



# OF THE

# SCOTTISH STAUNING ALPS EXPEDITION 1992



Edited by J.S. Peden

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FIG.1

LOCATION MAP

therefore hoped that time and conditions would allow us to include some climbing en route and we had identified several objectives for possible attention.

In September 1991, we learned that by strange coincidence a party of five French people were planning to traverse the Staunings on skis by a similar route starting two or three weeks earlier than us. As winter progressed I brooded on the prospect of being pipped at the post after 17 years of dreaming (and not a little effort). I finally came round to the view that it was doing the traverse which was important to me, not whether it was a first or not.

Contact was made between the two parties in February 1992 with a view to mutual co-operation. Then in late March, by even stranger coincidence, both parties suffered the departure of two members. After much frantic international telecommunication and recalculating of payload logistics it was agreed, just one month before the off, that the two groups would combine as a team of seven people, five men and two women.

Thus it was that the truly international Stauning Alps Expedition 1992 was born! The final line-up comprising two Scots, one English, one Australian and three French, was as follows:

John Peden Mandy Wilson Bob Neish Paul Thompson Eric Flamand Florence Germain Jean-Francois Haas





Plate 1 The members of the expedition at Mestersvig: (standing left to right) Jean-Francois Haas, Eric Flamand, Florence Germain, Mandy Wilson, John Peden, Bob Neish; (sitting) Paul Thomson

2. PLANNING

John Peden

# 2.1 <u>Route</u>

As on the earlier attempt the route started up the Oxford Gletscher (Uranus Gletscher in Bennet's guide) at the western end of the through valley of Holger Danskes Briller. In 1988 we had crossed directly from the Oxford Gletscher to Canis Minor Gletscher, one of the upper limbs of the Jupiter Gletscher, by a high and difficult pass just east of Tent Peak. For this attempt we intended to take the short Mercurius Passet which leads easily from Oxford Gletscher to Mercurius Gletscher, and then the longer but fairly easy crossing into Canis Minor Gletscher which we had first used in 1975.

The route then descends Jupiter Gletscher to Concordia where Jupiter, Main and Mars Gletschers join to become the huge Bjørnbo Gletscher. This is the most southerly of the four great glacier systems which drain the central Staunings eastwards to Schuchert Dal.

Concordia at 1000m, is the lowest point on the route before the final descent to Kap Petersen and in summer meltstreams and moraine ridges make travel difficult here. For this reason the route in 1988 followed Orion Gletscher to its head, crossed into the upper Borgbjerg Gletscher and then over Gemini Col to the head of Spaerre Gletscher. From there we crossed Plinganser Col to the head of Roslin Gletscher, the mid-point of the route.

Whilst the 1988 route took us into interesting country and proved two new passes it was a long road for a short cut! This time we planned to ascend Main Gletscher to its head and cross directly to the upper Roslin Gletscher by a previously uncrossed col. If this should prove problematic we had the longer but established option of the Darien Gap leading into Spaerre Gletscher and then Donnau Passet into Roslin Gletscher.

The route north from the Roslin system then crosses to Cantabrae on the west side of the watershed via Newnham Col. The Cantabrae descends by a large icefall in its upper part then flows into Sefstroms Gletscher. After descending Sefstroms Gletscher a few kilometers the route then ascends Kirkbrae to cross the Col des Pulkas at its head into a small unnamed tributary of the Lang Gletscher. This glacier is called Stor Gletscher on the Danish maps, being perhaps a loose translation of the Scots form of 'Long'! We chose the Kirkbrae rather than the slightly more direct Grantabrae as the pass from the head of the latter into the Lang Gletscher is steep and rocky.

The route joins Lang Gletscher at the point where is opens out into the side snowfields of its upper reaches. From the eastern basin the easy divide of Crescent Col leads to Gully Gletscher. After a short descent the route then climbs through an icefall to Col Major, below the magnificent peaks of Dansketinde and Hjørnespids. Ever since its first crossing in 1958, Col Major has been the principal route through Staunings from east to west. Easy snow slopes lead up to it from the west once the sometimes problematic icefall has been negotiated, but the east side is a steep couloir 450m in height which descends the precipitous headwall of the Bersaerkerbrae between the peaks of Hjørnespids and Lambeth. The conditions in this gully can vary widely from deep soft snow to hard ice, although the latter is most likely to be encountered in late summer.

The final and highest obstacle on the route is the pass at 2360m which lies just to the north of Col Major, linking the heads of the Bersaerkerbrae and the Skjodungebrae. This pass, named Flase Col, was first reached during the second ascent of Hjørnespids in 1968, by a steep snow gully from the Berserkerbrae side, but we know of no previous crossing. The descent of the north side to the Skjoldungebrae was expected to be the crux of the traverse. From the vertical aerial photographs, and from the rather distant terrestrial photographs we were able to obtain, this appeared to be a steep hanging glacier with the direct route obstructed by crevasses and serac faces.

In the event of failure on False Col an alternative, though much longer, route to Skoldungebrae is via the relatively easy pass at the head of Dunottar Gletscher, one of the tributaries lower down the Bersaerkerbrae. This, however, would seriously detract from the 'direttissima' concept, and so the crossing of False Col was an important objective. The final gentle descent to Kap Petersen via Skjoldungebrae, some 40km in length, was not expected to present any difficulties.

# 2.2 <u>Travel and Logistics</u>

Aesthetic, practical and cost considerations indicated a lightweight approach. Our assessment of the route suggested that it would take about 13 days of actual travelling, including the final day from Kap Petersen back to Mestersvig. To this we added an allowance of 10 days for bad weather, climbing and rest days, making a total of 23 days' supplies of food and fuel to be carried. (In the event the traverse took a total of 19 days of which 15 were spent travelling).

The basic plan was as follows:

- 1. Fly from Akureyri in northern Iceland by ski-fitted Twin Otter to a suitable landing site near the start of the route. This was expected to be on the frozen lake at the west end of Holger Danskes Briller, or on the sea ice if clear.
- 2. Using the Twin Otter, lay a depot of food and fuel at the mid-point of the route to reduce the weight to be hauled or carried during the first half of the expedition. (Purists might question the ethics of this part of the plan but after the miseries of 1988 we wanted to be able to enjoy the trip)

- 3. On completion of the traverse, ski from Kap Petersen 30km along the still frozen Kong Oscars Fjord to the mothballed weather station at Mestersvig, where it was known that a sufficient length of runway would be kept clear to allow a Twin Otter to land without skis.
- 4. Combine with a Scottish Mountaineering Club Expedition, operating independently in the northern Staunings, to fill the Twin Otter for the return flight to Iceland.

The flights to and from Greenland represent by far the largest part of the cost of such expeditions and for us the availability of a ski-fitted Twin Otter was the key to the expedition being possible at all.

As on previous expeditions the charter flights were arranged with Flufelag Nordurlands in Akureyri, the acknowledged experts in off-runway landings in Greenland. Our considerable thanks go to Sigurdur Adalsteinsson for his limitless willingness to advise on all aspects of the flights, to discuss options and to accommodate our sometimes rapidly changing needs. We must also express our appreciation of his 'bush' pilots whose casual expertise left us full of admiration.

The payload of the Twin Otter was the controlling factor for the outward logistics. This 18-seat aircraft has many admirable qualities but fuel efficiency is not among them. When fitted with skis the fixed undercarriage acts as a very effective airbrake reducing the available payload dramatically. The matter is made more complex by the safety regulations requiring sufficient fuel to be carried to reach the nearest alternative airport. This meant in effect being able to return to Akureyri, if unable to land in Greenland.

With seven people (500kg approximately), plus 240kg of equipment and 260kg of food the expedition weighed in at around 1000kg. As the payload was limited to only 800kg, a single direct flight to Nordvest Fjord was not possible. However Sigurdur arranged to ferry approximately 200kg of our food and equipment in advance to Constable Pynt, an airfield on the shore of Hurry Fjord near the outer coast serving the small community of Scoresbysund. The facility to refuel at Constable Pynt meant that we could fly AEY-CNP with 800kg, refuel and pick up the additional 200kg and then fly to Nordvest Fjord with 1000kg.

Once we had unloaded at Nordvest Fjord, the midway depot of food and cooking fuel weighing 175kg would be flown to Newnham Gletscher at the head of Roslin Gletscher with one of us on board as navigator. Ideally the aircrcaft would land and the supplies would be properly cached. However, in the event of a landing not being possible, for example in flat light conditions, the boxes would be dropped at low altitude.

This is a technique used successfully on a previous expedition and with which Flugfelag Nordurlands are experienced. Our boxes were double packed with a 'crumple zone' of corrugated cardboard to absorb the rolling impact and were painted fluorescent orange to aid location.On the day weather conditions were good and there was no problem with landing. It should be noted that airdrops are restricted within the Greenland National Park because of the high pollution risk.

A further depot of food and fuel was required at Mestersvig. This comprised a 2 day safety margin at the end of the trip in case our outward flight was delayed by bad weather etc., plus a 3-day contingency reserve in case we were forced to abandon the traverse and return early to Mestersvig. This depot of supplies, weighing 50kg, was taken into Mestersvig by Flugfelag Nordurlands on another flight during the expedition.

For the return flight from Mestersvig the Twin Otter was capable of lifting 1700kg as far as Constable Pynt, just enough for our seven people and the 9-strong SMC party, plus equipment. The payload from CNP to AEY was restricted to 1350kg and the plan was to unload much of our equipment at Constable Pynt to be freighted back to UK/France. (Greenlandair operates scheduled flights between Constable Pynt and Keflavik in Iceland). In the event 16 pairs of skis were off-loaded at CNP and this was deemed by the aircrew to have reduced our total weight to an acceptable level for the flight to Akureyri.

The bulk of our food and equipment was sent by sea to Iceland in advance, carried by Eimskip from Immingham to Rekjavik. The cases were consigned at the container terminal at Coatbridge near Glasgow, and Flugfelag Nordurlands kindly acted as agents in Iceland, handling the customs clearance and transporting the consignment from Reykjavik to Akureyri.

The UK party's travel to and from Akureyri was arranged by Dick Phillips. The outward journey comprised a scheduled Icelandair flight from Glasgow to Keflavik, with overnight accommodation in Reykjavik before taking the bus to Akureyri. Return was by scheduled flights from Akureyri to Keflavik and then on to Glasgow. The French party made their own travel arrangements using scheduled flights to and from Paris.

For the traverse itself all travel would be on skis. Sledges were to be used for hauling loads and although commercially available pulks were considered, their cost and weight swung the decision in favour of small plastic sledges (as found in petrol stations everywhere in winter) with modified traces and lashings.

The maximum load per person, at the beginning of the second half of the traverse, would be about 40kg. It was expected that each person would divide his or her load so that the high density items such as tents, food boxes and climbing equipment would be carried on their sledge and the bulky items like sleeping bags and spare clothing in their rucsack.

Much thought was given to col crossing techniques because on anything steeper than a skiable gradient ferrying and/or hauling would be required. In 1988 we spent an inordinate amount of time on this activity owing to poorly thought out procedures and lack of suitable equipment.

# 2.3 Safety and Insurance

For reasons of safety and for the integrity of the selfsufficient ethos of the expedition we identified a succession of escape options at each stage of the route to cope with contingencies such as injury, dangerous snow conditions or prolonged bad weather. These escape routes to Mestersvig were provided by Mercurius, Bjørnbo, Roslin and Lang Gletschers leading to Schuchert Dal. From there the easy Skel Passet gives access to Skel Dal. An alternative route to Skel Passet from Lang Gletscher was over Trumpington Col to upper Schuchert Gletscher. The final escape route to Skel Dal was via Bersaerkerbrae.

