PRELIMINARY REPORT

of

The 1963 Imperial College

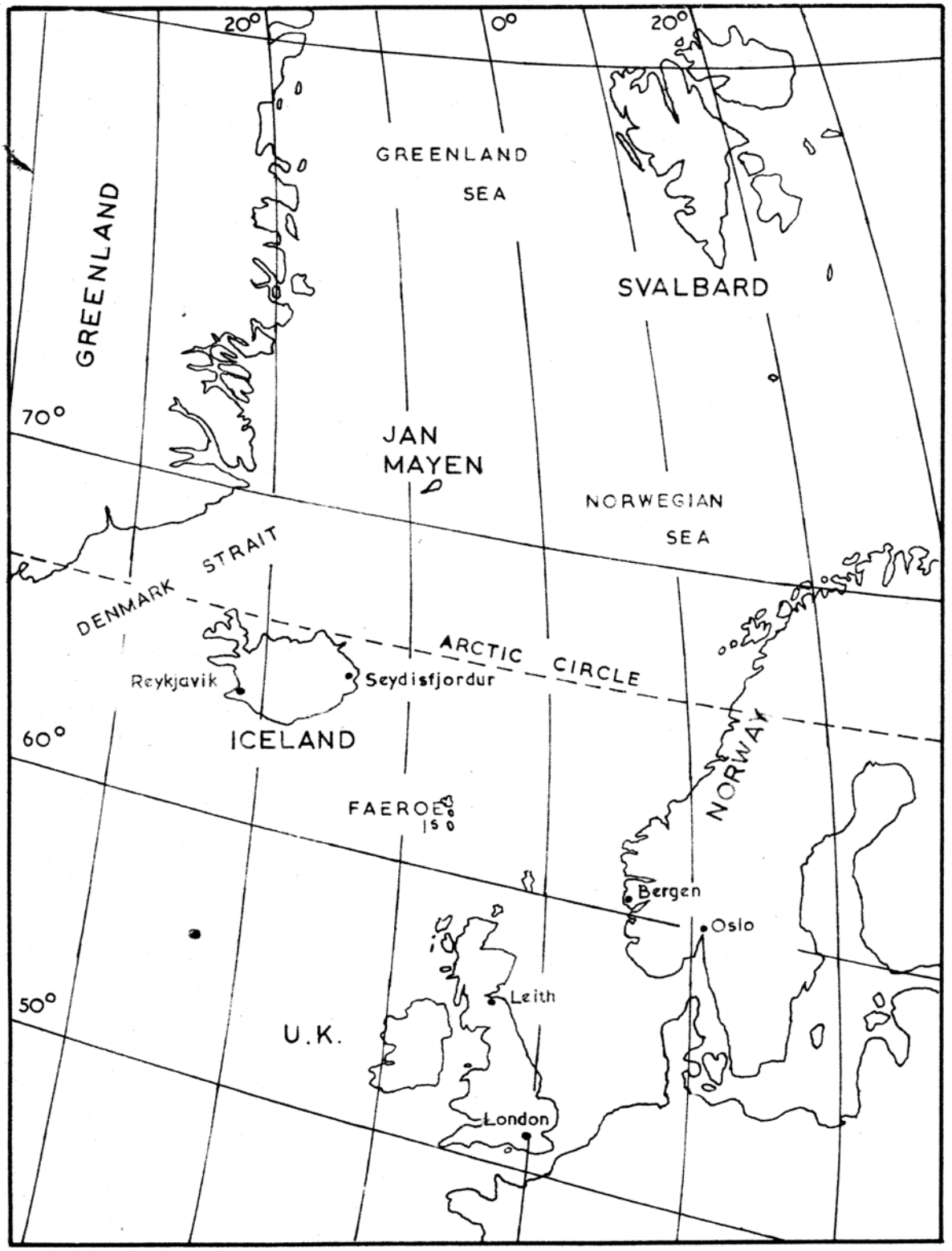
BEERENBERG EXPEDITION

to

North Jan Mayen Island, Greenland Sea

November 1963

C O N T E N T S



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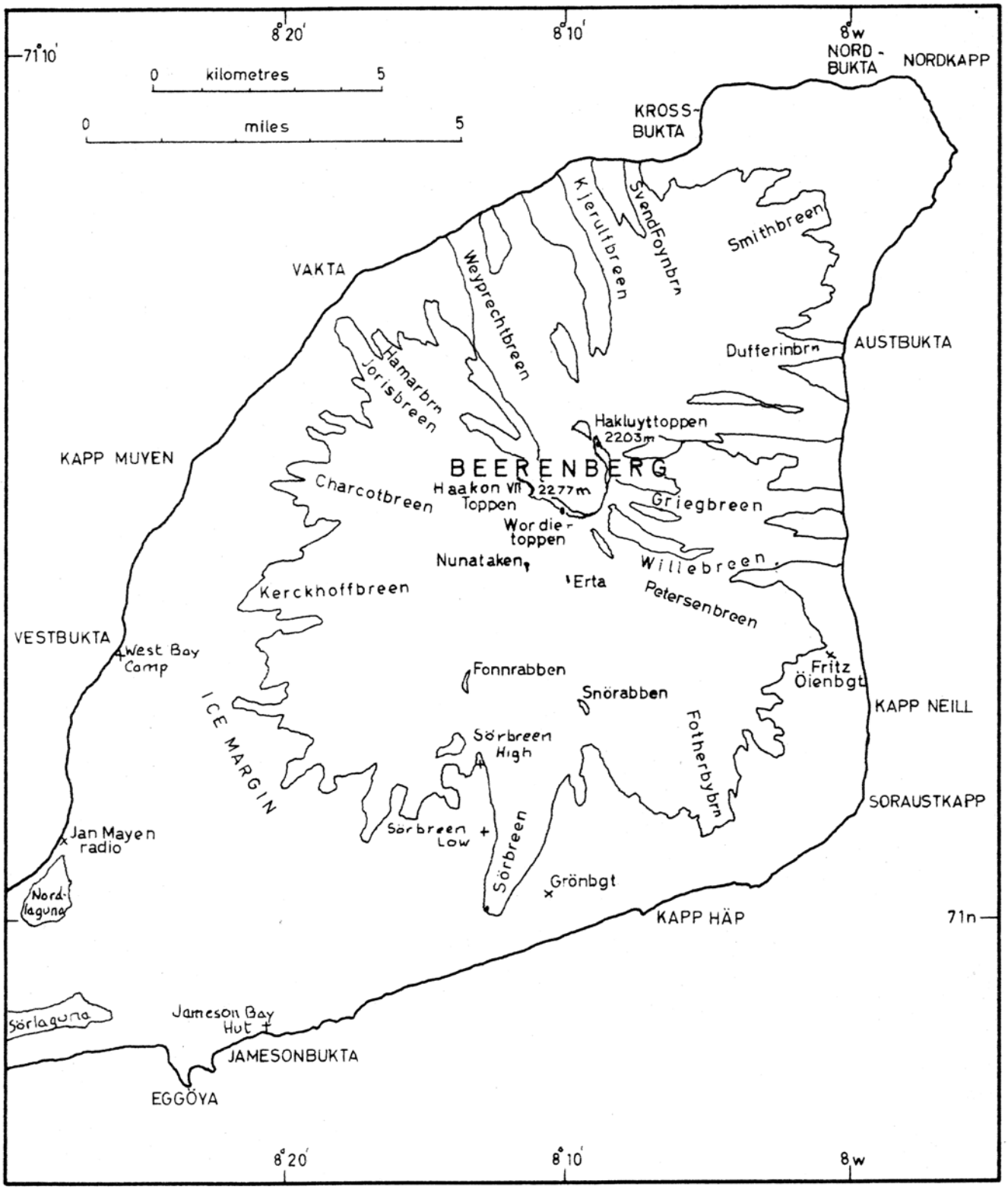

NORTH JAN MAYEN

INTRODUCTION

Jan Mayen is a small island on the Mid-Atlantic Ridge, situated in the Greenland Sea, 350 miles north of Iceland and the Arctic Circle. Scoresbysund, East Greenland lies 250 miles to the west. 36.5 miles long and orientated in a N.E.-S.W. direction, the island is dominated by the volcanic mountain, Beerenberg, which is post-Pleistocene in age. The Beerenberg, (2206 m. high) is sheathed in permanent snow and ice above 700m. with 20 glaciers radiating from its summit cone. Weyprechtbreen, the most spectacular glacier, drains the crater icefield and tumbles 2000 metres between rock walls up to 300m. high before terminating in ice-cliffs towering above the sea.

The Beerenberg comprises the northern part of the island (Nord Jan) which is about 10 miles in diameter. Sör Jan, which is about 4.5 miles wide and 20 miles long, consists of a ridge of mountains some 700m. in height. It is joined to Nord Jan by an isthmus 1.5 miles wide.

