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KARABINER MOUNTAINEERING CLUB



GREENLAND EXPEDITION 1994

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KARABINER MOUNTAINEERING CLUB

GREENLAND EXPEDITION 1994

Pourquoi-Pas Gletscher Area (66° 40'N 35° 49'W)

July 22nd 1994 to August 18th 1994

PATRON - The Lord Hunt of Llanfair Waterdine

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SUMMARY

During the summer of 1994 a group from the Karabiner Mountaineering Club of Manchester mounted an expedition to explore a mountainous area near the head of the K.I.V. Steenstrup Nordre Brae, approx. 66 degrees 42 min. N, 35 degrees 49 minutes W. on the remote eastern coast of Greenland. Nearest population centre ANGMAGSSALIK. Available records indicate that the area has had few visitors. The team set out from the UK on 22nd July returning on the 18th August.

The expedition's aim was to explore, and make a number of first ascents in the mountains around the Pourquoi Pas Gletscher.

1994 was the 50th anniversary of the Karabiner Mountaineering club and a successful expedition was thought to be a fitting salute to the founders and members who had already established a long tradition of world wide mountaineering.

Two years before the event, there began a long period of planning and team building.

The team was a strong one, which combined extensive alpine skills and general mountaineering experience. Several of the expedition members, with an avid interest in Eastern Greenland, had collected journals and reports over a considerable period. Maps were purchased and supplemented with aerial photographs for detailed study.

A ski-equipped aircraft was chartered to reach the work area. Other means of transport were available but would have greatly extended the time needed. Kulusuk, a small settlement in eastern Greenland was used as a gathering place for people and equipment. Heavy equipment and food was sea-freighted to Kulusuk and loaded onto the aircraft for the flight into the mountains.

Specialised equipment for travel included pulks (sledges pulled by people) and nordic skis. Tents were of a geodesic dome type. Climbing equipment was normal mountaineering gear. In addition each individual carried a full set of crevasse rescue equipment; dead man, hammer, ice screws, pulley, prusik loops and so on.

As part of the preparation the group agreed a common methodology for crevasse rescue and met to practice the techniques at a small Lakeland crag. Apart from that every one tried to "get fit".

Food was principally dehydrated, Catering packs were repackaged into two man, one day portions and combined with a starchy filler such as rice or mashed potato. Some tins of fish were used to break the monotony and tubes of cheese spread and pate were a great luxury. In addition to normal tea and coffee, lemon tea, chocolate and fruit juice powder were used extensively when hottish water, as opposed to boiling water, was the easiest option. Estimated calorie intake was around 4000Kcals per day.

Insurance was taken out through the British Mountaineering Council Expedition Scheme, one of the few able to meet the special requirements of the Danish authorities.

In order to enter the area a permit was needed from the Danish Polar Centre. Insurance, valid radio permits and test certificates for radio-locator beacons were a precondition for a permit to be issued.

Money was another relatively important prerequisite. The expedition was financed largely from the personal funds of the team members but also received significant grant aid from the following institutions.

The Scott Polar Research Institute, Gino Watkins
Memorial Fund
The Mount Everest Foundation
The British Mountaineering Council

Eventually the expedition got underway for Greenland.

In the field, all went according to plan except for an unusual amount of time being lost due to bad weather. All logistical arrangements worked perfectly. The pattern of the work was to cover the area in a series of three, six day excursions returning to base camp to restock with food and fuel.

Once in the mountains the team warmed up on a nearby easy angled peak. The seven hour excursion served to condition us to the scale of the landscape before us. In the clear air across a vast flat glacier all sense of distance is confused; two hours of hard skiing can leave an objective seeming as far away as ever.

A number of local forays showed that the imposing rock barriers enclosing the Pourquoi-pas glacier were shattered and extremely unstable.

The first excursion, therefore, was to an un-named glacier to the north of the Pourquoi Pas glacier. This higher glacier appeared, from the aerial photographs, to offer more access to the summits of the flanking mountains, via snow and ice routes on the northern slopes.

This proved to be the case and during the first tour six peaks, all in excess of 2000m, were visited two of which were ascended on skis. The latter two peaks were visited during an exploration of an area overlooking the head of the Champs Elysees glacier.

Directly opposite the second camp on the northern side of the unnamed glacier was a fine ridge offering a long day but with an apparently easy descent. The descent was surveyed during the exploration day and promptly rejected as a feasible route due to much steeper ground than had been expected with dramatic seracs and crevasses. The value of reconnaissance can not be over emphasised.

Ambitions to explore the ridge were abandoned due to threatening weather and a shortage of stores. The party returned to base to restock. Before the second excursion could get underway the weather broke and so began an unsettled spell that was to hamper the expedition for almost a week. For two and a half days the team members were confined to tents.

Eventually the weather cleared and a move was made to the second camp. Two climbers set off immediately for a small nearby peak. From the summit they were able to observe a number of fine peaks and a suitable site for another camp.

The next night an attempt was made on a high snow peak but abandoned because of a massive bergschrund and the poor state of the snow.

Later that day the bad weather again returned and we were confined for another two days. Time was by then becoming scarce so a decision was made to move on to another location from which the remaining objectives would be tackled. The move was made in fine weather but followed by a third bout of storms.

However long it seemed, it did not last for ever and the party emerged to limber up on a rock pile near to the tents before setting off for the main exercise of the day, after the sun had dipped and allowed the ground to freeze. That night the more technical team reached the top of a beautiful, shapely peak via a steep ice slope in time for the rose glow of the arctic sun rise, and in temperatures estimated to be below -15 degrees Celsius. On this top there was a cairn.

At the same time another pair tackled two slightly lower and less technical summits. Always the tops were rewarding and, in this second case as with most of the other peaks, there were no signs of previous visitors on these tops.

Further ambitions were thwarted by yet more bad weather. Even so, during the day before a night trek back to the pick up point one couple snatched a daring last summit. The most impressive snow pyramid in the area, but made hazardous by wind blown slab. This peak also had a cairn on top.

The expedition arrived back at base camp with one day to pack and rest. That day was not totally idle, one final summit was added to the tally. In addition, a good many photographs of a fascinating variety of small plants and grasses were obtained on an apparently arid rock ridge which ran down to the glacier. How they got there or survived the violent temperature cycles was a matter of total wonder to the observers.

To round off the trip our pilots treated us to a magnificent display of low flying and a memorable return flight out through the mountains.

1 INTRODUCTION

This report describes the Karabiner Mountaineering Club 1994 expedition to climb and explore in the mountains protruding from the vast glaciers in the remote region of eastern Greenland to the north of Kulusuk.

In the following sections is a description of first the conceptual phase, then the active planning and finally the expedition in the field.

Specialised detail has been expanded upon in the appendices.

To help planners of future expeditions relevant comments have been made where appropriate.

1.1 LOCATION OF WORK AREA

Mountain ranges near the head of the K.I.V. Steenstrup Nordre Brae, approx. 66 degrees 40 min. N, 35 degrees 49 minutes W. Nearest population centre ANGMAGSSALIK, see Figure 1.

Mont Forel, at one time thought to be Greenland's highest summit, lies approximately 100km north-west of Lake Fjord (Tugtilik) where in 1932 Gino Watkins disappeared. Between these places, many large glacier systems run parallel to the coast and in the middle of them is the Pourquoi-pas Gletscher linking the Glacier de France to the Sekstjernen basin.

