1\frac{1}{4}$ in. in width. The Queen's head is on the obverse, and on the reverse there is a ship in the middle distance among field-ice, with a slope of land to the left. As far as attractiveness of design goes, this medal is superior to the earlier one, and the beauty of the ship in the ice seems enhanced by the round setting.

The second Arctic medal had a much more limited issue than the first, and is rarely seen. Sir George Nares himself, who had been with Kellett, and at least two men on the 1876 voyage of the *Pandora*, were qualified for the award of both medals.

The Polar medal was instituted in 1904 on the return of the British Antarctic Expedition under Scott in the *Discovery*. The original paragraph in *The Times* for September 12, 1904, is as follows: "His Majesty the King has been graciously pleased to direct that a new medal for service in the Polar regions shall be struck and granted to the officers and crew of the *Discovery* in recognition of the successful accomplishment of their enter-

prise." This was a completely new departure. Up to this date a medal had been awarded only for Arctic service. There is no record, for instance, of an award to Lieut. Bransfield in 1820, Captain Foster in 1828–30, or Sir James Clark Ross in 1839–43, though all had made Antarctic expeditions under Admiralty auspices.

Like the first Arctic medal, the shape of the Polar medal is again octagonal. A new design was made. King Edward's head was on the obverse, and on the reverse was a sledging group in front of the *Discovery*, housed for the winter, with Mount Erebus in the background. Suspension was by an ornamental bar, and the ribbon was white, unwatered and $1\frac{1}{4}$ in. in width. A clasp was issued: "Antarctic 1901–1904."

The second award of the medal was made on the return of Shackleton's *Nimrod* expedition. The announcement appeared in the *London Gazette* for November 23, 1909, p. 8665. A new clasp, "Antarctic 1907–1909," was issued. The clasp only was given to those who already possessed the 1904 medal. The medal and clasp were in silver for the fourteen members of the shore party, and in bronze for those who had served on the ship only. Lord Milford Haven states that with the institution of this medal it was decided to grant it in future with special clasps for both North and South Polar expeditions.

A further issue of the Polar medal with clasp, "Antarctic 1910–1913," was made on the return of Captain Scott's *Terra Nova* party (*London Gazette*, July 24, 1913, p. 5322). King George's head took the place of King Edward's on the obverse. Fifty-nine medals in silver (or clasps for those already possessing the silver medal) were granted to those who had been members of the shore party or who had made more than one voyage; and six medals in bronze to those who had made one voyage only.

Since then two other Antarctic expeditions have received the medal: Mawson's Australian expedition 1911–14 (*The Times*, February 10, 1915, where no further details are given) and Shackleton's in the *Endurance* and *Aurora* (*The Times*, February 16, 1918). In the latter case the clasp reads, "Antarctic 1914–16," and the medal or clasp was issued in silver to eighteen and in bronze to six members of the *Endurance*, and in silver to eighteen and in bronze to eight of the *Aurora*. It appears, therefore, that the medal was not awarded to four of the *Endurance* and three of the *Aurora*.

It will be seen that custom has varied considerably. The distinction between silver and bronze was originally to distinguish ship and shore parties, then those making only one voyage, and finally as between ward-

room and lower deck. In the latter case also certain members were not proposed for the award.

The distinction between bronze and silver medals leads to certain individual differences. For instance Alfred Cheetham obtained the bronze medal for his service in the *Morning*, a bronze clasp for the *Nimrod*, the silver medal for the *Terra Nova*, and a silver clasp for the *Endurance*. Captain J. K. Davis, Sub-Lieut. A. L. Mackintosh and Rear-Admiral E. R. G. R. Evans have also received both the bronze and the silver medals. In this connection the record number of clasps is that of Frank Wild, who has the silver medal and four clasps, the maximum possible in the Antarctic, as two of the five expeditions took place at the same time. It would appear to be correct that anyone who has received both the bronze and the silver medals is entitled to wear both, but that there should be no cases, unless there has been a mistake in the issue, of someone holding two silver medals. I have not been able to trace any instance of anyone holding both the second Arctic medal and the Polar medal.

