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## SVALBARD SPRING 2006

### EXPEDITION REPORT



Jamie & Rach looking across Isfjorden from Deltanaset 10.6.06 by Megan de Silva



**BSES Expeditions**  
at the Royal Geographical Society, 1 Kensington Gore, London SW7 2AR

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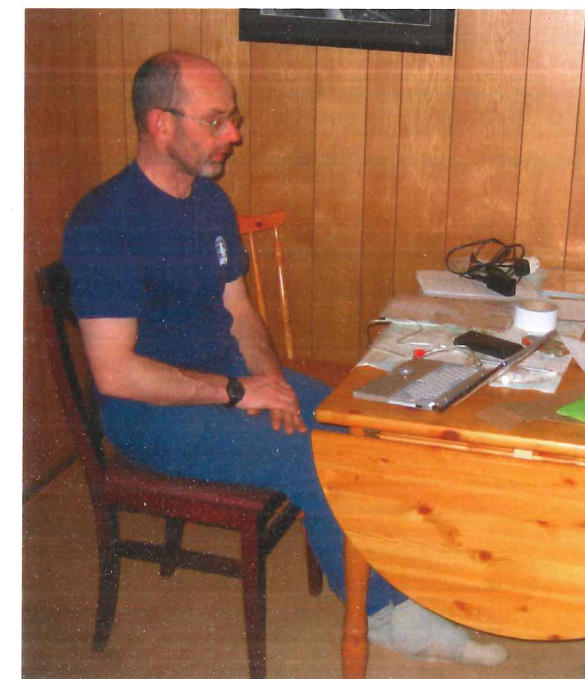


**SVALBARD SPRING 2006 - FOREWORD**

So how did I end up as the Chief Leader for the Svalbard Spring 2006 Extreme Arctic Expedition? Well, about four days before departing for my annual pilgrimage to the Alps I received a phone call from "the office" and within the space of a bottle of wine I had been badgered into Fire leading on Arctic Norway 2005. Whilst at the office, doing all the paperwork for that trip, I was soon being pestered to Chief Lead Svalbard 2006. I resisted. I deferred a decision until after Norway and then until after the Alps. During the Alps trip I decided definitely not, but as we drove up the autoroutes through France the phone rang. It was Will. Within those few, short minutes I ended up agreeing to do the trip and after a few meetings all was set. Or was it?

I had six months to get everything in place, or more correctly find out what was in place and then add anything that I felt was missing and change anything with which I didn't agree. It was a hard six months, as I didn't agree with quite a lot of the logistics that were in place and couldn't understand some of those that were.

Plan upon plan was developed, submitted, amended and re-submitted. Leaders dropped in and dropped out, scientists came and went, numbers of YEs rose and fell with the tide and then just when I thought I had it sorted the sea ice didn't form. So it was back to the planning. The advance party arrived in Longyearbyen early in March to warmer than average temperatures and no sea ice. More planning, several visits to the Sysselmannen and more and more plans. When the main party arrived all was in place, Base Camp 1 to 3 were fully stocked and provision for Base Camp 4 had been made. So it was that we set off on our three month adventure, or did we?














Svalbard Spring 2006 Expedition Leaders

	<b>Ade Harris</b> <b>Chief Leader</b>		<b>Nick Thompson</b> <b>Deputy Chief Leader</b>
	<b>Bruce Manning</b> <b>Chief Mountaineer</b>		<b>Sally Staton</b> <b>Doctor</b>
	<b>Eric Silverman</b> <b>Chief Scientist</b>		<b>Jackie Spong</b> <b>Base Camp Manager</b>
	<b>Raph Morton</b> <b>Comms</b>		<b>Leo Nathan</b> <b>Mountain Leader</b>
	<b>Roy Swindell</b> <b>Mountain Leader</b>		<b>Adam Griffiths</b> <b>Mountain Leader</b>



Svalbard Spring 2006 Expedition Young Explorers

	
John Ashton	Rachel Ayerst
	
Alex Crothers	Jacob Davies
	
Megan de Silva	Siobhan Evans
	
Jamie Hawton	Saskia Highcock

	
Anna Hogg	Rebecca Holohan
	
Olivia Morrison	Rozzy Pedder
	
Yann Rashid	Nic Robertson
	
Matthew Silley	Oliver 'Olly' Smith
	
Frances Taylor	Amy Underwood-Thompson
	
Peter Wilkinson	Peran 'Pez' Williams



**SVALBARD SPRING 2006 - DIARY**

By Ade Harris Chief Leader

The following section of this report is a transcript, with a few changes, of my diary of the expedition. It seeks to give an overview of what the individual Fires were doing, where they were doing it and how they got on. In most cases it also gives a daily, actual, weather report.

**Advance Party**

Leo, Raph, Jackie and Ade

1 Mar After lunch took the train to Heathrow to meet Sarah-Jane, collected some last bits and got on the 19.00 plane. It is late leaving and we meet up with Raph, who should have been on the 12.30 but events had conspired against him. We finally took off about 21.00, got to Oslo late and went straight to bed.

2 Mar Early breakfast, then found that the hotel had not been paid for, quick faff. We take off on time for Tromsø, then on to Longyearbyen – arriving mid afternoon. Edwin meets us, we have a quick tour of town and move into the bunkhouse. As soon as possible we head down to find the containers and some rations then back for dinner and an early night. Overcast/still/-15°C.

3 Mar Back to the containers to start sorting. At 10.00 I go for a meeting with the Sysselmannen to discuss our new itinerary due to the lack of sea ice. All went OK and the new plan is approved. More sorting then we take ice axes, pulk harnesses etc back to bunkhouse to fix in the warm. Also typed up new itinerary. Clear/breeze/-15°C, but felt colder.

4 Mar More kit sorting and counting, mainly moving stuff we didn't want to the blue container, counting chocolate and fixing crampons. Later Raph and Leo go skidoos whilst Jackie and I go back to the bunkhouse to check kit in the warm. Clear/breeze/-15°C.

5 Mar Back to the containers for more box shuffling until Raph and Leo use the skidoos with trailers, loaded with kit including the first Weather Haven tent, to make the first drop at



De Geerdalen. Meanwhile, Jackie and I continue sorting food. Evening spent checking ropes, tents and other equipment.  
Clear/still/-15°C, felt warmer.

6 Mar Back to the containers for more shuffling. Fix Leo's bent tow hook on the skidoo, then he and Raph take a second drop to De Geerdalen. Meanwhile Jackie and I sort kit for Vendomdalen. Had a good chat on the phone with Sarah-Jane, then load up skidoo trailers with first drop for Vendomdalen and collect some ammunition for the main party. Later to "Base Camp" then to the bunkhouse. Evening spent checking tents and sorting pyros.  
Clear/still/-15°C, felt warm.

7 Mar I try to sort bunkhouse rooms for main party but fail. Then down to Edwin's to get gun cleaning kit for the main party plus some odds and ends. Raph and Leo take the first drop to Vendomdalen whilst Jackie and I load the next trailer, sort the blue container and then start separating the food for Gipsdalen. Evening spent tent sorting and making trip flares and gun cleaning kits. Overcast/some snow/light breeze.

8 Mar I sort the main party's rooms then down to Edwin's to put traces on orange pulks that we had left in to warm overnight. A bit of a wait to get a brief on the tent we are to borrow from Edwin. Weather continues to deteriorate so the planned kit drop to Vendomdalen is off. Instead sent stoves, pans etc with Raph and Leo to be checked in the bunkhouse. Jackie and I go to see the Sysselmannen to submit the new itinerary, OK. Then back to the bunkhouse to spend the evening sorting kit and admin. Falling snow/breeze/-7°C.

9 Mar After a windy and snowy night we decide to stay at the bunkhouse to check the rest of the main party kit and finish checking tents and sorting the food for the Fires for the first few days. The rest of the day is spent sorting personal kit as well as trying to resolve the problems with the comms kit. Raph discovered that the Norwegian Polar Institute no longer use HF which is why we couldn't call them up. We also have problems establishing voice comms with the sat phones, although text seems to work – we need to do more work on getting something to work reliably or change the reporting procedure before we set off into the hills. Falling snow/wind/0°C.