The section of the route on the Sefstrøms Gletscher system, being on the west side of the watershed, was quite exposed though much less so than later in the season. In May an escape could be made relatively easily via Sefstrøms Gletscher to Alpefjord and from there by skiing round the coast to Mestersvig. The most exposed section was probably the first stage on the Oxford Gletscher as it was the furthest from Mestersvig.

Because of the possibility of encountering polar bears, particularly near the coast at either end of the traverse, we were required (and were happy) to carry a rifle and other deterrents. We also carried a fairly comprehensive medical kit and intended to be self-rescuing in all but the direst of circumstances. Against that eventuality and to satisfy the conditions of our permission we carried a lightweight handheld VHF airband transceiver and a radio beacon (EPIRB). Additionally each person carried an avalanche transceiver.

A further condition of our permission was that insurance cover be taken out against the cost of search and rescue. The amount of cover required was 900,000 Danish Kroner for the expedition as a whole for search and rescue plus DKr 250,000 per member for evacuation. This may seem a very high level of cover, but it reflects the considerable cost of mounting rescue operations in such remote areas, particularly as these require the diversion of resources from other essential activities, and all expeditions to Greenland are required to have insurance cover of this order.

The cheapest quotation we obtained was £110 per person through the BMC scheme, but the insurers were not prepared to sign the Insurance Statement form issued by the Danish Polar Center which includes the words 'irrespective of any limitation in policy clauses'. When we pointed out the apparent unreasonableness of this wording to the Danish Polar Center they commented that there were several Danish companies willing to sign the document; their premiums however were in the order of £500 per person. The French party had similar difficulties which were finally overcome when Jean-Francois persuaded his large public sector employer's sports club to support the expedition and put pressure on their insurance company, MAIF, to sign the document.

This is a subject which we believe the Danish Polar Center must address, in order to make it possible for expeditions to obtain search and rescue insurance at reasonable cost, such as is readily available for other remote mountainous regions.



FIG. 2

ROUTE MAP

3. EXPEDITION DIARY

John Peden

- 3 April Food and equipment consigned for shipment from Immingham to Reykjavik.
- 28 April Permission for expedition arrives from Danish Polar Center, two days before departure!
- 30 April French party flies Paris-Iceland
- Sat 2 May UK party flies Glasgow-Keflavik
- Sun 3 May Parties meet in Akureyri. Base camp set up at Youth Hostel.
- Mon 4 May Departure for Greenland delayed by bad weather. Various tourist activities.
- Tues 5 May Ditto.
- Wed 6 May Leisurely breakfast interrupted by news of improved weather Greenland. Flight in Akureyri/Constable Pynt/Nordvest Fjord. Exciting landing on sea-ice at Storm Pynt. John and Eric fly on to Roslin Gl. to lay depot of food and to Storm Pynt. Target fuel before returning practice but no bears sighted. Camp 1 at sea level.
- Thurs 7 May Traverse begins via Oxford Gl. Slow progress in deep snow. Camp 2 at 700m. Days distance: 9km.
- Fri 8 May Better progress to head of Oxford Gl. Camp 3 at rognon known as 'The Boulder' 1550m. Day's distance 13km.
- Sat 9 May Cross Mercurius Passet, 1800m (Oxford Gl.-Mercurius Gl.) and unnamed col, 1900m (Mercurius Gl.-Canis Minor Gl.) Camp 4 on Canis Minor Gl. at 1600m. Distance 4km. Overnight temperature lowest for expedition at -24°C
- Sun 10 May Rest day. Some people climb ridge of Dinosaur near camp for downhill skiing.
- Mon 11 May Glorious ski down Jupiter Gl. through snow covered moraines and melt-streams at Concordia (1000m) and good progress up Main Gl. (Upper Bjørnbo Gl.). Camp 5 at 1400m. Distance 20km.
- Tues 12 May Reach head of Main Gl. and Camp 6 at 2050m Distance 7km. Ferry supplies to crest of virgin col, (2250m) between Main Gl. and unnamed tributary of Roslin Gl. named by the expedition as Alliance Col for the 'Auld Alliance' between Scotland and France. Various parties also ascend peak to east of col. Cairn found (2420m)

- Wed 13 May Cross Alliance Col (with some discord!) and descend to Camp 7 on Roslin Gl. at 1550m near northern tributary containing depot. Distance 7km.
- Thurs 14 May Nominal rest day. Some members go on sight-seeing tour up to Roslin-Duart divide. Decision made later to move up to collect depot at 1800m on Newnham Col and then on to the sunny side of the glacier to Camp 8 at 1950m below Newnham Col. Team spirits raised by concentrated whisky and other goodies from luxury food boxes.
- Fri 15 May Easy crossing of Newnham Gl. (2220m) leads to hilarious descent of Cantabrae icefall. (Mixing alpine and nordic skiers, all pulling pulks, on one rope of seven is a recipe for chaos!) well bridged Crevasses all and fairly Lower straightforward route found. glacier reached with many incidents but no casualties. Camp 9 made in late evening at junction with Sefstrøms Gl. (1350m.) Distance 7km.
- Sat 16 May Rest day. Spectacular serac avalanche from peak opposite Camp (Sidney Fjeld). Domestic activities.
- Sun 17 May Descend Sefstrøms Gl. to junction with Kirkbrae (1200m). Then ascend Kirkbrae to Camp 10 at its head (1950m). Distance 10km.
- Mon 18 May Very easy crossing of Col des Pulkas (2150m) and wonderful descent to Lang Gl. (Stor Gl. on Danish maps) at 1550m. Gentle plod up Lang Gl. to Camp 11 below Crescent Col at 1800m. Distance 11km.
- Tues 19 May Ski crossing of Crescent Col (2000m) more a divide than a col then a whooping 2 mile schuss to junction with Gully Gl. at 1850m.

UK party ascends Gully Gl. icefall easily on skis (notoriously problematic in summer) to Camp 12 on crest of Col Major (2100m) and reconnoitres descent of Col Major. Good conditions found.

Meanwhile French party skis from Gully Gl. into upper snow basin south of Lambeth and makes first(?) ascent of snow peak on Gully Gl./Schuchert Gl. watershed before following on to Camp 12.

Wed 20 May Rest day. Plan by Paul and Bob to attempt Dansketinde by east ridge thwarted by cloud and snowfall early in day. Later improvement stimulates mass assault on Lambeth (2450m) via snowy northwestern corrie. Ski ascent as far as saddle between main peak and western outlier. Paul continues solo to summit by SW ridge but main party repelled by unstable snow on hard ice. John, Bob and Jean-Francois reach summit by alternative route via north ridge. Distant tracks seen on Bersaerkerbrae - evidence of SMC party's activities in Northern Staunings.

- Thurs 21 May Descend Col Major in soft snow, 450m to Bersaerkebrae and continue down a further 130m to 1520m before turning sharp left in mist up to Camp 13 at 1750m below False Col. Distance 5km.
- Fri 22 May Ascend to crest of False Col (2360m). 4 x 100m pitches of sledge-hauling from bergshrund to cornice (9 hours). Snow good for climbing unroped. Camp 14 on crest of col. Jean-Francois photographs camp from too near cornice edge and has lucky escape when cornice collapses behind him. John and Paul recce descent route - crux of traverse.
- Sat 23 May Descend False Col to Skjoldungebrae at 1800m. Route follows fall-line to begin with and then traverses left to avoid big serac face which threatens lower part of route. Difficulties experienced traversing with pulks and because of small crevasses and poor communications on convex upper slope. Euphoria on safe completion of difficulties. Descend upper half of Skjoldungebrae to Camp 15 at 800m. Distance 15km.
- Sun 24 May Descend Skjoldungebrae to Kong Oscars Fjord and Camp 16 at Kap Petersen hut. Distance 23km. Traverse completed in 18 days including 3.5 'rest' days. First signs of spring: patches of snowfree tundra and geese starting to arrive.
- Mon 25 May French party sets off for Mestersvig at noon. UK party decides to wait for firmer snow conditions in evening and spends pleasant day pottering. John and Mandy visit Kap Petersen and decide to get married. Paul sets off alone ahead of other three. All following skidoo tracks and wrongly decide Skel River 'aufeis' is safe to cross. Paul, and later John, break through ice crust. Not recommended.
- Tues 26 May Party regroups at Mestersvig on schedule with margin in hand to await Twin Otter flight on Thursday. Contact made with SMC party as agreed.
- Wed 27 May Various leisure activities. John, Mandy and Bob move to Hamna hut and ski out to Archers Oer find purple saxifrage in flower. Eric, Jean-Francois and Paul ski up and down Hesteskoen.
- Thurs 28 May Twin Otter arrives in patchy fog after much uncertainty. Departure delayed owing to indisposition of co-pilot.

- Fri 29 May Flight Mestersvig/Constable Pynt/Akureyri. Skis off-loaded at CNP to reduce payload. On arrival at Akureyri, UK party rapidly transfer to connecting flight for Reykjavik which is being held on runway awaiting arrival of Twin Otter! Bathing in hot spring at Blue Lagoon precedes celebratory dinner.
- Sat 30 May UK parties fly Keflavik-Glasgow. French party flies Akureyri-Reykjavik.
- Sun 31 May French party flies Keflavik-Paris after sorting out skis freighted from Constable Pynt.



#### 4. IMPRESSIONS

John Peden

Perhaps it is not possible to go to Greenland without first waiting for bad weather to clear. It is Sunday evening and we have arrived in Akureyri after our all-day bus journey from Reykjavik. We have just met our French companions for the first time and during our excited discussions Siggi phones the Youth Hostel where we are staying. He confirms what we already suspect; tomorrow morning's flight is in doubt because of the occluded front which is curled round the northern edge of a large slowmoving depression in the Denmark Strait.

Monday morning 8.20. We are all sitting having breakfast, sweltering in our polar gear, when the phone rings. No go! CNP and MRG both report overcast and snowing, visibility 150m. An easy decision then - all dressed up and nowhere to go. I can't believe this is happening to me again. Surely I paid my dues and more last time. Ah, but its a hard country, as Smart would say. Aye, and we're not even there yet.

Two days of being tourists in Iceland follow with no sign of improvement in the weather. Greyness and gloom pervade our basecamp, and Siggi's call on Tuesday evening gives no cause for excitement. Hardly surprising then that we're not even packed or breakfasted when his Wednesday morning call sets the place on fire. Conditions have improved so much that we must fly at once before it closes in again. He will come to collect us in 15 minutes!

Panic and chaos ensue as we fall over ourselves getting ready to go. The Warden shoos us out the door, kindly undertaking to do our cleaning up. Before we know it we're climbing aboard the familiar Twin Otter. Its sound and smell, the cramped seats and intimate flight deck are now for me indelibly associated with Greenland. A quick word with Jonas, our pilot, a big bearded man with a cheerful grin whom I trust instantly, then we're away. Take-off seems lethargic with the wide aluminium skis fitted not the usual short lumbering run then near-vertical climb.

Out over the sea our twin turboprops claw at the northerly gale and the breakers below us creep southwards. Jonas comes aft to chat. It seems he has only a general idea of our plans but is quite happy for me to keep him right as we go along - how wonderfully laid back.

The sea grows flat as the first ice appears - always an exciting moment - streamers of brash and small floes breaking away from the main icefront and driving southward in the gale. Cloud soon envelopes us and we grow nervous; what if....? Later it clears magically to give us magnificent views of the Blosseville Coast and up into Scoresby Sund as we cross Kap Brewster. The great basalt escarpment of Volquart Boons Kyst is unfamiliar in its white mantle and the ice stretches unbroken across Scoresby Sund to Jameson Land, studded with bergs locked in its grip.

As we head up Hurry Inlet and descend towards Constable Pynt everyone is wondering what the air temperature is outside. The runway is the only strip of snow-free ground to be seen and we taxi into the fuel point through a deep slot in the snowdrifts.

