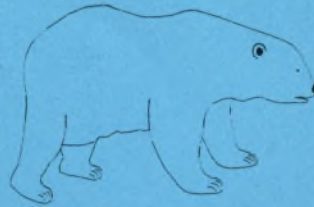


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**Durham University**  
**Svalbard '98 Expedition**

*Supported by the*  
**Royal Geographical Society**

**Interim Report**

October 1998

R.J.Schindler & I.J.Hamiduddin



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### Introduction

The programme of field research was successfully completed by the Svalbard '98 team which spent seven weeks undertaking work on two surge-type glaciers in Reindalen, central Spitzbergen. The field programme was comprised of four separate projects, with two undertaken on Arebreen, one on Kokbreen and the fourth at a number of sites in the vicinity. Follow up work on ice flow dynamics, based upon the re-survey of stakes placed in Arebreen by the Durham University Svalbard '97 expedition, had to be abandoned. This was the result of an unusually warm ablation season which had caused the melting out of the survey stakes. A study of the dynamics of alluvial fans was implemented in its place.

### Itinerary

Easter      Pre-expedition training at Finse, Norway.

June 30th    The team assemble in Oslo.

July 1st     Arrival in Svalbard.

July 2-3rd   Collection and testing of field  
                 equipment; helicopter flight to Reindalen.

July 4-10th   Assembly of campsite; preliminary ground  
                 surveys and testing; loss of some equipment due to a  
                 flood event July 11th -

Aug 8th     Scientific work undertaken.

Aug 9-16th   Expedition to the East Coast.

Aug 17-18th Travel back to Longyearbyen.

Aug 19-20th Equipment return; follow up literature search undertaken.

Aug 22nd    Arrival in UK.

### The Team

Iqbal Hamiduddin- Expedition Leader	Rob Schindler- Report Editor
Joe Langham- Logistics & Safety Manager	Liv Stormyhr- Research
Eleanor Haresign- Treasurer	Coordinator





## Research

Fieldwork was undertaken on four projects under two main research themes, namely: (1) hydrology and glacier surging; and (2) glacio-fluvial sediment transportation and deposition processes.

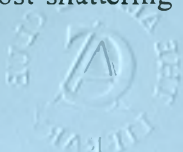
### **1- The evolution of supra-glacial streams.**

This study aimed to chart the sediment, solute and discharge relationships over a four week period. Due to constraints in the field slight adaptation was necessary. The revised aims centred upon the morphology of the channels, and sought the following objectives:

- To assess the relationship between rates of ablation and stream morphology over time
- To determine the relationship, if any, between plan and long profiles, especially regarding meander and step/pool sequences respectively
- To apply hypothetical and known hydrological principles to draw comparisons between alluvial and supra-glacial channel morphology.

### **2- Study of the dynamics of alluvial fans.**

This study aimed to investigate the formation of bars on glacio-fluvial outwash deltas or alluvial fans in Reindalen. A total of ten fans were studied, in which clast size and fabric were measured along sampling axes and a long-profile of each fan levelled in attempting to elucidate common characteristics and determine the hydrological conditions under which the bars form. Further work looked at the significance of frost-shattering to clast form.



### **3. Profiling and mapping of a dynamic ice terminus.**

Following work undertaken by Hagen (1991 ), the first 200 m of Arebreen was surveyed in detail using an electronic distance measurer, or EDM, to determine the change in morphology. From this conclusions regarding ice movement, regime and structure, as well as information regarding the glacial hydrology, can be determined when compared to previous surveys. The data will be an important addition to previous data regarding the behaviour of the glacier, and will enable more detailed understanding of the processes present at the terminus.

### **4. Glacio-fluvial sediment delivery from Arebreen**

A programme of work over a 26-day study period was undertaken to monitor temporal variations of glacially-derived suspended and dissolved sediments in the Arebreen proglacial stream. Furthermore, this work investigated controls on the causal-chain, including: (a) climatic conditions on glacial ablation; (b) ablation on proglacial stream hydrology ; and (c) meltwater production with sediment output. Features including an ice-surface moulin and sub-glacial stream exit portal in the snout of Arebreen indicate that Arebreen is unusually thermally complex for its small size. It is also known to have surged by approximately 100m in 1985-86 (Hagen, 1991), indicating that sub-glacial hydrology is important in the dynamics of this glacier.

## **Logistics**

### **Preparation & Training**

During the Easter of 1998, team members spent an enjoyable week in Finse, western Norway team-building, undertaking glacier and basic mountaineering training. Eleanor Haresign gained a St Johns Ambulance basic first aid certificate and Joe Langham attended the EAC-organised wilderness medical training weekend.

### **Travel & Freighting**

Food and equipment were purchased in the UK and then freighted by sea to Longyearbyen in June. Team members assembled in Oslo with remaining personal and scientific gear on June 30th, before taking a scheduled Braathens flight to Longyearbyen. Equipment and personnel were transported to the base camp site in Reindalen by a chartered helicopter.

### **Conditions on Svalbard**

This summer has seen the highest mean temperatures ever recorded on Svalbard. This caused an unusually high rate of snow and glacier melt, resulting in high river discharges, which hindered valley travel and rendered skis useless on the glaciers.



## Finances

Here is a brief summary of the expedition finances to-date. This is neither a final or exhaustive statement. We benefitted greatly from a very favourable exchange-rate, which lowered some of our actual costs.

Item	Projected Cost	Actual
	(£)	(£)
Flights	2040	2700
Helicopter	1500	970
Freighting	1000	910
Insurance	1000	890
Food	1025	470
Fuel	100	40
Equipment Hire	750	800
Equipment Purchase	100	100
Medical Training	95	112
Administration	300	187
<b>Total</b>	<b>7910</b>	<b>7179</b>

### Fund-raising

Durham University (Shell & BFSS award)	1700
Royal Geographical Society	2000
Scott Polar Institute	1000
Mount Everest Foundation	450
Norwegian Sponsorship	800
Personal Contributions	2700
	<b>8650</b>

### Outstanding Payments

Include insurance excesses for the equipment lost, the replacement of lost equipment and final report production and distribution.

**Svalbard '98 is very grateful for generous financial and technical support from the following:**

**Royal Geographical Society  
British & Foreign Schools Society  
Shell International  
Durham University Expeditions Committee  
& Geography Department  
Norwegian Water Administration (NVE)  
University Courses on Svalbard (UNIS)  
Norsk Polarinstitutt  
Mount Everest Foundation  
Scott Polar Research Institute**