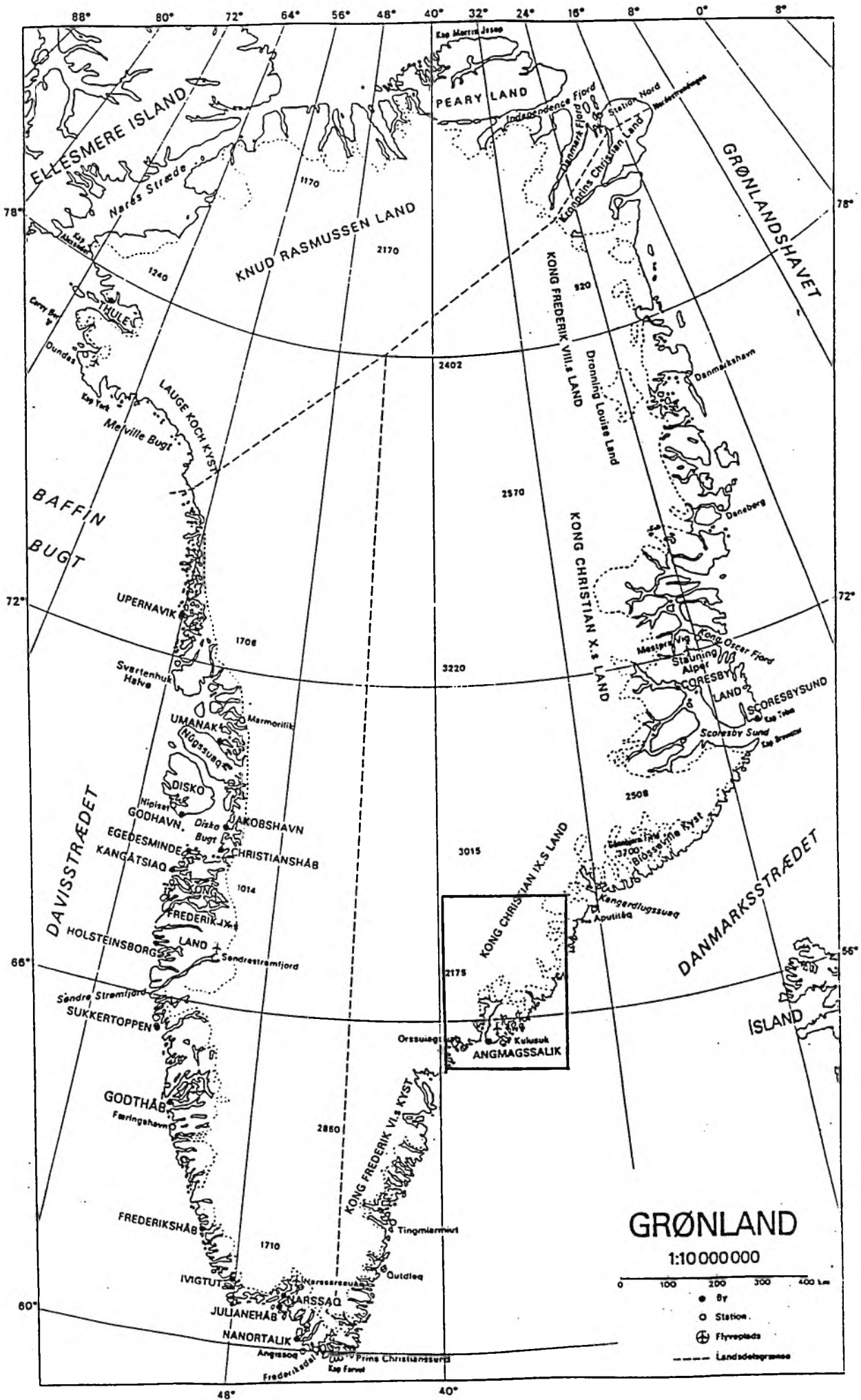
1.2 OBJECTIVES

The purpose of the expedition was to explore and climb in the mountain ranges, enclosing the Kristian, Champs Elysees and Pourquoi-Pas Gletschers. These three glaciers run South West from the head of the K.I.V. Steenstrup glacier system.

The ranges contain many unnamed peaks up to 3000 metres. Aerial photographs indicate a wide range of technical standard.

The objectives included visiting as many unclimbed peaks as possible by routes of moderate difficulty. The technically stronger team members planned to establish more difficult routes as appropriate.

The other major objective was to enhance the experience of the individuals in the team.



THE EXPEDITION AREA

1994 was the K.M.C. 50th Anniversary Year. The expedition was inspired by the Anniversary and was part of the celebration. Some club members had visited Arctic regions in the past and it seemed appropriate to build upon this tradition of exploration.

1.3 PEOPLE

The expedition team comprised of five Karabiner Mountaineering Club members plus three others. Team members had an extensive range of mountaineering and skiing experience, gained both in the UK and in many other parts of the world.

Jim Gregson (Leader) Age 47, School Teacher, British

18 Alpine seasons, extensive technical climbing in the European Alps. 1 Previous Greenland expedition. Nordic ski-touring and ascents in the Jotunheimen and Hardangerjokulen regions of Norway

Sandra Gregson Age 48, former bank clerk, British.

Alpine and ski experience as above, gained as a husband and wife team.

Paul H. Walker Age 27, Outdoor Management Trainer, British.

Extensive experience of Arctic expeditionary mountaineering.

Six expeditions to Eastern Greenland, three as leader. Ascents include Mont Forel by a new route. Six expeditions to Iceland, three in Winter, principally to the VatnaJokull ice cap. Expedition to the Jostadalsbreen Ice cap in Norway.

Lucy Walker Age 25, School Teacher, British.

2 expeditions to Norway, 1 to Iceland, Ascents of Iceland's two highest mountains in the Vatnajokull area.

Alan Jones Age 58, Retired University Assistant Registrar, British.

33 years skiing and mountaineering in Britain and the European Alps.

Made a trek into the Karakoram as part of the first winter international expedition to K2. The trek reached Concordia. Extensive skiing experience, including the Chamonix to Zermatt High Level Route and many ski-ascents in Austria, Norway and Australia. Qualified ski instructor. One previous expedition to Greenland to climb Gunnbjorn's Fjeld.

Andrew Howick Age 29, Computer Programmer, British.

2 Alpine Seasons making ascents in the Mont Blanc massif.

John Starbuck Age 39, Project Manager, British.

Several Alpine seasons. One previous Greenland expedition to climb Mt Forel.

Ascents in Alaska (Mt. McKinley by the west buttress). Asian peaks include Bhagirati II and Mera Peak. Africa, Mt. Kenya, Kilimanjaro and ascents in the Atlas Mountains. South America, Aconcagua and Cotopaxi.

Graham Harkness Age 46, Manufacturing Systems Manager, British

30 years experience of British mountaineering in summer and winter. Competent Skier.

2 PLANNING AND PREPARATION

Once the team momentum was established, the bulk of the detailed planning and preparation was achieved in about 12 months. Planning first consisted of identifying a number of suitable locations and examining the logistical options and outline costs associated with each of them.

As specialised transport is the biggest cost, in general, the more people involved to use it the cheaper it becomes. It was therefore necessary to co-operate with a second group to contain the cost.

Once the objectives were established firm costs were finalised and the various other details such as freighting of heavy equipment, insurance, permits and so on were arranged.

Meetings to work out the details plus training weekends served well as team building exercises and were essential preparation.

2.1 CONCEPT AND RESEARCH

The expedition plans grew from a suggestion that as our club would be celebrating the 50th Anniversary of its foundation during 1994, it would be nice to have a group of members participating in something a little out of the ordinary. Two of the prime movers in the venture, Alan Jones and Jim Gregson, had both made previous trips to Greenland, and were eager to go out again to the Arctic.

We were very favoured in having, as the Patron of our expedition, Lord Hunt of Llanfair Waterdine, himself a former President of the Karabiner M.C.

The original concept had been to make a second ascent of the Karabiner Fjeld in the Stauning Alps, latitude 71°38'N, 24°59'W. The mountain had been named after the club some 30 years earlier by the expedition patron.

For a variety of reasons it was decided to investigate another area. The reasons included the cost of travel because of more difficult logistics, the feasibility of aircraft landings on the glaciers and doubts about the glacier snow conditions. The authorities also have special regulations which specify additional Polar Bear precautions in the area.

Research is not easy but information is available in various journals and reports. Some of these are listed in the bibliography appendix 7. but there is no single point of reference.

Most of the research was carried out by Paul, Jim and Alan scanning a great many of these reports over several years.

The final work area was selected as a region where almost no previously reported expedition had visited before.

The next step was to purchase maps and aerial photographs. Available maps are not reliable for travel but are useful as an overview. Aerial photographs on the other hand are extremely detailed and were used to identify the glacier suitable for an aircraft landing.

A ski-equipped aircraft was selected as the preferred access option because of the limited time available to the team. The alternative was to fly to Kulusuk and then go by boat. The final stage would have been an arduous carry from the coast over the dry ice to the snow covered glaciers. There simply was not time.

The option of the ski equipped aircraft was then costed in detail as it was known from experience that the cost of a helicopter charter from Kulusuk was prohibitive.

2.2 LOGISTICS AND TRAVEL

People and personal gear went as far as possible using scheduled flights. Food and heavy equipment was freighted by sea to Kulusuk. A Twin Otter aircraft was used to land on the glacier. Eight of the passengers joined the Otter at Reykjavik and the rest of the passengers plus the freight was jammed in at Kulusuk, for the 45 minute flight to the mountains. The possibility of an airdrop of food was allowed for as a contingency in case of the Otter being overloaded.

It was known from previous experience that helicopter travel would be very expensive. The other option used by previous expeditions was a Twin Otter operated by Flugfelag Nordurlands h.f., a small Icelandic airline. This aircraft has the unique distinction of being the only one in the region equipped with skis. The Otter's cost advantage comes from its ability to land large payloads; however to be viable it must be full.

The Karabiner Mountaineering Club Expedition therefore decided to co-operate with another group who were prepared to land in the same vicinity but tour elsewhere. This made a total of thirteen people plus food and stores for 25 days.

Another condition of using the Otter was that the company need a few days leeway for the setting down and picking up in case of bad weather.

Getting people and personal equipment to Iceland is simply a question of the best deal on the scheduled flights(Iceland Air).

Freight was packed and sent by sea to Kulusuk. Ships visit Kulusuk six times a year from Denmark between July and November. The arrangement needs some care and it is prudent to have a fax confirmation that the arrangement is working at each leg of the journey. The last date for shipping from the UK was the end of May to arrive in Kulusuk before mid July. Only fuel was purchased locally in Kulusuk.

Kulusuk was chosen as a jump-off point as it has an airstrip and in recent years has started to host almost daily flights of tourists on one day excursions from Iceland, so some public air travel is available.

Kulusuk is the only airfield in that part of Greenland. Without an alternative airfield in Greenland the Otter is required by regulations to carry enough fuel to return to an airport in Iceland. It could not do this fully loaded so the heavy load had to go separately.

Eight of the expedition were to join the Otter at Reykjavik, the others to make their way there by other flights two days earlier to retrieve and organise the freight.

Much to everyone's amazement the whole load was lifted from Kulusuk in one flight lasting 45 minutes. On a six kilometre wide glacier the landing seemed to represent no problem for the pilots.

At the end of the expedition two flights were planned as the take off payload is much reduced because of the soft snow surface.

All rubbish, waste paper and so on, was to be packaged and removed after the expedition.

2.3 EQUIPMENT

Camping and travel equipment was specialised. A lot of winter mountaineering equipment was required both for climbing and glacier travel. Extreme clothing was not necessary during the summer.

Tents were Wild Country geodesic dome types. A self supporting type is essential. Snow pegs were available but in the event even these had to be re-fixed once or twice a day because of melting out.

Camping was organised around four two man units.

Stoves were MSR XGK's and Peak 1 multifuel's. It was known that the locally purchased petrol did not agree with either of these devices but there was no certainty of any other fuel being available. The fuel was known to soot up the burners and damage generator tubes so a lot of spares were also packed. In practice a Peak generator tube lasted less than a week and we struggled to keep them functional. Fuel was calculated at one third of a litre per pair per day.

Equipment was to be transported by Pulk, the design used was about 1.5 metres long with aluminium hauling bars or traces. Each pulk was equipped with a heavy waterproof nylon bag for securing the load. Pulks were pulled by skiers wearing body harnesses.