Constable Pynt is much improved by snowcover, compared with the dreich place it is in summer. Jonas explains that now ARCO have pulled out everything is back to normal. Everyone is friendly and things go smoothly on the basis of mutual cooperation. This is more like the Arctic! Our three big crates appear and are loaded on board. The Otter is refuelled and the last seven gallons of Jet A1 go into our fuel bottles - much cleaner than Icelandic paraffin.

Away we go again, up through the pass just north of the airfield at the usual ground-skimming height, then we're cruising out westward over Jameson Land. Little huddles of muskoxen here and there provide the only relief from the rolling whiteness. Away to the south bergs glint in the sun, their pattern unchanged now for 6 months or more. Ahead, the trough of Holger Danskes Briller is intermittently visible to our pilot through the bobbing heads and waving cameras. Excitement mounts as we cross Schuchert Dal, the two-mile width of its vast braided river shockingly still.

We roar on through the beautiful U-shaped valley containing the twin lakes of Holger Danskes Briller (Holger the Dane's Spectacles), the scene of protracted load-ferrying at the start of our ill-fated attempt in 1988. As we drop down over the second lake towards our intended landing at its western end, Nordvest Fjord opens magnificently to view. Its frozen surface looks very smooth. The thought occurs to me that the true right bank of Oxford Dal would offer easier going than the moraines which dam the lake. Siggi had been equivocal when earlier I had discussed landing on sea ice with him, but Jonas is unperturbed by the idea. "Its fine - where would you like to land?".

My instant and instinctive decision to land on the fjord beside our 1975 basecamp is, I suspect, based more on sentiment and the aesthetic purity of starting the traverse from sea level than on any rational thought about moraines. We swoop low over the *aufeis* at the mouth of the Oxford river then Jonas banks steeply round. Before we know it we have landed in a great flurry of snow and we taxi up to the shore. Elated, we jump out and start piling our stuff in the snow. It is a beautiful afternoon with not a breath of wind.

As soon as the unloading is complete Eric and I climb back aboard the Twin Otter and we line up for take-off again. At first it seems hardly able to move in the soft snow. Then as lift increases we suddenly accelerate and float into the blue sky. We bank steeply round over the rest of the party, incongruous dots of colour setting up camp as we head north to lay the halfway depot on Roslin. This flight is also a good opportunity to recce the first half of the route and Eric and I crane our necks to see out of every window at once. Almost immediately the snout of the Oxford Gletscher is sliding past beneath us, not a rock to be seen under a heavy snow cover. Before we get a chance to spot the best route we are already heading up the glacier. How familiar it looks even in winter garb and from this strange perspective. The peaks clustered round the upper corrie seem to welcome us as we drone effortlessly over the ridge dividing the Oxford Gletscher from the Bjørnbo system. The first two cols to be negotiated on our route look straightforward, and the crevasses on the Jupiter Gletscher look well filled.

Flying across this spectacular mountain range is a truly breathtaking experience and my pulse races with excitement as peak after peak unfolds. We check out the col leading from Main Gletscher to the Roslin and note that our proposed route is complicated in descent by large bergschrunds; an easier route lies a little way to the east.

Now as we cross Roslin Borg our intended landing site on the northernmost tributary of Roslin Gletscher comes into view. Jonas asks where we want to be put down and I point out the general area. The starboard wing dips sharply as we plunge into the narrow valley and follow it down to the wide open spaces of the Roslin to turn before landing uphill. We want to stash our foodboxes and fuel bottles below a prominent rock buttress on the true left flank, where they will be easy to find again in poor visibility but be safe from avalanches. Jonas taxis nonchalently up the last half mile of glacier and parks on a level area below the chosen buttress, then he and his co-pilot help us drag the stuff onto the crest of the windscoop at its base.

There is a feeling of unreality about suddenly walking around in the very heart of this great mountain range. The strangeness is perhaps heightened by the noise and exhaust fumes from the Otter's starboard engine, left burbling away on tick-over. This is no place to get a flat battery! With such an expensive meter running we are disinclined to hang around admiring the view, spectacular though it is, and after a downhill take-off we are on our way back to Storm Pynt, where Camp 1 has appeared in our absence.

Back on the sea ice there is a final session of photograph-taking with the aircrew looking justifiably pleased with themselves. We could not have been better served and bottles of Scotland's Finest change hands in appreciation. Then after a final low-level flypast we are on our own. As the echos of the engines fade away through Holger Danskes Briller we feel the immense stillness take over. This vast frozen landscape is our environment now and the nearest other people are at least a week away.

There is no time for meditation. Survival demands that we all become expert markspersons at once. We could be attacked by bears at any moment! The silence is shattered again by our erratic target practice until the weight of ammunition to be carried north has been reduced to a sensible minimum. Then emboldened by our new-found expertise we venture out on the sea-ice for an evening ski-stroll. Despite the disappointment of discovering that there aren't polar bears lurking behind every iceberg it is a delight to glide effortlessly across the firm surface in the clear soft arctic light. As Mandy and I pause to take in the space and tranquillity I feel a deep surge of joy. It's good to be back.

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Plate 2 Camp 1 beside Nordvest Fjord

A week into the traverse and we're at the Roslin food dump, only one day behind schedule. Time to pause over a welcome dram of Glenmorangie and reflect on the ups and downs thus far topographical and social.

In view of the delay in Iceland we abandoned the idea of an initial warm-up excursion round the coast to Syd Kap. Variations in fitness quickly became evident and we took turns to break trail through the deep fresh snow in Oxford Dal. Seemingly Eric trains by running huge rucksacks full of supplies up to Alpine huts. When it was his turn in front the only way we could keep up was to call a lunch stop, near the snout of the glacier. The terminal moraine, a wasteland of rotting ice and unstable rocks in summer, was benign in its snow cover. Spring is definitely the right time of year to be doing this - why didn't I think of it sooner?

After two days haul up the Oxford we started to loosen up. Mandy and I reached The Boulder first and took up residence on its 200m high crest. My spiritual home was strangely unfamiliar in its snow cover but the tent platforms from three previous visits were still visible. The 5m rocky scramble to the top from the glacier bow-wave upstream was enough to deter the others who camped on the snowy saddle beyond, leaving us to enjoy the vista in splendid isolation from our eyrie, (or love-nest according to Jean-Francois!)

The first col was easy-peasy as expected. Not even a bergschrund, or rimaye as Eric insisted. Why do you British always use German alpine terminology, not French? Good question. How many of us would know what to do with a mousqueton after all?

The second col from Mercurius Gletscher over to Canis Minor Gletscher was a larger affair, though straightforward enough, and saw the first divergence of tactics. The French, with better traction from their wider skins were able to zigzag up the lower part of the gully steeply enough that their sledges didn't constantly tumble over and they resorted to ferrying on foot only for the top 150m or so. We nordic skiers opted for sledge-hauling from the start using our 'carousel'. This was effective enough but slow, and we reached the top in the gloaming to see the French party already pitching their camp on the corrie floor far below.

I had neglected to change from my single leather ski boots into double plastic climbing boots and by the time I had belayed the other three, plus four sledges, down the first 100m my feet were frozen. My attempt to ski the descent failed at the first turn and I stumped down in a rage of frustration at the time it was all taking. My mood was not improved by having to collect two pairs of Alpine skis kindly left by the French party as abseil belays and carry them in addition to my own.

Morning came late for some and a rest day was declared. It had been the coldest 'night' so far and every slight movement of the tent caused a gentle blizzard of hoar frost. After the trials of last night there was now a feeling of being in tune with our environment, of having finally shaken down into expedition mode. The next two days saw rapid progress; schussing through the crevass-field at the corner of Jupiter Gletscher, a chill breeze urging us on out of that wonderful amphitheatre; gliding effortlessly through the maze of melt water channels and medial moraine ridges at Concordia, the stuff of nightmares in summer; floating in a trance with the rhythm of skinning up the gentle gradient of Main Gletscher; a feeling of great space as we snuggled down against the evening chill in this vast landscape, with our next objective visible 10 km away.

Before we knew it we had bumped into the headwall below the col which would take us into the Roslin Gletscher. Cue for a fresh bout of individualism. The argument for camping here, early in the day was won by Florence, whose blistered feet were giving her a lot of trouble. This incidentally strengthened the nordic skiers' belief that theirs was the superior technology for this terrain. There was a growing undercurrent of competition within the party and the focus of this tended to be the nordic versus alpine debate. The principal players in this competition were Eric and Paul, and to some extent myself. It was never openly stated but there was a great deal of 'lifemanship' being practised, to use the term coined by Tom Patey.

The slopes leading to the col looked fairly straightforward, steepening to a small rocky buttress just below the crest. Over lunch I proposed the name 'Alliance Col' for this as yet virgin pass. It seemed an appropriate name in view of the genesis of our party; a word common to both languages and having a strong historical resonance. Everyone agreed.

With half a day left Mandy suggested a ferry up to the col. Eric immediately announced that he was going to climb the peak to the right of the col, doubtless encouraged by my comment that I knew of no previous ascent. Instantly the camp divided along party lines and while we prepared loads Florence and then Jean-Francois headed off in Eric's wake. By the time we dribbled out of camp Eric was halfway up the south face moving without a pause.

We dumped our loads at the col then Paul and I carried on up the ridge, meeting the French on their way back down. Their long faces were explained by their having found a cairn on top. C'est la vie! The view from the top was stunning. The southern peaks and glaciers glowed in the soft pastel hues of twilight while northwards the innumerable jagged spires of the central Staunings lay in shadow against the bright sky. Paul, who is an accomplished free-heel skier, chose to descend directly to camp down the south face. It was a fine piece of skiing on quite a hard surface, undeterred by dropping a pole not far from the top.

The following morning when we were all assembled at the col in a welter of fine spindrift there was an astonishing absence of cooperative effort. At one point three completely separate plans for the descent were being vigorously implemented by their proponents on a 'deil tak the hindmaist' basis. Alliance Col? What a laugh. The discord continued when we reached the broad sweep of Roslin Gletscher. It had been agreed that the next day would be a rest day but even though we were now less than 4 km from our food dump full of goodies, the cross-party 'stop early' faction prevailed.

This was a constant source of frustration to me and some others. True, it was always late before we set off. We never got up until the sun hit the tent in the morning and then, no matter how much practice we got it always took us four hours from waking to being ready to go, what with melting snow, cooking breakfast, thawing boots, packing, repacking and so on. Then at the other end of the day a similar time was spent pitching camp, cooking meals, discussing tactics etc.

With such an investment of time I felt we should be trying to make a greater distance between each camp. Often Mandy and I felt we were just getting into our stride when the call came for a halt. To be fair the French contingent had a reasonable point about camping before it got too cold in the evening because with three of them in the tent they preferred to cook outside. However they were seldom ready to leave in the morning much before the rest of us.

Today some of us had a delightful excursion to the Roslin/Duart divide for the views down to Alpefjord and west towards the *Inlandis*. The slabby snow was ideal for waxing and we made good speed, carrying little but windproofs and a camera. On the flanks of Roslin Borg and other hills there had been huge slab avalanches presumably generated by the storm which had delayed our arrival.

Then it was time to pack up yet again and trudge up to the food dump.



After burning all the surplus packaging we have moved a short distance up the glacier to camp on the sunny side, with Newnham Col in view. The atmosphere has improved dramatically, thank goodness, helped in part by having talked out some of the differences which have been bugging people, and in large measure by the satisfaction of having reached halfway in good order despite everything. Perhaps the Glenmorangie has had something to do with it too.

This is a magnificent place below some very impressive unclimbed rock spires, well beyond our equipment and appetite on this trip. But a summer expedition to this area could be very productive as there are still many big unclimbed hills among the complex system of tributary glaciers radiating from Cantabridgia, on the Roslin/Dalmore/Cantabrae watersheds, with limitless scope for hard new routes.