10 Mar All of us plus Edwin skidoo out to Vendomdalen with three trailers to put up his huge tent and stash the food. Great day with beautiful views, out there for several hours then back for a bit more kit sorting. Michael Baggs arrives in the afternoon and we meet up with him for dinner. Clear/still/-20°C.

11 Mar Down to the containers doing admin on the way. We sort out the food for Wimondalen and also finished sorting the Gipsdalen supplies. All residual food is moved to the blue container. Looks like one trip to Vendomdalen and two to Wimondalen will finish the load drops. Not a nice day. Falling snow/cloud/wind/-10°C.

12 Mar Back to the containers once more. Raph, Leo and Michael set off on skidoos with loaded trailers to Vendomdalen. Jackie and I have a concerted effort to get all the BSES stuff into the blue container and to get it in some sort of order to make things easier for the arrival of the main party so we can access any spares we might need. Things don't go so well on the kit drop. Raph's skidoo breaks down (transmission failure) resulting in a time consuming recovery and then the bad news arrived that the Vendomdalen camp had been destroyed and that the tent was completely wrecked. The guys get back to Longyearbyen, have a quick lunch and then set off with me to do the first drop to Wimondalen. Yet more problems, firstly Raph has another

breakdown (engine seizure) and then finds that he had shed some load. Leo, Michael and I continue to make the drop and had a bit of an epic in soft snow, including turning over twice. Got the second Weather Haven tent up and then went back to recover Raph's trailer to the De Geerdalen stash (nearer) and then tow two trailers and a dead skidoo home. A late finish today. Whiteout most of the day.

13 Mar Pretty poor weather today, but as time was pressing Raph, Leo and Michael set out with the last three trailers to Wimondalen in some reasonably heavy spin drift. Jackie and I finish off sorting the good and bad gear in the container and making a list of what was where. We then retreat to the bunkhouse to sort some more kit for issue to the Fires. Around 17.00, when there was still no sign of the guys, I phone Edwin to suggest we initiate a search, luckily they turn up soon after and we were just able to avert a wasted trip in poor weather.

14 Mar At last a more leisurely day. Raph goes off to try and resolve our comms problems, Leo and Michael go to recce a suitable spot for the first camping night of the expedition whilst Jackie and I pulk tents down to the container and food up to the bunkhouse and generally tidy up any loose ends. Planned dog sled trip is cancelled due to poor weather, so we retreat up to the bunkhouse once more.

15 Mar Back on to sorting the loose ends, then after lunch put up the Cotswold tent at the containers and move the skis and poles into it. Later went out dog sledding with Annette in Adventdalen. This is a fantastic evening despite the fact that we fail to meet up with Raph and Leo for the change over. Made our way from the kennels to the De Geerdalen turn and back on a clear, cold, still night with Annette driving the bitches and Jackie and I following with the dogs – fantastic. Topped off with an aurora borealis light show. Clear and cold.

#### Main Party arrive.

16 Mar The big day arrives! I spend the morning with the Sysselmannen getting approval for the latest plan, which involves no sea ice. Then down to the airport for a chat with the Svalbard Radio guys in the tower. About 14.00 the main party arrives and are transported up to the bunkhouse for drinks and snacks before heading down to the containers to see the set up and get them some fresh air. After dinner a leader brief and a lot of talking to catch up.





The Fires referred to were as follows:

Rype: Ade, Jackie, Sally.

Isbjorn: Leaders – Roy, Nick; YEs – Jamie, John, Matt, Olive, Pez, Rachel, Saskia.

Polar Rev: Leaders – Bruce, Eric; YEs – Anna, Alex, Megan, Olly, Rozzy, Yann.

Rein: Leaders – Leo, Raph; YEs – Amy, Frances, Jacob, Nic, Pete, Siobhan

17 Mar Early down to the containers to try to track down missing HF radio, found it then off to the airport to retrieve it. Then back to the containers for issuing skis to the main party, who in their Fires have a little ski trip and a lesson in cooking at -15°C. Then up to the large dining hall to brief the YEs on the new plan, polar bear precautions and "Day 1" of Bruce's mountain skills syllabus.

18 Mar To the containers to issue to the Fires their pulks, ski skins, food and fuel for the journey to De Geerdalen then a little ski about with pulks. A brew up and lunch in the big tent then a personal kit fuff. At 1700 a radio brief to the group by Raph then, after dinner, the science brief is cancelled as Eric is ill. Jackie and I go down to Edwin's to discuss logistic plans.

19 Mar Expedition sets off. The Fires are driven one at a time to the end of the road and set off. Eric stays behind at the bunkhouse as he is ill and Sally stands in as Fire Leader. Roy became ill on the way. We settle down at Helvetiadalen 78°11'54"N, 16°19'36"E (as planned), with Roy ill. Quickly got the camp established and the trip wires set. A good day, clear/breeze/-15°C.



20 Mar Decided not to move on due to Roy's illness. Instead Bruce and Leo started the mountain training that was due to happen at De Geerdalen. So it was an introduction to boots, crampons, helmets and axe before lunch, then ice axe arrest after lunch. Roy seemed to be getting better by the evening. Clear/breeze/-15°C.

21 Mar Again stayed put. The expedition split into groups and rotated through sessions on snow shelters with Bruce and Leo and navigation with Raph, changing round at lunch time. Rype build a new toilet due to problems with the original filling with spindrift (used big pulk and Zdarski sack). Clear/breeze/-15°C. Later discovered that one expedition member had 5 frost bitten toes. Arranged a medevac for the morning. Windy/spindrift.

22 Mar Edwin arrived at about 0900 (1 hour early) to take our casualty to hospital, then came back to drop off Eric who joins his Fire and take out Jackie to help with the casualty. Rest of expedition moves up Helvetiadalen – Rein, Sally and I settled down at 78°14' 05"N, 16° 22' 20"E a short distance but a hard day. I am now very concerned about frost bite injuries, with one casualty in Longyearbyen and with five or six others with damaged fingers – considering a retreat. Windy/spindrift.

23 Mar Stuck in the tents all day. Struck up comms with Isbjørn and Polar Rev (We were camped with Rein) and told them that I was keen to pull back to Longyearbyen, regroup and sort kit there. They all seem to agree so told HQ London that was the plan. Some problems with bunkhouse bookings, then a good planning session in the tent. Windy with spindrift.

24 Mar General retreat. All Fires get ready and head for the road head, arriving at 12.30 (Isbjørn/Polar Rev), 1300 (Rype) and 1730 (Rein). Then a bit of a shuffle with Edwin's truck to get all the pulks back to the bunkhouse. A couple of briefs during the evening, followed by a re-planning session. Windy.

25 Mar Down to the containers to try to start the Base Camp re-stock for our latest plan. Sadly there are no skidoos so that was off. Visited frostbite victim in hospital. All Fires spend the day sorting their kit and repairing/replacing it as required and visiting at the hospital. Quite a lot of briefings and discussing today – tiring and frustrating. Breeze.

26 Mar Down to the containers for Isbjørn to exchange damaged/ill fitting/missing kit and to get Bruce and Leo on their way with the skidoos for the restock – all went well. Then sorted the food for the next two loads, due to go tomorrow. Polar Rev didn't show up for their kit sort in the afternoon so went up to the bunkhouse. Still more briefings in the evening then got started with catching up with the paperwork. Clear and still.

27 Mar Restock continues with the last two loads going to Helvetiadalen and then the generator and fuel being brought back from Vendomdalen. Last two Fires get their kit sorted, which means we are ready to try again. Clear and still.

28 Mar Fires to the containers by 09.30, 10.30, 11.30 to be driven to the road-head and then set off to the relocated Base Camp 1 (BC1) 78°11'54"N, 16°19'36"E. Lovely day, clear and still.