The award now made to Watkins' expedition is the first grant of the general Polar medal for Arctic service, and the clasp will read: "Arctic 1930–1931." Those who have followed the affairs of the expedition will agree that the honour is most appropriate, and fittingly emphasizes that this was the most important Arctic expedition from this country since 1875–76, when the last Arctic medal was issued.

RECENT POLAR WORK—SOME CRITICISMS

BY PROFESSOR R. N. RUDMOSE BROWN.

The growing output of polar books shows that Arctic and Antarctic regions still exercise a fascination, both to the explorer, and to the reading public; and the disappearance of the two-volume book is a welcome result both of financial stringency, and of a less verbose age. The conquest of the poles has allowed exploration to be diverted into more useful directions than the mere attainment of a high latitude. At the same time there is no denying that it has robbed polar work of a popular zest, and will not make it easy to raise funds for a large-scale expedition in the future. A two years' effort in the Antarctic will have to be done on scantier means than several of the expeditions for pre-war days, for the popular appeal will be restricted. And again, more is now expected, because more is possible with modern methods and technique, and knowledge of past mistakes. Byrd's marvellous flight to the South Pole and back stirred imagination comparatively little, while Greenland can now be crossed without the public taking the slightest interest. Contrast such successful ventures with the world-wide interest in Andrée's abortive attempt to fly in 1897, or the sensation caused by Nansen's crossing of Greenland in 1888.

The most striking difference between the polar work of to-day and that of twenty or thirty years ago lies in the technique of travel. After Binney in 1924 had shown the value of the aeroplane in Arctic reconnaissance, it became the sport of the adventurous spirits in flights marked by daring, but barren of contributions to Arctic knowledge. The airship did little more, though the fiasco of *Italia* was redeemed by the unostentatious success of *Graf Zepplin*. The Watkins expedition to Greenland would seem to have found a true use for the aeroplane in the Arctic (*Northern Lights*, by F. S. Chapman: Chatto and Windus, 1932). By its use time was saved, arduous journeys obviated, and useful survey in intricate relief accomplished. But in detailed exploration it did not take the place of ground work. Byrd used the aeroplane in much the same way in the Antarctic (*Little America*, by R. E. Byrd: Putnam, 1931): it supplemented, but did not replace ground work. On the other hand in the Antarctic, where much pioneer work remains to be done before detailed exploration can usefully be planned, the aeroplane has proved to be of outstanding value. Witness the fine results of Wilkins, Mawson and Riiser-Larsen.

That kind of use does not enter the Arctic field, where the pioneer has finished his work, and the scientific explorer is wanted to fill in detail.

Another innovation in recent expeditions has been the use of radio, and that is of more doubtful advantage. Christmas and birthday messages are welcome; dance music is pleasant at times, and news bulletins may occasionally excite a faint interest, but these advantages are outweighed by the drawbacks of alarms being broadcast (cf. *Northern Lights*), and interference with the leader's plans. And as Byrd says, radio "is going to destroy all peace of mind, which is half the attraction of polar regions." One must admit, however, that local radio, within the area of expedition work, might have great value.

