Patrons:-

Sir Ranulph Fiennes OBE
Dr Mike Stroud OBE

POLESTAR EXPEDITION

BRITISH TRANS-SPITSBERGEN 2001

"An Arctic Odyssey"

The expedition gratefully appreciates the support of the Gino Watkins Memorial Fund

Report Prepared by John Starbuck, December 2001

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SUMMARY

In the Spring of 2001 a team of four British men set out to make the first British unsupported longitudinal traverse of Spitsbergen, the largest island in the archipelago of Svalbard in the high Arctic and, if possible, by a previously unachieved all overland route.

Research prior to, and subsequent to, the expedition suggests that all four members of the expedition achieved, in chronological order, on 29 March 2001:-

- The first British unsupported longitudinal traverse of the South Spitsbergen National Park
- The first ever unsupported longitudinal traverse of the South Spitsbergen National Park in winter

a journey of 140 km and 1300 m of ascent and descent, over 12 days.

Three members continued on to achieve, on 4 April 2001:-

- The first British unsupported double longitudinal traverse of the South Spitsbergen National Park
- The first ever unsupported double longitudinal traverse of the South Spitsbergen National Park in winter

a journey of 250 km and 2900 m of ascent and descent, over 17 days.

And, most significantly, on 24 April 2001:-

- The first ever true unsupported longitudinal traverse of Spitsbergen i.e. using an all overland route

a total journey of 620 km and 7590 m of ascent and descent, over 38 days, covering the traverse from the Southern tip to the Northern tip, 452 km, 6180 m, in 25 days. One expedition member was air evacuated from the southernmost point with imminent frostbite to the feet; he has since made a complete recovery. A second member also suffered cold injuries to the toes but was able to complete the journey and he has also made a complete recovery.
DEDICATIONS

Glenn Morris would like to dedicate the success of this expedition to his children, Anna, Madeleine and Thomas.

Paul Walker would like to dedicate the success of this expedition to his family, Lucy, Jonathan and Naomi.

John Starbuck would like to dedicate the success of the expedition to his parents, Ronald and Cissy.

Glenn, John and Paul would also like to dedicate the success of the expedition to David Johnson, who unfortunately had to abandon his attempt early in the expedition.
HISTORY OF THE JOURNEY

The first person to travel unsupported between the northern and southern extremities of Spitsbergen was the Norwegian Odd Harold Hauge, North to South over 15 days, in 1993. O H Hauge made extensive use of passage along frozen sea ice and low level valleys to avoid several climbs over mountain passes and traverses of exposed ice caps.1

A second crossing, North to South, over 25 days was made by Jørn B Hauge (no relation to Odd Harold Hauge) in 1994, also making use of frozen sea ice and low level valleys.

Our research has also revealed a third Norwegian crossing, South to North in 2000, over 17 days by Geir Lindberg, Tommy Alstad and Geir Hansen, again making use of frozen sea ice and low level valleys.

It might be deduced that there has been an emphasis on travelling light and fast, a frequent Norwegian style, in order to achieve the crossings in the shortest possible time.

There have been three previous attempts by British teams in 1996 (two) and 1998 (one), but none were wholly successful. The best achievement of these, in 1998, managed 400 km from South to North but ran out of time. These are summarised in Appendix 1 (References 1,2,3).

The normal means of reaching and/or returning from the southernmost and northernmost points has previously been by snowmobile. However, the southern part of Spitsbergen was designated a National Park as early as 1973, but since Hauge’s original crossing regulations governing permissible activities within the park have been tightened and it is now prohibited for non-residents to use mechanised transport, thus forcing most current attempts to complete a double traverse of this part of the journey.

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1 Almost a third of the journey, some 130 km, can be achieved on the sea ice in the northern section, if the Wijdefjorden and Austfjorden are frozen. There are also at least six huts along the eastern and western shores of these long, narrow, north-south aligned fjords. In the middle section, Tempelfjorden and Billefjorden can be linked via the Mittag-Lefflerbreen with Austfjorden and Wijdefjorden to eliminate the exposed ice caps of Nordmannsfonna, Fjolnesfonna, Lomonosovfonna and Åsgårdfonna. In the southern section, Rindersbukta, Kjellströmdalen and Sassendalen can be used to eliminate the ascent and subsequent descent, of four high passes in the Torell Land and Heer Land districts.
THE EXPEDITION’S OBJECTIVES

The minimum objective of the Polestar Expedition 2001 was to achieve the first British unsupported longitudinal traverse of Spitsbergen, by any route. However, our research suggested that no one had achieved the traverse adhering to an entirely overland route which used only valleys, glaciers, mountain passes and ice caps along the mountainous central backbone of the island, i.e. without resorting to the relative ease of travelling along the sea ice of the fjords, which are generally frozen at this time of year. The Polestar Expedition 2001 thus also set itself this more demanding objective, if time and conditions permitted.

The team decided to attempt the route from South to North for the following reasons:-

- the snow cover should be preserved longer in the North as the Spring melt developed
- the loads would be lightened through consumption of food and fuel before embarking on the more mountainous terrain in the North
- during the journey the team would have accumulated a high level of fitness in readiness for the more mountainous terrain in the North
- the team would be more likely to benefit from the anticipated prevailing SW winds²
- the weather on the exposed Northern terrain might be more amenable as the season developed
- any sun would be on the team members’ backs which, when hauling, would present the better angle to the sun for absorbing any heat, more so than would the chest if travelling Southward
- the team felt there would be a psychological benefit of completing the rigour of the double traverse at the beginning rather than at the end of the expedition
- a food and fuel cache could be left at the northern boundary of the South Spitsbergen National Park, for collection after the double traverse, in readiness for the northern section.

² The wind turned out to be mainly Northerly, see weather report section
RESULTS OF THE EXPEDITION

The expedition met all of its objectives (see summary page).

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www.tangent-expeditions.co.uk

3 Members are listed in alphabetical order. See logistics section for strategy regarding leadership.

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## FINANCIAL SUMMARY

### INCOME

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### EXPENDITURE

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<td><strong>Total expenditure</strong></td>
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DONATIONS OF GIFTS OR SERVICES

We would like to thank the following who gave their help and services free of charge:-

Shane Winser of the Royal Geographical Society’s Expedition Advisory Centre for help and information on previous expeditions.
Jørn B Hauge and Geir Lindberg for advice on crossings and routes taken by previous Norwegian parties.
Sally Jolly of Welcome Printing for composition of the expedition logo and digitisation & printing of the expedition leaflets.
Don Green for software modifications to the expedition logo.
Anne-Marie Chivers for sending out the expedition leaflets to prospective sponsors.
Members of Tonbridge Rifle Club for advice on securing the appropriate type of firearm.
Kate Johnston of Addis for the provision of broom handles for the camp trip wires.
Brian Smith for donation of ice coring drill.
Jim Gregson and Nigel Edwards for providing references.
Anne Rose for enabling us to communicate with Glenn by e-mail.
Keith Starbuck of Stardot for purchase of top level web site domain name.
Famous Army Stores, Whitehaven, for donation of Union Jack
Sue Allen for the design and maintenance of the web site (www.posestar2001.co.uk).
GEN II apprentices and trainers for construction of the expedition’s polar bear proof food boxes, stove boxes, trip wire mountings etcetera.-
    woodcraft; Daniel Barwise, Craig Chambers, Garry Henderson, Scott Kenmare, Joe Murphy, Steven Tyson, Neil Clark (trainer)
    metalcraft; Matthew McAllister, Russell Bound, Sean Burns, Paul Farrell, Garry Harrison, Steven Sloan, Brian Straughton, Matthew Taylor, Clive Fletcher (trainer).
Bryan Ingall for welding work on trip wire support system.
Chris Sanders of Newcastle Airport for giving us free car parking for 6 weeks.
Dionne Martens of Newcastle Airport for making facilities available for press and TV interviews.
Dan Kirkby for raising our profile amongst the various media.
Janet Donaldson of Braathens S.A.F.E. for arranging carriage free return of our freight to the UK.
Grants

In the main (approximately 70%) the expedition was financed by the participants’ personal contributions, only 4% being secured from grant awarding bodies.

The expedition applied to the following organisations for grants and equipment awards, but without success:-

The Mount Everest Foundation/BMC - declined to send us an application form
The Edinburgh Trust - mislaid our communications until after closing date was past
Eagle Ski Club - no acknowledgement or reply received
The Reverend D J Streeter Award - no reply of any sort received to two letters
Malden Mills International Polartec Challenge - declined, due to our link with a charity
The Alpine Ski Club - the award went to a group attempting the same challenge⁴
The Captain Scott Society - award went to another application
Lyon Equipment - award went to another application
Mountain Hardware - award went to another application

The expedition achieved just one successful application - from the Gino Watkins Memorial Fund, administered by the Scott Polar Research Institute, who awarded us a grant of £400. The expedition actually departed the UK with no formal grant of any kind, as we only became aware of this benefit upon our return to the UK.

Corporate Sponsors

We would like to thank the following corporate sponsors for their donations in support of the expedition:-

Dormol Eynsford Parish Council Imagination Ltd
Keyte & Co Knockhall County Primary School Otford Parish Council
Stormont Truck Norman Tate & Partners Edward Tyrell Fencing Ltd
Mike Wash Associates

Private and Individual Sponsors

We would especially like to thank those individuals, both family, friends and colleagues, who showed their confidence in us through the making of their cash donations (Appendix 2). It was our commitment to these individuals, who had staked their personal money, whatever its value, which kept us going when conditions were worst and our spirits were lowest. We thank them all for supporting our enterprise in keeping Britain at the forefront of achievement in exploration and adventure.

⁴ Matt Tinsley & Neal Hockley

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We would also like to thank:-

The Sysselmann of Svalbard for giving us permission for the expedition.
Julie Fowler for the weighing out and packing of all the expedition food.
Pete Gilliver for last minute repairs to the expedition pulks.
Dr Torre Dalborg for authorising the emergency helicopter evacuation of David and his subsequent treatment.
Andre Høgen of Svalbard Polar Travel for provision of the snowmobile transport service.

Our additional snowmobile drivers\(^5\) who transported us on both outbound and return journeys:-

Erik Vike (Guide)
Inger Helen Høgen
Hildegunn Rønningen
Grete Nymo
Aud Andersen

and the other snowmobile drivers who helped with the additional loads of the outbound journey:-

Siri Álvik
Torgrim Sevlejordet
Hilde Eikeland

\(^5\) Several of the drivers were friends of the professional drivers and volunteered their services to be able to experience the wilderness outside of Longyearbyen. Some of them used their own snowmobiles, incurring some damage in the process.
SECTION 1, LOGISTICS

Advice and Information

A lot of advice and information on logistics within Spitsbergen was obtained from the offices of the Sysselmann and from our chosen snowmobile operators, Svalbard Polar Travel (SPOT). The Norwegian Tourist Board also provided a lot of information on accommodation, expedition outfitters etcetera in their standard tourist publications.

The Sysselmann's offices also provided advice on the information we needed to supply to secure permission for the expedition. This included details of our plans for drop off and pick up by snowmobile, an outline of our intended ski journey route, proof of rescue and repatriation insurance, list of emergency, safety, communications and medical equipment, and details of our previous experience in arctic exploration.

Maps - Spitsbergen is well covered by a series of 1:100,000 maps, to quite a good standard. Some maps are coloured, some are black & white. The map index codes required for this journey are:- C4, C5, C6, C7, D7, D8, D9, C10, C11, C12 & C13.

Insurance - expeditions are required to consult with the Sysselmann's offices to determine the level of insurance cover needed. In our instance it was advised that the level of rescue insurance cover needed would be 175,000 NOK per person.

Polar bear risk - the Sysselmann’s offices produce a small leaflet on the hazard presented by polar bears and the measures one needs to take to minimise this risk. It was notable that few locals would give much of an opinion on the level of risk depending on where one was located i.e. whether at sea level or up in the mountains. We were initially not sure whether this was because they were reluctant to lead us into a false sense of security, but in hindsight we think it was more the case that people were just not that knowledgeable or did not have first hand experience of the majority of the regions through which we would be passing.

Generally speaking, one is most likely to encounter polar bears on the coast, or inland in the south, wherever there is a low level crossing route between coasts (“polar bear alleys”) and it is best to avoid camping in such areas. The bears wake from hibernation in their dens around early-March and make their way from the mountains to the sea ice, ready to start seal hunting. Huts are occasionally to be found, usually by the coast, often with their origins in trapping and bears should be expected to be encountered in their vicinity due to the higher incidence of prey. Den areas also occur frequently along the coast lines.