The first genuine discovery of the island was in the 17th Century when rivalry between the Dutch and English whaling fleets promoted the exploration of the Arctic. It is said that Henry Hudson visited Jan Mayen in 1607 on returning from his Greenland explorations on behalf of the English Muscovy Company naming the island 'Hudson's Touches'. There is however, much confusion in the documentation of this discovery. The English whaler Thomas Marmaduke is also believed to have discovered the island in 1612 and named it 'Trinity Island'. The authentic discovery was made by two ships of the Dutch Nordsche Compagnie in July 1614, the present name of the island being derived from that of the captain of one of these vessels, Jan Jacobsz May van Schellinkhout. He, however, chose to name the island 'Mr.Joris Eylant' after the mate of his ship.

There are several records which suggest that the island may have been visited long before this era. Of these, one describes a voyage, attributed to the Irish monk, St. Brendan "The Navigator", made around the year 551:- "...they saw a high mountain rising from the sea in the north with mists clinging around it and smoke pouring from the summit. They put in alongside a black vertical cliff...." To anyone who has visited Jan Mayen this account has a certain authenticity. Later, the early Norsemen, in the Icelandic Annals for 1194, quote 'Svalbard' as being three days sailing from Iceland. This would be good time even for a modern vessel and it seems more likely that it was Jan Mayen they found and not Spitsbergen. In 1558, the Zeno brothers of Venice published a book of their northern discoveries and mention a convent, St. Thomas Zenobium, marked on their map on the Greenland coast but in the same position as Jan Mayen relative to Iceland; but this account is to be regarded with some caution. A female skull found on the island in 1959 adds further weight to the thesis of an earlier discovery since there is no record of any female having died on Jan Mayen.

Whaling around the island is thought to have commenced in 1614 and continued until 1642 with bitter rivalry between the Dutch, English and Basque interests. In 1617, six English ships were plundered by a superior Dutch fleet and only two were allowed to continue whale-hunting that season under a promise never to return. The Dutch then proceeded to erect houses and blubber kettles in shore and 4,000 tons of oil were sent home the same year. In 1632 Dutch boats were unable to reach the island because of the ice, but later in the season, two Basque vessels landed and robbed the Dutch cookeries. The following year therefore, seven men were left to overwinter on the island to guard against further piracy. Their diary makes sorry reading since after several months scurvy began to take its toll and all the men died before the relief ship arrived in the spring. Their graves can still be seen at Kvalrossbukta.

Following the whaling period, the exploration of the island passed into the hands of scientific expeditions. Scoresby surveyed the east coast in 1817 and revisited the island the following year. In 1877, the Norwegian North Atlantic Expedition spent four days there. The Austrian Polar Year Expedition overwintered 14 men in 1882-83 and their work provides the basis of later scientific research. They produced a map which was not bettered until 1955 when the Norwegian Polar Institute published the first map based on aerial photographs.

There were many visits to Jan Mayen after 1883 but only for brief periods and by small parties. It was not until 1921 that the island had its first permanent settlement when a Norwegian meteorological station was erected at Jamesonbukta. Seven years later, Jan Mayen became Norwegian territory. During the war, the meteorological station was moved to Nordlaguna on the north side of the island. In 1959, a LOPAN air and sea navigational station was built on the southeastern part of the island at Båtvika and the meteorological station was also transferred to this site in 1962.

Many scientific expeditions have visited Jan Mayen in this most recent period but only the two largest will be mentioned as they were the most intimately connected with the work of the present expedition. The 1938 Imperial College Jan Mayen Expedition undertook extensive glaciological and botanical studies. The 1961 University of London Beerenberg Expedition enlarged upon the work carried out two years earlier by a preliminary expedition, a group from Birkbeck College studying the geology of the mountain and a party from Imperial College extending the glaciological surveys of 1938 and 1959.

The climate, although maritime, is cold and characterised by violent storms and long periods of fog. The mean annual temperature is 0.0°C. and the mean for the warmest month is only 6.1°C. The annual precipitation, which has doubled since 1921, is about 70cms. It is not the low temperatures nor the violent storms that make

life on the island unpleasant, however, but the persistant fog and low cloud. This fog combined with the dark volcanic rock makes Jan Mayen a foreboding place.The vegetation, in consequence, is poor, being composed largely of mosses and lichens, though on sunny days, this produces a fine mosaic of brilliant greens and yellows. The bird life is very rich, especially in summer when large numbers of guillenots, auks, gulls, Fulmar petrels and other birds nest in the steep rock cliffs. The only non-migratory animal is the arctic fox which lives by hunting the sea-birds. During the winter, Polar bears are sometimes seen but only very occasionally.