A third change in polar methods is the application of mechanical power to transport. Shackleton, Scott and Mawson each tried it in the Antarctic, and each found it a failure, but these were early days. Newer expeditions have fared a little better. Byrd's "snow-mobile" had a short and undistinguished life, but the air-propeller sledges of the Wegener expedition to Greenland were a success. It is idle to deny that the era of mechanical transport has little more than begun, and yet it must be remembered that a man can never know the measure of a machine's capacity as he can his own. To stake success on the holding of a pin or cog is to introduce an unnecessary gamble into polar research. The whole tendency nowadays is to revert to the most primitive method of transport, that is, the use of dogs. It is curious how unwilling Europeans have proved to learn this, and other lessons from the Eskimo. The overbearing pride of the white man in refusing to learn anything from a "native" has held back polar travel for a century or more. Explorers of Canadian training learned the use of dogs, but those from Britain never took kindly to dog driving, and still less to the unnecessary sacrifice of dogs during a journey. But the Watkins expedition, as to some extent that of Binney in North-East Land in 1924, made use of dogs as well as Eskimo, Danes or Norwegians could have done. Thus they enormously eased their task, and saved themselves the martyrdom of physical exhaustion. The two journeys across the ice-cap were rendered possible, even if the expedient of travelling by night to get a better surface for sledge and dog had to be adopted at times. One awaits with eagerness the use of the Eskimo dogs on a large scale in the Antarctic, by an expedition that could then combine the efficiency of Amundsen's sledging with the scientific thoroughness of Scott's expedition. Another method of Eskimo technique is the use of snow in building. That, of course, is limited by the nature of

the snow, and would be only doubtfully useful with the finely powdered snow of the Antarctic.

The dependence of an expedition on hunting in preference to preserved food is no new conception in theory. Rae, who was one of the finest of all Arctic sledge travellers, invariably depended on his rifle. Stefansson and his men generally did the same, and this source of food was indeed the basis of the idea of a "friendly Arctic." Few Antarctic expeditions of this century have been blind to the value of seal and penguin. Fresh food is no new diet, though it was apparently repugnant to the old-time traveller, but its supply varies much in different parts. The Watkins expedition had native hunters to help in securing the supply. Spitsbergen expeditions are lucky to find a rare reindeer, and have to do as best they can on birds. But it is clear that without native help, or men whose special function it is to hunt, the time of an expedition would be too much occupied and its work curtailed by "living off the land."

All polar exploration, at least since the days of the naval expeditions of last century, is the work of young men, and in recent years youth has been further emphasised. Oxford and Cambridge have made exploration, chiefly in polar regions, a hobby, and shown the peculiar advantages that youthful enthusiasm can bring to the work. The Watkins expedition is the outstanding example, but many smaller expeditions to Labrador, Greenland, and Spitsbergen might be cited. Watkins went further, and argued against the older method of looking, where possible, for men of experience as a leaven to the personnel. He preferred men of no polar experience, unless that experience had been with him. The employment of a "raw staff" certainly eases the break with effete traditions, encourages new technique, and strengthens the position of the leader, but on the other hand it adds to the unavoidable risks of polar life, and may well cause a wastage in personnel in discarding the keenest men—those who have already tasted the charm of polar life.

Perhaps the most notable characteristic of recent Arctic expeditions is the amount of work most have accomplished, sometimes in a month or two, sometimes in a year or more. This is no doubt due partly to saving of time in landing, in settling down and getting started, in short, to taking advantage of the experience of earlier expeditions. It is partly due also to definite problems being tackled as the issues are narrowed with growing knowledge. But it is due most of all to the enthusiasm of youth, which is willing to take risks. On the Watkins expedition it is undeniable that risks were taken, great risks at times, as for instance when a party of

only two men crossed the ice-cap. The lonely vigil of Courtauld at the ice-cap station was a risk, an experiment in temperament no less than a trial of physical condition. The open boat journey to the west was an even greater risk. These ventures were all successful, and so were justified. Older men might have been more cautious, and achieved less. Therein lies the justification of youth. On the other hand on Akpatok Island a comparable risk was taken by two members of another expedition that cost a life (*The Isle of Auks*, by N. Polunin: E. Arnold, 1932). There is something to be said for reasonable caution, and the value of older counsel. One cannot leave this theme without adding a word of deep regret at Watkins' untimely end, due to no unnecessary venture, but to an accident common among the Eskimo, in whose technique he was so wonderfully versed. While the official record of the Watkins Expedition in *Northern Lights* marks a stage in Arctic research and technique, another volume on the same expedition is the most lighthearted and exuberant polar book that has appeared for many years. *Those Greenland Days*, by M. Lindsay (Blackwoods, 1932), conveys some idea of the fascination of the life, and the ready acceptance of its ups and downs, its lights and shadows.