29 Mar A cold night. In the morning the Fires go one at a time for rifle training in a nearby valley. Then in the afternoon the snow and ice training continues under the mountain leaders. Rype sort food etc in the morning then ski to the range during the afternoon for some shooting. Various leaders spend the evening sorting out some of the ten or so pairs of broken skis plus making long bindings so we can ski in Sorels. Clear and still all day.

30 Mar A very frustrating day. The delay in getting the glaciology work started continues when it is realised that the Total Station had not been tested and did not work. Also a part of the



prism tripod is missing. Later Raph goes back to Longyearbyen to see off our medivac, try to fix the Total Station and try to get some of the bits we need. Clear/breeze/cold.

31 Mar Leo and Bruce lead Rein and Polar Rev on an attempt at Helvetiafjellet starting at 09.00 – getting to Pt 836m by lunch time and returning from there. Rype and Isbjørn go over to the east end of Janssonhaugen (339m) and Innerhyta. All Fires back at about 15.30 got fed and watered. Raph re-appears early evening with a fixed theodolite and various other bits and pieces. Expedition starting to fall into place, but now weather set to get bad again.

1 Apr A much better day. After another fight with ski bindings Rein set off south to camp near the end of the Møysalbreen. Isbjørn and Sally go up Helvetiadalen for an attempt on Arctowskifjellet, turned back by time. Polar Rev do a recce to the mouth of Foxdalen in preparation for research work on Foxbreen. All back early evening in good spirits. Rype sort out the Base Camp all day. Overcast/cold/ breeze.

2 Apr Polar Rev set off up Foxdalen towards the Foxbreen, in worsening weather. Rein, from their camp on Møysalbreen below Møysalen, go playing on the Møysalbreen and do some crevasse rescue. Isbjørn stay in base camp and spend the morning bivi-bagging and the afternoon sorting kit to depart in the morning. Rype spend the morning sorting kit and after lunch take Edwin's S&W .45" handgun to the "range" for a bit of fun. Relaxing evening. Cold/wind/falling snow.

3 Apr Again weather is poor. Isbjørn call off their attempt to get to Foxbreen whilst Polar Rev and Rein take short trips onto the Foxbreen and Møysalbreen respectively. Some luck with getting the surveying kit set up for Polar Rev. Rype mainly involved with repairing an HF radio and a troublesome generator (carburettor ice) and then some of the afternoon repairing skis and issuing food. Later on Rype take a ski trip up the "range" valley for a bit of a stretch in a weather window. Above freezing/wind/falling snow.

4 Apr Still the weather is not too good. Polar Rev get up on to the Foxbreen and stash the surveying kit up there, Rein drop off their rubbish and waste at the Janssundalen hut ready for a re-supply tomorrow and Isbjørn are still stuck at Base Camp. Above freezing/wind/ falling snow.

5 Apr Rype use skis and pulks to take four days food and fuel for Rein, to the hut half way up Janssundalen and meet up there with Rein to hand it over and have a chat. About 7km each way so we were back by early afternoon. Isbjørn set off towards Foxdalen with a view to relieving Polar Rev by Friday. Polar Rev spend the day on the Foxbreen setting up the survey points, but are frustrated by equipment problems and deep snow. Zero/wind/falling snow and spindrift.

6 Apr Rype have a day skiing up Helvetiadalen and some way down De Geerdalen by way of a bit of relaxation. One YE with foot problems and I spend the day at Base Camp sorting out things such as holes in tents, trip wires and other such admin until they return. Meanwhile Isbjørn carry on up Foxdalen and meet up with Polar Rev who have established survey points on the glacier, sighting points off the glacier and taken a first set of readings. Rein leave their injured (foot problems) at their camp and ascend Hallwylfjellet (948m) – the first real summit to go. A windy morning giving way to a still/sunny afternoon.

7 Apr Isbjørn make it to the science project and start getting the handover for the surveying equipment from Polar Rev – this takes most of the day. Meanwhile Rein go up to the

Møysalbreen for a bit of skiing. All this was done in some pretty poor weather. Rype do some sorting in the morning and then go to the range with a K98 and the S&W .45" guns and have a really good time. Windy all day/falling snow/warm.

8 Apr Rype do another re-supply to Rein at the hut in Janssundalen in a lot of deep snow, then tidy up around camp. After lunch Polar Rev return to Base Camp and settle in for the night and start planning for the next few days. Isbjørn are busy on the glacier with survey work with Eric. Wind/falling snow/warm, going clear.

9 Apr Isbjørn, up at the glacier, continue with the survey of the glacier. Rein make a late break over the tops to join Isbjørn and end up setting camp at the col at about 01.00 – a long day for them. Polar Rev have a rest day in Base Camp and, after a lazy morning, they build an igloo under instruction from myself. Rype head for Longyearbyen by skidoo to drop off rubbish and toilet waste then pick up things such as a replacement rifle bolt. Still/warm/some snow



10 Apr A dramatic start as Rein didn't make contact yesterday evening and could not be raised on the 08.00 call. Rype and Polar Rev leaders get together to formulate a rescue plan, but Rein get in contact at about 08.30, just before the leaders set off. So a slightly delayed start for Polar Rev, with Sally, to have a go at Helvetiafjellet. I set off to repatriate the YE with foot problems to her Fire, Isbjørn, up Foxdalen, on the glacier. A lovely journey in true alpine weather, with true alpine scenery. Jackie and Nick stayed in camp. Still/warm/occasional snow.

11 Apr A busy day for Rype. We set off, three up on one skidoo, to check that the Wimandalen stash was alright. Drove to the end of De Geerdalen then walked over the pass to the Base Camp 3 position, discovered that it was (as I suspected) in a water course which, with the early melt, would cause a problem. Emptied, moved and refilled the tent, then walked and drove back. Meanwhile, Polar Rev in Base Camp all day, Rein surveying on the Foxbreen and Isbjørn move from the Foxbreen back to Base Camp. Clear/sunny/warm – alpine day.

12 Apr Raph takes Isbjørn round into Helvetiadalen to set up camp for a few days, accompanied by Jackie for the walk, and in the afternoon takes them up Ottofjellet fore summit (676m). Polar Rev set off again across Adventdalen to get up onto the Foxfonna icecap and reach Pt 781m. Meanwhile, Rein split up with some joining Eric for survey work whilst others go up Gilsonryggen (948m). Sally, Roy and I spend the day in Base Camp fixing and planning ready for the next phase. Clear but some cloud later, breezy and a bit colder.



13 Apr Rype set off for Vendomdalen to move the stash to the east side of the river but the skidoo smells like it is about to die so we turn back. Polar Rev with Sally instead of Nick, head across the valley for an attempt on Hallwylfjellet and make it to the 930m summit in high winds. Isbjørn go skiing up Fangenbreen in high winds and snow whilst Rein split up again with some doing science and some climbing Foxtoppen 955m. Jackie, Roy and I are in Base Camp all day, but Nick makes an afternoon break for it to dump waste in Longyearbyen after Edwin comes to sort the skidoo. Warm and thawing fast in the morning, wind and light snow afternoon.

14 Apr Rype set off once more to Vendomdalen, this time we are in a whiteout and just past Passhytte turn back to the hut to await a clearing. We tag on to the end of a Norwegian group but it turns out that they can't see either so we soon pass them again. About 800m from the stash we hit a deep snow bank and soon realize that the stash is very, very buried. We go back to re-plan. Meanwhile, Polar Rev rest in camp, Rein split up again with half on the Fofonna and half on surveying and Isbjørn do skills training on Ottofjellet. Colder/wind/falling snow.

15 Apr Polar Rev with Sally set off from Base Camp for a 3<sup>rd</sup> attempt on Helvetiafjellet via yet another route – they get turned back by another ridge and so practice crevasse rescues. Isbjørn practice abseiling in Helvetiadalen on their way back to Base Camp. Rype set off on skis with pulks across the Adventdalen to meet Rein at their camp on the Fofbreen to help them with some kit for their return to Base Camp. Unfortunately they weren't there nor visible so we picked up rubbish and toilet waste and headed home, Rein arrived in camp 21.30 after doing final science readings. Everyone in Base Camp so a lively night with some folk staying up to see in Easter day. Windy/sunshine/falling snow.