AIMS

The 1963 Imperial College Beerenberg Expedition was to be a purely scientific expedition mounted on the findings of previous parties from Imperial College and Birkbeck Colleges and concerned primarily with glaciological investigations of the Beerenberg ice-fields and related subjects.

The 1938 expedition found that the glaciers of the island were following a general trend of glacial retreat, which on the whole has continued up to the present time. It was with some surprise therefore, that the 1959 party found that one of the larger glaciers, Sorbreen, had advanced 150 metres from a point recorded in 1949 by aerial photography. In 1961, it was found that most of the glaciers had advanced and that the advance of Sorbreen had extended for a further 125 metres. The primary task in 1963 was to repeat and extend the previous observations of as many glacier snouts as possible and to assess whether or not this advance had continued.

The 1959 results had also shown that the advance of Sorbreen was associated with a fast flowing mass of ice near the snout. Considerably lower flow rates were recorded at the same position in 1961, showing that this mass had outrun itself. Flow measurements were to be extended to cover the whole glacier so that it might be possible to detect other surges. Alternatively, if no such surge was discovered, the flow profile of the glacier in a steady state would be obtained.

Meteorological records for Jan Mayen show that the advance of the glaciers has been associated with a 100% increase of precipitation since 1921 and also with a small decrease in the mean annual temperature. These measurements, however, were taken at sea level and there is no indication of how they varied with altitude. It was therefore decided to establish a meteorological camp at 700m. on Sorbreen in order to compare records with those of the Norwegian station. This work, in association with ablation measurements, might indicatewhether or not the glacier was likely to continue its advance. It was also hoped that by measuring past accumulation in snow pits, a direct correlation could be established with the known precipitation at sea level.

All these measurements were to be concerned with the present state of the glacier. Plans were also made to study past fluctuations by observing the moraine systems. With this in view, a detailed plane table map was to be made of the area around the snout of Sorbreen. This map, which would also indicate other features of special interest observed in the field, could be compared with a similar map made in 1938. Such a comparison would show any changes in the moraines due to slumping and changes in the courses of the main streams flowing from the snout of the glacier..

It was also proposed to date the moraines using the technique of lichenometry. This technique is basically a comparison between the size of lichens on a known dated surface with that of lichens on the surface which it is required to date. There are, however, a number of theoretical objections to the method and an ecological programme was planned to test the accuracy of the technique. A lichen collection made on the island in 1961 was also to be extended to cover those habitats which had previously been missed.

The geological work of the expedition was aimed at filling in certain gaps that inevitably became apparent after the return of the 1961 expedition. This consisted of gathering rock specimens, mainly from cliff sections, and geologically mapping an unvisited area on the east coast of Nord Jan. Another section of the geological programme was to be concerned with the coastal geomorphology, in particular, the raised beach chronology. This and some other parts of the glaciological and geological programmes which could not be attempted from our bases on the south flanks of the Beerenberg, was to be carried out from the boat during the last week of the expedition.

It was also planned to carry out a certain amount of glaciological and geological work on the Beerenberg summit cone and in the crater. The mountain had previously been climbed on a number of occasions but the crater walls had never been traversed nor the crater itself entered. It was therefore necessary to arrange a mountaineering programme before the scientific objectives could be carried out.

PERSONNEL

D.C. Birch	34	Mountaineer Schoolmaster, Ilkley, Yorkshire.
J. Bloor	35	Mountaineer Lecturer, Technical College, Leeds.
P. Dibben	23	Meteorologist P.G. Meteorology.
P.H. Draper	19	Assistant Meteorologist and mountaineer 1st year Metallurgy.
F.J. Fitch	39	Geologist Lecturer in Geology, Birkbeck College, London.
R.G. Fitch	19	Geologist 1st year Geology.
P.J.D. Guile	30	Glaciologist Technical Assistant, Dep't of Civil Engineering
C.J. Leaver	21	Botanist 3rd year Botany.
H.T. Lovenbury	21	Glaciologist and Surveyor P.G., Civil Engineering.
J.W. Sheard	23	Leader Demonstrator, Botany Dep't.
R. Stafford	20	Assistant Geologist 1st year Mining.
D. Thomas	39	Mountaineer Experimental Officer, H.M.Geological Survey.
W.N. Whaley	19	Assistant Surveyor 1st year Mathematics
A.F. Wilson	19	Assistant Botanist 1st year Mathematics

DIARY OF EVENTS

The planning of the present expedition really began when the results of the 1961 expedition were being written up. Several members of Imperial College known to be interested in Jan Mayen were approached early in 1962 and it was then decided that a large party was necessary to carry out the work envisaged. The complete party was chosen later in the year and applications were made for financial support. Official sanction from the Imperial College Exploration Board was given in the Spring of 1963.