Skis were essential for a touring expedition. In our case Nordic metal edged skis were used. Skins were also needed.

For glacier travel each person was equipped with crevasse rescue gear comprising harness, ice screws, dead man and a variety of karabiners, pulleys, prusik loops and slings.

Ropes were 11mm everdry type.

Clothing was a personal choice but based on a layering system. Wide variations in temperature were expected so an ability to regulate was essential. Down jackets were for campsite comfort only.

In case of emergency the expedition packed a comprehensive first aid kit and emergency signalling equipment. In the first aid kit apart from the usual bandages and plasters there were inflatable splints and powerful analgesic tablets.

The main emergency signalling system was the LOCAT LD26 radio distress beacon. The LOCAT can be received by any commercial or military craft on sea or in the air and will pinpoint the location of the party.

For close quarters the expedition also packed large distress flares and smoke flares.

2.4 TRAINING

Apart from building up physical fitness the two main skills developed were nordic skiing and an agreed procedure for crevasse rescue.

Perhaps the most important training was to revise and agree a procedure for crevasse rescue and self rescue. The team met at a small crag one weekend and practised with various prusik knots, pulley systems and hoisting techniques.

2.5 FOOD

Food was budgeted at about 4000kcal per day although it was not calculated; there was sufficient experience to know what was "enough".

Food was organised around two man tent teams, the maximum culinary expertise required was to boil water and in the circumstances this was about the limit of the available technology.

Meals were almost all dehydrated but some additions such as tubes of Primula cheese spread, vegetarian pate and the occasional tin of fish were added as luxury items.

Day food was the usual mix of high sugar sweet bars and chocolate.

All food was packaged in two man one day packs. Every item was packed in a triple layer of plastic bags and then combined into a larger day pack.

Over-packing was necessary because of the two month sea freight. Also to allow for the possibility of an air drop as a contingency in the case of the Twin Otter aircraft being unable to lift the whole expedition in one flight into the mountains.

Breakfasts were crunchy cereal or porridge pre mixed with milk powder.

Main meals were some form of starch filler, rice, pasta or potato powder, plus a sauce. The sauces were portions weighed out from catering packs of beef stew, curry, chicken supreme or chili. Puddings were of a "mix with boiling water" form or jelly and custard.

Fruit juice powder, lemon tea, and water based drinking chocolate were used to supplement the usual tea and coffee. Soups were also added as a supplementary item.

2.6 PERMITS

A permit to enter Greenland for a sporting expedition must be obtained from the Danish Polar Centre. The permit is only valid when accompanied by a radio permit for an emergency locator beacon and an insurance certificate covering search and rescue costs.

Addresses are listed in the appendix.

All details of address and permits required are supplied by the Danish Polar Centre in a letter containing a comprehensive set of guidelines.

2.7 INSURANCE

Special conditions are attached to the insurance cover required by the Danish authorities, to provide indemnity against possible search and rescue costs. The insurers must provide a special certificate.

The KMC expedition used the British Mountaineering Council Expedition insurance scheme which does supply the bond required by the Danish government.

2.8 FINANCE

Total cost of the expedition was £ 22,500. This included all travel and living expenses for the four week trip.

It also included all of the pre trip administration, this should not be underestimated. With a group from all over the country a lot of documentation was copied and circulated to keep people abreast with the developments. In addition there were a lot of telephone calls and fax messages during the evaluation period and booking of the transport.

Major cost items were transport, insurance and hire of the pulks and other special equipment.

On the income side the expedition was principally financed by the expedition members with a personal contribution of £ 2450.

Grants were also made by

The Scott Polar Research Institute, Gino Watkins
Memorial Fund
The Mount Everest Foundation
The British Mountaineering Council

In addition the Karabiner Mountaineering Club and some of the members, personally, made very welcome and encouraging donations. Total grants and donations were £ 2900.

Seeking grant aid required persistence. Dozens of letters were sent to a great many institutions and private companies. Most of the institutions then reply with a form to fill in.

In our case the results were worth while in terms of cash, discounts, and some free silk thermal underwear.

Grant aid came late in the day and was very welcome as there was a real threat that the cost could have escalated beyond the affordable limit for some members. In addition, cost of any contingency action would have had to come directly from the expedition members.

2.9 PHOTOGRAPHY

Expedition members used their own cameras, a mixture of Nikon, Olympus, Canon and Pentax; 35mm single-lens reflex and compact models.

Zoom lenses were useful for expedition work but care is needed to avoid flare problems.

Film stock was mainly Kodachrome 64, a fine grain film which copes well with bright conditions. The slow speed is rarely a problem even for hand held photography.

Film was purchased directly from Kodak with a generous discount.

A great deal of landscape and general photography was achieved, but less climbing and skiing action. Alpine style mountaineering limits the use of cameras while moving.

Temperatures as low as -12°C were recorded. Low temperatures did not cause any undue problems with camera batteries but care was needed handling film in the coldest conditions.

3 THE EXPEDITION IN THE FIELD

On Friday, 22 July 1994, six of the team travelled to Heathrow airport to fly out to Keflavik in Iceland, making a one night stop-over in Reykjavik.

The next day, Saturday, 23 July 1994, we transferred to Keflavik airport to be met by our two pilots from the charter company Flugfelag Nordurlands h.f., Ragnar Magnússon and Stefan Fridleifsson. With them, we flew by Twin Otter aircraft over to Kulusuk in East Greenland.

The journey across the Denmark Strait grew more exciting once we began to observe ice in the blue ocean waters, and the sight of so much pack ice along the East Greenland coast filled us with anticipation.

At the airstrip, we were re-united with Paul and Lucy Walker who had travelled out in advance to oversee arrangements with our freighted equipment (all safely arrived) and to purchase fuel for the expedition.

The two pilots made a wonderful job of stowing all of our various packages and parcels onto the plane, filling every available space, before inviting us to board for the flight into the mountains. As there were eight people in the KMC team, plus five others, that meant a tight squeeze.

Once in the air over Kulusuk island, the Twin Otter gradually climbed to a flying height just clearing the mountain summits to make a journey northwards for about forty five minutes. This took us over Angmagssalik Fjord, the Knud Rasmussen and 16 September Gletschers, then past the striped surface of the Glacier de France before turning north-east along the Pourquoi-pas Gletscher.

Throughout this flight there were spectacular vistas of the countless peaks and mountain ranges which afford immense possibilities to the ambitious mountaineer.

The pilot, not having seen the Pourquoi-pas before, took the Twin Otter down for a close sighting run of its surface before banking steeply into a left turn and putting it down ever so gently onto the level snow. The expedition had arrived!

Unloading was a quick process and in a short time, we and all our belongings were disembarked. The two Icelanders, courtesy of the aircraft GPS system gave us a fix on our position (66°40'N 35°49'W) then climbed aboard to fly back to their homebase at Akureyri in northern Iceland. We watched as the plane grew smaller, its engine noise receding, until it was lost to our sight.

We stood, somewhat in awe of our surroundings after the excitement of the flight. We had reached our destination through a lot of effort in planning, organisation and training; and having left the UK just the day before. Arrival time was 13:00 Greenland time (15:00 Iceland time, 16:00 Uk time).

We pitched tents and made a start on unpacking and sorting through the gear. By 22.00 hrs the sun had dipped below the mountains to the north-west and the temperature began to fall as we settled for a first night on the ice.

Most of the next day, Sunday 24 July, was taken up with further work allocating equipment to tent pairs and checking that we had everything to hand.

There was time for everyone to make some initial short trips on skis to work off the stiffness of our travel, and in the afternoon we agreed on a suitable objective to use as a training peak to launch our climbing activities.

Across to the south-east of the camp, lay a small mountain with a double-humped summit, which would allow us all to get started. We prepared our equipment and turned in intending a midnight start. At 1.00 am, we rose and just after 2.00 am, set off to ski over to the foot of our peak. In two and a half hours we reached a col below the north-east ridge of the mountain, where we switched from skis to climbing boots and crampons before roping up for the climb.

We crossed an easy bergschrund, followed by an ice slope, until a rocky ridge allowed us to scramble together up to the summit. There was no sign of any human visitors as we sat, all eight of us, contentedly, in the warming dawn sunshine, having made our first climb, a first ascent to boot. (Peak No. 1 - see summary)

To the south-east we could see onto the K.I.V. Steenstrup Brae glacier systems leading outwards to the coast. Along the Pourquoi-pas glacier itself were several attractive peaks and we felt we had got ourselves placed in an area which would permit us to attempt a number of worthwhile mountains. Reversing our ascent route, we climbed down and skied back to our landing site camp in the middle of the glacier.

Due to the level glacier surfaces and the generous snow cover, we were able to dispense with roping-up for ski travel. Throughout the expedition we were fortunate not to have to use ropes for any of our inter-camp journeys. Once we had switched into a "night for day" regime, we judged that the terrain and conditions were safe enough to make ropes necessary only for actual climbing activity. This spared us the frustration sometimes associated with roped glacier travel and helped those team members not so familiar with Nordic ski technique.

Back at our camp we rested and talked over plans for further action. Having had better views of the mountains flanking the Pourquoi-pas, study of our maps and aerial photographs led us to decide to try to place a new camp round on the higher level of the next glacier to the north, a feeder eventually falling west into the Champs-Elysées Gletscher. From such a camp we could mount attempts on peaks on the north side of the Pourquoi-pas.

On the same evening, Monday 25 July, the Forel team packed their gear and pulled away from the base camp site at about 11.00 pm. We did not expect to see them again until they returned to rendezvous with us at this location for the flight out, scheduled for the 15th of August.

During the morning of Tuesday 26 July, we sorted gear and gathered ration packs for our own foray. We loaded eight days supply of food and fuel into the pulks in preparation for an evening departure.