Although we encountered polar bears on our journey our overall impression was not that of a savage man-eating animal, rather one of an animal which has no predators and so can afford the luxury of being inquisitive when unusual happenings occur in its territory. This can lead to misunderstandings and unfortunate outcomes for the bears.
Preparations Prior to the Expedition

Several meetings were organised to debate what route to take, what equipment to use etcetera and minutes were kept of all agreements and actions for individuals to take away and work on.

Pre-expedition roles and duties were agreed:-

David:-
- set up and operate expedition bank account
- acquire second defensive weapon against polar bears
- acquire expedition logo badges for shell clothing
- acquire rugby shirts, embroidered with expedition logo, for resale

Glenn:-
- provide primary defence weapon against polar bears
- raise private sponsorship
- take initiative on raising awareness of Motor Neurone Disease

John:-
- provide containers for the food cache which would protect it from the attentions of passing polar bears, whilst being environmentally friendly to dispose of in-situ.
- provide a reliable polar bear warning trip wire system (previous British attempts found the locally hired ones to be very sensitive and hence unreliable)
- provide robust yet lightweight boxes for the MSR stoves which would save valuable time each time camp was established and moved
- provide a web site to promote the expedition and its cause
- apply for grants from all official bodies and for awards from equipment companies

Paul:-
- provision of logistics; flights, snowmobile transport, group camping equipment, pulks, food, fuel, preparation of maps, communications and safety equipment, detailed route selection.

It was agreed that the expedition would operate on a democratic basis with all decisions being agreed between the members. However, it was recognised that someone would need to be the nominal leader for various bureaucratic purposes. Since Paul worked from his home based office and hence was always near communications equipment, it was agreed he should be the nominal leader, where it was necessary to specify this.

Travel Between UK and Spitsbergen

Longyearbyen is served by flights from Oslo via Tromsø. Operators include SAS but the majority is provided by Braathens S.A.F.E.. Prices were similar regardless of operator, though there was a range of prices depending on Apex terms etcetera, from £310 - £520 for Oslo – Longyearbyen return.
From previous experience we were aware that it would be cheaper to send equipment out beforehand by air freight and to get one of the local operators to arrange to store it rather than incur excess baggage charges if it were to accompany the team.

**Access to Start and Finish Points**

Initial inquiries with the Sysselmann revealed that, for non-residents, no mechanical transport methods would be permitted to Sørkapp within the South Spitsbergen National Park and that access by sea would be very unlikely due to the presence of sea ice. When we learned of the Polish research station at Isbjørnhamna, at Hornsund we inquired whether we might be able to take advantage of the routine provision of supplies to there by snowmobile but this was also confirmed as being not permitted.

Helicopter transport to or from Verlegenhuken at the northern end was also prohibited, the only mechanised access being by snowmobile⁶.

The nearest access to Sørkapp would therefore be by snowmobile to the foot of the Doktorbreen, some 100 km north of Sørkapp. The expedition’s overall route length was therefore predicted to be about 530 km, inclusive of the initial southbound leg. This indicated a journey time of 15 days for the first stage to the southern tip and return to the drop off point on the Doktorbreen and then a further 25 days from there to the northern tip.

**Travel Within Spitsbergen**

Contact with several expedition suppliers in Longyearbyen secured quotes from £850 - £1500 per person for the snowmobile transport to and from the start and finishing points. The price was so high due to the constraints of only one passenger per snowmobile and the need for the driver-guides to be on duty 24 hours of each day.

The fact that such services are readily available should not be taken to mean that such journeys can be undertaken lightly; once outside of Longyearbyen one is in a truly remote arctic wilderness. Few locals venture off the well used day-tourist circuits, activities are closely regulated by the Sysselmann and the snowmobile driver teams have also to take their own firearms and emergency survival equipment and supplies to cater for any eventuality.

A previous expedition had reported impassable difficulties for snowmobiles getting up onto the Nathorstbreen from the Van Keulenfjord, so it was decided that enquiries should be made of whether access was more likely to be successful and to be permitted, from Rindersbukta via Paulabreen, Doktorbreen and Liestølbreen and to secure a quote for this route option.

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⁶ Helicopter transport would of course be permitted in the event of a need for emergency evacuation.
Support

The team agreed that the objective should be to achieve the traverse unsupported. The overriding reason for this was that the team felt there was too much opportunity for things to go wrong if positioning of pre-placed caches etcetera were to be delegated to others. The best chance of success would be for the team to be solely and entirely responsible for its own logistics. It was therefore decided that a support team would not be used.

Final Choice of Route

The team agreed to attempt a high level route, avoiding travelling over sea ice areas as much as possible. The reasons for this were as follows:-

- this would produce a purer line than the short cuts which could be effected by using sea ice crossings
- travel on land based snow was expected to be easier than the possible struggles over sea ice made uneven by pressure ridges etceteras
- there might be a lower risk from polar bears when away from the sea ice areas

If conditions, food reserves and time permitted, an on the spot decision would be made whether to climb Newtontoppen and Mont General Perrier, at 1717m, the joint highest peaks in Spitsbergen.

The Food and Fuel Cache

The team debated the merits and ethics of placing a cache of food and fuel at the head of the Liestølbreen, by using either snowmobiles or manpower, or whether to take everything on the 100 km journey South to Sørkapp, before commencing the journey North. The following points were considered:-
• no Norwegian contingent had ever even attempted such an all overland route so we
deduced that it was likely to be a very considerable challenge and that we should not set
our sights any higher than the minimum necessary to qualify for an unsupported crossing
• the schedule was fairly tight and to maximise the chances of success it would be risky to
use up time man hauling the cache into position from the nearest west coast access and
thus risking running out of time to complete the objective
• in terms of qualifying for being unsupported, it made no difference whether our
snowmobile transport delivered us to a coastal location or inland to the Liestölbreen.
• having reconnoitred and travelled the route South, it would save time and effort to
return via the same route, although this would not be as interesting as taking a slightly
different line each way.
• placing the cache at this high location would avoid a descent to the coast to collect the
cache and the subsequent re-ascent. It would also reduce any temptation to use the sea
ice.
• placing the cache high might reduce the risk of interference by polar bears
• considering that the double traverse of the southern National Park was an artificial
element introduced by the National Park regulations, then, would placing the cache
reduce the amount of effort needed to complete the purely end-to-end traverse, i.e.
would the man-hauling effort saved through leaving about half of our supplies at the
cache be more than off-set by the extra effort of carrying the other half southbound.

The team agreed that placing a cache provided the best chance of success, whilst not
compromising the expedition in terms of being unsupported, since we would not be
receiving any external help in the way of movement of supplies from start to finish. This
would leave a further, but somewhat esoteric challenge open to other non-residents in the
future, should they wish to go one better than our attempt, by travelling with the whole of
their supplies with themselves at all times\(^7\). To reassure the team of the purity of such a
cache strategy, John performed some calculations to compare the energy consumption of
this strategy against that which would be needed solely to travel between the southernmost
and northernmost ends (only 33 days of food compared to 40, but not possible due to the
access restrictions). These are given in Appendix 3. It makes little difference exactly what
weights are used in the calculations, the results always show that this strategy requires
more man.kg.days of hauling effort, than if the slightly fewer provisions for the purely
point-to-point journey were to be carried just between the two extreme points.

However, this strategy of caching carried with it one major risk. One of the previous
British expeditions had placed a cache in a similar location but had to abandon its attempt
when they returned to their food cache only to find it had been decimated by a polar bear
attack (Reference 2). The Polestar team considered that the intended cache location was
probably close to a bear migration route across one of the narrow sections of the mainland.
We were determined that we would not fail for the same reason, so the following ideas
were suggested as to how the cache could be made secure:-

\(^7\) This is the objective which Matt Tinsley and Neal Hockley would appear to have set themselves, albeit
not all overland. At the time of writing, this challenge is still awaiting completion by any route.
• wrap items, on an individual basis, that way if the outer packing was compromised, then maybe some part of the cache may at least survive intact.
• a blue plastic barrel could probably be gnawed through
• a steel 200 litre drum could probably suffer having the end ripped off
• anything which was substantial enough to withstand attack would be too heavy to transport for the rest of the journey and expensive pick-up arrangements would need to made for the empty container to be recovered later
• the container could be well covered in rocks if an adequate supply was available locally
• a GPS device could be used to mark the cache’s location.

In the end we commissioned seven strong bear resistant wooden boxes which we could burn in-situ and also took a strong Aluminium re-closeable box (Lacon), with strong lid closure clamps.

Outline Journey Timetable

The time period of the expedition was primarily set by the balance between starting soon enough to ensure that the Spring melt does not remove the snow cover at the end of the journey, yet not so early that conditions of weather, temperature and available hours of daylight make travel impractical. Reference to a daylight chart indicated that true night time should give way to twilight around 2nd April and 24 hour daylight should commence from about 19th April. At mid-March there would be an even split of 12 hours of darkness and light. Local knowledge indicated that adequate snow cover should be available until the end of May.

The journey from Doktorbreen to Sørkapp was estimated to be 100 km each way and then a further 330 km to complete the journey to the North. It was estimated this would require 14 to 15 days for the return journey to/from Sørkapp and another 25 to 26 days to complete the journey North. Allowing for a few days at the end for transport back from Verlegenhuken to Longyearbyen and to tidy up the expedition’s outstanding affairs, a total period of 6 weeks was considered to be about right.

Allowing for some initial time in Longyearbyen to get organised, the team felt it would be appropriate to arrive in Longyearbyen about 30 March, with a view to starting man hauling on about 2 April. However, Paul’s commitments to organising expeditions for his company’s clients meant that this would leave him too little time between his arrival back in the UK before his first clients were due to set out. In addition, we learned that another British team was considering the attempt; Matt Tinsley and Neal Hockley from Edinburgh and Cambridge Universities, starting in early April. The expedition was therefore set to be mid-March to end of April.

Communications

EPIRB locator beacons: - the expedition took one each at 121.5 MHz and 406 MHz. Although the 406 MHz is heavier, it was more powerful, provided more accuracy and was more reliable at low temperatures.
The advantages of an HF radio and a satellite telephone were weighed up: the satellite telephone would give clearer reception, provided there was a line-of-sight signal (system specification goes up to 76° N). The HF would give communication wherever the team were, but setting up an aerial of the correct length might have proven quite problematical, the signal might have suffered from a lack of quality and reception might have been quite patchy. All things considered the weight was thought to be little different, so the satellite telephone was chosen for its more reliable signal. HF radios were reported to be available in several isolated huts only a few days march away at coastal locations, but we could not secure any confident information as to their condition or their operability.  

A VHF air band radio was taken for emergency communications only, the idea being to take advantage of any aeroplanes passing overhead.

Weather Report

The expedition had no means of receiving weather forecasts. A barometer was carried and the pressure trends were noted to try and understand the weather patterns present.

Details of the weather experienced during the expedition are given in Appendix 4. In general terms, the prevailing winds were from the North and Northeast and temperatures were universally cold, rarely rising above -15°C and frequently somewhere below -30°C. Daily temperatures are also recorded in Appendix 4.

Comparison of the Expedition with other Polar Expeditions

In order to put the longitudinal traverse of Spitsbergen into perspective, we have compared our temperature data, distances travelled and height climbed against similar data recorded for typical expeditions to the north and south poles. This is presented in graphical form in Appendix 5.

It can be seen that for instance, whilst the distance might be only half of that to travel to the south pole, there is about twice as much climbing involved. Temperatures experienced were in general, between those experienced on the north and south pole expeditions.

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8 Neither of the huts at Sorneset or Polheim had a radio of any kind
SECTION 2, THE EXPEDITION

Expedition Members’ Experience

David Johnson

David is 50 and has led a number of expeditions to Greenland, both for mountaineering and research purposes. Together with Glenn, he completed the first British crossing by the original route undertaken by Nansen in 1888, of the Greenland ice cap. He is a Peak District Ranger in his spare time, is a qualified Winter Mountain Leader and has also taken part in expeditions to the Alps, Himalayas and Norway. He is a Fellow of the Royal Geographical Society and a member of the Arctic Club.