Behind our camp Newnham Col is overlooked by Snetoppen, the third highest mountain in the Staunings. We had intended a ski ascent of its huge south face in passing but the ample evidence of unstable windslab has put such thoughts firmly out of mind. As I sit here sipping the amber nectar I feel a flush of excitement. Tomorrow we will move into what is for me new country.

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Plate 3

Oxford/Mercurius/Jupiter Gletschers (Vertical aerial)



Alliance Col (Vertical aerial)

Plate 4



Plate 5 South side of Alliance Col from Camp 6 at head of Main Gletscher

An ascent of this steep but straightforward glacier took us to a very high camp near its head. From here we looked across to some impressive peaks in the Korsspids group, many of which are unclimbed. Here too lay the so-called Churchill Col, which the Edinburgh University expedition in 1976 had sought in vain and ended up traversing several minor peaks looking for a descent to the Lang Gletscher.

We intended to use the Col des Pulkas, used by Marc Breuil's party on their west-east traverse in May 1985. Its precise location was not immediately clear from his description, but our aerial photos showed a couple of likely lines and in the event this easy pass was fairly obvious; the leftmost dip on the snowy ridge between Bavaria Spids and Dreikant.

This brought us to the best ski run of the trip where the gradient and snow conditions were just right for a high speed schuss descending 600m to the Lang Gletscher. After a protracted lunch stop while poor Florence, accompanied by Jean Francois, had to skin back up to the foot of the col to retrieve her camera, we all wended our separate ways across the upper Lang basin to camp just below Crescent Col.

In the late evening Mandy and I waxed up the gentle slopes to the crest of the col, more a glacial divide really, and were rewarded by the sight of Dansketinde and Norsetinde, the two highest peaks in the Staunings, silhouetted against a fiery midnight sky. On our return our graphic description persuaded the French trio to follow suit there and then.

The following day a glorious two mile run from Crescent Col below the impressive fang of Bolvaerket, took us to the head of Gully Gletscher where the team divided. The British contingent opted to push on, keen to establish a route through the icefall which guards the access to Col Major. This icefall has a formidable reputation for difficulty in summer. Keith Miller had spoken of crevasses bigger than anything he had seen in the Karakoram. To our relief these were well filled with snow and we were able to skin up pulling sledges without difficulty although we did rope up, just in case. At the top where the young Gully Gletscher plunges over the edge of the upper corrie, the way was barred by two monster crevasses which stretched almost the whole width of the glacier. A long detour to the right let us through and up the final gentle slopes to Col Major.

The suddenness of the view over Bersaerkerbrae, 1500m below, to Knoxtinde and its satellites, was breathtaking. A keen wind was blowing over the col from the west where an ominous bank of cloud was building, and we pitched camp as quickly as we could on the very crest of the col.

The French meanwhile, had dropped their loads on the Gully Gletscher and skinned up into the big snow basin south of Knoxtinde to bag a minor snow summit before following on to the Col Major camp.

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Plate 6

Upper Sefstrøms Gletscher area showing Col des Pulkas (Vertical aerial)









Plate 8 Descending east side of Col des Pulkas



Plate 9

Upper Bersaerkerbrae and Knoxtinde from crest of Col Major



Plate 10 Camp 12 on crest of Col Major

This is our second night here. This morning we woke to our first real snowfall, with low cloud obscuring Dansketinde on the far side of the corrie. Paul and Bob abandoned their plan to climb Dansketinde and we settled in for a good fester. We were soon deprived of this luxury however, as the snow stopped and sunshine began to filter through the rapidly thinning mist. No longer able to justify inactivity the entire party promenaded across the snowy basin southward to the saw-tooth peak of Lambeth.

An assortment of people reached its summit by different routes and were impressed to say the least by the sheer drop of 2500m down its east face to the upper sanctuary of Bersaerkebrae. Beyond the foothills around Skeldal the distant Traill Island was gentle the Arctic light: southward lay the bathed in constellation of peaks through which we have travelled. Alpefjord was hidden deep in the lengthening shadows to the west. The jagged outline of Proctor's Pinnacle stood in sharp relief on the right bank of Gully Gletscher and nearer still the bulk of Dansketinde dominated the skyline. But best of all we had a wonderful view of tomorrow's route.

The descent gully from Col Major lay open in the foreground, and beyond its encircling ridge, flanked by the elegant spire of Hjørnespids, we saw for the first time our final obstacle, False Col. This potential route from Bersaerkebrae into the head of the Skjoldungebrae is the key to our traverse, and an aerial photograph of it has for many years been for me an icon for the whole project.

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The 1500m descent from Col Major goes without difficulty and from the foot of the gully we have a slightly hair-raising ski from bank Sanctuary down fog which has into a the Upper inconsiderately crept up Bersaerkebrae. However the details of the aerial photographs are so indelibly etched in my mind that I have no uncertainty about where to turn sharp left, back up towards False Col. We soon climb out of the cloud again and now operating as two ropes there is no disguising the race. Eric leads his team by the most direct route possible, battling up steep slopes at the limit of traction to save a few metres distance. Meanwhile our rope, with Paul at the front, takes a steadily rising line, weaving this way and that among the occasional crevasses. We get a cracking rythym going and forge inexorably ahead. Jean-Francois, ever the diplomat, brings the race to an end by demanding a 'comfort stop', and we leave Eric behind fizzing with rage.

After dinner, as the temperature drops, we sit and study the couloir leading to the col. Above the lower slopes it narrows to a snowy gully flanked by rocky buttresses and ribs for 200m or so, then opens out to a wide snow bowl below an elegant parabolic crest. A substantial scalloped cornice guards most of this, but high up to the left where the crest meets the rock wall above, there is a way through. A large avalanche cone at the foot of the twisting gully further right casts doubt on the stability of the cornice and we decide to seek maximum protection from the buttresses on the left flank of our gully.



Plate 11 Lambeth Peak from North



Plate 12

Col Major and Hjørnespids from Lambeth Peak. False Col in background (right)



Plate 13 On upper Bersaerkebrae approaching False Col. Kensington Peak right of centre



Plate 14

Camp 13 at head of upper Bersaerkebrae below False Col

Next day snow conditions turn out to be good and, as always, the angle is less than it seemed from a distance. The main difficulty is avoiding strangulation in the tangle of ropes, sledges, rucksacks and skis which engulf each belay stance. It's a slow procession, more a complex dance of the two steps forward, one step back variety, and the day is far gone by the time we're all assembled on the crest of the col.

The decision is made to camp and we hack out three level platforms in the narrow space available on the north side of the crest between the potential fracture line of the cornice (which is much bigger than it looked from below) and the icy slope which steepens away towards the Skjoldungebrae.

I am deep in the folds of our half-pitched tent when suddenly the begins to shudder, accompanied by a muffled roar. ground Adrenalin flushes through me as I instantly imagine I am plunging down the gully atop the disintegrating cornice. But no, I am not moving. I struggle out of the tent, pulse racing, and find everyone looking in shocked silence at Jean-Francois who is standing with a sheepish grin on his face. Just beyond him, not 3m from our tent, is a large space where the cornice used to be. A detached block of snow, carrying Jean-Francois' footprint, hangs over the gully in mute testament to how lucky he is. In trying to get a dramatic photograph of our campsite he has committed the cardinal sin of stepping too close to the edge, triggering the avalanche. Not being tied on, his body should now by rights be lying on the Bersaerkerbrae.

When I first reached the col I had spent some time investigating the descent while the others came up. I knew from photographs that the direct line would follow a hanging glacier which terminated in a sheer ice wall. Avoiding this to the left would involve much problematic traversing. Lower down we would also be exposed to serac avalanche both from the face we were skirting round and from another hanging glacier to the left. A more direct route could be made between the hanging glacier and the rocky ridge bounding it to the right, much less exposed to objective dangers. It was however much steeper and would probably involve a couple of abseils and complicated lowering of sledges.

Not liking the sound of the righthand route Paul sets off after dinner to have a look at the leftward traverse and comes back extolling its virtues. A heated debate ensues and to bring this to a close I eventually agree with Paul, rationalising that at least it is a technically easier route.

Later a feeling of great tranquility envelops us as we sit in the doorway of our tent, gazing out across the frozen landscape towards the midnight sun. Below the sun a curious tunnel of light shimmers and glows. Its cause must be the gentle dusting of tiny perfect snow crystals which is falling on us from a clear windless sky. At last we can see our objective, Kap Petersen. Beyond it the snowy lands on either side of the unbroken expanse of King Oscars Fjord seem to go on for ever. At our feet lies the deep trough of Skjoldungebrae; the convex slopes hide the final obstacles between us and this glacier which will lead us on a gentle winding descent to the sea, still over 30km away. In the morning a cold wind scours the col as we decamp and set off down. Above the first of the crevasses where the slope steepens a pair of skis make a good belay and one by one people disappear over the edge on a 100m toprope.

The theory is simple but the terrain ensures that the practice is fraught. Three main crevasses have to be negotiated whilst manoeuvring a sledge, one by jumping, the others by snow bridges off the fall-line.. In addition there are several narrow crevasses concealed by a fragile crust of snow to trap the unwary. The lack of any effective communication between climber and belayer owing to the convex slope and the wind, results inevitably in one unfortunate being lowered carefully into a crevasse, sledge and all, until messages are relayed from the front.

The third pitch involves a long traverse to the left in fairly intimidating surroundings including more hidden mini-crevasses. Tempers become frayed when the first couple of people down are more concerned with setting up a belay and sorting out the second rope which has somehow got fankled up among the seracs below us, than with helping others whose sledges are getting stuck in the perforations.

As people continue to sprachle across the traverse to the dubious sanctuary of an ice cliff others set off down the next straightforward pitch. At the end of 100m the angle eases and we unrope to walk down the final slopes to the fan of ice boulders underneath the translucent aquamarine ice face which has barred a direct descent.

Running through this last obstacle to minimise the exposure to further avalanche has a slightly nightmarish quality, as the snow becomes deeper and our sledges continually snag on blocks of ice. I am mighty relieved to reach clear open glacier on the other side, but I cannot relax until the last person, Eric, is safely down. Too many mountain tragedies have happened at the final hurdle.

We stop at this point for lunch and to sort ourselves out for skiing. As the tension eases and we realise that the traverse is now in the bag, excitement bubbles up and the 'crack' fairly flies.

Reverting to ski boots is not a simple matter for me as they are frozen solid and need yet more brutal treatment over the primus stove. Then we are away; a fast run down the undulating upper Skjoldungebrae, dodging the occasional minor crevasse until we reach the first corner of the glacier where it swings to the east.

At this point the gradient becomes much flatter and there is a sudden transition to a softer more open landscape. The party quickly spreads out. The tiny specks in the distance hardly seem to be moving at all, emphasising the huge scale of this glacier. The methodical rhythm of poling induces a trance-like state and we drift imperceptibly down between the shattered peaks on either side, lost in reverie. All the while the glacier bends gradually northwards again.

Many hours later we call it a day halfway down the glacier and pitch our tents in a little hollow at about 800m above sea level, our lowest elevation since the first haul up the Oxford Gletscher. The Skjoldungebrae is remarkably crevass-free and the surface has been pretty good. Now it is starting to become more rutted where the strengthening sun has been at work.

Mandy and I are away first next day, the eighteenth since leaving Nordvest Fjord. The going is still pretty good and we chase each other over the gentle humps and hollows in high spirits. We indulge in frivolous games like skiing backwards and putting big loops in our tracks to throw pursuers off the scent. Before we know it we are at the bifurcation, where one lobe of the Skjoldungebrae continues northwest towards Segelsållskapets Fjord while the main flow turns sharp right and heads for Kong Oscars Fjord. We stop for lunch beside an enormous perched block of rock 4km or so from the snout. Here the glacier steepens for one last fling and we have a fine view of the coast, now only 8km away, and over the still pristine surface of Kong Oscars Fjord to Traill Island. We are in no hurry and sit for ages while the others move on down by disparate routes.