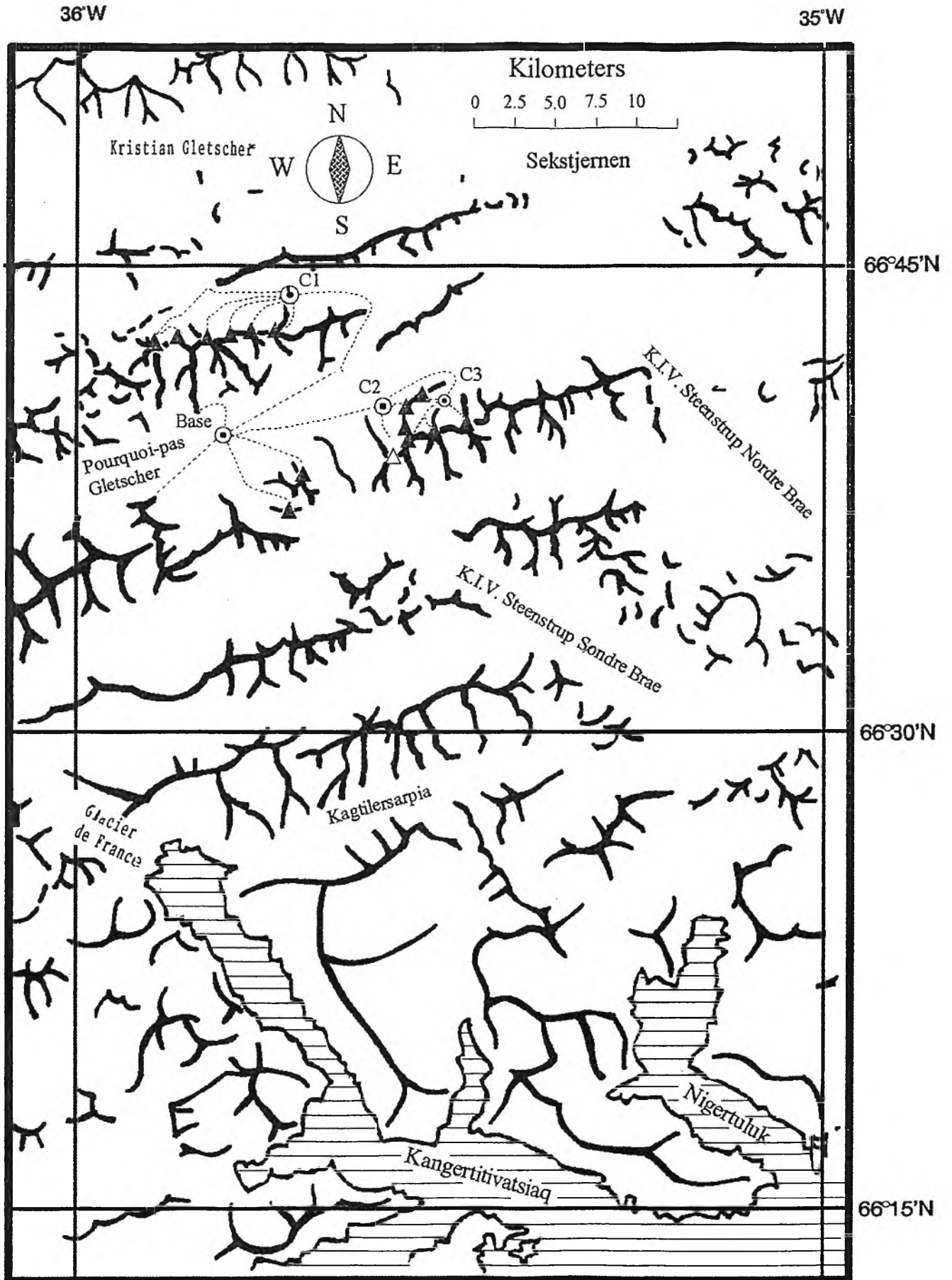
We intended to complete the switch to a "night for day" regime with this move, hopefully sustaining this for the rest of our time in order to take advantage of colder temperatures and better snow conditions for skiing and climbing. Sleeping and cooking would thus occur in the warmer "sunshine" hours, giving us some savings in fuel usage for melting snow. The few twilight hours bridging midnight would not cause us any undue visibility problems at our position beyond the Arctic Circle.

Having marked our depot of food boxes with a spare ski-pole and makeshift flag, we began to haul our pulks up the glacier at 19.30 hrs.

For some of the team this would be their first taste of pulk towing, and glacier travel by night, and we were all glad to be free of the hassle of using ropes. Each of us could adopt an easy, natural pace and we agreed to pull for two hours at a stretch and then take a brief rest stop. After three and a half hours we had passed the Pourquoi-pas "watershed" and pulled up onto a broad saddle from which the slope descended north-east into the basin of Sekstjernen. By 00.30 hrs we had travelled about 12 km and stopped at the toe of a mountain ridge marking the turning point onto the next glacier.

The slopes rose more steeply as we turned west and began to climb towards the Champs-Elysées. We decided to haul until 3.00 hrs before selecting a camp site.

KARABINER MOUNTAINEERING CLUB GREENLAND EXPEDITION 1994



- Mountain Ridges
 Peaks climbed
- Ski routes
 Peaks attempted
- Campsites

EXPEDITION AREA

We wanted a fairly level part of the frozen surface on which to pitch our tents. As the soon-to-emerge sun tinged the 27th of July sky pink we established our second camp at c. 1700 m, within easy striking range of several attractive peaks.

During the next four nights and days, between us we climbed six more peaks and tops, all of them first ascents. The weather was very fine and settled, allowing us to make excellent use of our time.

On 28 July we all skied up the glacier for 6 km, taking pulks for our climbing gear and sacks, and headed up to a shallow saddle below a snowdome. In two ropes of four we all then climbed to the snowdome and a tiny adjacent rock knoll. From there, six of us went on via a corniced col to climb to the nearby rock summit.

This involved three ropes-lengths of climbing, first on ice, then in rock grooves. This placed us on a small rock tower (Peak No. 2 - see summary) at c. 2200 m, completely unmarked until our crampons scratched signs of our passage. Soon after 6.00 am, the six first ascensionists climbed down the north-west ridge to rejoin Alan and Graham waiting on the forepeak, before enjoying a fine ski-run back to camp.

Our third peak, climbed on 29 July was also a full team outing. We skied for about an hour to gain a footing on its north ridge. This led over a corniced section into a dip, then merged into an ice slope steepening to about 45° before meeting a short rocky section leading to the top at c. 2100m (Peak No. 3 - see summary). We used some deadmen and ice-screw belays to safeguard the steeper section, climbed during a fine red sunrise.

Immediately above our camp rose a very fine pyramid shaped peak with an inviting north-east ridge, close enough not to require an approach on skis. On 30 July we set out to climb it. Roped up as two fours, we crossed the bergschrund and traversed ice terraces below rock pinnacles on the ridge, until we could climb steeper ice slopes to gain the arête just above the last tower before the final ice crest. While engrossed in this section, Alan found one of his crampons adrift due to a lost screw. A repair was eventually effected using a length of prusik cord, allowing him to continue. The way up to the summit led along the fine exposed crest of the ridge to the final rocks, which again bore no signs of previous ascent. This excellent peak (No. 4 - see summary) was a super viewpoint and from its 2180m height we could enjoy a 360° vista revealing the vastness of Greenland with range after range of beckoning mountains coursed by wide glaciers.

The descent from this peak was a little more testing for some of the team, not quite so accustomed to Alpine terrain and technique, but it was safely accomplished and completed a very satisfying ascent. The following day, 31 July, saw the team divide its attention for a change.

Three members, Alan, Graham and John, took off on an exploratory ski-tour up and across to the north edge of the glacier, to look down more directly onto the Kristian Gletscher and the lower Champs-Élysées glacier. From there they skied south-west then south for 5km, before making the ascents of two 2000m tops overlooking the Pourquoi-pas glacier from the north (Peak Nos. 6 and 7 - see summary). They returned to camp happy with their first ascents.

On this same day, the other five members, climbing as a pair and a three, made yet another first ascent, by two slightly different routes, of a further peak of c. 2080m (Peak No. 5 - see summary). This summit, like others climbed from the same camp, lay on the crest-line above the north edge of the Pourquoi-pas. It was approached through a glacier bay into a bowl below its east face. This face, of ice, was climbed via a direct line by Jim and Sandy, while Andrew, Lucy and Paul took a line closer to the north ridge. Again, the small summit rocks were unmarked.

To close this very successful phase of the expedition we had hoped to traverse the high level arête of P.2300 on the north, opposite side of the glacier. However, reconnaissance during the three-man ski tour of 31 July had revealed a major serac difficulty which would complicate, or even foil a descent. In the event, in the intended night the weather began to worsen and after some discussion we decided to make a return trip to Pourquoi-pas base, rather than risk being pinned down here with dwindling food and fuel reserves.

Accordingly, on 1 August, not long after midnight, we worked to minimise evidence of our campsite before skiing away and down to the east. Running without skins made for a quick descent towards Sekstjernen, turning the ridge end to head south-west then back to the site of our landing. We stopped on the intervening flat saddle at 2.00 am, then covered the remaining 10km to the food depot by 3.35 am. We re-established the camp as the rising sun began to disperse the cloud cover. A morning's sleep was followed by further relaxation as we discussed further options and reflected on our successes thus far.

From our summits, we had observed a very appealing group of peaks at the eastern end of the Pourquoi-pas glacier in the range running across to the K.I.V. Steenstrup Nordre Brae. Of these, two in particular would be more challenging - one a high blade of ice and rock accessible from a saddle to its north; the other a very striking pyramid of snow and ice. Additionally there were others that would be feasible for the less experienced team members.

The northern flanks of this range of peaks were very misleadingly drawn on our maps, and the aerial photographs we had were a more informative and reliable guide to follow.