Glenn Morris

Glenn is 43 and runs his own arboricultural business in Kent. He is an experienced climber and polar traveller who has climbed in Alaska, Greenland, the Andes, Alps and Himalayas. In 1999, he and David undertook a successful expedition to cross the Greenland ice cap, following the route taken by Nansen in 1888. He is a Fellow of the Royal Geographical Society and a member of the Arctic Club.

John Starbuck

John is 46, lives in Cumbria and is an extremely experienced mountaineer who has been involved in numerous expeditions to Greenland, Sweden, Norway, Finland, Russia, India, Nepal, Morocco, Kenya, Uganda, Tanzania, Canada, Alaska, Colombia, Ecuador, Argentina, France, Spain, Italy, Switzerland, Austria and Greece. He has made over 30 first ascents and new routes in Greenland and amongst his other ascents are Gunnbjorns Fjeld, Kebekeisake, Halti Haldi, Elbrus, Jebel Toubkal, Mt Kenya, Kilimanjaro, Mt Logan, Denali (Mt McKinley), Aconcagua and Mulhacen - each the highest mountain in their respective countries. John is also a highly experienced skier, rock climber and hill walker whose other achievements include the ascent of over 750 Scottish Munros and Corbets. He is a member of the Alpine Club, the Eagle Ski Club and the B.M.C.

Paul Walker

Paul is an experienced mountaineer who has organised 45 expeditions to Greenland and led 19 of these. He has made over 100 first ascents of previously unclimbed mountains in the Arctic. He is a director of Tangent Expeditions International, a qualified Winter Mountain Leader, is qualified in advanced medicine for Remote Foreign Travel, an experienced Telemark skier and one of the world’s leading specialists in Arctic Mountaineering. Paul is 35 and lives in Kendal. He is a member of the Arctic Club, B.M.C., Eagle Ski Club and is a Fellow of the Royal Geographical Society.
Training

General fitness: - John undertakes a regular programme of running, fell walking and climbing. Glenn is regularly occupied in manual labour in his tree felling business. David normally gets exercise during his Peak District National Park Warden patrolling activities, but had been distracted by the preparations for his wedding. Paul is usually too busy running his business to find much time for pre-expedition training but did have the advantage of youth over the rest of us.

Specific training: - we held a couple of weekend meetings to try out and perfect the camp trip wire system as well as to rehearse the correct and efficient erection of the rather complicated Mountain Hardware "Weather Station" tent. We were all familiar with the use of firearms from previous expeditions, but local training is available for those who need to rent firearms in Longyearbyen.

Provisions

Our food was based on four different daily menus designed to provide about 5,400 calories per day and this was repeated ten times to generate the forty days of supplies. We anticipated that this would be slightly insufficient for each day and expected to each lose about one stone from our starting body weight. At the end of the expedition, this proved to be about correct. The food was packaged up in two-man sized rations, double bagged in knotted polythene bags, the average weight being about 2.5 kg per two-man ration. The pairs cooked at each end of the tent and this packaging provided some flexibility by permitting each pair to make their own choice of menu for the day. Finally, all the two-man rations were packed inside strong bin liner polythene bags within the food boxes. Details of the food taken are provided in Appendix 6.

Each box had identical contents and provided five days worth of rations. We considered having all the boxes made of metal for maximum security, but then we would either have to carry them all the way with us, even when empty, but still quite a weight, or we would have to arrange some complicated and expensive pick up logistics, as it is strictly prohibited to leave waste in the wilds.

Our strategy was therefore to make wooden boxes, as secure as we could, which we could destroy by burning. We planned to use up the contents of the re-closeable Lacon box first and then to only ever open one wooden food box at a time and transfer the contents into the Lacon box and then burn the wooden box to save the weight.

At each camp, we set up two trip wire systems, one around the tent and one around the pulks with the food onboard, about 100 m away. This was not entirely satisfactory - whilst it was possible to look out occasionally to check the food, when the wind set off the trip wires it was difficult to hear the cartridges because of the distance. By the time we had returned to the food cache, we had decided that we were just as well off having the food pulks beside the tent and this also allowed us to have two trip wires set up around the tent,
thereby providing redundancy should one be falsely triggered by the wind\(^9\). Upon our return to the food cache, we in fact transferred all the food directly into the pulks and burned all the remaining boxes.

For stove fuel, we allowed a consumption rate of 0.5 litres per stove per cooking pair per day, thus providing 40 litres for the whole journey. Our past experience suggested 0.33 litres per stove per day would normally be adequate, but we felt there would be much more fuel needed to heat the snow and ice from the anticipated very low temperatures. This proved useful, as after some time, when we had established the actual fuel consumption rate, we were able to spare a little fuel for heating the air inside the tent and for some of us to pre-heat boots in the morning.

**Introduction**

The original idea for this expedition came from David. He was aware of an intent by the British army to mount such an expedition to attempt an unsupported longitudinal traverse of Spitsbergen, but that it never came to fruition. He suggested the idea to Glenn who took the bait and who in turn, mentioned it to Paul, who had previously organised expeditions to Greenland for both of them under the guise of his company, Tangent Expeditions International. John had been on eight previous expeditions to Greenland with Paul and had been considering an expedition to Spitsbergen; a chance comment in conversation led to the completion of the four man team. Glenn also wished to use any publicity arising from the expedition to raise awareness of Motor Neurone Disease and hence to raise funds for research into this condition, which is usually terminal and has no known cure.

**The Account of the Expedition Journey**

15 March.

The group rendezvoused at Newcastle airport. A few difficulties were encountered at the airport check-in with the rifle and trip wire warning blanks, until it was explained that the two were incompatible. We were then whisked off to a press conference in front of local journalists and television crews. We finally arrived in Longyearbyen at about 2:00 a.m. after an uneventful series of four flights. A scheduled bus service took us to our accommodation at the Nybyen guest house.

16 March.

A visit was made to the Svalbard Polar Travel Company (SPOT) to see their logistics manager, Andre Høgen, to finalise our travel arrangements and then to Svalbard Wildlife Services to rent a second rifle. Finally, a visit was made to the Sysselmann's office where more forms were required to be completed, in-spite of having already provided the necessary information by post, earlier. Andre then took us down to his warehouse where

\(^9\) Upon our return to Longyearbyen at the end of the expedition, we tried out the UK style mini-12-bore cartridge firing blanks in somewhat more amenable and controlled conditions; to our dismay and retrospective alarm, not a single one would detonate!
we were able to check our freight had arrived safely and to unpack and sort it into loads ready for the snowmobile drivers to fasten securely onto their sledges for the next day's outbound journey.

17 March.

At Andre's warehouse nine snowmobiles were warming up ready to go, all with sledges attached and our supplies loaded on, along with many cans of fuel for the long journey. The convoy set off East, across the flat snowfields out of Longyearbyen, before turning southwards and up Todalen. This led over a small col and descended via Gangdalen into Reindalen, passing a small hut and fuel dump before heading out across the Van Mijenfjord towards Nathorst Land. At this point, the snowmobiles were able to pick up speed and we raced along at 70 kph. However, at this speed it was not long before our knees became first numb and then very painful with the cold as the still air temperature was about -20°C. Then it was into unknown territory for some of the drivers as we went up Bromelldalen, over a col and down the Sysselmannbreen to Van Keulenfjorden. Our objective was to get up toward the head of the Liestølbreen to set up our first camp and make the food cache for collection on the return journey. But as we had anticipated, the way up on to the Nathorstbreen was barred by vertical ice cliffs and the snowmobiles had to race around the foot of the ice cliffs for almost the entire width of the glacier before a steep, snow covered ice ramp was found on the southern edge. Another ten minutes and the group arrived at the intended location for the expedition's food cache at the head of the Liestølbreen. After saying our good-byes to our drivers the rest of the day was spent setting up camp and sorting equipment and individual loads ready to start the journey South, the next day.

Day 1, 18 March, 9 km.

Leaving half of our food at the cache in a slight depression to reduce its visibility, we set off southbound up the Krøkjebreen. With our heavy loads our progress was slow in deep dry snow and we only managed 9 km before passing over a col and making our first camp a short way down the Dobrowolskibreen.

Day 2, 19 March, 12 km.

Due to unfamiliarity interpreting the map and its scale, an early navigational error was made in reading the land forms and we passed to the west of Gråhø peak rather than over our preferred col to its north-east. This mistake was only realised when we found ourselves above a snow covered 200m steep rock cliff escarpment (Keipen) which we could find no safe way down with the pulks. To recover the situation required a slight retracing of our steps northward down the Keipbreen and then the acceptance of another 100 m of further height loss down the Dobrowolskibreen to get to the junction with the enormous Nathorstbreen and make camp. This put us over a day behind schedule.
Day 3, 20 March, 11.5 km.

A re-ascent of 440 metres up the Nathorstbreen and the Besshøbreen to get back near to our originally intended line. In spite of being tired with our heavy loads we had to extend the day's work by half an hour to find a level area for the camp, below the SW ridge of Blåhø.

Day 4, 21 March, 15 km.

A final short ascent to the highest point of the col and a short descent of the Nøvbreen merged into a long gradual descent of the Flatbreen, camping near to Økshamaren peak. The camp position was chosen such that the next day we should be able to get all the way across the junction of the Hornbreen and the Hambergbreen, a wide W - E corridor which was likely to be used by polar bears for crossing from one coast to another, the first 'polar bear alley' we expected to encounter.

Day 5, 22 March, 14 km.

Just after starting off from the mid-day food stop we spotted a polar bear ambling along from West to East about 500 metres away. We watched its pattern of movement carefully as it disappeared behind the occasional snow ridges. When it was clear that it had not detected us and that it was clearly determined to reach the sea ice in Hambergbukta, we continued on our way across its tracks to go up the Sykorabreen and camped about two thirds of the way up, below Ostrogradskifjella

Day 6, 23 March, 12 km.

We continued ascending the Sykorabreen by way of a depression on its western, leeward side. This proved to be very slow going due to the usual deep dry snow which we had routinely encountered so far. So we veered eastward onto a slight ridge in the glacier and this was found to be somewhat scoured of loose snow and much better going. We crossed over the Hedgehogfonna and Skilfonna snow fields and camped below Brendetoppane peak. We were falling even further behind our prescribed schedule and decided to leave one of our food boxes and some fuel here, for collection on our return, by hopefully, the same route. This was a risky strategy as this food box was one of the lighter weight ones and was not painted white to camouflage it, but we did bury it in the snow and mark it with a spare ski stick.\(^\text{10}\)

Day 7, 24 March, 13 km.

On down and across the northern part of the Vasilievbreen to camp at the far side of its junction with the Øydebreen. Our choice of this route had been supported by BB Hauge who had encountered many dangerous crevasses on his route along the Hornbreen and Svalisbreen. We stopped short for the day, however, as we encountered an icefall on the

\(^\text{10}\) This was not in our original plan, but the calculations in Appendix 3 show that this action still did not reduce the man-hauling effort compared to a purely end-to-end traverse.
north side of Fallknatten peak, with no obvious way to get around it. After a
reconnaissance the prospect of the way ahead through the ice fall looked impossible but it
looked as if there might be a way down onto the sea ice thus allowing a crossing of the
Isbukta to make up for our slow progress. We did not really want to digress onto the sea
ice, lest this diminish our claim to an all overland crossing, but, on the other hand, we were
only on the southbound leg, not the traverse proper. We decided to sleep on it.

Day 8, 25 March, 0 km.

We woke to a strong wind and much spindrift, generating a ground storm and low
visibility. It showed little sign of improving so we decided to rest and consolidate our
position. The tent was caked with ice inside, much of our equipment was very wet and our
sleeping bags were matted throughout with ice, so this provided an opportunity to try and
dry things a little, though it was very difficult to achieve much in this respect.

Day 9, 26 March, 12 km, (- 6 km).

We faced a difficult decision this day; to try to get access onto the sea ice of Isbukta and
head for the far shoreline peak of Nordre Randberget, or to turn northwards and rejoin J B
Hauge’s route at the head of the Øydebreen. We were so far behind schedule that the idea
of retreating further from our objective was unpalatable, so in an attempt to make a saving
in time, and noting our concerns regarding our crossing being not all overland, we
succeeded to taking a gamble on the sea ice access option. However, the weather
continued to be as foul as the previous day with a NE wind blowing spindrift into our faces
and after much weaving over and around crevasses we could not locate a safe way down
through the ice cliffs to the sea. With morale at the lowest level yet we turned around and
headed into the stinging wind, back north and west to camp below the east side of the
Isryggpasset, extending the day by an hour and some 6 km further away from our southern
objective.