For me the descent to the snout is anything but elegant as I whee-crash on the increasingly variable surface. As ever, Mandy fares much better with her economical, controlled style.

Its hard to tell when we're off the glacier but the terminal moraine is surprisingly painless. We follow what in summer is clearly a lateral melt-water channel on the lefthand margin with exciting bob-sleigh runs interspersed with little frozen lakes. Suddenly we're on the *aufeis* and then the sea. Our traverse is complete!

Tired now, we ski slowly round the coast for the last couple of kilometres to the hut near Kap Petersen and join the others who are already ensconced. As we wait for our evening meal to cook I am moved to pass round the sigg bottle with my jealously guarded drops of whisky for a celebratory dram!

The hut is nowhere big enough for seven people. We and several others pitch our tents for the last time on a snow patch nearby, and, for the first time since the Twin Otter left us on the shore of Nordvest Fjord, I hear a sound made by something other than ourselves: the unmistakeable honking of barnacle geese arriving from their wintering grounds, in Scotland as likely as not.

After overcoming a strong disinclination to rise, we spend the following morning pottering around the hut. Spring is in the air. On the crests of hummocks where the wind has kept the cover thin the snow is already gone, and on sheltered south-facing slopes the first traces of green are appearing. We wander out over the shattered ice around the tide-line to a small islet. Its rocky crests are liberally covered with bright orange *Xanthoria* lichen, glowing in the soft sunlight. The intensity of the colour seems almost unnatural after three weeks in a white landscape. To the south beyond the dark dolorite cliffs of the Menanders Islands we can see the Nyhavn Hills and the radio masts at Mestersvig 30km away.

After inspecting some remnants of wooden fox traps we return to the hut for lunch and Eric, Florence and Jean-Francois set off for Mestersvig. The snow is very soft and wet now, and the rest of us decide to wait until evening for the temperature to drop below freezing again. Anyway I want to go to Kap Petersen itself, another 2km up the coast, to satisfy my purist streak. Mandy agrees and we put on our skis again. We make our way across the bay to the headland, revelling in being unencumbered by sledges or rucksacks.

We sit together on the rocks gazing across at the vividly coloured sedimentary formations of Lyells Land, and northwards over the perfect whiteness of Kong Oscars Fjord to the outer islands: Traill, Geographical Society and in the distance Ymers Island. As we sit there I am overwhelmed by a feeling of great contentment. No extravagant jubilation or puffed up pride, just a wonderful completeness. Without conscious effort I find myself suggesting to Mandy that we get married. She, evidently deciding that three weeks of uninterrupted proximity to each other in Greenland is a sufficiently severe test of a relationship, mutters something to the effect that she can't think of any good reason why not! The deal is settled with a kiss. Kap Petersen is forever a special place!



#### 5. PASSES AND PEAKS

#### 5.1 Passes

Following some unpleasant experiences in 1988 we gave careful consideration in our planning to the matter of getting our caravan efficiently over the eight passes on the route. Clearly a range of different techniques might be required for both ascending and descending, depending on the steepness of the ground and on the snow or ice conditions. We expected that these could vary from deep snow at a moderate angle to  $50^{\circ}$  ice slopes. Three important considerations were common to all situations.

Firstly, ascent and descent routes should both follow the fallline as much as possible because traversing with the sledges is difficult and frustrating even on easy ground. Secondly, pitches should be as long as possible to reduce the number of time consuming belay set-ups required, Thirdly, as many people as possible should be either moving or sledge hauling at any one time, to avoid excessive waste of time and the problem of people getting cold whilst hanging around.

Our planned technique for ascent in the worst case of steep ice was as follows:

1. First person (A) belayed by (B) leads pitch on double 8.5mm rope and fixes both ropes to belays.

2. (C) and (D) jumar up fixed ropes (removing runners), each trailing a continuous loop of 5mm cord.

3. (A), (C) and (D) set up two sledge-hauling carousels with continuous loops of 5mm cord, using a pulley and two jumars at the belays for each. Meanwhile (E) and (F) jumar up the fixed ropes.

4. (C) + (D) and (E) + (F) haul sledges tied on to the carousels by (G). Meanwhile (B) jumars up the fixed ropes and then belays (A) leading the next pitch.

5. (G) follows the last sledge by jumaring or being belayed on the other carousel.

We decided to go for 100m pitches and so we had  $2 \times 100m \times 8.5mm$  climbing ropes and  $2 \times 200m \times 5mm$  carousel loops. Thin cord such as 5mm is notorious for becoming tangled which can only be prevented by keeping it taut. This was to be done by suspending one of the sledges from a pulley at the bottom of the loop.

In fact we did not encounter any steep ice ascents and althought we did deploy the 'master plan' on the second col crossing using one carousel (the French party having opted for ferrying) it was not ideal for the soft snow and the cord tended to cut into the nylon pulley sheaves. We also discovered that such a system requires considerable discipline and full understanding by all participants for maximum effectiveness! Most of the cols had fairly short ascents and as belaying was unnecessary each person simply ferried his/her load in two carries.

False Col was the only other long ascent requiring sledge-hauling and for it a simpler technique was adopted. While each pitch was being led on a single 8.5mm rope all the sledges were hauled up the previous pitch one at a time using the other rope round a pully fixed to a belay. As each sledge was tied on at the lower end, one or more people, having climbed the pitch (unroped), dumped their rucsack, clipped their jumars on to the top end of the rope and ran back downhill. This proved highly effective and although it still meant having to climb each pitch twice it was much easier than static hauling or ferrying.

For the descents we found that the most effective method was to lower each person (using a figure-8 at the belay) with their sledge separately attached to the rope above them. This gave two hands free to control the sledge. Uncontrolled lowering did not work as the sledge always tried to veer off to the side. One person took two sledges allowing the belayer to downclimb, which was always practical in the conditions encountered. Most of the cols required only one or two pitches of roped descent before easier angles were reached.

Col Major and False Col both needed 4 x 100m pitches, the latter being made much more difficult by having to traverse to avoid a large ice cliff in the middle section. The convex upper slope coupled with a fresh wind made communication between belayer and climber impossible, resulting in more than one person nearly being lowered (very carefully) into one of the several small crevasses encountered.

The French party skied the top pitch of Col des Pulkas but as this meant their sledges had to be taken down for them it was not a popular procedure with the rest of the party. In general everyone walked down the lower slopes with their sledge in front until the angle became skiable towing the sledge.

Details of the eight passes we crossed are as follows:

- 1. <u>Mercurius Passet</u> 1800m (Oxford Gl.- Mercurius Gl.) Ascent: 100m 25° Descent: 200m 30°
- 2. <u>Unnamed col</u> 1900m (Mercurius Gl.- Canis Minor Gl.) Ascent: 350m 30° Descent: 300m 35°
- 3. <u>Alliance Col</u> 2350m (Main Gl.-Roslin Gl.) Ascent: 100m 30° plus 40m 45° Descent: 100m 45°
- 4. <u>Newnham Col</u> 2300m (Newnham Gl.-Cantabrae) Ascent: 100m 25° Descent: 100m 40°

- 5. <u>Col des Pulkas</u> 2000m (Kirkbrae -Lang Gl.) Ascent: 100m 35° Descent: 250m 30°
- 6. <u>Crescent Col</u> 2000m (Lang Gl.-Gully Gl.) Gentle slopes both sides, skiable pulling sledges.
- 7. <u>Col Major</u> 2100m (Gully Gl.-Bersaerkerbrae) Ascent: gentle slopes above Gully Gl. icefall Descent: 50m 45° then 400m 40°
- <u>False Col</u> 2350m (Bersaerkerbrae-Skjoldungebrae) Ascent: 400m 40° Snow gully. Large cornice avoided on left. Descent: 350m 40° Numerous crevasses. Large ice cliff avoided on left.

# 5.2 Peaks

We had hoped to have time to attempt a number of peaks along the route and several specific objectives had been identified. These included various unclimbed peaks around the heads of Main, Roslin and Sefstrøms Gletschers, plus Snetoppen, the third highest summit in the Staunings which lies northwest of Newnham Col.

In the event a general desire to press on and the presence of fairly widespread windslab with some recent avalanche activity cooled ambitions in this direction. There are some very fine unclimbed peaks between Newnham Col and Cantabrigia, but they would clearly involve high standard rock-climbing for which we were not equipped.

From Col Major Paul and Bob were ready to attempt Dansketinde via the saddle between it and Hjørnespids, but as the day dawned overcast and snowing they abandoned the plan. An improvement in the weather later in the day resulted in a massed assault on Lambeth.

In total three peaks were climbed.

1. The unnamed peak (2420m) to the east of Alliance Col was climbed by five members without difficulty, all solo. A cairn was found on the summit. Eric and Florence ascended the south face on alpine skis, while Jean-Francois, Paul and John climbed the west ridge from Alliance Col. All descended the west ridge except Paul who skied down the south face on his nordic skis.

2. Eric, Florence and Jean Francois made a ski ascent of a snow peak east of Crescent Col. It is the highest point on the ridge running south from Knoxtinde forming the Glully Gletscher/Schuchert Gletscher watershed. From the head of the main Gully Gletscher they gained the high snow basin south of Lambeth by a steep slope to the right of the spectacular icefall which drains the basin, then ascended the peak directly. This was its first ascent as far as we are aware. They called it, somewhat tongue in cheek, "Froggies' Beaut"! 3. Lambeth (2450) was climbed by four members of the expedition. The whole party first reached the saddle between the main peak and its western outlier on ski from Col Major. The upper part of the corrie headwall was at the limit of traction for some people whose skinny skins were wearing a bit thin.

Paul and Eric set off solo and gained the southwest ridge, only to discover it was hard green ice under a thin crust of snow. Eric turned back, as did the rest of the party which had been following roped up. Paul continued to the summit with some difficulty owing to the front points of his crampons not protruding much beyond the welts of his nordic ski boots, and returned by the same route.

Meanwhile John, Bob and Jean-Francois climbed a  $50^{\circ}$  snow face to gain a rock spur leading to the north ridge which gave about 200m of pleasant unroped mixed rock and ice climbing to the summit at Scottish Grade II. The descent, also unroped, was by the same route.



John Peden

6. MAPS

The 1:250 000 scale maps published by the Danish Geodetic Institute are the largest scale maps of the Staunings commercially available. Sheets 7102, 7202 cover the southern and northern halves respectively.

Sheet 7102 has simple cartography and depicts the landforms in sufficient detail to identify individual glaciers, mountains and ridges (accurately in our experience) down to quite small features. It should be noted however that these maps were produced photogrammetrically from vertical aerial photographs without any ground control. This means that absolute heights, and to a lesser extent distances should not be relied upon. The 100m interval contours do give a good indication of relative heights locally but at this scale important vertical features are often missing.

Sheet 7202 is a much older mapping and its cartography is more stylised. Features shown by the 50m 'contours' are at best indicative and at worst grossly misleading. This is particularly noticeable along the common  $72^{\circ}N$  latitude in the Sefstrøms Gletscher area where distortions produce a marked lack of correspondence between the two sheets.

The outline maps accompanying Bennet's guide at a scale of 1:100 000, were based on the Danish maps but also drawn directly from the aerial photographs. They iron out quite a number of the anomalies, particularly in the northern sheet, but our studies of the photographs together with experience on the ground suggest some further improvements. These are most significant in the areas around the heads of the Spaerre/Borgbjerg/Main Gletschers and around the Kirkbrae/Lang/Gully Gletschers. Revised excerpts from Bennet's maps are included in this report at a reduced scale of 1:200 000. These incorporate some additional information on peaks and passes but are by no means intended as a comprehensive update.