From this time onwards the business of the expedition went forward with ever increasing momentum. Stores and equipment were ordered, collected, checked and finally packed. At the same time, other members worked on the logistics and scientific programme of the expedition. Much of the scientific equipment had to be made in College workshops and packing was finally completed in the 28th of June. That night, Wilson and Whaley set off for Leith by lorry with the equipment. The remainder of the party travelled to Edinburgh overnight, arriving early on the 1st July.

Our boat, 'Haakon VII' of Oslo, a rescue vessel chartered from the Norwegian Life-Boat Institution had arrived at Leith the previous evening. Some members, more familiar with the larger wooden Norwegian sealers, found her smaller than expected. Built in 1958, 'Haakon VII' has an overall length of 87ft. and a displacement of 150 tons. She has a speed of 11 knots and is fitted with Radar, Loran, and Decca navigational systems. Our experiences found her to be most comfortable and seaworthy although inclined to pitch in short seas. Last minute stores were purchased in Leith, bonded stores collected, the boat loaded and customs cleared during the morning. The expedition finally sailed at 1430 hrs. and was seen off by Pat Bloor and Dave Thomas who was to join us later on Jan Mayen.

Poor visibility and a choppy sea accompanied our passage down the Firth of Forth and several members went to bed feeling somewhat worse for the experience. The following morning found us north of the Orkneys on a course to the west of Fair Isle and the Shetlands. The last sight of land was the island of Foula which we passed at 1400 hrs. on 2nd July and that evening, we saw the last of the land-based seabirds. For the rest of the voyage, we were escorted by fulmars whose graceful flight provided many a moment of pleasure. The only other life seen on the voyage was two species of whale, a narwhale and sundry Russian fishing vessels. Much of the

first two days was spent on deck in glorious weather. During this time, modifications were made to certain items of equipment. The rest of the time was spent on the bridge or reading in our bunks.

Early in the 5th July, we arose to find ourselves sailing up the coast of Sör Jan in dismal weather, the cloud obscuring everything above the 300m. cliffs. We dropped anchor at Båtvika only to find that it was impossible for our stores to be transported overland to Jamesonbukta as had previously been arranged. Owing to the lateness of the season the lagoon, Sörlaguna, was still too high for heavy vehicles to negotiate the track around it. There was no alternative but to attempt a landing at Jamesonbukta. Fortunately, we had one of the very few days during the whole of the summer when it was calm enough to land there. Unloading proceeded from 0930 hrs. until 1350 hrs. using one of the ship's lifeboats and a dory loaned by the Loran station. The remainder of the day was spent moving the two tons of equipment up a steep 20m. slope of volcanic sand to the hut.

During the following days, the party worked from Jamesonbukta where a large twelve man tent was erected as a temporary measure. The base hut was cleaned out, the stores organised and "Sörbreen Low" camp was set up on a site used in 1961. On our second day at Jamesonbukta, we were visited by the head and deputy head of the Meteorological Station. They very kindly arranged to transmit weather forecasts to us twice daily and to pass on messages for us at these times. Unfortunately, our walkie-talkie sets did not operate on any of their frequencies so that two way radio contact was not possible. The Norwegians, however, offered to bring mail up from Båtvika after each air drop, in theory once every week, so that some contact could be maintained. We were also informed that the lowest temperature for Jan Mayen, -23°C., had been recorded the previous winter.

"Sörbreen Low" was immediately occupied by Sheard and Lovenbury who reconnoitred the glacier and established cairns on the lateral moraines where stake lines were to be drilled across the glacier. At the same time, Dibben and Whaley established the meteorological camp, "Sörbreen High", on the upper end of the W. moraine at 700m. and commenced taking records.

On the 10th July, Guile and Birch arrived by air from Oslo. The following day, work on the glacier began in earnest when the first line of stakes was established at 300 metres. This work continued for a week in fairly clear weather but rain and high winds did cause some delay. During this period

we worked at all hours of the day so that the lines could be inserted as quickly as possible. Much of the work was done at night (the midnight sun lasts until July 27th on Jan Mayen) when the snow was firmer and drilling in ice far easier. For the remainder of the expedition, however, we tried to keep a regular day. Altogether, 6 lines of stakes were inserted in the glacier; a total of 26 stakes.

