

CAMBRIDGE UNIVERSITY EXPLORERS AND TRAVELLERS CLUB

# CAMBRIDGE EAST GREENLAND EXPEDITION 1971

PRELIMINARY REPORT

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### Members:

- A. W. Billinghamurst B.A., The Perse School, Cambridge. Leader.
- C. F. E. Karney, 2nd year Engineering, Trinity College, Cambridge.
- R. F. Squibbs, 2nd year Engineering, Churchill College, Cambridge.
- S. T. Williams, 2nd year Engineering, Emmanuel College, Cambridge.

### OBJECTIVES

The principal aim of the Expedition was to continue and complete certain aspects of the detailed glaciological survey of the Roslin glacier carried out by the Cambridge Staunings Expedition of 1970, namely:

1. To locate and re-establish the August 1970 stake patterns on the upper Roslin glacier, and to fix their new positions by theodolite triangulation.
2. To map by plane table the lower 2 kilometres of the Roslin glacier.
3. To measure the conductivity of the ice melt water at various points on the Roslin glacier.

Subsidiary projects (depending on the time available and feasibility) were:

1. By sampling willow scrub to attempt to measure the rate of recession of the Roslin glacier over the past 15 to 20 years. A pilot survey in 1970 had indicated that this method might be feasible in the case of this glacier.
2. To make a lichenometrical survey of earlier ice margins.
3. To collect samples of glacial debris for scanning electron microscope examination.
4. To make meteorological observations.
5. To collect insect samples.
6. To visit areas to the south-west of the Roslin glacier, and in particular the upper regions of the Sporre glacier basin.

### GENERAL REPORT

From the beginning of December 1970, few weeks passed without a meeting of the expedition members to consider points of general and detailed planning.

The logistic problems of maintaining even a small party in the Central Staunings Alps are considerable. However not only were we able to use supplies and equipment left by the 1970 expedition, but also the Royal Air Force once again helped with an air-drop. Without this invaluable assistance the expedition's time in the field would have been severely limited. The Nordisk Mineselskab Company also helped us greatly by providing a helicopter lift from Mesters Vig to the Schuchert Valley for our delicate survey equipment.

Our preparations went smoothly during the spring and early summer, although considerable anxiety was caused by the fact that we did not receive permission from the Danish Civil Air Authority to land at Mesters Vig until three weeks before our departure. More reassuring was the news, a few days before we left Cambridge, that the RAF air-drop had succeeded.

From Reykjavik we flew by scheduled service to Isafjordur in N.W. Iceland, and thence by a Piper Aztec twin engined six seater to Mesters Vig, the most northerly airstrip in East Greenland. Flying at between 3,500 and 5,000 feet, we had unforgettable glimpses of the Blossville Coast, Scoresby Sound, Liverpool Land, the Staunings Alps, and finally, Kong Oscar's Fjord beside which lies Mesters Vig airstrip. We touched down just before midnight on 11 July.

The next evening we began the walk which was to take us across the Werner Mountains via the Mellem Col to the vast Schuchert Valley into which the Roslin glacier debouches. Poor snow conditions on the crevassed eastern side of the pass gave way to a firm surface on the far side, and enabled us to make a quick descent of the Arcturus glacier in the early hours of the morning. Distant white shapes glittering in the early morning sun proved to be icebergs set fast in the ice of Scoresby Sound, some fifty miles away.

After receiving many kindnesses during our short stay at the Malmbjerg Mine, we moved off again to cross the Schuchert and Lang glaciers with their interminable moraines and areas of dead ice. The tundra between the glaciers was easier going and provided us with pleasant bivouac sites. Two days later, in the afternoon of 17 July, having located our survey equipment cache, we arrived at our Base camp site, on the edge of the tundra, about a mile from the glacier's edge. The accuracy of the RAF air-drop impressed us. Most of the parachutes were within 75 yards of the 'target'.