The aerial photographs are available for purchase from the Danish Geodetic Institute who will provide a key map showing the flight lines and photograph centre points. Each photograph in a flight line overlaps the preceding and following ones by about 60%.

The photographs are about 9" square and are at an approximate scale of 1:50 000. They show great detail and are invaluable both for planning and in the field to supplement the maps. It is worth noting that the photographs are truly vertical only at the centre and become increasingly oblique as the radius from the centre increases. This can make reading them tricky to begin with.

High angle oblique aerial photographs taken on the same flights are also available and these, too, can be very useful.





#### 7. WEATHER AND SNOW CONDITIONS

Northeast Greenland is often referred to as the Arctic Riviera; apart from the rather low temperatures the sunshine hours and calm conditions throughout May rivalled the best of the Riviera.

We were delayed for two days in Iceland because of bad weather in NE Greenland. By the time we arrived on 6 May the weather was calm with the sun shining from a cloudless sky. It remained settled for almost the entire trip. On occasions high cirrus gathered and on a couple of days very light snow fell. This cleared to blue sky within a few hours.

Winds were generally calm or light. Only while crossing Alliance Col and while camped at the top of Col Major did the wind pick up to a strong breeze. The Sirius Patrol had warned us of sudden storms with wind speeds up to 75 knots but these did not materialise.

By the beginning of May the Stauning Alps are experiencing 24 hours of daylight. At 72°N the sun stays above the horizon from around 7 May until about 5 August.

However, air temperature remained below freezing until mid-May when daytime maxima began to edge above freezing. The lowest temperature of  $-24^{\circ}$ C was recorded during the 'night' of 10 May. The following table gives minima for the period 9 May until 21 May (after which the temperature seems not to have been recorded).

10 Mav 9 11 12 13 14 15 16 18 19 20 21 17 Minimum (<sup>0</sup>C) -23 -24 -23 -22 -17 -19 -15 -15 -22 -16 -16 -14 -15 Altitude (m) 1550 1600 1600 1400 2050 1550 1950 1350 1350 1950 1800 2100 2100

Minimum temperatures continued to rise throughout the trip. Maximum daytime air temperatures increased from typically  $-7^{\circ}C$  at the beginning to  $+5^{\circ}C$  or so by the end.

It was clear that fresh snow had fallen during the storm prior to our arrival. In the sheltered valley of the Oxford Gletscher the fresh snow was unconsolidated which made skiing and pulling sledges hard work. However as we gained altitude the snow became more wind packed and the need for trail breaking dimished.

There was much evidence of recent slab avalanches on the mountain slopes adjacent to the glaciers. 'Funny snow'!!!!! was experienced on a number of the steeper col crossings. Even on relatively level glaciers we quite often experienced the surface suddenly sinking by a centimeter or two under our skis. This was more likely due to a layer of depth hoar collapsing than to snow bridges over crevasses settling, but it fairly made us jump! Breaking crust occurred here and there but it was not a big problem. Towards the end of May, as we descended the lower part of Skoldungebrae and on the fjord ice, the snow surface became wet during the day. This froze to a hard surface at 'night', making waxing difficult.

# 8. FAUNA AND FLORA

#### Mandy Wilson

May is not the best time of year to experience the fauna and flora of the arctic. Only fox tracks were in evidence around the Nordvest Fjord camp. Snow bunting, an all year resident, were seen from time to time throughout the journey even in the most desolate ice clad mountains of the Central Staunings. A wheatear sat on the avalanche debris at the base of False Col and chirped at us in obvious amazement.

Occasional tracks of arctic hare were seen emerging from beneath the boulders of medial moraines. A hare track ran over Col des Pulkas at 2000m.

A possible gyr falcon sighting was made during the ascent of Gully Gletscher.

On arrival at Kap Petersen on 24 May the first small groups of Barnacle Geese were recorded. Four geese circled our camp before heading off towards Alpefjord. One or two unidentified waders flitted over the Kong Oscars Fjord ice. A number of ravens were seen in the vicinity of the Kap Petersen hut.

On scanning the sea ice with binoculars numerous seals were seen sitting out on the ice. Our route across the sea ice to Mestersvig passed several seal breathing holes. The ripped up carcass of a very small pup formed the centre of attention of a loud group of glaucous gulls.

On 27 May we found purple saxifrage (*Saxifragia oppositifolia*) and Arctic Willow (*Salix arctica*) flowering on the Archer Islands.

9. <u>FOOD</u>

Mandy Wilson

The day we packed the food the party was composed of six people, three vegetarians and three omnivores. The party that flew from Iceland to Greenland on 6 May was composed of seven people; one vegetarian and six omnivores. This resulted in 28 six-person-day boxes and 28 one-person-day boxes, with a mixture of two-person packs and three-person packs within each box and an underabundance of dried mince. As I could not manage to explain the intricacies of the system to anyone else it fell to me to distribute the daily rations.

The daily ration was designed to provide 4500 kcals per person per day. Of the 28 days of food packed 2 day worth constituted luxury rations; the remainder were basic boxes. Since we had to carry 8-10 days food at the beginning of each food stage of the journey the weight of the daily ration had to be kept to a minimum. To do this we attempted to keep the average calorific value of the rations above 100 kcal/oz. Quick and easy-cook food was important; fuel also had to be carried.

On my previous trips to Greenland the choice of rations had been quite limited. By the end of the trips everyone was craving more interesting food. This time we went for variety and as Eric commented we craved for very little (although the help-yourself salad at the Blue Lagoon Restaurant in Iceland was demolished quite happily).

There was too much food. 4000 kcals would have been adequate.

The contents of our basic rations boxes are given in detail below:

BREAKFAST

Four breakfast menus were available and designed to provide around 500 kcal/person/day.

Me	nu No.	Portion size (oz)	kcal/ oz	kcal/ serving	kcal/ menu
1.	Porridge Dried milk Brown sugar	3.0 1.0 1.0	$104\\134\\110$	$311 \\ 134 \\ 110$	555
2.	Crunchy muesli Dried milk	3.0 1.0	110 134	330 134	464
3.	Muesli Dried milk	$\begin{array}{c} 3.0\\ 1.0 \end{array}$	110 134	330 134	464
4.	Dried egg Oatcakes Crunchy muesli Dried milk	1.5 2.0 1.0 0.5	$150 \\ 90 \\ 110 \\ 134$	$225 \\ 180 \\ 110 \\ 67$	582

#### Notes:

The expedition could not have had 'Scottish' in its title without taking porridge for breakfast. None of the expedition members commented on their dislike of porridge prior to leaving Scotland (Florence, Eric and Jean-Francois didn't have a chance). Cleaning the porridge pot when water had to be melted and fingers were cold also discouraged its preparation. The surplus of other more interesting foods resulted in a reduction in the consumption of all the breakfast cereals; ground rice, oatcakes and cheese, semolina and smash were all eaten in preference.

Florence had brought her own supply of 'Almandine'. This was a sweetened almond based powder which was mixed with hot water. This, along with oatcakes and cheese would have been my preferred breakfast.

The dried egg powder was very good, but most appropriate when there was plenty of time to enjoy it.

LUNCH

A one person lunch ration was made up of one item selected from each of the following categories. This provided a daily lunch ration of between 2400 - 2600kcal/person/day.

1-0-1/

Dantian

	size	portion	
Nuts	2oz	280-320	Cashew nuts Salted peanuts Nuts and Raisins Tropical trail mix Bombay mix
Dried fruit	20z	140-200	Banana chips Figs Apple rings Sun dried bananas Apricots
Cheese/other protein	20z	180-230	Variety of hard cheeses Primula spread (plain, chives, ham) Salami
Other spreads	20z	160-350	Peanut butter Tartex
Savoury biscuits	2oz	250	Oatcakes Wholewheat Bran Hovis crackers
Sweet Biscuits	2oz or 1 bar	220-280	Shortbread Digestives Classic bars Gold bars

Sweets	2oz or 1 bar	230-340	assorted chocolate bars Bounty bars Halva Marzipan
Muesli bar	1 bar	180	Assorted
Jam	20z	160	Raspberry Apricot
Margarine	2oz	450	Flora

Notes:

The low temperature at the beginning of the journey resulted in the following items freezing and being difficult to eat: hard cheese, primula cheese spread, tartex, peanut butter, salami. The frozen cheese became a popular addition to the evening soup. Tubes of primula cheese and tartex were taken to bed or the tubes split open and eaten as savoury lollies. Chunks of peanut butter and prised off lumps of salami were eaten with savoury biscuits. The Hovis Crackers became very brittle in the cold and difficult to spread. The higher temperatures for the second half of the journey made the food easier to consume.

As with every meal there was a general surplus of lunch food. Some of this was used to replace breakfast food as mentioned above but quantities of margarine and jam were burnt. Based on our experience 1.5oz and loz respectively would have been enough. Most of the lunch items were popular except for the leathery apple rings, the rather dry banana chips and the muesli bar; some of this food was also burnt.

#### DINNER

There were six dinner menus each providing between 1000 and 1300 kcal per person per day.

Me	nu no. P	ortion size	kcal/	kcal/	kcal/
		(oz)	OZ	serving	menu
1.	soup	0.5pt	112	140	
	chinese rice	3.6	104	370	
	flaked almonds	1.0	170	170	
	vegetable strogano	ff 1.8	108	192	
dried leeks		1.0	30	30	
	ground rice	1.0	101	101	
	jam	1.0	80	80	
	dried milk	1.0	134	134	1217
2.	soup	0.5pt	112	146	
	couscous	4.0	100	400	
	parmesan	0.3	120	30	
	herbs	1.0tsp	20	2	
	cashews	1.0	160	160	

vegetable casserole dried mushrooms dried onions semolina jam dried milk	$ \begin{array}{c} 1.8\\ 0.5\\ 0.5\\ 1.0\\ 1.0\\ 1.0\\ 1.0\end{array} $		$156 \\ 15 \\ 15 \\ 101 \\ 80 \\ 134$	1239
<pre>3. soup    pasta choice - veg    or</pre>	0.5pt 3.6	112 98	146 353	
<pre>*pasta choice-meat sunflower seeds vegeburger dried egg dried mushrooms apple flakes</pre>	3.61.02.20.51.01.0	98 160 125 200 30 80	$353 \\ 160 \\ 275 \\ 100 \\ 30 \\ 80$	1143
4. soup pasta choice pumpkin seeds vegetable bolognese or	0.5pt 3.6 1.0 1.8	112 98 160 98	$146 \\ 353 \\ 160 \\ 176$	
<pre>*bolognese mince   dried onions   dried peppers   apricot rolls</pre>	3.0 0.5 0.5 2.0	91 30 30 100	$273 \\ 15 \\ 15 \\ 200$	1065
5. soup smash vegetable stroganoff or	0.5pt 3.6 1.8	112 95 108	146 342 194	
*savoury mince cashews sunflower seeds mushrooms apple flakes	3.0 1.0 1.0 1.0 2.0	91 170 170 30 80	$273 \\ 170 \\ 170 \\ 30 \\ 160$	1211
<pre>6. soup     instant noodles     vegetable casserole     dried leeks     mushrooms     semolina     jam     dried mille</pre>	0.5pt 3.0 1.8 0.5 0.5 1.0 1.0	112 124 87 30 30 101 80	$     146 \\     371 \\     156 \\     15 \\     15 \\     101 \\     80 \\     124 $	1100
urieu miik	T.U	134	134	1192

\* non vegetarian alternative

Notes:

Soup: a wide variety of soups were taken. These were very popular

Carbohydrate: Three types of Crosse and Blackwell Pasta Choice were taken; four cheese, alfredo and the non-vegetarian tomato and bacon. They only take 5 mins to cook

Batchelors special fried rice was very good and contains a range of tasty dried vegetables etc. It cooks in 10 mins. Four ounces of couscous is too much (3oz would have been enough). Parmesan cheese, herbs and cashew nuts were taken to enhance flavour of the couscous.