Once the stake lines had been established on Sörbreen, attention was directed towards other parts of the programme. At"Sörbreen High", the meteorologists had started a heat balance study of a small area of Sörbreen adjacent to the camp. This entailed measurements of snowfall, rainfall, ablation of the snow surface and percolation of melt water. Readings of atmospheric pressure, dry bulb temperature and maximum and minimum temperatures as well as continuous records of pressure, temperature and relative humidity were made throughout the period of the expedition.

After Birch's arrival on July 10th, he and Bloor set up a mountaineering base at "Sörbreen High" and successfully recconoitred the Beerenberg by reaching the crater rim and climbing Haakon VII Topp, in preparation for a descent into the crater. On July 17th, an advanced camp was established at Nunataken by seven members in the course of a day's work on the glacier. During the next five days, the mountaineers traversed the complete crater ridge and entered the crater itself, both feats being achieved for the first time.

Draper moved to "Sörbreen High" on July 18th, replacing Whaley who joined Guile and Lovenbury at "Sörbreen Low". Attempts to insert several longitudinal stakes between 400m. and 700m. were unsuccessful due to persistent low cloud. However, the secondary triangulation was commenced before bad weather curtailed these activities on July 22nd

Meanwhile, Sheard, Leaver and Wilson had started botanical work on the snout of Sörbreen. This included a general collection of lichens and a study of lichen growth rates.

At the same time, the geologists, Fitch and Stafford, were working from Grönberget, a camp just to the east of Sörbreen, making detailed rock collections from the sea cliffs and correcting the 1961 map. A route to the east coast section was also recconoitred.

On the 22nd July, a gale force wind increased in strength all day. The mountaineers radioed that they were breaking camp at Nunataken and retreating to"Sörbreen High". Later we learnt that they had spent two hours searching for the camp in a "white-out" when they were in fact within 500 yards of it the whole time. The experiences of the mountaineers showed that it would be unwise to establish a camp in the crater and this part of the scientific programme was abandoned. Although the meteorologists had to dig themselves out a number of times during the blizzard at "Sörbreen High", little damage was sustained. "Sörbreen Low" fared no better and it was eventually evacuated in the height of the storm.

"Sörbreen Low" was now erected on a more sheltered site and Guile moved to "Sörbreen High". Birch, Bloor and Guile now took over the glaciological programme. Surface flow and ablation measurements were taken when possible and the triangulation of Sörbreen was continued. Besides this, all the stakes and cairns had to be inspected since most stakes had been broken and many of the marker cairns had collapsed during the gale. Birch and Bloor also helped the geologists who had moved to "Sörbreen High" in order to make rock collections above Nunataken. The mountain was again climbed but in very poor visibility.

Botanical work continued on the snout of Sörbreen though a trip was made to Kvalrossbukta to correlate the lichen growth on a surface of known age. Meanwhile, the surveyors established a base line for the triangulation below the snout of Sörbreen. Attempts to complete the triangulation so that work could start on the plane table mapping were continually hampered by poor visibility.

On August 2nd, the geologists together with Lovenbury, Whaley and Wilson man-packed their camp and a week's stores to Fritz Öienberget on the East coast. The persistent low cloud of the previous few days cleared "en route" and the party was able to fix the positions of both Fotherbybreen and Petersenbreen using compass and rangefinder. The geologists first job was to map the area around Fritz Öienberget. The greater part of the programme, however, consisted of making flow by flow rock collections from the cliffs for subsequent palaeomagnetic analysis. Very poor weather throughout the two weeks and the effect of magnetic attraction on the compass made it impossible to orientate the specimens precisely enough; they had, therefore, to be left "in-situ".

Sheard now moved to "Sörbreen High" where he and Dibben excavated several snow pits on the upper slopes below Nunataken. The profiles observed in these were supplemented by readings taken with a rammsonde between the pits. Draper meanwhile inserted thermistors in 4 holes drilled to 6 metres at the centres of the 300m., 420m., 700m., and 900m. stake lines in order to measure the ice temperature relative to depth. Birch, Bloor and Guile had by now completed the triangulation of Sörbreen and they flew back to Oslo, together with Leaver, on August 14th. Thomas had arrived earlier on the same plane.