We abandoned the notion of a circumnavigation of this range as a close study of the aerial photographs revealed potentially difficult and time-consuming crevasse zones. We planned instead to make a journey involving placing two separate camps, from which we could attempt the selected peaks, and assembled eight days worth of supplies. This was later increased to twelve. Late in the afternoon of 1 August, a small group of white birds flew over our camp. We retired to sleep, intending to leave in the early hours of the next day.

An alarm call at 1.00 am revealed a sky of leaden grey, with mountains down the glacier, to the west, thickly swathed in cloud. By the time we had breakfasted, the air was damp and the nearby peaks were swallowed in mist. At 3.00 am it began to snow and we decided to wait and see. In any case, after our very active first week, we needed more rest. The snow continued to fall for the rest of 2 August, confining us to our tents. There was a cold wind from the east. We agreed to try to make our move again from midnight on, but the 3rd of August arrived with no change, still windy and low, clinging mist. Low pressure was indicated markedly on the altimeter/barometer. By 7.15 am heavy rain started to fall, and with it our spirits. Trying our patience, the bad weather persisted all through the day, being too bad to go outside the tents except for dire personal needs. Time passed slowly in a mixture of sleeping, reading, cooking, eating and diary writing.

As August moved on from 3rd to 4th without any let-up in the poor weather, team morale ebbed lower. We had lost two full days so far and were well into another morning of sleet and rain. There was danger of us lapsing out of "night for day" routine, plus the need for time to allow conditions on the mountains to stabilise. By 11.30 am on 4 August, the weather started to clear. A group of five startlingly white birds, Ivory Gulls, surprised us with their calls and alighted on the snow close to the tents. When the sun broke through, there was a flourishing of activity as we all emerged to stretch ourselves and spread our damp belongings to air and dry. As we warmed up, our spirits rose, and soon we talked of moving off for more climbing.

Having added to our previously packed supplies, we waited to assess the weather. If it looked to be settling we would set off to explore and climb in the massif over to the east. Accordingly, in the evening of the 4th we struck our tents and finished loading the pulks before skiing away up the Pourquoi-pas just after 20.00 hrs on not quite frozen snow. The evening sunlight made the travelling very pleasant and we aimed for a prominent nunatak about 9km away.

By midnight we had passed this rocky point and moved on to a position in the mouth of a wide glacier bay where we decided to place our first, interim camp. Having been forcibly idle for so long, Jim was keen to do something positive. Of the others, only John was energetic enough to agree to join him, so the two quickly left the newly erected tents to ski towards the nearest peak.

After only thirty minutes, they changed into climbing boots and roped up. Moving quickly, a crevassed zone was negotiated to gain a rocky slope which led up the mountainside, narrowing down into a ridge overlooking a big icefall to the left. The rocks of this ridge harboured a variety of mosses and some bright coloured lichens. A zigzag ascent up ever-steepening slopes of ice led on to a dome from where a corniced edge continued onto the highest point (Peak No. 8 - see summary), at 3.15 hrs, 5 August.

Just beyond the top, on a small rock shelf, there was a cairn. Closer inspection disclosed an aluminium canister, inside of which was a rolled note inscribed "Schweizer Grønland Expedition 1966, dated August 9th, 1966. 'Schneekuppe' 2090m. Otto Höfliger. Ueli Imdorf. SAC - Pilatus".

The altimeter read 2010m at this point. Names and expedition details were written on a piece of headed paper and added to the canister which was replaced in the cairn. By 3.30 hrs the sun rose as a magnificent red disc and they enjoyed the change of colours in the landscape. From the summit they were also able to see across to the two higher peaks that the expedition hoped to attempt later, and to assess the approaches that would have to be made. A suitable camp area was also identified on the glacier below. The return to camp was quick, and the following day warm and sunny.

In the evening, the whole team set out to attempt the large snow peak at the head of the glacier bay 3km south-east of the tents. As the 6th of August ushered itself in we were climbing the slopes up towards its bergschrund. This crevasse proved to be impassable, it was too wide to cross where we reached it, and crossed the whole slope for more than 100 metres. In addition the upper edge was considerably higher than the lower edge.

We traversed the mountain face for a half kilometre to investigate further possible access routes, but found very soft snow conditions. The consensus of opinion was not to push the matter.

Giving it best we descended, and skied off to have a closer look at some small nunataks nearer to camp. From there we witnessed and photographed a very spectacular sunrise, before skiing to a nearby glacier hollow where we spent some time in demonstration and practice of snow and ice techniques. Once back in camp we pondered our forward plans.

Annoyingly at 11.20am it began to rain from the west. The weather worsened later in the day, with strong wind driving against the tents. In the night, the rain turned to snow which fell heavily through the morning of the 7th of August.

In the afternoon we held a "conference" to air and share our views on how best to use our remaining time. This was frank but congenial, and as a result we agreed to travel round to attempt the two high peaks seen earlier, but also that not all eight of us would try them. Some less technical objectives would be sought for some of the team.

As the evening was fine we decided to move to a new camp site and by 20.30 hrs we were all skiing through the Pourquoi-pas watershed and down towards Sekstjernen below a subsidiary ridge not shown on the map.

After 5km we turned up into the slopes climbing a higher glacier shelf behind this ridge leading into the bay below the two peaks. At midnight we reached a good position for a camp and by 1.00 hrs on Monday the 8th of August, the tents were up and we retreated inside to keep out of the cold wind.

From this camp at c. 1500m there was an exceptionally fine outlook to the north and east. Below us lay the whole of Sekstjernen, ringed by high peaks. Beyond, we could see the more level slopes of the inland ice, the Greenland ice-cap, and far in the north-east the snowy summits of the Kronprins Frederik Bjerger at latitude 67°N. It was an impressive and expansive sight, idyllic apart from the cold winds which seemed to frequent this location.

Sadly, as we were entered our final week, it began to rain at 18.30 hrs and by 21.00 hrs when we had intended to start, some of the team were outside "battening down" in a strong wind. Through the night and into the 9th of August the rain continued, so we could not set out.

After a lull in the morning, the wind shifted to the east and snow fell as the pressure drifted downwards. This lasted until the early evening, surrounding the tents with a deep blanket of very dry powder snow. The 10th of August produced a fine sunrise at 4.00 am and at 6.00 am Sandy and Jim set off up the glacier slopes in the hope of a good ski run in the powder.

As the day was fine, we all set off to try and climb the small triangular rock peak just across from the tents on the subsidiary ridge. This would give us a short day out while allowing the snow on the higher peaks to settle. There were no problems in getting on to the rocks and we climbed on loose ledges to gain a ramp line leading across the mountain's south face. This led to a small step on the east ridge from where a quick scramble put six of us on the summit, putting us back into the first ascents tally (Peak No. 9 - see summary). We were glad to be active again, and prepared for our attempt on the higher of the two big peaks.

On the 11th of August, we were on our way, making a very cold start -12°C . Graham and Alan started with the rest of us, but later branched off on their own and made an approach over glacier slopes to two summits further west. During the morning they successfully reached both of these tops, both being first ascents (Peak Nos. 11 and 12 - see summary). This gave them great satisfaction and later we shared their pleasure and sense of achievement.

While Graham and Alan were thus engaged, the remaining six had gained the high saddle just below the summit fin of the highest peak. The cold forced the party to don jackets and extra gloves. Above the saddle we climbed a steep ice slope approaching 50° , past a prominent crevasse, for three rope-lengths. This landed the team on an exposed ridge crest along which we could use rock belay points for a further two pitches. The southern slopes of this mountain were very steep cliffs falling hundreds of metres into the Steenstrup Braer glaciers. The summit rocks were small (Peak No. 10 - see summary) and on a jutting edge behind them a cairn was perched. This mountain of c. 2400m appeared to be the highest in this chain and gave a fine climb.

We were pleased with our success and returned to camp after some time spent enjoying views extending from the iceberg-studded Denmark Strait out to the east and south, round past Sekstjernen to the ice-cap, and as far as Mont Forel in the north-west.

Above the tents, the big white pyramid peak stood sentinel, one of the most attractive in the area. It deserved an attempt, and we were becoming more conscious of time slipping by before we would have to return to the landing site for our pick-up flight. We sorted out our gear for a try to be started as the night changed into the 12th of August.

At the appointed hour, John called us from deep sleep with news of a very strong westerly wind. There was a shouted discussion about wind-chill factors and so forth, as a result of which we decided not to set out. This wind was shifting a lot of powder snow about and creating deep drifts around and between the tents. By 7,00 am, there was a brief lull and after inspection Jim was convinced that no new snow had fallen and outside there was only spindrift.

Jim and Sandy felt that there was a chance to make an attempt on the peak, but only one, in the light of our need to return to base for the 14th of August. Of the others, only Andrew was willing to join the attempt, but that would have complicated matters for Sandy and Jim who wished to climb quickly as a pair.

Jim and Sandy started just after 10.00 hrs on Friday in a strong cold wind. After only about 15 minutes they were in the lee of the big mountain wall above the camp and out of the wind completely. Indeed, it was calm from then on, the campsite being a victim of very localised air currents.

After leaving the skis the snow was deep so crampons were not used. They gained height, with one big detour to get round a huge crevasse, 15m wide, and headed up to try to gain the mountain's north ridge. They chose to aim for a low dip in the ridge where the obvious bergschrund might be easiest.

The wide bergschrund was spanned by a snow bridge. By cutting a knee ledge in the upper lip it was possible to get across and climb up firm ice to the ridge crest. An ice piton and a marker sling was left for the return.

Once on the ridge they had hoped to make quicker progress, but very tricky wind-slab snow prevented this. Crampons balled up badly and they were conscious of the increasing exposure. A corniced hump in the ridge was crossed into a crevassed dip, then began a zigzag up a broader section aiming for the final sharp crest. The snow was so bad that crampons were removed until the terminal arête.