It took a further three days to organise base camp, to prepare the survey equipment and to sort and cache the air-dropped supplies, some of which were to be picked up in early August by members of the Northern Universities Natural Sciences Expedition prior to their visit to the Bjornbos Glacier. The need to make detours to avoid large melt-water streams was the principal reason why it took us sixteen hours to haul and carry some 300 lbs of supplies and equipment to the site of our Glacier camp, fifteen miles up the Roslin.

During the next two weeks the three Roslin stake lines were surveyed mainly by Karney and Billingham, while Squibbs and Williams wrestled with the caprices of a drill motor which had not wintered well! The drilling was often cold and frustrating work, compensated for only by the magnificence of our surroundings.

After two weeks at Glacier camp, all four members descended to Tundra Base, and work on the moraines and snout area was begun. A week later Squibbs and Williams left once again for Glacier Camp, in order to continue re-drilling the stake holes. They returned a week later, having succeeded in re-establishing all 26 stakes to a depth of some  $2\frac{1}{2}$  metres. Their return was delayed by 48 hours' continuous snow,

but despite the conditions they descended the 15 miles of glacier in  $5\frac{1}{2}$  hours.

Two days later, on 21 August, we closed down Tundra Base Camp and began a five-day walk to Mesters Vig. Again we were fortunate in having our survey equipment lifted to Mesters Vig by helicopter. We had not counted on this, but were naturally pleased not to have to relay loads on our return over the Mellem Col, for much new snow had fallen of late; indeed, we were held up for 24 hours at the Malmbjerg Mine because of weather conditions. We escorted two members of the Northern Universities Expedition over the col, and were glad to have a party of six to share the track-making. The average depth of soft snow during the ten hour glacier crossing was half a metre, with a maximum of one metre. Short skis or snow shoes would have been very useful, but we had none.

We arrived in Mesters Vig on 25 August, flew to Reykjavik on 28 August and by midnight on 30 August had returned to Cambridge.

#### PROJECT REPORT

##### 1. Location of 1970 stake-lines on Roslin and Dalmore glaciers.

All the 26 stakes of the three stake-lines were located and their new positions were fixed by theodolite triangulation.

##### Calculation of ablation.

Ablation since July/August 1970 was measured at 23 of the stakes. The remaining three had melted out.

##### Re-establishment of stake-patterns by re-drilling holes.

Because of difficulties with the drill motors this took much longer than had been allowed. However all stakes were re-set, most of them to a depth of some  $2\frac{1}{2}$  metres. Depth to which each stake was set was recorded with date.

##### 2. Plane-table mapping of lower 2 kilometres of Roslin glacier.

Because of time lost on the re-establishment of the stake-lines, and low cloud during the few days reserved for this at the end of our period in the field, it was not possible to add many more details to the work done in 1970. However, two large cairns were built in prominent positions above the snout, and these were linked to the plane-table survey of the terminal ice-margin and moraines.

##### 3. Measurement of conductivity of ice melt-water.

Conductivity measurements of ice melt-water were made at representative points along the glacier. These readings have been passed to Mr. L. Davies of the Scott Polar Research Institute for use in checking attenuation calculations in connection with the expedition's radio echo-sounding project.

4. Survey of Glacier Snout and terminal moraines.

(a) Determination of rate of recession of Roslin glacier snout.

For reasons which will appear in our full report, it is not expected that the sampling of willow scrub will enable the recession of the glacier in recent years to be plotted by relating the age of the oldest plants at a given site to the time elapsed since the ice retreated from that site.

The 1971 ice margins at the Roslin snout were mapped by plane-tableing for future calculation of the rate of recession.

(b) Recording of occurrence, and age of vegetation on terminal moraines.

The traverses of the Roslin terminal moraines were made; the occurrence and age of willow scrub, and the occurrence and size of chamaenerion were recorded. The location of these traverses was recorded on the plane-table map of the snout and the terminal moraines.