16 Apr Admin day. 09.00 YE brief, then foot inspection by the doctor, individual reviews for YEs with their Fire Leaders, check of group and individual kit and the YEs weighing which options of activities they prefer for the next stage. This determined which Fire they would be in and after lunch an emotional break up from their old Fire and the move into new groups as follows:

Rype: Ade, Jackie, Sally.

Isbjørn: Leaders – Roy, Nick; YEs – Amy, Frances, Jamie, Megan, Olly, Pete, Pez.  
(science, survival skills, art and photography).

Polar Rev: Leaders – Bruce, Raph; YEs – Matt, Nic, Olive, Rachel, Rozzy, Yann. (adventure).

Rein: Leaders – Leo, Eric; YEs – Alex, Anna, Jacob, John, Saskia, Siobhan. (adventure).

All Fires succeeded in finding the Easter bunny using the GPS.

17 Apr Move day. The Fires start their 5 day move to our new Base Camp (BC2) 78°13'32"N 17°24'57"E in Vendomdalen. It should only take 3 days skiing/walking with pulks, so there is time for climbing peaks or taking a more scenic route. Sally travels with Isbjørn, a YE joins Rype because of foot problems. Isbjørn and Rein stop near the Passhytte whilst Polar Rev push on to the mouth of Trehøgddalen. A wild and windy day with a lot of snow.

18 Apr Whilst the Fires battle it out with the bad weather, Rype prepare to move to Vendomdalen. Edwin and Ellen arrive about 15.00 with two trailers each and we load everything onto the four trailers, then travel with three on Edwin's skidoo and two on mine, in a whiteout, to our proposed new BC 2. By 21.00 Rype have the Weather Haven and HF up. Meanwhile, Isbjørn move past Passhytta, Polar Rev sit tight and Rein retreat from the Adventelva. Windy, falling snow and a little below freezing.

19 Apr Rype put up the toilet tent, the pyramid tent and generally prepare for the arrival of the Fires. Isbjørn move along Trehøgddalen but get stuck at the watershed and stop for the night, Polar Rev come down Eskerdalen and up Sassendalen to BC2 and Rein follow up Trehøgddalen. Wind dropping, and sky clearing and down to -3°C.

20 Apr Rype with Polar Rev go to the stash at the old Base Camp 2 to start moving the food across to the new Base Camp 2. Then a mad couple of hours fixing broken equipment in order to get Polar Rev on their way to the east coast – they leave at about 14.30. Soon after Rein arrive in camp from their journey from BC1, closely followed by Isbjørn and they settle in for the night. Gentle breeze, some snow, about -3°C.

21 Apr Rype, Rein and Isbjørn go across to the stash to collect the rest of the food and equipment and bring it across to BC 2, then both Fires spend the day at camp doing personal admin. Eric and Amy spend the day loading glacial survey information onto the computer and later a few go sledging and skiing locally. Meanwhile Polar Rev continue on their journey to the east coast and finish less than a day away. Wind, snow and -4°C.

22 Apr Rype take half of Isbjørn to the snout of the Jinnbreen by way of a bit of exercise in the afternoon following a wild and windy night and early morning. The other half of Isbjørn and Rein remain in camp whilst Polar Rev make it to the east coast for the day and back to their campsite. Very windy from the south with temperatures rising to zero, still in the afternoon.

23 Apr The weather is disgusting with strong southerly winds and wet snow, Rype get soaked trying to save tents and equipment and are in the most part successful. Rein opts to stay in camp and try to keep dry. Isbjørn sit out the worst of the storm and then make a break for it but get caught in the eye of the storm, they do, however, get some of the way down Sassendalen towards the coast. Meanwhile, Polar Rev continue their east coast adventure by moving some of the way up the Elfenbeinbreen as they start their journey back to Base Camp. Wet and windy, above zero.

24 Apr The storm blew through overnight. A beautiful day in Vendomdalen spent sorting out Base Camp after yesterday's weather. Rein dry out their kit and then set off across the valley, Isbjørn continue towards Sassenfjorden and Polar Rev continue up Elfenbeinbreen and down Skrottbreen in their bid to return to Base Camp. Clear skies, still and warm.

25 Apr Isbjørn make it to the coast at Sassendalen, dip their feet in the sea and scale Pt.14m, Polar Rev have an exciting time on Wallenbergfjellet – including a lower off of their pulks, whilst Rein go hunting for fossils in Moskusdalen (they find none). After a small amount of camp admin, Rype ski across to Moskusdalen to drop off the HF battery that Rein had left behind – a lovely trip across, Sassendalen and back. Clear, still, +4°C.

26 Apr Rype spend the day re-securing tents and equipment and preparing two trailer loads to go out with Bruce. Isbjørn move their camp up to the col south of Kapp Schoultz in preparation for an attempt to reach the "BSES" hut tomorrow and Rein continue their search for fossils relating to the Permian Mass Extinction – without success. Polar Rev get up at 06.30, intending to reach Base Camp for lunch prior to Bruce leaving the expedition. However, they ski straight past Vendomdalen to Eskerdalen and add a further 16km to their journey, making it 28km with loaded pulks. Bruce quickly packs and is whisked off to Longyearbyen. Hazy sun and about +3°C all day.

27 Apr Rype ski to Eskerdalen to recce a new site for Base Camp 2 in case the melt comes even earlier than we thought. Isbjørn head along the coast and find the "BSES" hut dig out the



snow, fix the windows and move in for the night. Polar Rev spend the day washing themselves and their kit, whilst Rein ski tour up Stensiöfjellet as a break from fossil hunting. Clear and dry about +4°C.

28 Apr Having taken two hour shifts on polar bear watch through the night, Isbjørn return to their camp near Kapp Schoultz – tired but happy. Polar Rev head over one of the lower summits of Milne Edwardsfjellet on a day trip from Base Camp and Rein return to Base Camp from their camp in Moskusdalen. Rype ski around Milne Edwardsfjellet to the hut in Fulmardalen (it had gone) for a 24km leg stretch. Clear, breeze +2°C – felt alpine.

29 Apr Isbjørn begin their journey back to Base Camp and stop approximately 3km up Sassendalen, Polar Rev (plus doctor) leave Base Camp and head for Templefjorden via the “glacier route” and stop at the mouth of Brattlidalen and Rein head out to the east coast reaching the head of Fulmardalen. Meanwhile, Rype continue to battle it out with the wind and melting snow in an attempt to stop the Base Camp tents from blowing away – we succeed, however, a pulk made a break for it, reaching the frozen river bed before being caught. Sunny at first then cloud, wind and snow. About +1°C

30 Apr Isbjørn continue on their journey towards Base Camp, this time setting up camp at the north east end of Eskerdalen. Polar Rev realise that they may need more food for their Sassendalen epic and send half their number to meet up with Rype for resupply, whilst the other half lower their pulks into Brattlidalen. They then intend to rest in the afternoon and travel at night when snow conditions may be better. Rein make it to Bellsunddalen from where they can see the wildlife of the east coast. Mostly clear but a strong wind.

1 May Rype ski out to meet Isbjørn who are skiing in from Eskerdalen, we are all in Base Camp by lunch time. Polar Rev continue on their way to Templefjorden, again by night, whilst Rein travel down the coast to Kapp Dufferin from where they see two distant polar bears and become aware that they are close to a popular polar bear spot. Clear and still, about 2°C.

2 May Isbjørn have a day at Base Camp sorting themselves out ready for a ten day trip to the east coast, Polar Rev head out (at night) to the “BSES” hut via Noisdalen and Kapp Schoultzhamna and Rein climb the 620m Rurikfjellet behind their camp. Rype explore the nearest ridge of Milne Edwardsfjellet looking for fossils relating to the Permian Mass Extinction, we find plenty of fossils but the fault lines are too indistinct to put an age on them. Mainly ammonites. Clear and still all day, about +2°C.