Day 10, 27 March, 16.5 km.

The Isryggpasset, as its name suggests, was a beautiful sweeping narrow tongue of snow.
It was just possible to pull the still heavy pulks up the gradient and we were on top and
onto the Austsjøkulen within an hour. Another extended day took us all along the western
side of the Vasiliievbreen, fairly close under the range of mountains to the west and with no
signs of the crevasses reported by BB Hauge, probably because we were at least a month
earlier in the season than his visit. Again, our camp position south east of Cuvervillefjellet
was determined by the need to cross the next polar bear alley, linking the west and east
coasts, in one day.
Day 11, 28 March, 14.5 km.

Over Sørkappfonna, the extensive, featureless southern ice cap. The ascent, though gradual, was over deep and hard sastrugi which made for very difficult progress, but eventually the top of the slope rounded off and we began the descent of the Mathiasbreen on a much better quality surface. Due to the polar bear risk we decided to make camp well before reaching sea level, at the head of this glacier, so that we could reach a map-marked hut at the southern tip and still have time to return to a camp in the relative safety of the mountains if the hut was not present or not useable.

Day 12, 29 March, 12 km.

It was a good surface to ski down the lowest part of the Mathiasbreen on its eastern flank until we came to a gully which finally led down through moraine to sea level. We descended this calling and whooping so that any bears would hear us and hopefully move on without a surprise encounter. Another 6 km along the flat, criss-crossing bear and fox tracks, finally took us to Sørneset, the southernmost point of Spitsbergen, marked only by a rocky outcrop. Glaucus Gulls, in their dark winter plumage, were flocking in on the strong wind from the west. After the requisite photograph session we skied along the snow covered beach, until we arrived at the hut at Skjemmeneset.

To our intense disappointment the hut was padlocked and where the key should have been stored there was just a broken metal housing. We looked high and low for wherever the key might have been alternatively placed, but to no avail. We were able to remove the storm shutters from the window and look inside to see whether the hut was meant to be used by passers-by and appearances seemed to indicate this to be the case. We were tired, worn down, 4 days behind schedule. Morale was at an all time low. Both David’s and Paul’s feet had been in a bad way for several days by this time and we were quite desperate to secure the shelter, get warm, dry out and take stock of the situation. We cut through the hasp with a penknife saw and entered the hut.

Firewood and emergency food supplies were present and the log book indicated earlier, but very infrequent, casual stays along with a number of inspections. Later that evening we noticed that an emergency beacon light was flashing on the roof of the hut, so we were at a complete loss to understand why what obviously seemed to be an emergency facility was locked, without an accessible key.

At last we were able to get a really good look at David’s toes for the first time. They did not look frost-bitten but were clearly very red and swollen to about twice their normal size. This had been making it very difficult for him to get his boots on and of course this had compounded the situation by just restricting the blood circulation further. Frostbite would have been an almost inevitable outcome if he were to try to continue in the conditions we had encountered so far. He decided that the only sensible thing was for him to abandon his attempt at the subsequent south to north traverse. However, this was not as simple as it may at first seem because of the regulations prohibiting the use of mechanised transport in the southern national park.
Paul was also very anxious about the condition of his big toes, the front half of which had no sensation of feeling and were clearly affected with large white blisters. We all went to sleep with concerns as to whether the expedition could be continued and with any prospect of success.

Day 13, 30 March, 0 km.

We used our satellite telephone to call Andre at SPOT and explain our situation. He kindly agreed to find out our options for getting David evacuated, through discussion with the Sysselmann. It transpired that David would need to telephone a doctor in Longyearbyen hospital and explain his symptoms. On the basis of the ensuing discussion the doctor would decide whether it was appropriate to initiate a helicopter evacuation. This authorisation was duly given. Paul decided that he would try and continue. We began to re-organise the equipment on this basis and about an hour and a half later David was whisked away along with all of his equipment11.

The group gear was reallocated amongst the remaining members, 60 kg now being shared between only three, ready to start the south to north traverse the next day. All the rest of the day a gale raged outside the hut and we were glad for the protection it afforded.

We were doubly glad of this protection as, in the early hours of the morning, Glenn woke us all with the alarm call that there was a bear outside. Peering out of the window we could see it, in the dim light, sniffing around where we had tipped our waste water. Glenn got ready with the rifle. Meanwhile, the bear had put its forepaws up on a mound of snow below the window in order to look inside the hut. We could clearly see the three black dots of its nose and eyes and we froze in silence and awe. After a few seconds the bear dropped down again, sniffed around once more and then casually ambled away southwards onto the sea ice. We breathed a sigh of relief, not that we were afraid for ourselves, we felt fairly safe within the hut, but it would have been a tragedy to have to kill the animal just for being inquisitive in going about its natural business of looking for food each day.

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11 After the expedition's return to the UK, it was learnt that David had a turbulent 1 ½ hour flight over the sea back to Longyearbyen, alternately flying high and low to avoid the worst of the bad weather. He was taken to the hospital for examination by Dr Torre Dalborg and photography of his feet. He was given Aspirin and a cocktail of other drugs to promote blood circulation, followed by a sensory examination to determine the extent of circulation. The staff were concerned as there was a clear demarcation line. After a night's stay under observation, there was little difference despite a lot of discomfort as the circulation returned. After more photographs, David was discharged, but required to return for check ups on the following two days, after which he discharged himself. Upon return to the UK he was given further check ups at the Military Medical Centre in Chester. The end result is that he has no obvious permanent damage, just the temporary loss of toenails. His expedition equipment was recovered in Longyearbyen by the remaining expedition members.
Day 14, 31 March, 26 km.

A nice dawn, with little wind. We had breakfast, packed up, cleaned the hut, left some useful items for future occupants, refitted the storm shutters and reset the lock. Despite the previous day's weather our ski tracks were still visible, so we quickly reached the gully back up onto the Mathiasbreen. To our delight and relief, after all the snow of 'porridge' consistency we had so far encountered, the best surface yet of the journey eased our progress back up the 300 metres of the Mathiasbreen to the Sørkapffonna. This we crossed on a reduced level of sastrugi and pressed on to re-cross the polar bear alley to camp below Haitanna on the Vasilievbreen, slightly further north than our camp on the 27th. A best yet daily distance of 26 km and, along with the height gained, our morale was lifted; with more similar days we might succeed.

Day 15, 1 April, 19 km.

We returned up the Vasilievbreen and then the Austjøkulen, crossed through the Isryggpasset and down onto the Øydebreen at our earlier camp. We then set out NE between Fredkollen peak and point 400, to try for the Mariepasset, but the height loss down to this pass looked a lot more than the map suggested. So we took a gamble on an ENE line, heading straight for the Svanhildpasset and made camp here, quite a bit nearer to our intermediate food cache which we had left on the Skilfonna snow field.

Day 16, 2 April, 19.5 km.

We continued East around Brendetoppene to our intermediate food cache, which we found still intact. We already had with us David’s share of food and we also picked up his share here as well, just in case some of the main cache had been destroyed - it might just be enough to salvage the expedition if this main risk had become manifested. After burning the box we continued back over the Skilfonna and Hedgehogfonna snow fields and down the Sykorabreen to camp in the middle of the junction of the Hornbreen and the Hambergbreen. This was a risky strategy, to camp in the middle of the polar bear alley, but to have stopped short of it would not have helped us make up valuable time. Yet it would have been too long a day to try and get completely across it to a relatively safe location on the far side. About an hour earlier we had come across the fresh tracks of a mother and cub, potentially one of the most hazardous scenarios one could encounter with polar bears due to the very protective stance taken by the mother.

Day 17, 3 April, 16.5 km.

Our steps were re-traced back up the Flatbreen, but this time we took a right branch up our originally intended line of the Isbroddbreen, camping below Nøva peak.
Day 18, 4 April, 15 km.

We finished off the Isbroddbreen, then a turn NW and a tough steep climb up to Blåhøpasset, with a spectacular view back eastwards down the Davisbreen to the sea. Across the Knokisen to camp on the Ljøsfonn.

Day 19, 5 April, 13 km.

Up to the head of the Ljøsfonn and then a crossing of one of the lower passes of the Sølvknappane group of hills. A gradual contouring descent took us down onto the Krakjebreen, but we could not see any sign of the food and fuel cache until the last few metres. All our efforts to camouflage the cache had been successful as there were no signs of any polar bear tracks. Our return journey had taken only 5 1/2 days compared to the 12 days southbound, putting us now only 3 days behind schedule. The food had to be re-organised to cater for three - we just ended up using three identical bags over consecutive two day periods, so we had the same menu two days in succession.

We then faced the decision of whether to go for our all overland route attempt or whether to take a line of least resistance over the Rimfonna, via the Rindersbukta, a succession of low valleys to Sassendalen and then via the Tempelfjorden and Billefjorden to connect with Austfjorden and hopefully an easy passage to speed our progress north and make up time.

As we had no idea of the progress being made by Matt and Neal, or even in which direction they might have chosen to make their attempt, it was tempting to take this easier line. However, we had no indication or firm inclination as to the frozen status or otherwise of these fjords.

Although we were still 3 days behind schedule we had just lifted our morale with progress back to the cache and there was every prospect of the environmental conditions steadily improving as the season advanced. We could see no point in taking a defeatist stance at this time and so we decided to stick with our gambit for the all overland route. We probably had secret second thoughts once the sledges were loaded up again the next morning with the supplies from the cache, but no-one said anything.

Day 20, 6 April, 15 km.

All the remaining food boxes and spare food, including David’s rations, were burned using the superfluous fuel to assist the fire. The pulk weights were now up again with the loading of the food and fuel for the remainder of the journey. In spite of this we made good progress on a slightly shortened day up the remainder of the Liestoibreen, up its left branch and then East through the pass between Nudden and Nubben peaks, with a steep descent to camp on the upper part of the Nuddbreen. Our pre-planned route choice had been the col to the East of Nubben peak, but we had by now become used to just what contour spacing could be managed with the pulks and we thought this col would not be a good choice. This was proven correct as the north side was far too steep for managing a pulk in descent.
Day 21, 7 April, 21.5 km.

At last a good schuss, down the upper Nuddbreen, but back to the hard slog of pulling on the shallow angle out onto and across the Strongbreen and about three quarters of the way up the Morsjnevbreen to camp under Utstikkaren mountain.

Day 22, 8 April, 14 km.

Continued up the Morsjnevbreen and down the Vigilbreen, around the eastern toe of Vigilen peak and a slight re-ascent to camp on the Richardsbreen. A very hard day due to the poor snow surfaces, but we managed the required average distance.

Day 23, 9 April, 17.5 km.

In spite of the day being all downhill, the snow surfaces once again made it a long hard descent of the Inglefieldbreen to camp below Braastadfjella mountain. Again, the pressure to press on meant camping in the middle of a polar bear alley as the Andrinebreen was too steep to be likely to provide a good camp site.

Day 24, 10 April, 19 km.

A big 300 metre ascent of the Andrinebreen, almost from sea level, knowing we had to immediately descend the other side, back almost to sea level. But good fortune was with us as we had a nearly perfect surface for pulling the pulks up such a steep slope. Previous experience on the trip, of relating contour spacing on the map to the angle of the ground, had shown us that we were not going to be able to adhere to our pre-planned short cut of using the col to the west of Schmidtberget, so we accepted that we would have to descend into Bellsundalen and work our way around Friedrich peak. There were snowmobile tracks here, probably from the hut in Kjellstrømdalen. Two snowmobiles passed by our camp that evening, but did not pay us a visit.

Day 25, 11 April, 20 km.

Continued the descent of Bellsundalen and swung north around the toe of Friedrich peak to ascend Agardhdalen towards the moraine of the Elfenbeinbreen. This was a massive moraine pile, up to 100 metres high in places. A single snowmobile track led up to the left hand edge of the moraine and gave us an indication of where best to find a way through. As we reached the crest of the moraine and stopped for a rest, we saw a party of snowmobiles descending into the more extensive and more complicated eastern edge of the moraine. The subsequent major ascent of 500 metres up the Elfenbeinbreen was aided by an almost perfect surface and camp was made near the top of the Elfenbeinbreen.

Day 26, 12 April, 17.5 km.

After an initial uphill section to complete the ascent of the Elfenbeinbreen, the route continued northwards and we got our first view of the remaining journey north as the vista towards the northern ice caps opened up in front of us. As we skied along a level section,
another party of snowmobiles traversed along a hillside ahead of us, but again no contact was made and our lack of contact with humanity continued. As the Rabotbreen came into view, we began to swing NNW and camped on the col just east of the Moskusflanken.