In a totally different category are two books that relate the experiences of polar residents, not explorers. *Klengenberg of the Arctic* (Jonathan Cape, 1932) gives the inside view, and lets us see the Arctic from a new angle. Jan Welzl's *Thirty Years in the Golden North* (Allen and Unwin, 1932) is an amazing yarn, but too full of inconsistencies and departures from geographical accuracy to be accepted as a serious contribution to Arctic literature.

Antarctic books have not been numerous in recent years, though an amazing amount of work has been done in the south. Byrd's *Little America* and Gould's *Cold* (Brewer, Warren & Putnam, 1931) deserve more attention than space allows here. The *Discovery Reports*, lavishly illustrated with maps and photographs, contain a mass of new material on sub-Antarctic lands and seas, which most expeditions, in a hurry to get south, have passed by (e.g. *The South Sandwich Islands*, vol. III, pp. 133–198, 1931, and *Hydrographic Survey Operations in South Georgia*, etc., vol. II, pp. 297–344, 1932). And finally there have appeared two useful compilations on the history of Antarctic exploration. Of these, Hayes' *Conquest of the South Pole* (Thornton Butterworth, 1932) brings up to date Mill's *Siege of the South Pole* in a series of chapters on the expeditions from 1907 onwards, each told partly by extracts from

explorers' diaries, and each revised by a member of the expedition concerned. The other general book is B. Aagaard's *Fangst og Forskning i Sydishavet* (Oslo, 1930, 2 vols.; vol. III in the press), which should make us regret if our Norwegian is not fluent, for the books cover all the early history of Antarctic endeavour, especially Norwegian, and give a detailed account of recent Norwegian work. The bibliography is the best that has yet appeared in any country. Maps and photographs abound in these volumes. The political rivalry that has entered into polar arenas in recent years has stimulated endeavours in various directions, e.g. the Danes and Norwegians in East Greenland, the copious output of *Skifter om Svalbard og Ishavet* on Spitsbergen research and the monumental Danish work on *Greenland* (3 vols.; Oxford Press, 1927–29). That is its happy side. Its Gilbertian aspect was the wrangle over Bouvet Island and the non-existent Thompson Island. But it becomes deplorable in the arguments about priority of discovery and place-names round about Enderby Land. This sort of thing robs exploration of its disinterestedness, and makes one long for the old happy days when polar regions were No Man's Land, and one could leave the world behind in going north or south.

THE WATKINS MEMORIAL FUND

We print below the letter sent out by the small Committee which is raising the Watkins Memorial Fund.

The news that H. G. Watkins had been drowned in Greenland came as a stunning blow to all who knew him, and to those who had followed him and sponsored him there came besides a feeling of utter disappointment that a great project of exploration, which might have culminated in the first crossing of the Antarctic continent, had been cut short by the one eventuality which they had not considered.

Now he is dead, but he has left behind him the wealth of his experience and the inspiration of his creed that it is our duty to complete the exploration of the world. Perhaps his greatest gift was his ability to turn failure into success, and we, his friends, have sought how best to carry on his work.

In the past it has usually been some chance generosity which has enabled youth to go and prove itself, but often enough the chance has not presented itself, and sound plans have had to be abandoned for want of financial support which is seldom given without proof of achievement.

We believe, therefore, that the most suitable memorial is a Trust Fund in the name of Gino Watkins to assist young explorers at the beginning of their careers. The income of this fund will be in the hands of a small committee of experienced men who will give it year by year to those who seem most able to carry on the work of Polar Exploration.