Jim and Sandy left sacks and decided to tackle the summit ridge moving together, first on its left side then over on the right. Luckily the ridge was not corniced; they were able to plunge axe and hammer shafts into the very crest, only thirty centimetres wide, while kicking hard with their feet to get through the soft top layer of snow into the ice beneath. On the left side the north east face fell in icy buttresses for six or seven hundred metres, and below their feet to the right was a sheer sweep of ice at 50°. Taking time to make good steps, for coming down, they persevered, passing one or two transverse crevasses, until the arête eased and a few rocks led up to a pointed summit which was reached at 14.00 hrs (Peak No. 13 - see summary).

The climbers yelled to attract the attention of the others down at the camp; and those who had been watching fired off a mini flare. Neither group saw or heard the respective signals.

On the summit there was a cairn. The map spot height of 2370m, appeared to correspond with this peak. The descent began after only ten minutes on the top. The overcast sky might have led to any sort of weather.

Snow conditions had been a worry on the way up, one big snow slide would have given cause to renounce the attempt. Now the climbers needed all of their considerable Alpine experience for a safe return.

Security lay in mutual trust rather than any gear. There was a needed to be off the mountain. The narrow terminal arête was not so trying, it was possible to get fairly sure crampon placements in the underlying ice, and to move together to the point where the sacks were retrieved. From then on the descent was a test of nerve. The wind slab settled every so often with a sickening creak, and it was a struggle to cope with desperately balled-up crampons. Minor slides broke away from their feet and the exposure made itself very apparent.

Both were very tense, and recrossing the crevassed hump was rather frightening until it was possible to reach the ice piton and sling above the bergschrund crossing and step back down over the softening bridge, two hours after leaving the summit.

On the easy ground back to the skis, Jim and Sandy were glad to be off the hazardous snow of the ridge but felt no elation over the ascent. That sense of pleasure came later.

We needed to retrace our tracks to Pourquoi-pas base, as we would have to ready ourselves for flying out on 15 August. After a period of rest, Sandy and Jim felt that they could accompany the others back during the night of 12/13 of August.

Once packed, Jim and Sandy were faced with the prospect of a six hour ski haul, only a couple of hours after the seven hour round trip to climb the mountain.

This journey was interrupted by one mishap, a heavy fall in difficult snow caused Jims pulk to break loose from its towing bar and set off down the glacier on its own. Fortunately after 500m it stopped, without having detoured into a crevasse. Repairs were managed by our two engineers, Graham and John.

Eventually, through gloomy twilight, we all arrived back at the landing site camp area, between 2.00 and 2.30 hrs on the 13th of August. The tents of the Forel group were already in situ. They had arrived back on the 12th of August.

Sunday, 14 August, was for relaxing, apart from John and Andrew who just after midnight set out on an eight hour round trip to climb a mountain of c.1800m from the north. (Peak No.14 - See summary)

During the morning, Graham and Alan made a short ski trip to the north edge of the glacier to search the toe of a ridge for flowers and to collect a few rock samples. On their return they reported that they had photographed a variety of different plant species growing on the seemingly inhospitable slopes.

The others sorted the equipment for re-packing ready for the following day when we expected the aeroplane to come in to pick us all up.

During the morning of Monday, 15 August, we all busied ourselves in packing our personal gear, and then dealt with cleaning up the camp area. This meant filling in all of our 'excavations', demolishing snow walls and packaging up all of the waste for flying out.

Eventually apart from two or three tents, all was packed and we sat on our baggage to wait. As the plane would be flying in direct from Iceland we were unsure as to its precise arrival time. Suddenly at 12.20hrs the aircraft lights were spotted way off to the south east. The Twin Otter circled over the glacier before making a final very low pass over the camp to land smoothly within 50 metres of the tents, running for a further 100m before turning to taxi back.

We were to fly out in two trips, as take-off weight from the ice was critical, so eight of the thirteen people loaded their gear onto the small plane together with some of the group equipment.

After a surprisingly short take off run the Twin Otter was airborne and we were treated to another visually splendid passage out to Kulusuk airstrip. While the aeroplane made the return trip to Pourquoi-pas base and back to collect the other five people, we in the KMC group were able to pay a quick visit to Kap Dan village, the Inuit settlement on Kulusuk island.

When the Twin Otter returned, we off-loaded equipment which would be returned to the UK by sea freighting. Personal gear was then re-stowed and ten people from the two expedition groups boarded again for the flight to Reykjavik in Iceland, capably piloted by Ragnar Ólafsson and Ágúst Magnússon. The other three flew out to rejoin us the next day after over-seeing the arrangements for the freight shipment. We then set out celebrating the success of our expedition.

4 CONCLUSIONS

All expedition objectives were met and all team members expressed a keen interest in the possibility of another expedition.

Such a prolonged period of unstable weather is rare in that area but it should be noted that the average precipitation rises rapidly between the ice cap and the coast, the ice cap being a virtual desert. Weather was a frustration but in the mountains it has to be accepted gracefully. Otherwise the expedition was a lucky one and significant mountaineering and ski exploration was accomplished.

Without the loss of time and poor snow conditions associated with the unstable stormy weather more ascents and more extensive travel could have been achieved. The expedition team was very active nonetheless.

The area has tremendous potential for future expeditions. There are range upon range of mountains with only a few of the major peaks having been climbed.

Some psychological acclimatization was necessary, especially for less experienced alpinists who were not familiar with the isolation and the constant presence of potential danger. The sense of isolation and remoteness from rescue led to some tempering of climbing ambitions.

This true wilderness is wonderful but the feelings to return are addictive. Almost everyone who has experienced the Greenland mountains wants to go back.

All pre-planning worked well and equipment performed as required. In the field the expedition was well managed and, in the event, there was no need for contingency actions or to test emergency procedures.

More research is needed into the best combination of stoves, likely to be compatible with locally available fuel. The Inuit petrol in the types of stove available was dangerous when, used for cooking in tents during bad weather.

Malfunction of the stoves increased the risk of flaring and in one case deterioration of the shutoff valve resulted in a stove fuel tank being engulfed in flames.

A 'nice-to-have' would have been a hand held Global Positioning System (GPS) to log the precise locations, but this was too expensive.

Nordic ski techniques of a high standard were not needed for general progress on the wide flat glaciers but greater competence would have made coping with difficult snow conditions easier.

On the final return journey to base, very demanding conditions were encountered and even simple step turns were very difficult to execute.

Skins were essential for traction when towing heavy loads.

All of the team members gained personal satisfaction from the experience in many varied ways. Despite the great expense of reaching Greenland's mountains all would want to go back if the opportunity arose.

APPENDIX 1 - KARABINER MOUNTAINEERING CLUB GREENLAND
 EXPEDITION 1994 FINANCIAL ANALYSIS

INCOME	£
Personal Contributions	19,600
Donations - Gino Watkins Memorial Fund	1,500
- Mount Everest Foundation	600
- British Mountaineering Council	<u>600</u>
	2,700
Private - Karabiner Mountaineering Club	100
KMC Private Members	<u>100</u>
	200
	<u>22,500</u>

EXPENDITURE

Research, Maps, Photographs	290
Interviews and meetings	151
Insurance	1,320
Flights	13,384
Accommodation	480
Sea Freight and packaging	1,610
Fuel	30
Food	880
Telephone and Fax	400
Admin/copying/postage/etc	555
Radio beacons and permits	400
Photographic Supplies	800
Hire of equipment	<u>2,200</u>
	22,500

APPENDIX 2 - LOGISTICS AND TRAVEL DETAILS

SCHEDULE FLIGHTS

There are no direct flights from the UK to anywhere in Greenland. Flights to the East coast, from Iceland, are made via Keflavik International airport and Reykjavik domestic airport, and occasionally Isafjordur and Akureyri in the North. All flights from the UK to Keflavik are with Icelandair.

There are twice weekly flights between Glasgow and Keflavik and daily flights from Heathrow to Keflavik. Coach transfer then takes you to Iceland's capital, Reykjavik, from where onward charter flights can be arranged from Reykjavik domestic airport.

There is a twice weekly flight between Keflavik and the East Greenland airstrip at Kulusuk operated by Greenlandair.

Private aircraft charter between Iceland and Greenland is available all year round on any days, but at a cost! All private air charter arrangements to the Kulusuk/Angmagssalik and Schweizerland Alps region of East Greenland were co-ordinated by the Cumbrian based UK agent "Tangent Expeditions" (details in Appendix 9).

The Icelandair tickets were purchased through "Dick Phillips Specialist Icelandic Travel Service" and the Twin Otter ski plane and smaller Cessna aircraft charters were booked through Tangent Expeditions, as was the sea freight.

All the food and sea freight was packed ready for freighting by the end of May at Paul and Lucy Walker's house in Flookburgh, Cumbria. Certain items of individuals personal equipment not required until arrival in Greenland, such as climbing boots, harnesses, helmets, etc were also packed.

All sea freight is trans-shipped via Denmark, and arrives in Angmagssalik, East Greenland. It is then shipped over to Kulusuk island and transported by lorry to the airport. The whole process takes approximately six weeks. There are seven sailings per year from Denmark, the first arriving in Angmagssalik approximately the first week of July, and then once every three weeks until the end of October. In an attempt to reduce costs all round, Tangent Expeditions co-ordinated sea freight by sending out all UK expedition freight to this area together. Our freight was sent with two other group's on the first sailing of the year.

The expedition chartered two aircraft, a Cessna 402c and a Twin Otter ski plane. Both were chartered from Iceland on a day each at the beginning of the expedition and a day each at the end. Because of the phenomenal cost of these charters it was necessary to share the charter arrangements with a separate expedition being organising by Tangent.

Both aircraft are chartered at a fixed cost between Reykjavik and Kulusuk but are costed on a per hour flying time basis once in Greenland. Thus the further into the unexplored mountain ranges you fly, the more expensive the charter.

The advance party flew out and back to/from Kulusuk on the Cessna, the main party on the Twin Otter.