Smash was delicious (personal comment) 3.6oz was far too much for an evening meal but provided much needed relief from porridge the following morning (another personal comment) 2.5oz would probably have been enough.

Sharwoods noodles (with margarine) were good and quick to hydrate but quite bulky to carry.

Sunflower seeds, pumpkin seeds, cashews etc were taken to add to the carbohydrate dishes. For the most part they were not necessary.

Protein: Hera make a range of soya based dried meals; vegetable stroganoff, casserole etc. These are quite good although MacDougall's savoury mince and bolognese mince were quite delicious in comparison (non-vegetarian comment) 20z of dried meat would probably have been enough.

Realeats Vegeburger and vegebanger mixes are very tasty. They need to be fried which was a hassle when we were tired. However vegeburger fry-ups on rest days were popular even with carnivores.

Vegetables: we kept away from dried carrots and mixed vegetables since previous experience had deemed them painful to excrete (especially if they have not been fully rehydrated) Dried onions are excellent, the mushrooms and peas were very good and the leeks were good except for the tough woody pieces.

Dessert: We were usually too full or had enough dirty pots already to partake of dessert. The dried apple flakes seemed to be popular as they only require a few seconds in boiling water to rehydrate and did not increase the washing up load. Ground rice and semolina provided a porridge substitute for the following morning.

#### DRINKS

Tea1 bagHerb tea2 bagsBournvita/horlicks1tspHot chocolate1 sachetCoffee1tspOrange crystals (Apeel)1pt

Each expedition member preferred a different range of drinks so some attempt was made to provide for the original expedition members. In the event we had an inexhaustible supply of herb tea, a premium on coffee and ordinary tea, too much Apeel and not quite enough hot chocolate. Horlicks was not especially popular. MISCELLANEOUS

Sugar: Extra sugar was taken for use with desserts and in drinks. A ration of loz/person/day was taken. This was hardly used at all. Enough sugar was available in the breakfast and evening meal ration.

Dried milk: Approximately 2oz/person/day was available as indicated in the tables above. We always had a surplus; 1.5oz/day would have been adequate.

Salt: A small bag of salt was added to each days rations. Most food was already salted and we had more than enough.

Herbs: Some extra herbs and spices were taken. The food was in general tasty enough and the packs were unnecessary.

Toilet paper: Each 6-person box had 1 roll. 1 roll extra was added for the extra person for 5 days.

Matches: A small box of matches per day was adequate. The freezing conditions meant that damp matches were not a problem.

Detergent: We took a small amount of detergent. It was spilt shortly into the journey and we managed without it for the rest of the trip.

Dish cloths and panscrubs: 2 J Cloths and 2 pan scrubs lasted the inhabitants of each tent for the entire journey.

## LUXURY RATIONS

Two days of luxury rations were packed for the planned rest days at the Roslin food dump and likewise for the days in hand at Mestersvig at the end of the trip. Breakfast and lunch rations were the same as the basic rations. The following delicacies were included in the dinner rations:

Tinned hamTinned sweet cornTortelliniTinned tunaCakeTinned anchoviesAngel delightTinned cream chickenTinned chineseTinned tunaCakeTinned anchoviesAngel delightTinned cream chickenTinned chineseTinned tunaCakeTinned chineseTinned tunaTinned cream chickenTinned chineseTinned tunaTinned chineseTinned chineseTinned tuna

Tinned red kidney beans The crushed empty tins were quite heavy to carry out!

PACKING

As previously noted the food was originally packed in 6 person/day units in purpose-made cardboard boxes, size 24 x 30 x 17cm. These were kindly supplied free of charge by Bowater Containers Ltd. in Edinburgh and were made from 2mm solid board with separate full height lids.

The boxes were lined with heavy duty polythene bags and packed tightly to prevent damage due to movement of the contents. During a marathon weekend session all dry goods were weighed into 2 or 3 person portions for ease of use by each tent, and packed in polythene bags which were de-aired (by mouth!) to reduce both volume and problems with bags bursting. A few items such as margarine were packed separately in bulk 'supplementary' boxes. Then once the number in the party changed from six to seven 'extra' boxes were packed with 1/person/day units of food (as far as possible) to add to the basic and luxury boxes.

Additionally the boxes destined for the Roslin depot were double boxed, two to an outer, with 4-5cm of corrugated cardboard packing all round to help absorb impact if they had to be airdropped. Finally the outers were taped up and then bound with nylon banding to help prevent bursting. The outer boxes were of the same construction as the inner and were 38x44x32cm in size.

Each basic and extra box weighed 6.5-7.0kg, while the supplementary and luxury boxes were 10-12kg each The total weight of food boxes was about 310kg including 50kg sent separately to Mestersvig.



Mandy Wilson

The following communal equipment was taken:

Camp	ing	and	General

# weight(kg)

2	lpt Optimus stoves and spares	2.0
2	MSR multifuel stoves and spares	1.0
3	Fuel funnels	0.3
6	5L heavy duty polythene bottles	3.0
3	1.5L Sigg aluminium fuel bottles	0.4
6	0.75L Sigg aluminium fuel bottles	0.6
3	Nesting sets of cooking pots	2.5
3	Aluminium kettles	0.9
3	Tents and underlays	8.7
1	Rifle and ammunition	5.5
1	VHF radio	0.7
1	EPIRB	0.5
3	Sets miniflares and thunderflashes	0.9
1	Medical kit	0.8
1	General repair kit	0.5
2	Ski repair kits/spares	1.0
1	Max/min thermometer	0.2
3	Snow shovels	1.5
		<u>31.0</u>

# Climbing

2	100m x 8.5mm climbing ropes	9.2
4	100m x 5.5mm carousel cord	8.4
1	50m x 5.5mm general purpose cord	1.1
3	Ice hammers	2.1
1	Deadman	0.3
10	Ice screws (titanium)	0.6
6	Rock Pitons	0.6
3	Friends	0.3
19	Chocks	0.8
10	Extenders	0.2
4	Tape slings	0.6
18	Karabiners (not including personal)	1.4
4	Belay plates	0.3
4	Figure 8 descenders	0.5
2	Petzl ascenders (with handle)	0.5
4	Pulleys	0.1
	·	<u>27.0kg</u>

Each person also took the following personal equipment:

Rucksack	2.5
Sledge	2.3
Skis/poles/skins (average nordic/alpine)	5.5
Sit harness	0.4
Chest harness/sling	0.2
Petzl ascender	0.2
2 x 5mm prusik loops	0.1
5 Karabiners	0.3
Avalanche transceiver	0.3

Ice axe Crampons Helmet Boots Clothing Sleeping bag Sleeping mat Camera and film Mug/bowl/kfs Miscellaneous

			0.7
			0.9
			0.6
			2.5
			3.3
			2.0
			0.7
			1.5
			0.5
			1.5
			<u>26.0</u>
х	7	=	<u>1821.0kg</u>

Total weight of equipment = 240kg

10.1 <u>Tents</u>

We used the Northface Westwind tents having found then generally satisfactory during the 1988 attempt. The UK distributors, First Ascent, very kindly lent us the tents. We operated as two pairs and a threesome with John and Mandy and Paul and Bob each sharing a tent and the French party squeezing into the third.

The tent is tunnel-shaped with three hooped poles of different lengths. It pitches inner first and is self-supporting once the corners are pegged out using ski poles, ice axes etc. It is by far the lightest 2/3 person mountain tent on the market and has a very good usable volume being widest and highest in the middle.

The flysheet attaches to the poles with velcro tabs which are very fiddly but do add to the stability in a wind which can be further improved with two guys each side. Camping in snow you tend to run out of things to attach guys etc to (skis are good) For added comfort and security we usually built snowblock walls around the tent if there was a wind.

The front bell of the flysheet is rather low so we generally dug a pit to provide a safe cooking area plus additional storage and to provide a comfortable footwell while sitting in the tent doorway. At least the flysheet has been redesigned with double ended zipped entrances on both sides - a great improvement on the earlier model.

Condensation was always present owing to relatively poor ventilation of the space between the inner and the fly sheet although it was never unbearable. It is rather disconcerting however, to wake up to gentle snowfall inside the tent when someone moves against it.

We used 3mm closed cell foam underlays over the whole area of the groundsheet which greatly improved the general comfort level with very little weight penalty.

#### 10.2 Stoves and Fuel

Each tent had one stove. The UK party used 1pt Optimus stoves while the French group used multifuel MSR stoves. We had one spare MSR stove which, for some reason which was never explained, covered Eric and Jean Francois with soot whenever they attempted to use it.

Meths for priming was shipped from the UK. 40 litres of Jet A1 fuel (a fraction similar to paraffin) was obtained from the pump that refueled the Twin Otter at Constable Pynt. A combination of Sigg bottles and heavy duty 5 litre plastic containers were used to carry the fuel and proved satisfactory. There is nothing worse on an expedition than leaking fuel containers.

Our fuel allocation for the party was about 0.5 litres per stove per day. This was more than enough to cook with and provide central heating for the evening diary writers. The Jet A1 burns with a slightly more yellow sooty flame than paraffin, particularly at low pressure.

Both types of stoves performed well at low temperatures although the O-ring seal on the pump of the new model Optimus was not nearly as effective as the old leather washers. The reliability of the Optimus allowed it to be used inside the tent; the MSR stove was considerably lighter but more prone to flaring. Eric, Florence and Jean-Francois spent many cold hours cooking outside.

#### 10.3 <u>Sleeping bags and mats</u>

Four season sleeping bags eg Rab 800 were confortable even at the lowest temperature. Everyone used standard 'Therma-rests' which provided adequate insulation on top of the 3mm foam tent underlays.

#### 10.4 <u>Clothing</u>

During the day, when the sun was high and the air still, thermal underwear or other light clothing was adequate during periods of physical exertion. A light breeze reminded us that the air temperature was well below freezing and fleece tops, salopettes and light windproof jackets were rapidly donned. Once the sun dipped below the mountains the warmth of the sun disappeared and air temperature fell quickly; down jackets were useful and down boots were a nice luxury for keeping feet warm whilst in the tent.

# 10.5 <u>Boots</u>

Suitable boots were required for skiing and climbing. The French party wore Asolo 101 plastic double climbing boots which were suitable for skiing on alpine skis, suitable for climbing and at times too warm giving rise to the occasional blister.

The nordic party all took plastic climbing boots for the climbing associated with col crossing. There was, however, debate amongst some members as to whether double x-country ski boots were necessary (the cost of double boots being an important aspect of the debate).

Finally Paul took Asolo double nordic ski boots, John took Asolo Snowfield single boots and Bob and Mandy took a homemade version of double boots consisting of the climbing boot inners inserted into oversized Gronel single nordic ski boots. All designs of double nordic ski boots were comfortable and warm. The single nordic boots, which were also very comfortable, were warm enough during the day and when moving but were very cold if activity was restricted. They also tended to become wet and then froze solid overnight which required fairly barbaric treatment over the stove in the morning to allow them to be put on (sleeping bags already being full of salami, cheese spread, suncream etc!)

#### 10.6 Skis

The UK party had unanimously opted for nordic equipment for lightness and comfort, based on previous satisfactory experience. For at least 90% of the distance the glacier gradients are very gentle whereas the approaches to cols are sufficiently steep that skiing (up or down) with a sledge or heavy load is not practical. The French party on the other hand, was accustomed to using alpine ski-mountaineering gear and were committed to using it.

This difference in technologies proved to be of no real consequence - differences in speed were determined much more by how well each individual was going on any given day than could be attributed to equipment. Suffice it to say that the different equipment served as a convenient focus for the latent(?) rivalry which inevitably existed between the two groups.