3 May Isbjørn set off to the east coast and camp about half way up Fulmardalen. Polar Rev who are now completely nocturnal sleep for the day in the hut and then set off back to their camp in Noisdalen by night. Rein ski out 9km on the sea ice on the east coast, a day that brings them several close encounters with polar bears – one joins them for breakfast, another they spot at some distance and a third they have to chase away. Rype climb the second rib on Milne Edwardsfjellet (675m), cross to the other summit (665m) and then return to Base Camp down a small glaciated valley, an alpine day. Clear and still, about +2°C.

4 May Isbjørn continue towards the coast, this time camping at the snout of the Elfenbeinbreen and Polar Rev have to take a break as one of their number has an arm problem. Rein move further down the east coast to visit the French in their boat at Inglefield Bukta and then move inland to camp below Adalen – no further reports of polar bears. Rype ski around to Trehøgddalen and then climb two of the three summits of Trehøgdene (634m and 649m) for splendid views in every direction. Clear and still, about +2°C, turning cloudy later.

5 May Isbjørn make it to the coast and camp at the east end of Agardhdalen with a view to exploring from there and Polar Rev make a night move onto the Von Postbreen glacier on a route that requires four stomper lowers for the pulks. Rein climb the Andrinebreen as part of their circuitous route back to Base Camp via the glaciers. Rype do Base Camp admin, mainly fighting the melt out, until Adam Griffiths arrives on the last skidoo from Longyearbyen. We convince Edwin to take back the last of our rubbish and surplus kit as we are now totally reliant on ski and foot to move, via Base Camp 3, to Longyearbyen. Cloudy, breeze and about +2°C.

6 May Isbjørn, at the coast, have poor weather and are disappointed by the lack of polar bears which they had hoped to see. Polar Rev have a long night on the glaciers and make it down to the snout of the Rabotbreen glacier, with a view to reaching Base Camp tomorrow evening and Rein continue their homeward march, reaching the Kjolldalen by the evening. Rype spend the day trying to stop Base Camp from melting/thawing away – an endless struggle that we are going to lose. Cloudy, still and about +4°C all day, the melt is definitely on!

7 May Isbjørn go skiing on the sea ice, stalk a ringed seal and also encounter polar bears within 250m of them. Following a very windy day, Polar Rev set off to Base Camp in a brief lull but get caught out in high winds and Rein make it onto the Hellefonna and, as they are high on an icecap have a rough time of it at their camp. Rype sit out the worst of the wind then have a mad dash to get Base Camp moved to a more secure and less melted spot – a frantic two hours with the wind building up again. Broken cloud, very windy (20m/s) and dropping to -4°C.

8 May Isbjørn, on their return trip to Base Camp make it as far as the snout of the Sveigbreen and stop there for the night, whilst Polar Rev arrive at Base Camp at 0600 and spend most of the day sleeping. Rein move over a high col to the Hellefonna and set up a camp from which they intend to try some local summits. Rype wait for Polar Rev to surface for a catching up session on their adventures. Clear with a gentle breeze, about -3°C most of the day.

9 May Isbjørn go up the Sveigbreen and cross a col to the top of the Jinnbreen not too far from Rein who climb Kloa and find some entertaining pitches around their camp area. Polar Rev, armed with Adam, their new mountain leader, set off across Vendomdalen to climb Milne Edwardsfjellet (675m) by the fourth rib and Rype head south to tackle Dalsnuten (616m) by a rib on the east side. Clear, slight breeze, -2°C.

10 May Some of Isbjørn relax on the Hellefonna whilst the others investigate a route down the Jinnbreen. Polar Rev set out mid morning on a recce for the move to Base Camp 3, which will now be much harder due to the early melt and so has been started five days early. Rein reach



the summit of Strombergfjellet (880m) and also climb some ice. Rype prepare for the move then ski some way up Vendomdalen to check the best route for Isbjørn and Rein to descend given the amount of water now in the valley. Clear and sunny, slight breeze about zero all day.

11 May Polar Rev continue with the recce to Wimandalen, relaying back crossing points for some of the larger water courses. Isbjørn and Rein return to Base Camp ready to start the move of all the kit, which will probably take two runs. Rype sort out the food and fuel issue and pack up some of the tents, rubbish and other equipment for the move. Snow early on then clearing, about -2°C.

12 May Isbjørn set off to Dump 1, near Eskerdalen, with their personal kit, Polar Rev reach Vindodden on the recce then return to Sveltihel and Rein set off with their personal kit to Dump 2 past Deltadalen. Rype tidy up the now empty Base Camp and wait to start the move. Colder and overcast.

13 May Isbjørn return to Base Camp 2 to collect base camp kit and move it to Dump 1, Rein meet them at Eskerdalen and take the kit to Dump 2. Polar Rev ensure that the route from Sveltihel to De Geerdalen is passable. Jackie and Sally join Isbjørn and then continue with Rein to Dump 2. I go from BC 2 straight to Sveltihel. Clear with sun then overcast with a breeze, -2°C.

14 May Polar Rev go to Dump 2 and move the base camp kit to Sveltihel, Isbjørn and Rein also make it to Sveltihel with all their kit and so the whole expedition is there to discuss the next part of the move. Clear, breezy and cold.

15 May The whole expedition takes pulks, skis, climbing kit and food to Elveneset, leave it there and then return to Sveltihel to sleep. Clear, cool and about 0°C all day.



16 May Isbjørn and Rein move base camp equipment to Elveneset and return to Sveltihel. Polar Rev and Rype move personal kit to Elveneset and set up camp, then in the afternoon take the rubbish up to the col enroute to Wimandalen and return. Clear, light breeze and about 0°C.

17 May Polar Rev and Rype carry base camp equipment plus pulks to the remaining snow then pulk to Base Camp 3 (BC3) 78°19'59"N 16°07'57"E to drop off the base camp kit, moving the rubbish from the col to Wimandalen on the way. Isbjørn move from Sveltihel to camp at

Elveneset. Rein move through Elveneset to De Geerdalen, needing two journeys to move all their kit. Mainly clear, some snow and +1°C.

18 May Rype take the last of their equipment to BC3 and Isbjørn do a double shuttle to get their personal and camping equipment to the snow line and then pulk to BC3. Polar Rev join Rein at a frozen waterfall in De Geerdalen for some ice top roping and then join the rest of the expedition at BC3. The move from BC2 to BC3 now complete after seven days of work. Some cloud and snow, breezy and -1°C.

19 May Complete expedition in BC 3, checking and repairing equipment and then the second Fire change:

Rype: Ade, Jackie.

Isbjørn: Leaders – Roy, Raph; YEs – Anna, Jacob, Matt, Megan, Pete, Saskia.

Polar Rev: Leaders – Adam, Sally, Eric; YEs – Amy, John, Pez, Rachel, Siobhan, Yann.

Rein: Leaders – Leo, Nick; YEs – Alex, Jamie, Nic, Olive, Olly, Rozzy.

Breeze, snow and -1°C, rather damp.

20 May The Fires spend the morning collecting and sorting their food for the next stage of the expedition. In the afternoon most of the expedition go to Diabasodden to say goodbye to a YE, who is collected by Edwin in a boat he has borrowed. Sun then snow then more sun, about -1°C most of the day.

21 May Isbjørn and Polar Rev depart to make food caches in various places around Nordenskiöldland in preparation for their planned adventures. Meanwhile Rype, with the assistance of members of various Fires, go back to Diabasodden to form a beachhead in preparation for moving the expedition back to Longyearbyen in June. All camp at BC3. Snow, still and +1°C.

22 May Isbjørn do the Wimanfjellet (913m) horseshoe behind BC 3 and then spend the evening preparing to move out. Polar Rev move to Tobredalen and set up the glacial science camp below the Blackbreen and Rein set up a camp at Kreklingpasset. Rype spend the day packing rubbish and excess food ready to move it down to the beachhead in the morning. Sun and light snow, still, about 0°C most of the day.