The surveyors had completed the triangulation of the snout and were able to start plane table mapping. On August 11th, Draper and Wilson set out to Fritz Öienberget to assist the geologists. They managed to cross the snout of the Willebreen and reached the Griegbreen. On their return, Draper rejoined Dibben and Thomas at "Sörbreen High" and Wilson joined Sheard in the luxurious confines of the Old Meteorological Station on the west coast.

The botanists now continued their lichenometrical work on Kerckhoffbreen and carried out a study of the effect of wind exposure and radiation on the vegetation of one of the coastal lava platforms. The meteorologists, together with Thomas, continued the snow-pit work and surface flow measurements. They also climbed the Beerenberg in fair weather on August 24th. The surveyors continued to map the snout of Sörbreen until August 25th; even then, the map was not wholly completed due to the inclement weather conditions.

After leaving Fritz Öienberget, the geologists moved around to the Old Metoerological Station and made various rock collections on the west coast. After recording the position of the snout of Kerckhoffbreen, they returned to Fritz Öienberget with food for a further three days and a theodolite to fix the orientation of the palaeomagnetic specimens. Having achieved this object during one day of excellent weather, they were then caught by a blizzard before they could return. Since they were expected back at Jamesonbukta the same day, they had to leave everything behind, including the theodolite and the specimens so carefully collected earlier and rope up in order to return before the expedition sailed.

"Haakon VII" rejoined the expedition during the last week, bringing out F.J. Fitch, leader of the 1961 expedition, from Iceland. He, together with Lovenbury, Sheard and Thomas, visited both Sör Jan and Krossbukta collecting geological

specimens, making observations on raised beaches and noting the positions of glacier snouts. The work was to some extent hampered by bad weather and high seas which limited the number of landings. The remainder of the party completed the glaciological and geological programmes and brought in all the camps to Jamesonbukta.

On September 1st, stores were brought down to Båtvika by lorry with the help of the Norwegians and loaded onto the boat. In the evening, we were entertained to a meal at the base and F.J. Fitch presented a silver platter to the Norwegians in commemoration of their help at the time of the tragic accident in which five members of the 1961 expedition lost their lives. That evening, we sailed around to Kapp Neill to await daylight before attempting to recover the geological camp at Fritz Öienberget. After a period of uncertainty in the early morning waiting for the weather, it was decided to land a party of three. The equipment and geological specimens were quickly collected and after sailing some distance up the East coast to view the glaciers, we turned for home.

The first of the return voyage was marred by sickness due more to the physical effort and anxieties of the past week than to the state of the sea. We docked at Leith in the early hours of the 6th September after a most beautiful journey down the East coast of Scotland the previous evening. After clearing customs, we bade farewell to the crew of "Haakon VII" and made our way home by train.

PRELIMINARY CONCLUSIONS

It must be emphasised that the results of the expedition are still being worked out and that the full findings will not be available for several months. The only conclusions that can be drawn in this preliminary report are general comments derived from notes taken in the field.

More data has been collected on the general advance of the Beerenberg glaciers and it is now known that both Kerckhoffbreen and Hamarbreen and to a lesser extent Fotherbybreen and Petersenbreen have also joined in the general advance. There is, however, no evidence of any advance of Smithbreen or Wardbreen. We are now in a position to compare the advance of the glaciers with their respective characteristics and in this way shed more light on the cause of the advance.

Hamarbreen, now visible on top of the cliffs, has advanced to this position since 1961. Sörbreen, on the other hand, is no longer advancing. The flow rates at both the 300m. and 100m. profiles are lower than in 1961 and there is now no crevassing in this region. The snout, however, although stationary, is a little nearer the sea. It therefore appears that the maximum extent of the glacier in the recent advance occurred in 1962. The general flow profile of the glacier, nevertheless, would seem to suggest that it still has a healthy mass budget. In connection with one of the north coast glaciers, an opportunity has arisen to calculate its rate of flow. A large rockfall has occurred since 1961 from the side of Kjerulfbreen and the debris has extended to the snout. A rough calculation, assuming the fall took place two years ago, gives a minimum flow rate of 2 metres a day.