Day 27, 13 April, 20 km.

Another good schuss down to the toe of Hillgardfjellet, then a slow re-ascent to the col east of Strøkarrfjellet. From this col there was a nice long steady schuss down into a bowl for a relatively sheltered rest, then another re-ascent in two stages, which proved less difficult than they looked from below and led up to another col between Köpingfjellet and Seelheimfjellet. However, there was then a very difficult, steep, but short descent onto the Potpeschniggbreen. Finally, another steady ascent took us up to a camp just below the col between Fallosen and Maunoirberget.

Day 28, 14 April, 17 km.

Initially good travelling along to and down from the col, but then we got into a lot of fresh deep powder snow and full length skins were needed to get enough traction to pull the pulks up the slope on a compass bearing into deteriorating visibility. After this section sastrugi then dominated with alternating hard and soft consistency, the worst surface of the trip so far. A strong wind picked up from the east and remained most of the day, reducing visibility to almost zero and making rest stops uncomfortable as we contoured around the west side of the high ground of the Filchnerfonna. The wind fortunately eased at the end of the day and we found a flat place on which to camp at the start of the Lomonosovfonna. This was the hardest day of the journey so far.

Day 29, 15 April, 17 km.

Second day on the Lomonosovfonna and a steady ascent of another 300 metres. The same strong easterly wind as the day before, with tempting glimpses of craggy mountains out to the east, but the visibility was lost again as the wind increased the amount of spindrift in the air. Only short rest stops were possible again. Here we saw an almost complete ice crystal rainbow around the sun, with a partial second one 180° behind us. False suns appeared on each side of the real sun. We called it day after 7 1/2 hours and all hands put to erecting the tent, ignoring the erection of the trip wire system which would probably have soon gone off in the gusty wind anyway.
Day 30, 16 April, 0 km.

We woke to the same strong wind as the previous day, so decided to wait a while and see how things developed. We were all very tired and lethargic and concerned about breaking camp in case the wind got worse whilst moving and we might find ourselves unable to erect the tent. The pressure had been falling over several days but had now appeared to bottom out. So we decided to stay put and consolidate our position by cleaning snow and ice out of the tent and trying to get equipment dry. After all, we had been beating the target distances we had to cover each day to catch up on the earlier delays in the southbound journey and were now only one day behind schedule.

The pressure rose slightly throughout the day but the wind got stronger towards the late afternoon and early evening to gale force, reinforcing our decision not to have travelled. We turned in to sleep, knowing that a difficult decision to retreat to the Wijdefjorden sea ice route may be needed if there was no improvement by morning.

Day 31, 17 April, 27 km.

The storm raged with strengthening vigour all night, but died out in the morning. There were huge snowdrifts around the tent and two of the pulks were buried. We were now 2 days behind schedule but we had shown ourselves that we could manage twice our target distance given the right conditions and we had not secured any sight of the northern fjords to determine their extent of freezing, so we elected to carry on over the ice caps. The surface was hard going again but we encountered some old snowmobile tracks. These went directly up the hill to the summit of the Lomonosovfonna, but the firmness of the surface and the easier going made up for the extra height gain. The potentially good schuss down the northern slope was ruined by the presence of atrocious hard sastrugi and a cautious descent had to be made to below Saturnfjellet.

As we were climbing a small rise below this peak, we saw two other people coming over the crest towards us. These were the first people we had met face to face since first starting out from the main food cache. It was an incredible coincidence that these two people should be the other team trying to make the first British longitudinal traverse; Matt Tinsley and Neal Hockley from Edinburgh and Cambridge Universities. It proved to be a very amicable meeting. A quick break for a snack and exchange of news indicated that they had started at the northern tip on 1 April, just one day after we had set off from turning around at the south.

Yet, in 15 days they had made southward progress of slightly less than half that which we had made from the south, over 16 days. They explained that their snowmobile drivers had been unable to use the Wijdefjorden to transport them to the northern tip because it was not frozen and instead had been transported through the mountains and over the Åsgårdfonna ice cap, a route which they were now reversing, having attempted the Wijdefjorden route and had to abandon it in favour of climbing back up onto the

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12 We later learned that these had been made by the convoy transporting Matt Tinsley and Neal Hockley to their northern starting point.
Åsgårdfonna, but not now via the optimum route. Bad weather had then slowed them down on the ice cap before they descended the Trinity Hallbreen onto the Veteranen glacier.

We advised them of the route we had used via the Isryggenpasset in the south, to save them wasting their valuable time also, said our goodbyes and wished them luck. But we did not have much confidence that they would be able to reach the southern tip, let alone return to their pick up point near where our main food cache had been, within the remaining time which they had allowed themselves. We skied on and passed their last camp just 15 minutes later. We pressed on for an extra hour to reach the Trebrepasset, knowing then that the next day should all be one long gradual descent.

Day 32, 18 April, 28.5 km.

A beautiful morning, blue sky, no wind. A long steady descent of the Veteranen glacier. At 29 km, our best day yet, coupled with the previous day’s 27 km, we had already recovered the last day lost to storm on the Lomonosovfonna and were now back on our pre-planned schedule.

Day 33, 19 April, 21.5 km.

We started up the Trinity Hallbreen, our most demanding climb of the journey, some 760 metres to be climbed to regain the level of the northern ice cap at the Himinbjørgfonna. We had expected only to be able to manage to achieve the climb over the 10 km length of the glacier and establish camp at the beginning of the ice cap but we were so fit at this stage of the journey that we completed the climb in only 5 hours and put the next 3 hours of our usual 8 hour day into making 8 km progress northwards along this penultimate ice cap.

Day 34, 20 April, 24.5 km.

Our journey continued onto the featureless, gently undulating Åsgårdfonna. We had a slight but thankfully non-serious incident at the end of our lunch break, as John’s leg disappeared down an invisible crevasse whilst getting back onto his skis.

Day 35, 21 April, 25 km.

A cold breeze gradually developed into a strong wind (30-40 mph) with a spindrift blizzard reducing visibility to zero and which lasted all the way off the ice cap until on the relative shelter of the Dunérbreen. It was a difficult pitch here for the tent due to the tiny amount of snow cover lying on otherwise bare water ice. Both stoves stopped working simultaneously and it was a prolonged struggle to prepare the evening meal. Despite now

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13 We later learned that Matt and Neal reached Sørneset on 1st May and returned to their rendezvous pick up point, close to our drop off point, on 6th May, thereby taking 31 days for the end-to-end traverse. They left their packs and supplies at the southern edge of the Serkappfonna, before descending to the coast and back with only rucksacks. They also reported using our route advice to save wasting time where we had difficulties in the Vasilievbreen area (Ref. 4).
being just over one day ahead of schedule, the conditions throughout the day had been so harsh that morale was quite low and tempers were frayed.

Day 36, 22 April, 25 km.

It was calm initially but then a strong westerly wind started. The 9 km descent of the Dunérbreen was made very difficult by very hard and smooth water ice on which it was nearly impossible to control our skis. We made progress by linking up patches of accumulated wind blown snow and waiting for the wind to subdue where they ran out. A gap in the moraine mound was identified which led to a snowy descent through a steep gully, but then more desperate sheets of flat water ice. At one point, with the strong wind, Paul took off sideways like a sailing boat for 10 metres. There ensued a struggle around shallow moraine looking for snow cover. The surface was quite difficult, hard packed snow ridges, with soft drifts in between. We tried to keep close to the mountains for the deepest snow cover but this was actually found to be best mid way to the sea. Then the weather deteriorated again with a northerly blizzard and zero visibility. We had to resort to using the direction of the spindrift blowing over our ski tips to navigate by, as nothing else was visible in front. When everyone’s skis began balling up we decided to set up camp on the Eolussletta in the continuing storm.

Day 37, 23 April, 0 km.

The wind roared all night and heavy wet snow continued to fall. During the day the wind moved further around to the North. The visibility soon improved dramatically and by early evening was almost perfect with superb views back up the Dunérbreen. In the later evening the wind died out, giving superb travelling conditions for the final leg to the northern point in the 24 hours of daylight which was now available. However, democracy resulted in a decision to stay put and rest, ready for the next and hopefully, final day. The weather stayed perfect all through the midnight hours and into the early morning.

Day 38, 24 April, 32 km.

Woke to one of the most beautiful and calm mornings of the whole trip. Unfortunately, by the time we set off, very black storm clouds were coming in fast from the west. Snow flurries began to fall and we had to put on our windproof outer shell clothing. With a strong southerly wind behind us, we reached Verlegenhuken in 3 hours at 09:35 GMT, in unpleasant, overcast, cold and windy conditions. We lunched, dutifully took photos, displayed the Union Jack, and fired four rounds in subdued celebration. When it became too cold to linger any longer we skied back south down the west coast of the Mosselhalveya for 6 hours and 20 km, into the bitter wind to reach the Polheim hut at 1900 hrs, finally arriving in beautiful weather. The evening sun was glinting on the dark open sea, with blue-white icebergs bobbing about, contrasting the glaciated mountain backdrop. 25 April.

An overcast day spent sorting and drying gear and cleaning the hut whilst waiting for the snowmobiles to arrive. We eked out our final rations of a few biscuits and drinks, until we
were down to one malt loaf and a couple of tea bags. If the snowmobiles did not arrive soon we would have to tackle some of the ancient rotting tins which had accumulated over the years in the hut. In the evening several seals were spotted basking on the pancake ice floes in Mosselbukta bay.

26 April.

An arctic fox trotted by the hut in the early hours\textsuperscript{14}. Having checked that the hut surroundings were bear-free once and gone outside to empty the ash sweepings from the hut stove, John then went out again a minute later to empty a second lot of ash, only to see a very large polar bear's rear end ambling away not 20 feet away from him. Upon examining its tracks it was clear that it had come upon the hut over a shallow rocky ridge, then padded around the wooden veranda and past the hut door just seconds before, without making any sound. We secured photographs through the windows before it ambled off over a rocky outcrop. Needless to say it was some time before anyone decided to go outside for the usual daily constitutional.

The snowmobiles arrived in the evening and expressed astonishment at the size of the bear's footprints, being some of the biggest they had ever seen. In recognition of the significance of our achievement, the drivers had brought with them a bottle of champagne for celebration. We all spent a cramped night with every nook and cranny occupied. There was a little relief as we each took a one hour turn on watch over the snowmobiles\textsuperscript{15}.

27 April.

The trailers were loaded and we were away by 0800. It wasn't long before we had to stop to repair one of the sledges. Then up Mosseldalen and the Tåbreen onto the Åsgårdfonna. Along here the last snowmobile suddenly came to a dead stop as the suspension on its sledge failed and its ski dug deep into the snow. Not only did this completely mangle the sledge's ski but John nearly took off in flight over the head of Andre, the driver.

A turn west was made to find the start of the Sorbreen but on the way off the ice cap we encountered a zone of big crevasses. The drivers started jumping these, but they became gradually wider and wider until the biggest was about 2 metres from near to far side. We felt the impact of the front skis and then the track belt on the edge of the far sides when the snowmobiles dropped slightly as we flew through the air and the snow bridges collapsed under us, leaving a trail of ominous black slots. One snowmobile suffered a buckled torsion strut, bent from the impact. Having cleared the zone the drivers looked back with ashen faces, clearly shaken at how lucky we had all been to get through without any more serious mishap.

\textsuperscript{14} We subsequently learned that if an arctic fox is spotted, one should reasonably expect a polar bear to be in the vicinity also, as the foxes follow the bears in order to feed on the scraps of kills left behind.

\textsuperscript{15} Polar bears apparently like to eat the seats, so the drivers tie on a fuel can, which the bears don't like the smell of.
The subsequent 1000 m of descent of the Sørbreen to the Wijdefjord was spectacular but uneventful. Below us we could see the limit of the sea ice within the fjord, frozen to the south and open water to the north. The drivers noted that the ice edge had retreated since they had passed this way the previous day. We raced south, down the Wijdefjorden and Austfjorden, at up to 50 mph on the rough knobbly ice. As we sped along, grey mottled seals basking by their blow holes would lift their heads as if tut-tutting over the noisy intrusion. They were dotted all over the place and then we spotted a nasty bright blood red mess on the ice where one had been inattentive and had recently become a bear’s breakfast. The bear, with red jaws, was spotted shortly afterwards. We passed a number of other huts which border this fjord and which earlier expeditions had used, as this is an area of high polar bear risk, this being a popular location for their over-wintering dens. One of the huts is a trapper’s permanent home.