23 May Isbjørn move from BC 3, up Wimondalen and down Knorringbreen to camp in Hanaskogdalen, while Polar Rev get started setting up survey positions and practice crevasse rescue on the Blackbreen. Rein climb Helvetiafjellet (1075m) via the north west ridge and then move camp to the snout of the Tellbreen. Rype take the excess food (from departed YEs), return food and rubbish down to the beachhead at Diabasodden and then spend the afternoon inspecting and repairing equipment. Clear, strong breeze and about -2°C – felt colder.

24 May Isbjørn have a hill day, reaching the summit of Konusen (983m) and Creocerasaksia (739m) with clear views. Polar Rev continue setting up the glacier survey equipment and Rein ski up the Tellbreen and descend the Fangenbreen. Due to high winds in Wimandalen, Rype spend the day doing admin and then, after the evening radio call, do the Wimanfjellet (913m) horseshoe, finishing at 01.30. Clear and sunny, strong winds and just below freezing all day (and night).

25 May Isbjørn summit on Telgefjellet (921m) via the north ridge and descend the west ridge via pt 843m. Polar Rev continue with the glacier survey but are suffering as a result of the large amount of water that is now about. Rein do a cirque of summits (1001m, 964m, 991m and



915m) just to the north of Helvetiafjellet. After a slightly late start, Rype climb Knorringfjellet (948m) via the north west ridge and return the same way as the north east ridge is blocked by a steep gendarme. Warm and cloudy, +3°C with a lot of soft snow and running water.

26 May Isbjørn have a rest day in Hanaskogdalen, Polar Rev continue with surveying the Blackbreen and Rein move their camp to beside the Tellbreen and do a bit of rope work. Rype make an ascent of Knerton (581m), a fine, rocky summit. Cloudy, still and +3°C.

27 May Isbjørn meet up with Rype on the Knoringbreen to drop off their rubbish and excess food, they then continue to the head of the Blackbreen, whilst Rype take two more pulk loads to the beachhead at the northern end of Wimandalen then return to BC 3. Polar Rev split, with half dropping off rubbish at the Grønsteinfjellet col and the others resting and Rein have a rest day. Low cloud, still and about +4°C.

28 May Isbjørn split with half collecting supplies from their food cache and the others starting on the surveying. After meeting with Isbjørn, Polar Rev move to camp on the Krecklingpasset and Rein pulk from the Tellbreen to the Blackbreen, en route to BC 3. Rype start to dismantle BC 3, due to flooding, and prepare to move northwards to the coast. Cloud, light breeze, 0°C.

29 May Isbjørn split once more with half continuing with the survey work and the others reaching the summit of Stäket (982m). Meanwhile Polar Rev reach the summit of Arctowskifjellet (945m) and Rein move down Wimandalen to BC 3. Rype take the Weather Haven down to the coast and set it up, then ski up to the Grønsteinfjellet col to collect rubbish, return it to the beachhead and then return to BC 3. Snow, clearing then hot, +3°C.

30 May With half of the Isbjørn continuing with the surveying the others climb two unnamed peaks above their camp – now named Adetoppen and Jackiefjellet! Polar Rev climb Helvetiafjellet (1075m), by the north east ridge, at long last summiting after their exploits from Base Camp 1. Rein spend the day taking equipment to the beachhead and repairing some of their broken kit. Rype head up to the Knorringbreen and reach the summit of Telgefjellet (921m) by the north rib, returning via the north ridge. Cloudy, still about +1°C.

31 May Half of Isbjørn continue working on the Blackbreen digging snow pits, whilst the others climb Telgefjellet (921m) and Stäket (982m). Polar Rev stay in their camp all day and Rein do the Wimanfjellet (913m) horseshoe from BC 3. Meanwhile, Rype move the last of the base camp equipment and personal kit down to the beach head and set up Base Camp 3A (BC3A) there. Clear, light breeze, +2°C.

1 Jun Half of Isbjørn continue with science work whilst the others climb Knorringfjellet (948m). Polar Rev move across Adventdalen to a new camp at the west end of Janssondalen and Rein come down to BC 3A on their way to going climbing at Diabasodden. Rype have an admin day setting up the new Base Camp and finding spares to send out to Fires to keep their kit working. Later Rein and Rype meet with a British group of MPs and Lords accompanied by the Sysselmannen who have come to meet the Expedition. Cloudy, light breeze, +4°C.

2 Jun Again Isbjørn split with half continuing with the survey work whilst the others climb Birkafjellet (976m), whilst Polar Rev move their camp to below Skolten. Meanwhile, Rein go up Wimandalen, across Knorringbreen and down Blackbreen to meet up with Isbjørn and take over the “science camp”. Rype climb Marhøgda (393m) on the way to Deltaneset, returning along the coast for a bit of sea level traversing. Cloudy, light breeze, +4°C, rain later.

3 Jun Isbjørn leave the science camp and move away to camp near the Krecklingpasset. Polar Rev, from their camp south of Adventdalen, climb Skolten (1128m) via the north west ridge, whilst Rein split, with half carrying on with the science work and the others climbing Telgefjellet (921m) by the north rib. Rype climb the nearby Grønsteinfjellet (309m) and from there spot about 20 white whales plus a few dolphins in the bay by BC 3A. Upon their return they are still there for a further two hours, no more that 25m away. Clear, light breeze and about +6°C.

4 Jun Isbjørn, from their camp near Krecklingpasset, do some rope work and bathe in the nearby melt-water. Polar Rev return from Skolten to the north side of Adventdalen, a journey that takes 10 hours due to the difficult river crossings. Rein split with half the Fire continuing with the survey work whilst the others climb “Adetoppen” (989m) and “Jackiefjellet” (842m). Rype spend the day segregating broken and useable equipment and preparing for a three day recce along the north coast of Nordenskiöldland – now the easiest way back to Longyearbyen. Clear, strong wind, about +6°C.

5 Jun Isbjørn climb Helvetiafjellet (1075m), whilst Polar Rev pull pulks from Krecklingpasset to Tobredalen. Meanwhile Rein make an ascent of Stäket and Rype make an advanced base camp in Janusdalen. Cloudy, strong westerly and rain later.

6 Jun Isbjørn ski to the “science camp” to meet up with Rein for the evening and Polar Rev move their camp to the col below Grønsteinfjellet. Half of Rein make an ascent of Knorringfjellet whilst the others dig a snow pit. Rype climb Janusfjellet (798m), Konusen (983m), Carolinefjellet (c925m) and Louisfjellet (845m) in a large circuit from their advance camp. Low cloud, rain with snow higher, still.

7 Jun Rype return to BC 3A and get it ready for the Fires returning for the last time, sneaking back just before Isbjørn arrive who have had to leave some of their stuff at the snow line. Polar Rev climb Grønsteinfjellet (309m) and collect their remaining food from BC 3. Rein continue their research, digging a further snow pit. Cloudy, easterly breeze, some rain and +4°C.

8 Jun Isbjørn collect the last of their kit from Wimandalen and after lunch build a raft. Polar Rev bring their kit into Wimandalen, leave it there, do the Wimanfjellet (913m) horseshoe backwards and then move into BC 3A. Rein come to Base Camp via the Blackbreen, Knorringbreen and Wimandalen. Evening leader brief and the leaders agree that the YEs should plan and complete the return trek to Longyearbyen without the leaders, who will maintain radio contact and follow a day or so behind the YEs. The YEs are asked to divide themselves into 3 equal groups and then from within their group choose their leader. This causes quite some consternation as the YEs don't want to have to ‘exclude’ anyone. Breeze, rain showers and clear later.

#### Fire change:

Rype: Ade, Nick, Adam, Eric, Leo, Raph, Sally.

Isbjørn: Leader – Megan; YEs – Jamie, John, Olly, Matt, Siobhan.

Polar Rev: Leader – Pete; YEs – Jacob, Nic, Rachel, Saskia, Yann.