The nordic skis used were mainly Fischer E99's which were ideal in terms of weight, camber and sidecut, tracking extremely well. Paul used Asnes Nansens (A-ski) which although heavier also performed well enough. Its greater sidecut allows easier turning.

Waxes were effective on the level sea-ice both at the beginning without loads and to a lesser extent at the end between Kap Petersen and Mestersvig pulling relatively light sledges. Swix purple wax proved most effective although the frozen surface was hard to grip and stripped the wax off very quickly.

For the remainder of the trip we used skins for climbing in order to get good and assured traction for pulling the sledges. As might be expected the wider alpine skis performed better climbing steep slopes but we at least are convinced that on balance this minor disadvantage was more than compensated for by the comfort factor on the terrain encountered.

## 10.7 <u>Sledges</u>

As on previous 'Peden' expeditions we used children's plastic sledges, one per person. These we obtained from Mailbox International Ltd at Stalybridge and they weighed 1.9kg each. These were modified as follows:

For towing two terylene cord traces approximately 2 metres long were attached to the sledges and run through 3/8inch nominal bore commercial aluminium alloy tube. The ends of the traces were looped for clipping onto climbing harnesses or rucksack waist belts depending on personal preference. To secure the load a series of holes were drilled through the plastic around the perimeter of the sledge and short terylene cord loops fitted to take thin nylon lashing cord.

The sledges were very light and performed well on the gentle terrain of the glaciers. Crossing the traces resulted in the sledges following the skier's tracks much better. Packing the sledges with a low centre of gravity improved stability but on steeper slopes where traversing was necessary the sledges persistently turned over. The French party could ascend more steeply on their alpine skis and broader skins and consequently made better up-hill progress with their sledges on the steeper ground.

Apart from bent traces (which could be straightened) the sledges survived the trip with little more than a few scratches. Only Paul's sledge suffered severely bent and broken traces when it was sent careering down the last steep section of a col.

#### 10.8 Climbing gear

We took sufficient hardware and ropes to allow two teams to operate simultaneously in the worst expected case for crossing cols. As this was never encountered we had more than enough climbing equipment for glacier travel and col-crossing purposes.

On the previous attempt we had been encumbered with the large amounts of gear thought necessary for our ambitious climbing objectives. This time we made a clear decision that climbing aspirations should be secondary to the traverse and that no additional gear would be taken. This proved to be a sound decision.

The compromise of one ice axe per person plus three hammers amongst the whole party worked well. Had steeper or icier ground been encountered then some people would have 'jumared' rather than climb using two tools so the arrangement would still have been appropriate.

The Petzl ascenders worked well on both 8.5mm rope and 5.5mm cord for sledge hauling.

#### 10.9 Rifles and flares

<u>Polar Bear Deterrents:</u> During May polar bears and their cubs are hunting seal on the sea ice. Since we were to spend a few days at the beginning and end of our journey travelling on or near the frozen fjords it was considered necessary to carry polar bear deterrents.

Mini flares and thuderflashes were to be carried by each person for use as initial deterrents for inquisitive bears. In our ignorance we bought these at a local ships chandlers and then discovered that there was no way we were going to be allowed to take explosives on the flight from Glasgow to Keflavik! At the last minute in desperation we contacted Icelandair's Heathrow office. The Station Manager, Mr. Olafur Smith, was both sympathetic and helpful and arranged for the pilot of one of the LHR-KEF flights to carry the flares and we could collect them on our arrival. Then we discovered that neither the Post Office or anyone else would accept them for delivery to Heathrow. Eventually we resolved the impasse by purchasing a second lot of flares by telephone/credit card from a chandlery in London who were willing to deliver them to Icelandair at Heathrow.

The Danish Polar Centre also requires that a rifle is carried by all expeditions entering the National Park. After considerable discussion with 'rifle experts' we purchased a second-hand Parker-Hale 270. We were assured that this weapon firing 150 grain rounds, would stop a polar bear at close range. Ian Naples kindly gave Bob, John and Mandy some lessons at a rifle club in Fife, after which we felt considerably more confident in our ability to deal with polar bears if the need arose.

We had to obtain a UK fire certificate, another bureaucratic maze, plus a licence from the Chief of Police in Greenland. Airport security at Glasgow required careful sorting out and Olafur Smith was again helpful in clearing it with customs and Police in Reykjavik. The rifle minus bolt, and the ammunition (packed securely) went as checked luggage and the bolt was carried with hand luggage.

After all this trauma, not to mention the effort of carrying the rifle etc all the way across the Staunings, it was a great disappointment that no traces of polar bears were seen. The base managers at Mestersvig had not seen a bear for six months.

## 10.10 Radio communications

Fortunately a proposed requirement for expeditions to carry HF (shortwave) radio was rescinded by the Danish Polar Centre shortly before we left; this requirement may now be in force. Having to carry an HF radio would have added considerably to the weight of our sledges.

Instead we carried an EPIRB (Emergency Radio Beacon) and an aeronautical frequency hand-held VHF radio. This was kindly lent to us by ICOM. VHF works on line of sight. We envisaged that in an emergency we would have been able to contact over-flying passenger aircraft and for communication with search and rescue aircraft. As it turned out only two planes flew over us during the entire trip. We were very happy that neither piece of equipment was required.

We had to get a radio permit from Greenland Telecom for both the VHF set and the EPIRB, This cost DKr500. In theory a radio operator's licence should have been presented in order to obtain the radio licence but although Jean-Francois held an operator's licence as a qualified pilot it was not called for.

#### 10.11 Medical

In addition to each member's personal first-aid kit we carried a fairly comprehensive medical kit. This was adapted from the kit put together for the 1988 expedition and contained the following:

Co-codamol	-	Mild to moderate pain, headache etc
Temgesic	-	Moderate to severe pain
Pethidine	-	Severe pain
<pre>Injection cyclimorpl (morphine)</pre>	h-	Very severe pain/major injury
Benzocaine	-	Throat lozenges
Amethocaine	-	Anaesthetic) snow blindness
Chloromycetin	-	Antibiotic ) and conjunctivitis
Amoxycillin	-	Chest and throat infections (antibiotic)
Cephradine	-	Soft tissue infections (trauma or cold injury)
Lomotil	-	Diarrhoea
Asilone	-	Indigestion (tablets)
Anusol	-	Haemorrhoids (cream)
Betadine	-	Antiseptic ointment
Zinc & Castor Oil	-	Chapped hands, barrier cream etc
Zinc, starch & talc	-	Chafing feet, groin etc (powder)
Aristocav	-	Temporary dental filling
Elastoplast strappin	ng	Scalpel blade
Surgical scissors	0	Micropore tape
Assorted steriswabs		Steri-strip sutures
Assorted sterile dre	essing	s Lyofoam wound padding
Conforming bandages		v 1 - 0

Morphine and Pethidine are controlled drugs and so we obtained a licence from the Home Office to carry and export these. They recommended that clearance also be obtained from the Icelandic/Greenland Consulates. We did not do this but had no difficulty.

Apart from the usual blisters and chapped hands the only medical conditions of note were Paul's flu-like cold and persistent subsequent cough which troubled him for the first week or so and three mildly frost bitten toes: John's little toe which didn't enjoy standing around on Col No.2 at 2am in wet ski boots, and Eric's two big toes which had suffered more serious frostbite in the past.

Happily one problem which does not afflict travellers to the Arctic in May is mosquitoes.

# 11. FINANCIAL STATEMENT

# INCOME

	<u>UK Party</u>	<u>French</u> Party	<u>Combined</u> <u>Total</u>
Mount Everest Foundation British Mountaineering Council Gino Watkins Memorial Fund Personal contributions Bank interest	900.00 400.00 1250.00 4281.76 57.75	4729.42	900.00400.001250.009011.1857.75
	TOTAL INC	OME =	11,618.93
EXPENDITURE			
<u>Travel</u> Scheduled flights Air charter - outward Air charter - return Misc. travel & subsistence	972.00 4300.00 1514.37 331.98	750.00 300.00	1722.00 4300.00 1514.37 <u>631.98</u>
Freight	<u>Sub-</u>	total =	8168.35
Sea freight - outward Air freight - outward Air freight - return	203.00 300.00 39.69		203.00 300.00 39.69
Fauinmont	<u>Sub-</u>	total =	542.69
Rifle Ropes and climbing gear Sledges Packaging and miscellaneous	185.00 382.52 79.32 127.68	50.00	$185.00 \\ 382.52 \\ 79.32 \\ 177.68 \\$
	<u>Sub-</u>	total =	824.52
<u>Consumables</u> Food Fuel Ammunition and flares	$917.24 \\ 9.15 \\ 216.61$		917.24 9.15 216.61
Administration	<u>Sub-total</u> =		1143.00
Administration Insurance Radio permit Firearm certificate	200.00 55.33 46.00	150.00	350.00 55.33 46.00 230.04
Report	200.00	50.00	250.00
	<u>Sub-</u>	total =	940.37
TOTAI	. EXPENDIT	URE =	11,618.93

Note: Expenditure by the French party is approximate and is included to make the overall financial statement representative for a party of seven.

#### 12. USEFUL ADDRESSES

# Expedition permission and advice

Danish Polar Centre Hausergade 3 DK-1128 Copenhagen K Denmark

Tel. 010 45 33 15 86 66

## Advice

Sirius Patrol Postboks 202 2950 Vedbaek Denmark

#### <u>Maps</u>

Danish Geodetic Institute 7 Rigsdagsgarden DK 1218 Copenhagen K Denmark

### Grants

Mount Everest Foundation c/o The Royal Geographical Society 1 Kensington Gore London SW7 2AR <u>Contact</u>: WH Ruthven Hon. Secretary Gowrie Cardwell Close Warton Preston PR4 1SH

Tel.0772 635346

Gino Watkins Memorial Trust c/o Scott Polar Research Institute University of Cambridge Lensfield Road Cambridge CB2 1ER Tel. 0223 336541

#### Insurance

British Mountaineering Council Services Ltd. Crawford House Precinct Centre Booth Street East Manchester M13 9RZ Tel. 061 274 3233 Shipping

Eimskip (Shipping Company) P.O. Box 220 121 Reykjavik Tel. 010 354 1 697 100 Iceland (Eimskip UK Agents) M.G.H. Ltd MGH Transportation Centre Middleplatt Road Immingham South Humberside DN40 1AH Tel. 0469 571880 Flights to Iceland and travel in Iceland Dick Phillips Specialist Icelandic Travel Service Whitehall House Nenthead Alston Cumbria Tel. 0434 382440 CA9 3PS Icelandair 172 Tottenham Court Road London Tel. 071 388 5599 W1P 9LG Charter flights to Greenland Sigurdur Aldalsteinsson Flugfelag Nordurlands hf. Akureyri Airport Box 876 602 Akureyri Tel. 010 354 6 27901 Iceland Radios ICOM (UK) Ltd. Sea Street Herne Bay Kent Tel. 0227 741741 CT6 8LD Radio licence for Greenland Greenland Telecom P.O. Box 504 DK-3290 Qagortog Tel. 010 299 3 82 85 Greenland

Firearms licence

Politimesteren i Grønland P.H. Lundsteenvej 1 Postbox 1006 DK-3900 Nuuk Greenland Tel. 010 299 2 14 48

## Licence to carry Morphine

Home Office Drugs Branch 50 Queen Anne's Gate London SW1H 9AT Tel. 071 273 3000

Plastic sledges

Mailbox International Ltd. Bayley Street Stalybridge Cheshire SK15 1QQ Tel. 061 330 5577

North Face Equipment

First Ascent Units 4 & 5 Limetree Business Park Matlock Derbyshire DE4 3EJ

Tel. 0629 580484