A re-fuelling dump had been made at the foot of the Mittag-Lefflerbreen. Then up the Mittag-Lefflerbreen, down the Ragnarbreen and out onto the frozen Billefjorden. Up the Nordenskiöldbreen and down again to Gipsdalen. Whilst we had a break the guide, Erik, checked out the route; a difficult steep run to get up onto the Boltonbreen. Down the Murchesunbreen and out onto the frozen Tempelfjorden. Across this to the Fredheim hut, crossing several big cracks in the sea ice. A major break up was imminent and it may all have been carried out to sea any day - we had only just made it in time. Across the huge flat black expanse of Sassendalen, between marker towers, then through the narrow Eskerdalen, and finally along Adventdalen back into Longyearbyen. It was very wet slushy and blackened snow, a big thaw was obviously in progress and Andre was concerned for the viability of his intended tours with clients over what remained of the season. Back at Andre’s garage there were more celebrations with another bottle of champagne.

28 April.

Fresh food for breakfast at the Nybyen guesthouse was a delightful experience and we could have kept eating forever. The day was spent sorting and packing equipment in readiness for freighting home. John managed to secure a telephone based interview from the UK press.

29 April.

The bus picked us up from Nybyen in fresh falling snow and we were back in Newcastle by late afternoon. In spite of our publicity contact’s efforts and having now accomplished our objective, we were a little disappointed that the press were not there to meet us, having shown such interest when we had started out. However, from their perspective, it was a Sunday evening and, for us, we were a little relieved as Paul was clearly looking forward to getting home and seeing his family again as soon as possible.
CONCLUDING REMARKS

In our applications for grants and equipment awards we claimed, boldly, that we were the strongest British team ever to attempt this traverse. Despite this we received very little support. However, our claim has been vindicated without reservation. We achieved all of our objectives. Indeed, we succeeded in completing the traverse by a more demanding route and in a shorter time than an almost totally subsidised and much younger team.

We took a big risk starting so early when temperatures were at their coldest and the daylight hours so short immediately after the end of the polar night. Even with the most modern equipment technology available we had an arduous time of it in the southbound section of the expedition. For a short period of time we all four gained a first hand insight into what the early polar pioneers must have felt during the difficult times on their pioneering journeys with their much more basic equipment.

Unfortunately one of us did not make it all the way. Major David Johnson, who after all had conceived the idea of the expedition, took a very difficult and brave yet wise decision to terminate his attempt at the southernmost point and we can only guess at how bitterly disappointed he must feel. Nevertheless he can console himself with the fact that he did complete the first British traverse of the South Spitsbergen National Park and the first ever such traverse in Winter conditions. And he, along with the rest of us, still has all of his toes, so we can all look forward to further adventures in our chosen sport.

Nevertheless in spite of the appalling, inescapable environmental conditions, our meticulous planning paid off and three of us did succeed where three previous British attempts have failed. Once again in the history of polar adventure, a British team was audacious enough to attempt something no-one had done before. We did it first, we did it fastest and we did it all overland. We have set a new standard for others to emulate and we hope that in due course someone will do it better.

Our companions in adventure, Matt Tinsley and Neal Hockley also made a valiant effort in similar conditions and can pride themselves with the first British crossing in the North to South direction. However, their journey was not by an all overland route and they took 31 days, end-to-end, compared to our 25.

We can only speculate as why they attempted to start out by travelling along the edge of the Wijdefjorden when they knew that northern seas were not frozen; was this part of a strategic plan to make up time and distance on us? After all, in terms of being the first to complete the traverse from end-to-end we effectively started out, leaving the southernmost point, only one day before them - they would not have to complete the return northbound leg of the southern national park to qualify for being the first, but merely to arrive at the southern tip before we arrived at the northern tip. If this was a gamble on their part it clearly did not pay off, as they then had to haul their sledges and supplies up onto the northern ice caps whilst they were at their heaviest and into a high, exposed environment earlier in the season than when we encountered it; factors which we had taken into consideration in selecting our own direction of travel.

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Also, unfortunately they did not truly carry all of their supplies the whole distance, inclusive of the return northbound leg, having cached their equipment and proceeded to the southern tip only with rucksacks. Due to their lack of foresight associated with this course of action, the target of an unsupported crossing, carrying all supplies over the whole distance of the traverse and including over the return leg, still remains to be achieved. Nevertheless, we would like be the first to recognise that their achievement, in terms of the extent of physical effort put into moving supplies, has the potential to be greater than ours (whilst they carried more of their supplies a further distance, they did not carry it up and down a similar amount of height gain and loss).

Regardless though of the merits of who did exactly what, when and how fast, all told a tremendous achievement for Britain in the year 2001.

We were somewhat disappointed at the level of financial and equipment support proffered to the expedition as result of our applications to the various recognised bodies. The competition for awards is intense and one needs to assemble the best quality case one can make. All of our applications were quality work, being typed and accompanied by good supporting information. We thought we had presented our case well, that we thought we were the strongest British team ever to attempt this challenge and that we had the best possible chance of success. Yet we received only £400 in official grants (only 4% of our budget), whereas Matt and Neal succeeded in obtaining £5850 in official grants, (92% of their budget, Ref. 4).

The reader may well be excused for wondering why the team with the greater polar experience came away from the grant system so poorly rewarded. The answer lies in the rules and criteria which the bodies’ selection committees apply, generally preferring to make the awards to the younger, the less experienced and generally less able to find their own funding.

We cannot say that we were conscious of it at the time, even during our moments of greatest difficulty, but there must be an element of a stronger desire to succeed when it is one’s own money and that of friends and family which is being staked, rather than that of organisations with a more distant relationship.

As regards advice for any future expedition considering an attempt to better our effort, well, we have presented enough evidence within this report of our thoughts at the planning stage and how events actually transpired in comparison, to enable you to make your own judgements. Some improvements we would suggest are as follows, but we will not accept any responsibility if you embrace these and fail!
• we would still go south to north
• we would probably not bother to keep the food within bear resistant boxes whilst on the sledges, only at a food cache.
• if we were moving camp every day, we would probably not bother keeping the food at least 100m away with a separate trip wire system around it, rather keep it in the sledges, close by the tent, and with a double trip wire circuit for that “second chance” diversity.
• we would not use the UK type mini-12-bore cartridges again, even though the local devices are very expensive and prone to be hair triggered
• we would prefer to take weapons from the UK
• we would choose a tent far simpler to erect, with less fussy, detailed features
• we would use vapour barrier liners inside and bivvi bags outside, of our sleeping bags
• Glenn would use a reindeer skin in lieu of a Thermarest (the rest of us have no experience of reindeer skins)
• we would use boots with an adequate amount of space for foot movement and blood circulation
• we would not go without the half length skins
• we would not use Gore-Tex based outer shell clothing
• we would never go outside of a hut without a rifle, every time!
• we would not take a video camera and tripod!
• we would take an Iridium satellite telephone in place of the Mobiq Mini-M
• we would take more insulation for the legs on the outbound snowmobile journey

REFERENCES


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16 This report by Tinsley and Hockley of their expedition contains statements which imply that the Polestar Expedition received external support. This is categorically denied by the members of the Polestar Expedition. Also in their report Tinsley and Hockley make claim to priority on the completion of the first British unsupported longitudinal traverse of Spitsbergen. Accordingly, the Polestar Expedition has twice invited Tinsley and Hockley to present their reasoning as to why they believe that the Polestar Expedition was not unsupported or otherwise to withdraw their claim, to amend their report and withdraw all previously distributed copies of it. They have singularly failed to take either of these courses of action.

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Figure 1 Whole of the expedition route showing snowmobile and skiing routes
Figure 2 Map showing the route and camps for the southern third of the expedition
Figure 3 Map showing the route and camps for the central third of the expedition

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Figure 4 Map showing the route and camps for the northern third of the expedition
Figure 5 Photomontage of the southbound part of the expedition from the depot to Skjenneset

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Figure 6 Photomontage of the route northwards from Sørneset to Inglefieldbreen
Figure 10 Expedition members before, during and after the expedition
Dear Mr. Starbuck,

The Queen has asked me to thank you for your letter of 7th September telling her of the success of the Polestar Expedition 2001 which was concluded on 24th April this year.

Her Majesty much appreciated your thoughtfulness in sending her information on the accomplishment of Mr. Glenn Morris, Mr. Paul Walker and yourself in achieving the first British unsupported longitudinal traverse of the arctic island of Spitsbergen and in so doing raising greater awareness of Motor Neurone Disease and helping to raise funds for this charity.

The Queen was glad to know that Major David Johnson has made a full recovery from the injuries caused from the cold and frostbite and can appreciate how disappointing it must have been for him, as the originator of the expedition, to have been unable to join the rest of his team at the conclusion of your journey.

Your description of the terrain, the temperatures and of your close encounters with no less than four polar bears is most interesting, as is the photograph and map which you enclosed with your letter, and Her Majesty sends you all her warm congratulations and very best wishes.

Yours sincerely,

MRS. DEBORAH BEAN
Chief Correspondence Officer

John Starbuck, Esq.

Figure 11 Correspondence to the team from Buckingham Palace
From the Senior Policy Adviser

12 October 2001

Dear Mr Starbuck,

The Prime Minister has asked me to thank you for your letter of 7 September informing him about the successful first British unsupported longitudinal traverse of the arctic island of Spitsbergen.

I should be grateful if you could forward the enclosed letter to Major David Johnson from the Prime Minister.

May I add my congratulations to you, Glenn Morris and Paul Walker for completing the expedition.

Sarah Hunter

Mr John Starbuck

Figure 12 Correspondence to the team from Downing Street

This report and all photographs within it are copyright of the Polestar Expedition 2001
The Prime Minister

12 October 2001

Dear Major Johnson,

May I offer my congratulations to you on your part in the historic achievement of becoming the first British expedition to complete the unsupported longitudinal traverse journey of the Arctic island of Spitsbergen. This historic achievement is a fitting tribute to your hard work and dedication.

I was sorry to hear that you were unable to complete the journey due to frostbite but I am sure that you must be proud of having conceived this great expedition.

May I wish you every success with any future expeditions that you may have planned.

Yours sincerely

Tony Blair

Major David Johnson

Figure 13 Correspondence to David from Downing Street

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Hot-footing it to the Arctic

City climber sets sights on Arctic record

Spitzbergen quest for John

Arctic first hopes
New Hutton man leading Polestar Expedition

Figure 14 Newspaper articles prior to the expedition's departure
Close encounters of the Polar kind

Adventurers return in triumph after Arctic trek

John's world first

SELLAFIELD'S POLE STAR SETS RECORD

FREEZE FRAME

Ten seconds from being a polar bear's breakfast...

Figure 15 Newspaper articles upon the expedition's return

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Appendix 1

Summary of Previous British Attempts

1. 1996, March, North to South

Members; Andrej Vaughan, David Cowell

Covered 243 km, unsettled weather, poor snow conditions, loads too heavy, limited polar experience, inefficient routines, unfamiliarity with equipment.

2. 1996, March/April, South to North

Members; Tom Aylwin, Tim Burton, James Mayer, Nick Ravenscroft

Travelled only 16 days, deep snow, gale force winds, turned around before reaching Sørneset, returned to find food cache destroyed by polar bears.