Rein: Leader – Amy; YEs – Anna, Alex, Olive, Pez, Rozzy.

9 Jun The whole expedition moves spare kit to the high water mark to await the boat. It appears at 14.30 but the sea is too big to collect the equipment. Strong breeze, broken cloud then clearing.



10 Jun The YEs, in three Fires, set off on the walk back to Longyearbyen, reaching Deltanaset by the evening. Meanwhile, Rype wait all day for the boat that eventually arrives at 21.00, load it and then Jackie and Roy go with the boat to Longyearbyen to unload.

11 Jun YEs continue to Revnaset and Rype follow along the coast then up Carolinedalen and down Louisdalen to camp at Revnaset.

12 Jun All made their way to Hiorhamn, arriving between 12.00 and 14.00, then called in a boat to get us back to Longyearbyen. Settled in at the campsite. Breeze and cold.

13 Jun An equipment sorting day, involving cleaning and sorting equipment both at the campsite and at the containers. Spent the evening helping Edwin with his new boat.

14 Jun An admin day spent writing reports and YE review sheets plus some interviewing. Spent the evening helping Edwin with his new boat.

15 Jun Spent the morning in discussions and then went to the Kroa in the afternoon for the goodbye meal and speeches.

16 Jun The main party book in at Longyearbyen airport at 02.00 for the 04.00 flight, the remainder go to bed late then spend the day sorting the last of the kit.



17 Jun A day off! Visited the Svalbard museum and did some shopping.

18 Jun Rear party leave for home. Expedition ends.

## YOUNG EXPLORER DIARY EXTRACTS

### Yann's diary extracts:



Monday 20<sup>th</sup> March 2006

Sleeping in the arctic is horrible – in fact I barely slept at all. Let me explain: not only is your tent frozen, but a lot of condensation occurs, which freezes on the tent fabric and then falls on your face. I therefore covered my face up with my bivvy bag hood – which only made things worse as my breathe vapour condensed against the inside of my bag making it very damp ...

Tuesday 4<sup>th</sup> April 2006

Last night I thought our tent was going to fly away. We woke up to a whiteout and remained in our tent until it had slightly cleared up.

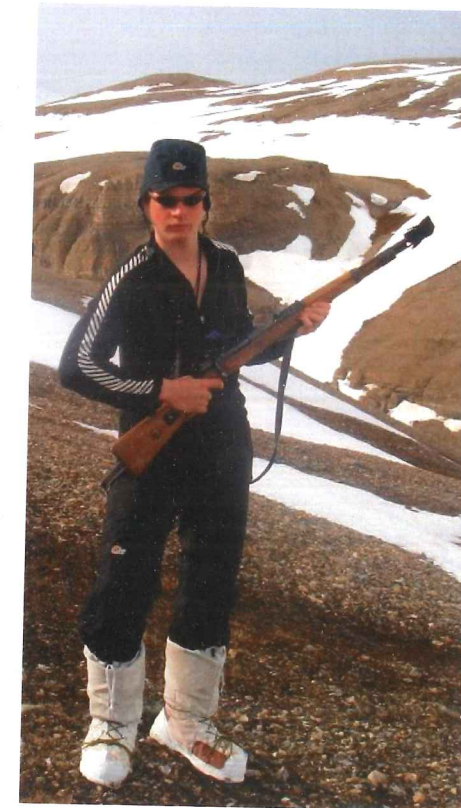


Olly's diary extracts:

13<sup>th</sup> April – “The windy Peak”.

Another day, another peak and another pen, my favoured red one has run out! So today we woke up bright and early, well at least Rozzy did, to cook breakfast in bed. A fine bowl of hot breakfast cereal accompanied by hot chocolate, ummmmm! It was then all hands on deck to be ready to leave by 9, though it was more like 9.30.

We were off, with Sally for company rather than Nick today. It was across Adventdalen again, though this time we went the high route and cut the corner off slightly. Again it was a bit of a trek and finally we reached the base of today's peak, though it was a fair climb just to get there. Once at the base we roped up, me, Bruce, Megan and Anna joined forces this time. And we were off, up a very long, steep snow climb to the summit of this 914m ish peak. It was a bit of a bastard. It took forever, was a killer on my thighs and the winds were blowing. It must have been a couple of hours climb I reckon, when we reached what seemed like the top. It flattened out slightly, but still climbing, till eventually we reached the top plateau. And boy was it windy! We all huddled together for a while then wandered over to the other side of the plateau, where we were going to go down. However the wind blew there even more and with one tremendous blow we were all taken off our feet (well some of us) and had to go into ice axe arrests. With that we quickly turned around and headed straight back down the way we came to lower ground. We'd achieved another peak and were back on safe ground. Phewwww.....

Matt's diary extracts:

Saturday 22<sup>nd</sup> April – “The Beautiful East Coast”

It was a horrible day. I was in a crap mood this morning because I didn't want to move. I was shattered and we made a 9km round trip in a white out to see the sea, which looked rather white! It was hard work and we have to move again tomorrow. We slept all six of us in a tent this afternoon and now we're ready to go to bed and it's started raining!

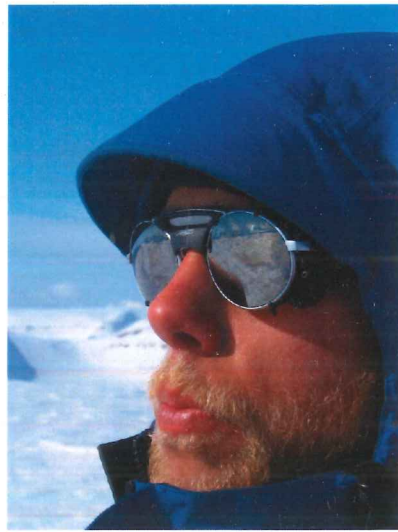
Wednesday 31<sup>st</sup> May – “Glacial Fun”

I woke up to gorgeous blue skies today in my solo bivvi spot and cooked myself some breakfast and went and ate it on the moraine. I then went back to my humble abode to pack up camp before donning my skis and heading back to camp. Got back to science camp only to be told that the previous night the rest of the Fire had managed to bridge Matt's crack – or cross the wind hole on the glacier by lashing skis together!

I was also told that my day of science would consist of digging the snow pit and not doing the survey points which was awesome. Saskia left for her solo at about 12 and Pete, Roy, Eric and I were left to finish the pit. When we finished Eric, Pete and I went for some skinless skiing down the Blackbreen, which was good fun and quite humorous. The afternoon was finished off by some survival bagging.

Before dinner we had evening activities which required us to construct and perform a Tyrolean traverse over Matt's crack which was really good fun. We got back to camp and had dinner around 11pm before Jake, Megan and I had a good chat about movies and ghost! I'm really enjoying my time in Isbjorn mark 3!



John's diary extracts:

3<sup>rd</sup> May 2006

It started like any other day today. We got up at 8.30 and started making breakfast. Just whilst drinking my tea looking out onto the sea ice another huge carnivore walked past my tent. This one today was close enough to mean we all rushed out of our tent guns in hand and bear flares armed. He just kind of sauntered past though not seeming to care. I think he was slightly confused though, I mean you would be if 10 strange multicoloured animals jumped from nowhere pointing cameras, guns, bear flares etc at you. We set off to the sea ice (the direction of the bear as well) about 10.30. On the way we saw another bear about 10km away. This place is like the bear M1. When we were 9km out to sea we reached the pressure ridges etc but still couldn't see the sea! It must be miles out if not all the way to Russia. Anyway on the way back it got worse! Leo spotted another bear sunning himself on the ice, maybe it was the one from this morning who knows? Anyway at first he didn't move, he knew we were there though. He kept putting his head up and looking at us from about a 1km away. Then it got worse. He got up as we were trying to sneak past him and decided to come and investigate us. I remember thinking at the time that it was a good job they don't hunt in packs. I don't fancy getting surrounded by a pack of polar bears! Anyway he continued to get closer so we all came together into a tight group and started to shout very politely to the bear if he would mind leaving us alone, but unfortunately I don't think he understood English so he carried on coming. After taking plenty of photos and seeing him come to within 200m we decided that it might be a good idea to get the rifle and bear flares ready. 200m soon became 100m and we fired the first flare which seemed to have no effect. The bear just seem to stop blink for a second, then carry on. 75m. Bear flare number 2 hit home and I think he got the message whilst literally relieving himself ha ha ha. I guess he was scared after all. The thing was huge, I had no idea if it was male or female, young or old but it was big enough for me. He seemed to circle downwind of us and was probably sniffing the air for our sent, which I'm sure he enjoyed (stale sweat). After more polite screaming he finally got the message and left. Everyone was on a high after and the adrenaline was defiantly flowing. Chris Tarrent came here and spent 1 month looking for one bear. We saw 4 in 3 days! Chris you were looking in the wrong place! Walking back to camp the mist rolled in. Laid in my sleeping now I feel really safe. I'm glad there's 2 party poppers (bear flares), some strong string and roughly 3mm of nylon on my tent protecting me from the worlds largest carnivore. I'll be luckily if I get any sleep tonight.