With this object the men who followed Watkins in the British Arctic Air Route Expedition have already subscribed a sum of over £300. Others who knew him may wish to share in this tribute to his name; and those who may read of his work in Edge Island, in Labrador, and in Greenland may feel that by giving to this fund they are becoming partners in similar achievements yet to come.

Subscriptions and inquiries should be addressed to Mr Augustine Courtauld, 33 Trafalgar Square, S.W.3.

J. J. Thomson
Hugh Robert Mill
T. G. Longstaff
Frank Debenham
J. M. Wordie
Stephen Courtauld
J. M. Scott
Augustine Courtauld

RECENT POLAR BOOKS

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

ANDERSON, FLORENCE BENNETT. *Through the Hawse-Hole.* Toronto: The Macmillan Company of Canada, Ltd., 1932. Pp. ix + 277. $3.60.

CHAPMAN, F. SPENCER. *Northern Lights.* Foreword by Admiral Sir William Goodenough; and additional chapters by J. M. Scott, Captain P. M. H. Lemon, and Augustine Courtauld. London: Chatto and Windus, 1932. Maps and sixty-four plates. 7 × 10. Pp. 304. 18*s.*

GWYNNE, STEPHEN. *Captain Scott.* New Edition. London: Lane, 1932. 5*s.*

HAYES, J. GORDON. *The Conquest of the South Pole.* London: Thornton Butterworth, 1932. 18*s.*

JENKINS, JAMES TRAVIS, D.Sc., Ph.D. *Whales and Modern Whaling.* London: Whitherby, 1932. 12*s.* 6*d.*

v. STAËL-HOLSTEIN, Baron Dr LAGE. *Norway in Arcticum. From Spitsbergen to Greenland.* Copenhagen: Levin and Monksgaard; London: Williams and Norgate, 1932. 6*s.*

LINDSAY, MARTIN. *Those Greenland Days.* London: William Blackwood and Sons, Ltd., 1932. Maps and illustrations. 5½ × 8½. Pp. 256. 15*s.*

MACINNES, TOM. *Klengenberg of the Arctic.* An autobiography. London: Jonathan Cape, 1932. 10*s.*

MATTERS, LEONARD. *Through the Kara Sea.* London: Skeffington, 1932. Fifty-one illustrations. 18*s.*

MUNN, Captain HENRY T. *Prairie Tracks and Arctic Byways.* London: Hurst and Blackett, 1932. 12*s.* 6*d.*

PEARY, MARIE AHNIGHITO. *The Red Caboose.* New York: Morrow Publishing Co., 1932. Illustrations. $1.75.

POLUNIN, NICHOLAS. *The Isle of Auks.* London: Edward Arnold, 1932. Illustrations. 10*s.* 6*d.*

REYNOLDS, E. E. *Nansen.* London: Bles, 1932. 10*s.* 6*d.*

SKEIE, JOHN, LL.D. *Greenland; the Dispute between Norway and Denmark.* Foreword by G. M. Gathorne-Hardy. London and Toronto: J. M. Dent, 1932. 5*s.*

SØRENSEN, JON. *The Saga of Fridtjof Nansen.* Translated from the Norwegian by J. B. C. Watkins. London: George Allen and Unwin; New York: the American-Scandinavian Foundation, W. W. Norton and Co., 1932. 18*s.*

THOMAS, LOWELL. *Kabluk of the Eskimos.* London: Hutchinson, 1932. 10*s.* 6*d.*

ERRATA

The Polar Record, No. 4, July 1932:

Page 37. *For* Miss Lefroy, of Crondall *read* The Misses Lefroy of Crondall and Winchester.

Page 44. *For* Lat. 81° 16′ N., Long. 82° 43′ E. *read* Lat. 81° 16′ N., Long. 93° E.

Page 64. *For* W. A. Grinstead *read* W. A. Grinsted.
For P. A. Shepherd *read* P. A. Sheppard.