All members of the Karabiner expedition and the Tangent group flew into the glacier together in one flight. Due to greatly reduced payload restrictions on the flight out, two outward flights were required to transport the groups back to Kulusuk.

Although we were very lucky and all our logistical arrangements worked perfectly, it must be emphasised that all flights to/from Kulusuk and into and out from the mountains are weather dependent. All landings/take offs require good visibility and contingency days must be allowed at both the beginning and end of the expedition. One day delays are common, two to three days quite possible.

Expect additional freight storage charges in Greenland to be quite expensive, although sometimes they are waived. There seems to be no pattern to this!

Fuel can be purchased in Kulusuk (Kap Dan) village some 20 minutes walk from Kulusuk airstrip but is limited to leaded petrol. This was purchased by the advanced party and consequently many stove spares were taken and used!

APPENDIX 3 - EQUIPMENT DETAILS

SKIING/SLEDGE HAULING

Due to the size and fairly flat, crevasse free nature of the glacier terrain, metal edged Nordic skis were used for their lighter weight and lower cost than Alpine. Skins were taken and were essential for uphill work and the extra traction required for pulling pulk sledges. Spare ski sticks and spare screws/rivets were taken. A complete spare set of skis could be advantageous on a longer and/or more committing ski journey.

Most skis were waxless. The two waxable pairs were not used with wax but with skins for pulk towing and up hill skiing. Expedition suitable Gronell and Artex ATK10 and ATK30 leather ski boots were taken. Cold was rarely a problem. Separate plastic climbing boots were taken.

Two sizes of fibreglass pulks were taken, both manufactured by Snowsled of Tetbury, Gloucestershire, in 1.2m and 1.5m lengths. They had fixed aluminium hauling shafts (traces) and a mixture of waist and full body harnesses. These were invaluable in hauling provisions and equipment from one camp to another.

A good pair of glacier glasses was essential for ski travel during the day and in fact at all times when up and around during the day.

TENTAGE

The expedition used four Wild Country tents of the geodesic design. They included two Mountain Quasars, a Mountain Super Nova and a Hyperspace. All bar the Hyperspace had snow valances which were very useful but not essential. Although some snowfall should be expected, it is not usually in large quantities during the Summer months and not usually accompanied by strong winds.

Only a handful of 4-6 alloy pegs were taken per tent for camping at Kulusuk. Otherwise 18'' alloy snow pegs were taken for use on the glacier, averaging about 8 per tent. Numerous other items were improvised as pegs during bad weather, ie skis, ski poles, snow shovels, ice axes, ice screws, snow blocks, etc.

Thermarest sleeping mattresses were taken by most. Those with Karrimats insisted two layers were necessary! 3/4 season sleeping bags were taken by all. Night time temperatures averaged -5' to -8'c: the warmest around freezing, the coldest around -15'c. Goretex bivouac bags were taken but in the circumstances were not used as no bivouacs were made.

STOVES/CAMPCRAFT

Two MSR XGK and four PEAK 1 Multifuel stoves were taken; one stove per tent group plus a couple spare.

Spare stoves and plenty of spare parts are essential due to the very poor quality of the leaded fuel. Aviation fuel similar to Kerosene may be available from the airport at Kulusuk although there are no obvious means of transferring it from the huge tankers that fill the planes, into the 5 litre plastic fuel cans that we had.

Metal thermos flasks were taken and considered invaluable, with one large one per climbing pair or one small one each, along with water bottles.

In reality, much water can be obtained without the need for snow melting. Black bin liners filled with snow and left out during the day can provide suprisingly large amounts, as can the 4 and 10 litre Ortlieb water carriers that were also taken. By building a South facing leaning wall on a clear day, the mid day sun could provide several hours of dripping melt water from it which can easily be collected by placing pans etc under the drips! There can occasionally also be found small melt water pools near to the edge of the glaciers.

In practice, we averaged a daily fuel consumption of just 0.33 litres of fuel per tent pair per day, but was obtained by being extremely careful. It is however best to plan on up to 0.5 litres.

NAVIGATION/SAFETY

Although we had 1:250,000 scale maps of the area, all peak and glacier identification and navigation work was based on aerial photographs obtained from the Danish Polar Centre in Copenhagen. These were on a scale of 1:150,000 but were excellent in their detail. Compasses were taken but rarely used as we were never forced to travel in bad weather.

One headtorch per pair was taken for possible use toward the end of the expedition and was required in the last week for map reading inside the tent after about 10pm.

Several Swiss army knives were taken, being very useful for all sorts of minor repairs. In addition a tool kit including adhesives, spanners and a file were extensively used.

Parachute Rocket Flares and Handsmokes were taken for fixing our position to a rescuing helicopter or ski plane. Two Personal Locator Beacons had to be carried for the requirements of the permit. In distress mode, these give out distress signals on the two main shipping and air emergency frequencies simultaneously and pin point your location. No radios with voice facilities were taken and it is doubtful if they would be of much use unless extremely powerful. The pilots reported that even they were completely out of any radio contact with Kulusuk or Iceland whilst setting the plane down on the glacier on a perfect day!

A fully comprehensive expedition first aid kit was taken to facilitate all major first aid incidents. Pethidine was taken as the strongest pain killer available on special prescription considering we had no one with professional medical training, (although several members were first aid and mountain first aid qualified). This was backed up with two light weight kits for use on the mountains whilst climbing. The main kit included airways and both inflatable arm and leg splints.

CLOTHING

Greenland weather is not as extreme as one might think during the Summer months of July and August. What would suffice for a Winter climbing trip in Scotland would be more than adequate. In practice, Goretex trousers/salopettes were hardly worn, along with Goretex overmitts which stayed in the sack the whole time. Wild Country or similar thermal light weight gloves did the trick nine times out of ten.

Gaiters were taken for both plastic and ski boots, with Yetis for those who felt the extra protection worthwhile.

A mixture of articulated and rigid, strapped and step in crampons were used depending on boot type. Spare nuts/screws etc should be considered essential.

The usual layering system of clothes was taken, with duvets being a pure luxury for sitting outside the tents on a cold evening rather than a necessity. At no time was it cold enough to warrant climbing in one. A good balaclava is obviously recommended along with Goretex jackets or similar.

Take your swimming gear and/or shorts! Both for sunbathing on the glacier and for the delights of Reykjavik's open air pools on your return to Iceland. Some of both factor 15-20 sun cream and total sun block should be considered essential.

Also a good wide white sun hat is desirable if you don't want the neck to burn up within the first day, along with an eye shield for those who may have problems sleeping in the 24 hour daylight. And ear plugs!

Technical climbing and crevasse rescue equipment is that which we would normally take on a Scottish Winter climb and/or trip to the Alps. Don't bother too much with large amounts of rock gear as the rock in the area we visited was not brilliant. Ice gear protection however, was excellent at all times. Plenty of spare prusiks were taken along with pulleys and jumars for crevasse incidents. Generally speaking single 11mm ropes were used for climbing.

Snow shovels were a tremendous advantage for clearing snow after bad weather and for digging toilets and crafting walls, wind breaks, sun loungers, tables, etc!

APPENDIX 4 - FOOD

The expedition menu overleaf worked on the repetition of a six day cycle and was compiled by the joint experience of several members of the expedition along with personal experience of many previous expeditions to Iceland, Greenland and Norway over the last seven years. This was in conjunction with research and reference to several menus from major Arctic and Antarctic expeditions, from which various items were incorporated. This worked well, with the expedition completing four full cycles of the menu in it's 24 day period.

Due to the wide temperature variations of between +15'c and -15'c only certain foods could be taken. This implied mainly dehydrated, although we did not use any of the commercially available camping meals. All the food was the sort of thing which can be found in most supermarkets. We did however, use various tinned fish and pate which keeps well, and some processed cheese, which both required eating sooner rather than later in the expedition.

The menu was worked out as below in order to get a balance. In reality the food was packed in double (two person) day packs and what you got on a particular day depended on which day pack you picked out! The main purchase was from Liverpool's Makro and McClure's of Windermere during the last weekend in May.

The expedition lasted 28 days in total, requiring dehydrated foodstuffs for 24 of these days for eight people; ie 192 man days. This was packed in the form of 96 double (2 man) day packs - 24 for each of 4 pairs.

In addition to the food listed overleaf, the following miscellaneous items were also taken.

Mixed Veg	Tom. Puree	Sweeteners	Refresh Orange
Mixed Herbs	Salt	Hot Chocolate	Lemon Tea
Garlic Puree	Sugar	Dried Milk	Tea/Coffee

One final point worth mentioning is the increased possibility of tooth ache whilst on an expedition of this sort. Invariably, teeth do not get cleaned as frequently as they might, and minor tooth problems can easily become irritated by the cold and large quantities of chocolate and other sweet stuff. A small dental cement kit was taken and although not used was felt to be a worthwhile safety precaution in case of fillings coming out.