3. 1998, March/April, South to North

Members; Thomas Agombar, David Mills, Alexandra Phillips, Timothy Saunders

Covered 400 kms, much time lost early on due to bad weather, ran out of time.
Appendix 2

List of private and individual sponsors

J Hogg
R F Morris
J T Rampe
M D Phillips
W & K Britten
J Bolton
Hon J Hogg
G Bragg
L Durovic
J M Rice
C Worraker
Dr P F Harrison
D A Shipman
C Bellenger
H D Grewcock
A T Radcliffe
R C Pearce
S E H Twallin
J Gibson
B L Hosp
A W Billington
N Tate
J Denham
W Ranger
M E Spicer
P J Stowe
J Rampe
A W Haselden
E M Holland
N Barton
Mr & Mrs Anderson
A Coles
A Frith
M Starbuck
J M Owlett
J Howes
F Spokes
Sir M Bett
A C Hibberd
R F Walsh
D J Caller
J C Twallin
G E & V Starbuck
J P B Gornall
C Chan
T & L Dixon
N Knight
I E Richardson

Various of John’s colleagues at BNFL and many other anonymous individuals
### Appendix 3: Comparison of possible strategies in terms of relative man-hauling effort required

**Assumptions:**
- Weight of four pulks including personal & group loads (kg) 200
- Weight of food consumed by four men each day (kg) 4
- Weight of fuel consumed each day by two stoves (kg) 1

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<th>Scenario 1</th>
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<td>Make cache and go to south tip &amp; back with 14 days of supplies. Pick up 26 days supplies at cache</td>
<td>Make cache and go to south tip &amp; back with 14 days of supplies. Make 2nd cache at 5 days south. Pick up 26 days supplies at cache</td>
<td>Take all supplies to the south tip, starting with 40 days of supplies</td>
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<td></td>
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<td>235</td>
<td>235</td>
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<td>225</td>
<td>225</td>
<td>205</td>
<td>360</td>
<td></td>
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<td>205</td>
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<td>340</td>
<td></td>
</tr>
<tr>
<td>335</td>
<td>300</td>
<td>205</td>
<td>335</td>
<td>Supplies exhausted again (scenarios 2&amp;3)</td>
</tr>
<tr>
<td>330</td>
<td>330</td>
<td>205</td>
<td>330</td>
<td>Pick up 26 days cache at Liestolbreen (not applicable to scenario 1)</td>
</tr>
</tbody>
</table>

| 325 | 325 | 325 | 325 | Same for all scenarios from here onwards |
| 320 | 320 | 320 | 320 |
| 315 | 315 | 315 | 315 |
| 310 | 310 | 310 | 310 |
| 305 | 305 | 305 | 305 |
| 300 | 300 | 300 | 300 |
| 295 | 295 | 295 | 295 |
| 290 | 290 | 290 | 290 |
| 285 | 285 | 285 | 285 |
| 280 | 280 | 280 | 280 |
| 275 | 275 | 275 | 275 |
| 270 | 270 | 270 | 270 |
| 265 | 265 | 265 | 265 |
| 260 | 260 | 260 | 260 |
| 255 | 255 | 255 | 255 |
| 250 | 250 | 250 | 250 |
| 245 | 245 | 245 | 245 |
| 240 | 240 | 240 | 240 |
| 235 | 235 | 235 | 235 |
| 230 | 230 | 230 | 230 |
| 225 | 225 | 225 | 225 |
| 220 | 220 | 220 | 220 |
| 215 | 215 | 215 | 215 |
| 210 | 210 | 210 | 210 |
| 205 | 205 | 205 | 205 |
| 9405 | 10280 | 10180 | 12180 | Supplies exhausted (all scenarios) |

| 0 | 9 | 8 | 29 | Extra effort compared to scenario 1 (%) | 57 |

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<table>
<thead>
<tr>
<th>Date</th>
<th>General Comments</th>
<th>Cloud a.m.</th>
<th>p.m.</th>
<th>Direction a.m.</th>
<th>p.m.</th>
<th>Wind a.m.</th>
<th>Strength</th>
<th>Early</th>
<th>Mid Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-Mar</td>
<td>Cold, clear</td>
<td>None</td>
<td>None</td>
<td>SSW</td>
<td></td>
<td>Very Light</td>
<td>Light</td>
<td>-23</td>
<td>-20</td>
</tr>
<tr>
<td>18-Mar</td>
<td>Cold, clear</td>
<td>Little to South</td>
<td>S</td>
<td>Light</td>
<td>Light</td>
<td>-24</td>
<td>-17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-Mar</td>
<td>Cold, clear</td>
<td>Little to South</td>
<td>W glacial</td>
<td>Mod on glacier</td>
<td>-26</td>
<td>-20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-Mar</td>
<td>Fairly warm and windy at times</td>
<td>Hazy, obscured sky to South</td>
<td>N</td>
<td>Very cold</td>
<td>Very cold</td>
<td>-25</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-Mar</td>
<td>Broken sun, hazy</td>
<td>Very little</td>
<td>N</td>
<td>Hazy, cold</td>
<td>Strong</td>
<td>-26</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22-Mar</td>
<td>Very cold start, slight warmth to sun</td>
<td>None</td>
<td>Light mist</td>
<td>NS light</td>
<td>-30</td>
<td>-24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23-Mar</td>
<td>Very cold start, slight warmth to sun</td>
<td>None</td>
<td>None</td>
<td>N</td>
<td>-30</td>
<td>-24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-Mar</td>
<td>Very cold wind all day</td>
<td>Little</td>
<td>Spindrift</td>
<td>NE</td>
<td>-18</td>
<td>-17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-Mar</td>
<td>Ground blizzard</td>
<td>Fair amount, hazy all day</td>
<td>NE</td>
<td>Strong</td>
<td>Strong</td>
<td>-18</td>
<td>-14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-Mar</td>
<td>Ground blizzard all day, eased at pass camp</td>
<td>Fair amount, hazy all day</td>
<td>NE</td>
<td>Moderate</td>
<td>Moderate</td>
<td>-20</td>
<td>-18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27-Mar</td>
<td>Nice in morning but cold wind in afternoon</td>
<td>Cloudy/misty on ice cap/clearing</td>
<td>NE</td>
<td>Moderate/strong</td>
<td>Moderate/strong</td>
<td>-7</td>
<td>-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28-Mar</td>
<td>Very cold wind all day, everyone cold</td>
<td>Storm</td>
<td>NE</td>
<td>Gale</td>
<td>Gale</td>
<td>-17</td>
<td>-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29-Mar</td>
<td>Reached tip of Someset and hut, beautiful</td>
<td>Broken/misty on ice cap then clear</td>
<td>E</td>
<td>Light</td>
<td>Light</td>
<td>-30</td>
<td>-27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-Mar</td>
<td>At hut all day</td>
<td>9/10</td>
<td>9/10</td>
<td>Light, sunny, cold all day</td>
<td>Very Light</td>
<td>Very Light</td>
<td>-14</td>
<td>-12</td>
<td></td>
</tr>
<tr>
<td>31-Mar</td>
<td>Excellent mileage, good weather, better surfaces</td>
<td>7/10</td>
<td>7/10</td>
<td>NE</td>
<td>NE</td>
<td>-28</td>
<td>-15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-Apr</td>
<td>Cloudy, hazy, occasional sun, showers, misty</td>
<td>7/10</td>
<td>7/10</td>
<td>Light</td>
<td>Light</td>
<td>-24</td>
<td>-17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Apr</td>
<td>Sun and very cold all day</td>
<td>Fine sunny, no wind</td>
<td>SW</td>
<td>Very Light</td>
<td>Very Light</td>
<td>-22</td>
<td>-17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Apr</td>
<td>Hazy sun all day, cold gentle northerly wind</td>
<td>6/10</td>
<td>6/10</td>
<td>NE</td>
<td>NE</td>
<td>-14</td>
<td>-12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-Apr</td>
<td>Mild perfect morning, warm</td>
<td>10/10</td>
<td>10/10</td>
<td>Very Light</td>
<td>Very Light</td>
<td>-12</td>
<td>-9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-Apr</td>
<td>Fine sunny, no wind</td>
<td>9/10</td>
<td>9/10</td>
<td>Moderate</td>
<td>Moderate</td>
<td>-24</td>
<td>-24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-Apr</td>
<td>Hazy sun, broken cloud</td>
<td>1/10</td>
<td>1/10</td>
<td>NE</td>
<td>NE</td>
<td>-24</td>
<td>-24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-Apr</td>
<td>Hazy, light snow, poor visibility</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-Apr</td>
<td>Very cold NE wind, coldest feeling day yet</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-Apr</td>
<td>Cold again, sunny all day, very cold breeze at times</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Apr</td>
<td>Excellent, no wind</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-Apr</td>
<td>Excellent, cold wind in last two hours</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-Apr</td>
<td>Windy start, worst yet</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13-Apr</td>
<td>Very hazy most of day, chilly in light wind but OK</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-Apr</td>
<td>Windy all day, snowed last night and lightly all day</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-Apr</td>
<td>Very windy and cold all day, wild, worst travel day</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-Apr</td>
<td>Blizzard, storm, no travel</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-Apr</td>
<td>Improved all day, windy start, perfect calm evening</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-Apr</td>
<td>Excellent all day, some local 8 glacial wind</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-Apr</td>
<td>Calm and clear all day, warmest feeling travel day yet</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-Apr</td>
<td>Calm. Clear then misted in throughout day to light snow</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-Apr</td>
<td>Wind got stronger all day. Extremely bitter and cold</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22-Apr</td>
<td>Clearish (some mist), turning to whiteout/blizzard</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23-Apr</td>
<td>Ground blizzard, poor visibility, strong wind, perfect evening</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-Apr</td>
<td>Beautiful start and finish. Poor visibility and ground blizzard mid 4 hours</td>
<td>10/10</td>
<td>10/10</td>
<td>Light</td>
<td>Light</td>
<td>-18</td>
<td>-20</td>
<td></td>
<td></td>
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</table>

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Appendix 5: Comparisons with other Polar expeditions

Comparison of Maximum Temperatures

Comparison of Accumulated Height Climbed

Comparison of Minimum Temperatures

Comparison of Accumulative Distances

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Appendix 6

Food types taken

We had quite a variety in our food, taking into consideration beforehand what a bonus this would be to morale. The menus were based on several years of experience of Greenland expeditions.

Our plan was to take provisions for about 5,400 calories per day and to resort to half rations on days if and when we were immobilised by bad weather. We knew that this would be a deficit against the likely daily requirements and in confirmation of this, we each lost the order of a stone in weight.

Breakfasts included muesli or nut crunch cereals with powdered milk, porridge & treacle, or malt loaves. Hot flasks of drink were simultaneously prepared for consumption at each rest stop.

Lunches were based on various sweetmeal biscuits to accompany blocks of cheese, minipepperami’s, Pringles crisps. A variety of chocolate based snacks, small cake bars and cereal bars. Both these and the cheese had to be put into an internal clothing pocket at the beginning of the day to have any chance of being edible.

Evening meals started with powdered soups, often accompanied by croutons, followed by a carbohydrate base of rice, pasta or noodles accompanied by one of several dehydrated main meals. Lastly a high calorie desert to look forward to of sponge cake with custard or Hot Crunch pudding.

We had various cup-a-soups to drink along with the usual tea bags and coffee, though these latter had little calorific value and the soups were preferred.

Each of us also had a range of snacks to nibble on at all times (peanuts, pine nuts, dextrose tablets), though this required some discipline to make them last!

Thanks to this variety, every meal was looked forward to and there was never a feeling of “oh no, not that again!”
Appendix 7

Equipment Report

Group equipment

The expedition carried some 60 kg of group equipment (excluding the weight of the pulks themselves) of which the major items were:

Pulks and spares
Tent and spares
Stoves in stove boxes and spares
Pan sets
Bear proof food boxes (wood)
Bear proof food box (Aluminium)
Mobiq Mini-M satellite telephone and spare battery
Rifles and ammunition
Camp trip wire kit
Solar recharging system
Digital video camera, film and tripod

- Snowsled pulks - serviced with new runners - performed excellently
- Mountain Hardware Weatherstation tent - we have to say that this was generally adequate for the job, because we managed for 38 days in it, but it had a lot of design flaws which make it unsuitable for polar travel in sustained low temperatures:
  1. It was supposed to be designed for five, but was in fact cramped for four with all their polar equipment. Very suitable for three plus gear.
  2. It was chosen, to a large extent, for the windows, which it was anticipated would permit us to see any polar bears approaching in good time. However at the persistently low temperatures which we experienced the windows were permanently frosted up and the access ports to them, from within the inner tent, were a tremendous nuisance as they repeatedly collected snow and hoar frost which then cascaded onto the occupants and their equipment; every camp required a constant battle to cope with this.
  3. The number of plastic clips through which the poles had to be threaded was ludicrous and there was no colour coding to help get the right poles in the right clips. Very often clips were missed and then had to be twisted on later. This was OK if they were warm and pliable, but they became rigid and inflexible at these low temperatures. Continuous pole sleeves would have been a far better design and quicker to erect.
  4. The ring features on the groundsheet stake out tabs and the plastic hooks which held the flysheet on, were far too small and fiddly to be managed at these low temperatures.
  5. The use of Velcro to secure the porches of the flysheet to the porch poles was another fiddly feature which let the tent down, particularly when hooks were also employed for the same function anyway.
• MSR Dragon fly stoves - these kept going in spite of there being insufficient time for regular maintenance. Heat output was sometimes erratic so they were stripped down, cleaned and re-assembled, but only twice in 38 days of heavy usage. We later concluded that the erratic performance was most likely due to the limited oxygen supply available in the tent vestibules, which we had kept well sealed against spindrift incursion.