Six lines of stakes were established on Sörbreen at approximately 100-, 300-, 400-, 700-, 900-, and 1500 metres altitude. All these stakes were visited three or four times during the expedition so that ablation and flow measurements could be recorded. Thus for the first time, we have a reasonably complete flow profile of the glacier. The data collected from the 100-, 300- and 900 metre lines can be compared directly with measurements made in 1959 and 1961. Careful analysis of these results may indicate the possibility of any further advance of the glacier. It should also be mentioned that all but three of the stakes inserted during the 1959 and 1961 seasons were found on the glacier surface. It should thus be possible to gain some idea of the surface flow rates in 1960 and 1962. Both longitudinal and transverse strain rates were measured on the 300m. line but it is difficult to distinguish any trend due to the low flow rates.

The survey work included the secondary triangulation of Sörbreen in order to determine the accurate positions of the stake lines and the precise fixing of several glacier snouts. A detailed map of the snout of Sörbreen was completed to a scale of 1:5,000 and will enable comparisons to be made with similar surveys in 1938 and 1949. This work also included a survey of morainic and glacial features both on and around the glacier snout. Several samples were collected for subsequent analysis.

The meteorological work was carried out as planned; detailed records were gathered at Sörbreen High camp throughout the expedition. These records are the first to be taken on the mountain and a comparison with those taken at the Norwegian Meteorological Station will be of interest. The heat balance programme was less successful and this was due to difficulty in sampling the snow surface. It was found impossible to replicate measurements because of uniformity of the snow. The results do indicate, however, that in fine weather the heat transfer to the glacier surface due to radiation is greater than that due to turbulent conduction while the condensation transfer is negligible. It is much to the credit of the meteorologists that they were able to keep their complex recording apparatus in operation throughout the whole of the expedition. In conjunction with this work, pits were dug at three points on the upper snow fields and the stratification observed. These profiles were supplemented by rammsonde soundings carried out between the pits. The same difficulty of snow unconformity was experienced and care will have to be taken in correlating the various horizons between each profile.

The geological programme was also completed as planned. Rock collections were made for research work in progress at Birkbeck College in connection with the 1961 expedition. The geological map made by that expedition was corrected in certain details and expanded. A flow by flow paleomagnetic rock collection awaits laboratory studies along with other supplementary collections. It is hoped that these collections will show the effects of a fresh lava flow on the magnetism of the flow beneath it and give some indication of the age of various flows. Rocks were also collected from selected parts of the island for absolute age determinations using the potassium-argon radioactive decay method. Raised beach studies showed that the present day lagoons and wide beaches are not associated with raised beaches but are much younger in age. Two wave cut platforms associated with raised beaches may be distinguished. Drift-wood was collected from a raised beach correlated with the lower of these two platforms for C^{14} age determination.

The results of the lichenometry programme still have to be obtained from material gathered in the field. There are indications, however, that on Jan Mayen the method is not likely to be of much use because of the extent to which the size of lichen thalli are influenced by ecological variation. It is hoped that an assessment of the accuracy of the method will be possible. It should be remembered that the dates of certain moraines on Jan Mayen are already known approximately and it may therefore be asking too much of the technique to expect it to give a more accurate dating.

Another section of the botanical programme was concerned with an assessment of the effect of aspect and exposure on the vegetation of one of the coastal lava platforms. The vegetation was sampled along transects which ran across a series of undulations of the lava surface. It has been found that many of the species present have marked preferences of habitat in the hummock-hollow system. In addition to this work, a lichen collection commenced in 1961, was extended to habitats not previously visited.

In conclusion, it may be said that the expedition carried out the greater part of its scientific programme as planned. Perhaps the most arduous part of our work still lies ahead but it is intended that the results should be made available with the minimum delay.

FINANCIAL STATEMENT

Expenses		£ s d
	Travel	2,724- 3- 2
	Equipment	349- 3- 9
	Food	223-17- 9
	Film	86- 3- 3
	Freight	83- 6-11
	Scientific equipment	40-16- 5
	Sundries	37- 3-10
	Total	£ 3,544-15- 1

Income		
	North Atlantic Treaty Organisation	712-13- 3
	The Royal Society	500- 0- 0
	Mount Everest Foundation	500- 0- 0
	Imperial College Exploration Board	200- 0- 0
	Birkbeck College	500- 0- 0
	Personal Contributions	600- 0- 0
	British Petroleum Co. Ltd.	100- 0- 0
	Shell International Petroleum Co. Ltd.	100- 0- 0
	Burmah Oil Co.	50- 0- 0
	Gino Watkins Memorial Trust	50- 0- 0
	W.J. Yapp Charitable Trust	50- 0- 0
	Esso Petroleum Co. Ltd.	10- 0- 0
	Sundry creditors	32-13- 3
	Total	£ 3,405- 6- 6

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