DAY	BREAKFAST	LUNCH	EVENING MEAL	EXTRAS
1	Alpen + Milk Brews * 2	Cup-a-Soup Hob-Nobs + Butter + Jam Snicker Bar Penguin Fudge	Curry/American Beanfeast + Rice Hot Crunch Pud. (Chocolate). Brews *3	Fruitcake Tinned Mackeral or Sardines.
2	Harvest Crunch + Milk Brews * 2	Krackawheat + Block Cheese Lion Bar Club Biscuit Fruit n'Nut	Spag. Bolognaise /Beanfeast Bolognaise Apricots + Custard. Brews * 3	Soup Mixed Nuts or Peanuts
3	Porridge + Milk Brews * 2	Cup-a-Soup Digestives + Primula Twix Club Biscuit Galaxy	Chicken Supreme/ Beanfeast/Tinned Vegetarian + Mash Hot Chrunch Pud (Lemon) Brews * 3	Glucose Tablets
4	Alpen + Milk Brews * 2	Cornish Wafers+Pate Mars United Biscuit Fudge	Chilli + Rice/ Beanfeast Chilli /Spag. Bog. Bolognaise SK Jelly Brews * 3	Fruit Cake Tinned Tuna Soup
5	Various Oat Based Cereal + Milk Brews *2	Cup-a Soup Digestives + Butter + Jam Toffee Crisp Muesli Bar Bournville	Various Sauces Egg noodles/ Tinned Vege. Sultanas + Custard Brews * 3	Short Bread
6	Porridge + Milk Brews * 2	Ritz Crackers + Primula. Topic Yoyo Chocolate Crisp	Minced Beef + Mash/ Bean Feast/ Mince + Onion Hot Crunch Pud. (Banana) Brews * 3	Golden Syrup or Ginger or Sticky Toffee Cake

APPENDIX 5 - DETAILS OF MOUNTAINEERING AND EXPLORATION

SUMMARY OF ASCENTS MADE BY EXPEDITION MEMBERS

- | | | | | | |
|----|----------------|------|----|-----------------|------|
| 1. | James Gregson | - JG | 2. | Paul Walker | - PW |
| 3. | Sandra Gregson | - SG | 4. | Lucy Walker | - LW |
| 5. | Alan Jones | - AJ | 6. | Graham Harkness | - GH |
| 7. | Andrew Howick | - AH | 8. | John Starbuck | - JS |

- Peak No. 1 - pos. 66°37'N 35°43'W c. 1500m 1st ascent by E. Ridge.
25.07.94 climbed by all members.
- Peak No. 2 - pos. 66°42'30"N 35°50'W c. 2200m 1st ascent by N. W. Ridge.
28.07.94 climbed by JG, PW, SG, LW, AH, JS, and to forepeak by AJ, GH.
- Peak No. 3 - pos. 66°43'N 35°46'W c. 2100m 1st ascent by N. Ridge.
29.07.94 climbed by all members.
- Peak No. 4 - pos. 66°43'N 35°44'W c. 2180m 1st ascent by N. E. Ridge
30.07.94 climbed by all members.
- Peak No. 5 - pos. 66°43'N 35°47'W c. 2080m 1st ascent by E. Face
31.07.94 climbed by JG, SG, PW, LW, AH.
- Peak No. 6 - pos. 66°42'30"N 35°53'W c. 2000m 1st ascent by N. Flank
31.07.94 ski approach by AJ, GH, JS.
- Peak No. 7 - pos 66°42'30"N 35°53'W c. 2000m 1st ascent by N. Flank
31.07.94 ski approach by AJ, GH, JS.
- Peak No. 8 - pos 66°40'N 35°34'W c. 2090m 1st ascent by 2 Swiss on 09.08.66 (note in cairn) 05.08.94 climbed by JG, JS.
- Peak No. 9 - pos 66°41'N 35°32'W c. 1650 1st ascent by W. Ridge/S. Face
10.08.94 climbed by JG, SG, PW, LW, JS, AH.
- Peak No. 10 - pos 66°40'N 35°31'W c. 2400m (Cairn) Prob. 1st British ascent by W. Flank and N. E. Ridge. 11.08.94 climbed by JG, SG, AH, PW, LW, JS.
- Peak No. 11 - pos 66°39'N 35°34'30"W c. 2000m 1st ascent by N. E. Flank
11.08.94 climbed by GH, AJ.

- Peak No. 12 - pos 66°39'30"N 35°34'30"W c. 1900m 1st ascent by E. Flank 11.08.94 climbed by GH, AJ.
- Peak No. 13 - pos 66°40'N 35°28'W c. 2370 spot height on map (Cairn) Prob. 1st British ascent by N. Ridge. 12.08.94 climbed by JG, SG.
- Peak No. 14 - pos 66°38'N 35°42'W c. 1800m. (Cairn) Prob. 1st British ascent by N. Ridge. 14-8-94, climbed by JS, AH.
- Peak No. 15 - pos 66°39'N 35°36'W was also attempted by all members on 06.08.94. Abandoned in poor snow conditions at an impossible bergschrund.

NOTE All positions are approximated from maps at a scale of 1:250000. Heights are taken from readings by Thommen altimeter or are based on estimates.

Reference should be made to Map No. 66 Ø 1 Steenstrup Braeer and Map No. 66 Ø 2 Schweizerland in Grønland 1:250000 Series published by Geodaetisk Institut, Danmark

APPENDIX 6 - EXPEDITION DIARY

- May 30th Equipment and food despatched, bound by sea for Kulusuk, East Greenland.
- July 20th 1994 Advanced party Paul and Lucy Walker flew from Heathrow to Reykjavik, Iceland.
- July 21st 1994 Advanced party flew from Iceland to Kulusuk, East Greenland
- July 22nd 1994 Advanced party retrieved sea freight and purchased fuel for stoves. Repackaged ready for air lift to glacier.
Remainder of the expedition en route from London Heathrow to Reykjavik, Iceland.
- July 23rd 1994 Six members of the expedition flew from Reykjavik to Kulusuk in the Twin Otter. Expedition assembled and loaded into the Twin Otter. Expedition flown from Kulusuk to base camp on the Pourquoi-pas Gletscher.
- July 24th 1994 Sorting of equipment and food. Familiarisation with ski equipment.
- July 25th 1994 Ascent of Training peak by the whole team on the south side of the Pourquoi-pas Gletscher. (Peak 1)
- July 26/27th 1994 Ski journey to site of camp 1 near upper arm of Champs Elysees Gletscher.
- July 28th 1994 First ascent of peak No.2 c2200m by six members, and to forepeak by remaining two.
- July 29th 1994 First ascent of peak 3 c2100m by whole team.
- July 30th 1994 First ascent of peak 4 c2180m by whole team.
- July 31st 1994 First ascent of Peak Nos.5,6,7 by two separate groups.
- August 1st 1994 Return ski-journey to Pourquoi-pas Gletscher base.
- August 2-4th 1994 Storm bound.
- August 5th 1994 Ascent of Peak No.8 c2090m by two members.
- August 6th 1994 Failed attempt on a high snow peak to South of Camp 2.
- August 7th 1994 Stormbound till evening. Moved on to camp 3 in the evening.

August 8-9th 1994	Stormbound
August 10th 1994	First ascent of peak No.9 by six members
August 11th 1994	Ascent of Peak No.10 c.2400m by six members. First ascents of peak Nos.11 and 12 c.2000m an 1990m by two members.
August 12th 1994	Ascent of Peak No.13 by two members set off for return to Pourquoi-pas Gletscher base.
August 13th 1994	Arrived back at Pourquoi-pas Gletscher base.
August 14th 1994	Ascent of peak No.14 by two members. Packing of gear for return flight
August 15th 1994	Flight from glacier to Kulusuk. Six members returned with the Twin Otter to Reykjavik, Iceland. Two remained to finalise arrangements for return shipment of freight.
August 16th 1994	Remaining two arrived in Reykjavik.
August 17th 1994	Sight seeing and celebration dinner.
August 18th 1994	Expedition members returned by scheduled flight to London, Heathrow.

APPENDIX 7 - BIBLIOGRAPHY / REFERENCES

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8. M. Banks, "Greenland", David and Charles, 1975

APPENDIX 8 - ADDRESSES

Rather than try to list all the relevant bodies, organisations and companies individually, there exist four main sources of information for expeditions to East Greenland. It would be most beneficial to write to these organisations directly to request full and up to date information packs containing most relevant information.

Both the British Mountaineering Council and the Expedition Advisory Centre at the Royal Geographical Society, can supply general information packs for expeditions to Greenland. Their addresses are;

British Mountaineering Council,
Crawford House,
Precinct Centre,
Booth Street East
Manchester,
M13 9RZ.
Tel. 061 273 5835

Expedition Advisory Centre,
1, Kensington Gore,
London,
SW7 2AR.
Tel. 071 581 2057
Fax. 071 584 4447

Enquiries relating specifically to Radio, Mountaineering, Scientific, Research and Expedition Permits and regulations governing visits to National Parks and the special insurance requirements set out by the Danish authorities should be sent directly to;

Danish Polar Center,
Strangade 100H,
DK-1401, Copenhagen K,
Denmark.
Tel. 010 45 3288 0100
Fax. 010 45 3288 0101

The greatest accumulated source of information on expeditions specifically to the Schweizerland Alps region of East Greenland is currently held by a specialist logistics consultant, Paul Walker, of Tangent Expeditions. He can be contacted at the following address;

Tangent Expeditions,
10, Stockdale Farm,
Moor Lane,
Flookburgh,
Grange Over Sands,
Cumbria,
LA11 7LR.
Tel. 05395 59087
Fax. 05395 59088

ADDENDUM - ADDITIONAL DETAILS OF THE ASCENT OF PEAK 14

Andrew and John set out at midnight. A ski trek of approximately two hours ESE, up and across the Pourquoi-pas glacier led them into a magnificent cirque with impressive, towering, rock walls at the back.

With the summer season coming to an end the area now experienced a deep twilight. Initially it was difficult to make out sufficient detail of the crevasses on the slopes leading up to a low flat saddle which separated a thumb-like nunatak from the main objective.

The time taken to change into climbing gear proved useful to let the light improve and a route was soon identified. After negotiating two awkwardly aligned crevasses the climb was a simple zig-zag up 35° neve until the final rope length from the summit ridge crest, where ice necessitated the placing of an ice screw for security.

The ridge led in one rope length to the whale backed summit, with a cairn.

The view across the cirque to the SW revealed the true nature of another rock peak visible from base camp. From that angle it was a steep, symmetrical triangle of orange rock and the potential ascent, a knife edged ridge, would no doubt provide an exhilarating climb.

Descent was by the same route, and on the ski trek back to base camp the nesting site of the Ivory Gulls, seen earlier, was identified high up on a barren rock face, on the east side of the spur running N from the orange rock peak.