5. Lichenometrical Survey.

The occurrence of lichen was recorded during two traverses of the terminal moraines and will appear on the plane-table map. A map (scale 1:1000) was made showing occurrence of lichen on presumed older moraines partly 'over-run' by lichen-free moraine and out-wash deposits of a more recent date.

A lichen 'micro-map' of part of the lichen covered surface of an identifiable boulder some 500 yards west of Tundra Base Camp, was made for future calculation of the lichen growth rate for that part of the Schuchert Valley.

Collection of lichen samples. Samples of five types of crustaceous lichens occurring on pebbles in the Schuchert Valley and in the Delta Dal were collected for identification.

6. Collection of glacial debris.

At the request of Dr. D.H. Krinsley, Sedgwick Museum, Cambridge, samples of grits and silts were collected from various identified sites (for examination by scanning electron microscope). Identification of the sites is supported by photographs and sketches. Among samples were layered silt and grit from pro-glacial lake beds.

7. Meteorological observations.

Temperature and pressure readings were taken at Tundra Camp on 19 and 20 July and from 6 to 19 August. Corresponding readings for Mesters Vig for the period of our stay in Greenland were obtained from the Danish station.

8. Collection of insects.

16 specimens were collected (for the Perse School Biology Department), 15 in the terminal moraine area of the Roslin glacier.

## 9. Visit to the Spørre glacier Basin

Lack of time meant that this project had to be abandoned. However, one day was spared for what was possibly a first ascent of a 2290 metre snow peak to the south of the Roslinberg. The peak, which was climbed by its east face, immediately overlooks the upper reaches of the Roslin glacier.

## 10. Mapping of terminal moraines of the Roslin Glacier

A network of cairns was established and mapped by plane table. Two traverses were made of the terminal moraines (mapped by plane table with elevations). Details shown on the final map will include the distribution of willow scrub, chamaenerion and lichen, as well as some topographical features. These traverses will also be plotted as vertical profiles. A description (with illustrations) of the terminal drainage system of streams and lakes of the Roslin glacier will be included in the full report.

## ACKNOWLEDGEMENTS

We would like to thank the many individuals, firms and institutions who have helped us.  
For their gifts, loans, services or advice, we thank especially:

Dr. K. J. Miller; Dr. R. V. Switsur; Dr. C. Swithinbank;  
Dr. Hawtrey May; Wing Commander D. le R. Bird, RAF;  
Dr. F. L. Dawson; Dr. G. Halliday; Alastair Allan Esq;  
C. L. Liffen Esq; C. L. Williams Esq; M. H. McFarlane Esq;  
R. J. Revell Esq; F. Sørensen Esq; Herr Hintsteiner;  
Frau Hintsteiner (Senior); Mrs. Stella Merz; Mrs. Squibbs;  
Miss Jane Little; Miss Judi Badcock.

Royal Geographical Society; Mount Everest Foundation;  
Augustine Courtauld Trust; Cambridge University Engineers  
Association; Scott Polar Research Institute; Cambridge  
Staunings Expedition 1970; Cambridge University Health Centre;  
RAF Lyneham; No. 47 Air Despatch Unit, RAOC Lyneham; Trinity  
College, Cambridge; Emmanuel College, Cambridge; Churchill  
College, Cambridge; Northern Universities Natural Sciences  
Expedition to East Greenland 1971; The Geography and Biology  
Departments and Combined Cadet Force, Perse School, Cambridge.  
Nordisk Mineselskab As., Copenhagen; The British Sugar  
Corporation, Glenvilles Ltd; George Payne & Co. Ltd;  
Symbol Biscuits Ltd; The Wrigley Company; Smith & Nephew Ltd;  
Merck, Sharp & Dohme Ltd; and all the firms who kindly  
contributed to the Block Order Scheme.

## FULL REPORT, RESULTS, ACCOUNTS

The expedition's full report will be published in the Autumn of 1972. It will include a detailed financial statement.

## FURTHER INFORMATION

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