• Stove boxes - these were made for us by the GEN II apprentices from 2 mm Aluminium sheet and allowed us to leave the stoves fully assembled at all times. They consisted of a rear and two side walls welded to a base plate and with a sliding lid. There was a pipe clip to hold the fuel bottle and some guides on the base to prevent the stove from sliding around. They performed perfectly, saving us hours of time otherwise assembling and dismantling stoves with cold fingers at the end of long hard days of man-hauling.

• MSR pan sets - we used one stainless steel set, which previous experience had shown was very easy to clean, even when food was burned on the bottom. We also tried a set of the new Teflon coated non-stick aluminium pans, but we only had metal utensils and it was not long before the Teflon coating was seriously compromised.

• Food boxes:- we commissioned the GEN II apprentices to construct for us some wooden boxes from plywood with rebated joints and internal corner braces, both glued and screwed, to give the maximum rigidity and strength. They were also bound in all three planes with nylon reinforced binding tapes. 12 mm ply was used for the food cache boxes (12 kg each) and 9 mm ply for the boxes we carried with us (9 kg each). The boxes easily survived the shipping from the UK and the snowmobile journey out to our starting point, but were never put to the ultimate test as they were never investigated by any bears. These wooden boxes were sized so as to use the maximum width of the pulk and hence keep the centre of gravity low down. We also carried an aluminium box made by Lacon (7 kg), in which we kept food for ready access at each camp, but this had a footprint quite a bit narrower than the pulk and resulted in a number of overturns of the pulk.

• Mobiq satellite telephone - the specification for this was that a signal should be available up to 76°N, the latitude at which we would only just start our journey at the southernmost tip. But we hoped that once we had some altitude in the mountains, that this would effectively bring the satellites above the horizon. This proved to be the case, until we began the descent down the northern slopes of the Åsgårdfonna. The satellite telephone proved invaluable at the southern tip for expediting the evacuation of David; without it we would have had to return with David to Sveagruva, which, along with the further peril to David’s feet, would not have left us enough time to complete the expedition.

• Weapons. Glenn purchased a new Remmington .308 and took this out from the UK. Soft nosed ammunition had to be purchased locally in Longyearbyen. We had been advised that at this calibre, repeated shots would be needed to kill a polar bear. .357 was the recommended calibre for stopping a bear in its tracks, but the weight of the weapon becomes impracticable for carrying comfortably. It wasn’t exactly easy to ski along in a pulk harness and with a rifle across the shoulders whilst also keeping balance over rough terrain. The weapon would slide off the shoulder and bringing it around into action with double mitts on was not an elegant manoeuvre.
David was to supply a pump action shotgun, modified to fire single slugs of lead; not very accurate, but effective at close range. Unfortunately he left the amendment of his shotgun licence too late for the authorities to process the change in time, so we had to rent another rifle in Longyearbyen. This was a very old and very heavy 30.06 of unknown origin. The bolt was very difficult to strip down and reassemble for servicing. The rental cost was nearly a third of the cost of Glenn’s new rifle.

- **Trip wire system**
  Addis donated to us two dozen hollow metal broom handles with plastic top features for hanging them. By cutting slots in these tops, we had a ready means of supporting the trip wire cord. The cord was stored on a reel made from a redundant chain spool from a hardware store, mounted on a piece of polythene pipe and turned with an old ski stick tip. We used a radius of about 25 metres, by attaching a 25 m line to a ski stick in the centre of the camp and then skiing around in a circle whilst holding the other end of this 25 m line and placing the broom handle supports at 45° intervals. The spring loaded firing mechanisms, bought in the UK as proprietary items, worked reliably enough although the black powder filled shotgun style cartridges were very unreliable and failed to go off, even when it was clear that the firing pin had struck the primer cap. Sometimes the strong winds would release the spring mechanisms and the cartridge would not fire.

- **Solar recharging system** - we used a KISS system solar panel to top up the batteries of the satellite telephone - output early on the journey was not very great due to the low angle of the sun but this improved significantly towards the end of the expedition.

- **Video camera** - we took a National Panasonic NVDX100 three chip colour digital video camera. This is a superbly lightweight and near broadcast quality camera, but unfortunately we found that we simply did not have enough time in our busy daily routine to do any significant filming. In addition, even if time had been available, the prevailing conditions of such extreme and persistent cold were not conducive to either operating the camera or to persuading other members to co-operate with a cameraman’s wishes.

**Personal equipment**

Skis:-

Åsnes Sondre Nordheim x 2 (John & Paul)
Karhu XCD (Glenn)
Dynastar Montagne (David)

Skins & waxes - Black Diamond Back Country half-length skins - these were a superb asset; they permitted the tip and tail of the ski to glide on every stride, saving us lots of energy. Only on the worst sastrugi did they lose traction if one did not get the stride length quite right. Their benefit was not immediately obvious until we had to switch back to full length skins for one day, when the additional drag arising from tip and tail friction was immediately noticeable. We did not use waxes at any time as the pulk weights were far too heavy for the snow conditions encountered.
Boots:-

Garmont Libero boots - both David and Paul had these and both suffered cold injuries to the toes, though this could just be coincidence as both believe their toes are more susceptible to cold than average. In retrospect both David and Paul believed that they would both have been better off with a size up. A snug fit may well be what is necessary for good downhill control, but for this kind of tour, good circulation through a non-constricting fit is far more important.

Scarpa T3 (Glenn - brown - old style, John - black - new style). Glenn used his old T3s from his 1999 Greenland crossing, having found them to be very comfortable, though there was some concern about brittle failure at very low temperatures as the outer shells of David’s pair of similar boots was found to have shattered into several small pieces after air freighting back to the UK in 1999.

The ankle of the new Scarpa T3 boot was higher cut than the previous model and is now similar to the earlier T2 model. There was therefore some uncertainty as to whether it would still be a comfortable touring boot. John did not note any problems from the high ankle cuff but reported the same pressure discomfort on the inner ankle bone which has been encountered previously by others on the original style. This could only be relieved by taping double thickness’ of Karrimat to his lower leg.

Vapour barrier boot liners - John had some very old and well worn versions from REI of Seattle, which worked well and he never had wet or frozen boots. Paul had some new ones from PHD and found there to be no difference to how wet and frozen his boots became with or without the liners.

Camping

Thermarests:- invaluables; we cannot imagine the trip being tolerable without these. However, we made the error of inflating these by blowing directly into them from our lungs. The moisture in our breath froze within the mattresses causing the upper and lower faces to stick together in randomly dispersed areas. These areas seemed to coincide with a subsequent de-lamination of the surfaces from the internal closed cell foam filling, resulting in air filled blisters, which then gradually spread and made the mattresses uneven to sleep on. The manufacturers advise not to inflate the mattresses in this manner in such cold conditions as we encountered. In the warmth of the Polheim hut we drained several millilitres of water from our Thermarest mattresses.

Sleeping Bags:-Paul and John used top of the range down filled sleeping bags (Rab and North Face), whilst David and Glenn used top of the range synthetic filled sleeping bags (Ajungilak). Initially, all members started sleeping just in their sleeping bags, but in all cases, the bags soon became saturated with perspiration and became matted, frozen lumps, which had to be wrested apart before getting inside to sleep. A ring of ice would form around the hoods from frozen breath and sleep was only gained fitfully in short bursts as each time we rolled over, all the stored warm air would be replaced with cold air,
somewhere below -30°C. In the first few weeks of the journey the cold was so intense that we slept fully dressed in our normal hauling clothing, including our full windproof outer shell garments.

PHD vapour barrier sleeping bag liners: these were expensive for what they are, but were invaluable. After repeated, slow drying out our bags in the weak sun, by tying them onto the top of the pulks, John and Paul began to use these to prevent body moisture from soaking into the sleeping bag insulation. Slowly but surely this also helped our bags to dry out, but the penalty was waking to humid clothing, which was not very conducive to getting out of the bags in the morning.

John and Paul also used Gore-Tex bivvi bags to protect the outsides of the bags from the worst of the ice and condensation within the tent. Getting in and out of three layers of sleeping bag was a real chore and the gymnastic antics was often a source of great annoyance to the other tent occupants, but it was the only way to get a decent period of continuous sleep.

Clothing

John used a Gore-Tex outer shell suit of jacket and salopettes by Mountain Range and also Wild Country mountain mitts - but at the end of most days, the Gore-Tex shells had to be peeled apart from the underlying fleece jacket or glove due to perspiration freezing between the two layers. The resulting icy fleece jacket or glove would then have to brushed down in the tent vestibule to remove the worst of it, otherwise it would thaw in the tent and the clothing would become saturated and would have to be dried by wearing them whilst sleeping (which of course helped to make the sleeping bags wet...).

Paul used an outer shell lightweight Paramo Fuera windproof jacket which proved to be superbly breathable, extremely lightweight and comfortable and virtually no internal icing up was experienced.

Glenn and David used Helly Hansen North Pole Parkas, left over from their Greenland crossing. These were made from Microfibre and this too performed very well with no internal icing up. (this product is now discontinued).

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17 Our thermometers only went down to -30°C and their needles spent a lot of their time stuck against the bottom end stops.

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KIT LIST

Personal Kit:-

Watch
Head torch
Expedition rucksack
Daysack
Gore-Tex bivvi bag
Karrimat
Thermarest
Sleeping Bag
Vapour Barrier Liner
Food bowl
Insulated Cup
Spoon/Knife
Pee Bottle
Stainless Steel Flask
Compass
Glacier Glasses
Snow Goggles
Neoprene Face Mask
Multi-tool
Skins, bindings, poles
Skins – one full length pair & one half length pair each
Crampons

plus a variety of personal clothing items, varying from person to person

Communal Equipment:-

2 x sets of 1:100,000 maps
40 days food
40 days fuel (48 litres)
40 days toilet paper
7 x 80 litre wooden food boxes
1 x 80 litre metal food container (airtight/sealable)
1 x pair spare ski poles - Lifelinks/double as avalanche/crevasse probe
4 x 1.6m pulk
spare pulk hauling bar & miscellaneous pulk spares
waxes for pulk runners
3 x MSR Dragonfly stoves
3 x MSR Cook pan sets & heat exchangers
2 x MSR fuel bottles
1 x set of stove spares (lots)
8 x 5 litre plastic fuel containers
2 x protective lightweight aluminium boxes for assembled stoves
1 x 4 man tent
20 x snow pegs
2 x snow shovels
1 x snow saw
2 x tent brush
2 mm insulated foam matting for inside tent groundsheets
2 x thermometers
2 x watch altimeters

Safety Equipment:–

1 x 406mhz EPIRB
1 x 121.5mhz EPIRB
VHF airband radio & batteries / spare batteries
Satellite telephone, batteries and solar recharging equipment
Video camera and batteries
2 x hand smoke flare
4 x sets of 8 mini flares
4 x rocket flares
2 x lightweight rifles & 40 rounds ammunition
3 x GPS
2 x trip wire systems
1 x medical kit

Technical (crevasse rescue) equipment:–

1 x 30 m x 7.8 mm rope
1 x 50m x 8.5 mm rope
1 x harness (each)
1 x 8 ft sling (each)
1 x lightweight walking ice axe (each)
1 x pulley (each)
4 x screwgate karabiners (each)
1 x ice screw (each)
1 x Petzl Tibloc jumar device (each)
3 x prussik cords (each)
2 x snow stakes
Appendix 8

Motor Neurone Disease

Glenn has a long standing association with the Motor Neurone Disease Association and wished to use any publicity arising from the expedition to raise awareness of the disease and hence to assist in raising funds to support research into the condition.

Motor Neurone Disease is a muscle wasting disease for which there is no cure. Rarely do people who become affected survive more than 3 years. A notable exception is Professor Stephen Hawking. The expedition had the support of the Motor Neurone Disease Association.

At the time of writing some £1795.61 has been raised and has been donated to the Imperial College School of Medicine and to the London Hospital Medical College to aid with the identification and functional analysis of a gene that causes the adult onset of motor neurone degeneration.