Saskia's diary extracts:

Sunday 7<sup>th</sup> May

Set off pulking up the Vråbreen in lovely sunny weather. I was leading and it was some of the hardest pulking I've done so far. As we approached the top the sky clouded over and it began snowing thickly with a howling wind -within seconds our thermals were soaked. We crowded into the Kisu and got waterproofs on. When we came out it was sunny but still really windy. We ploughed on over the col- on the other side the ground fell away steeply and so did we. I started whizzing down unable to stop fell over and my ski pole flew away. Right I thought this is okay I'll get out of my traces and go and get it, took my skis off idiotically put them the wrong way round and one of them raced down the hill. Luckily someone ran to get it. Then ski and pole packed away I tried to move my pulk, it tipped over and my karrimat spun away probably landing in Russia! Oh well another normal day in the Arctic.



**MEDICAL EXPEDITION REPORT**

By Dr. Sally Staton

**Assembling medical kit:**

The medical kit consisted of four individual Fire medical kits and one large snatch bag that accompanied the doctor. Most of the contents were taken from the "rolling" BSES medical kits kindly compiled by Sue and Martin Spurling, and were then adapted for the Svalbard expedition, in particular for cold injuries.

Decisions over IV fluids and IV drugs were made according to previous Svalbard expedition medical reports and the advice of other professionals in the field of expedition medicine. In anticipation of cold injuries, hot packs, an insulated IV line, a collapsible bowl for rewarming hands and feet, aloe vera and nifedipine were carried. On the basis that infections would be unlikely to flourish in the cold, limited supplies of antibiotics were included. Opiates were not carried (tramadol was used instead), owing to difficulties in their transit across borders.

**Medical kit contents:**

See Appendix 1 for Fire Medical kit  
See Appendix 2 for Snatch Bag

YEs and leaders also carried personal medical kits with contents as advised by BSES pre-expedition information pack. However, it is worth noting that on inspection many of the YEs' kits were lacking in a number of the items suggested and were poorly adapted to deal with the likely problems that would arise in the field. In future it would be worth emphasizing to YEs the necessity of having a good supply of simple painkillers, dressings, zinc oxide tape, and blister plasters.

**Notes on individual contents:**

**IV drugs** - Most of these (except lignocaine and tramadol) freeze at temperatures of  $-20^{\circ}\text{C}$  experienced in March in Svalbard. Unfortunately there is no clear guidance on many drugs' activity once thawed. Drugs that were not anticipated to be required immediately during an emergency were stored in a strong box and allowed to freeze on the basis that they could be thawed as required. (A 10ml vial takes approximately 2 minutes to thaw in a warm hand). Vials of adrenalin, chlorpheniramine and diazemols were carried on the body of the doctor at all times to prevent them freezing. The Fire leaders carried the anaphylaxis kits issued to the Fires in a similar manner.

**IV fluids** - The decision over type and quantity of IV fluids to carry on an expedition is always a difficult one. All IV solutions freeze at temperatures of  $-20^{\circ}\text{C}$ , but the general advice is that they are safe to administer once thoroughly thawed. There is a paucity of equipment available for thawing and warming IV fluids in the field, and it relies on a source of battery power to operate which clearly is not available in the majority of field situations. On this basis, only a limited supply of fluid was carried (2x 500ml Normal Salines, 2x 500ml Gelofusin), which was to be thawed by heating in hot water, and then administered through insulated IV lines, with a heat pack strapped to each side of the fluid bags. 500ml bags were carried owing to their greater surface area for exposure to the heat packs.

**Medical Tape** - Zinc oxide tape sticks well at cold temperatures, micropore and elastoplast do not (and therefore are not worth taking except for people with allergies). Large quantities are required for frequent frostbite dressings.

**Non-adherent dressings** i.e Melolin dressings - Large quantities required for sterile dressings for cold injuries.

**Antibiotics** - The start of the expedition saw a number of people struck down by a respiratory tract infection for which 2 people were given antibiotics. This may well have been related to the fact that the whole expedition retreated to the Longyearbyen bunkhouse for a few days one week into the expedition, and were thus in an environment better suited for virus transmission and incubation than the arctic cold. On this basis it might have been advisable to take an extra course of antibiotics (most probably amoxicillin or augmentin) for each Fire Medical kit.

**Aloe Vera** - There is a good evidence-base for the use of aloe vera as an anti-inflammatory agent in the treatment of frostbite, and therefore aloe vera capsules were carried in the medical snatch bag, and were used in bathing frostbite injuries. Interestingly, the doctors at Longyearbyen hospital also supported its use.

**Nifedipine** - There is evidence for the use of calcium channel blockers in the treatment of recurrent problematic chilblains. Some medical professionals also support its use in the initial stages of frostbite treatment, and the individual who was treated at Longyearbyen hospital for third degree frostbite was given a course of nifedipine 20mg bd for 5 days during her hospital stay. It was also used in the treatment of one individual with cold-injury related hypersensitivity symptoms.



**Contacts:**

**Longyearbyen Hospital** - Situated on the main high street in Longyearbyen, just opposite the Post Office. Staffed 24 hours by a nurse, and doctor on call. Clinic times are 8.30am-4.30pm Monday to Friday, with a doctor on the premises at these times. The staff team respond to and co-ordinate emergency rescues from the hospital. The facilities are fairly comprehensive, including basic x-rays (no CT), laboratory service (including cardiac enzymes), small operating theatre (procedures limited to expertise of doctor on site), trauma room with video link to Tromsø, and 3 in-patient observation rooms. Serious cases are air transferred to Tromsø (approximately 2 hours away). The staff are extremely friendly and helpful and visitors are welcomed anytime. 24h emergency tel: 00 47 7902 4200

**Pharmacy** - Situated on the right of the entrance door in Svalbardbutikken. It has a very limited supply of dressings and simple painkillers. Any other drugs or dressings must be obtained from the hospital.

**ISOS (International SOS)** - This is the medical emergency and evacuation service used by BSES. The repatriation of our YE with frostbite was organized through ISOS, and the service they provided was disappointing. They were extremely slow in organizing and confirming flights, and required frequent prompting from the leader team in the field in order to complete this straightforward task. There was a lack of consistent, timely and accurate information from their operatives, and problems were experienced regarding the payment of services, which they had vouched to cover. This poor service left the leader team with little confidence in their ability to effect a rescue of any other individuals during the expedition. I would not recommend their use on any future expeditions.

**Medical Conditions Encountered On The Expedition****1. Cold Injuries**

The first week in the field saw an alarmingly high number of cold injuries, with 6 YEs developing second degree frostbite (5 on hands, 1 on feet) and one third degree frostbite (foot). The majority of individuals had also suffered from differing degrees of frost nipped extremities (hands, feet, cheeks, noses). The conditions during this period were unusually harsh, with air temperatures of  $-15^{\circ}\text{C}$ , and high winds. This combined with the relative inexperience of the YEs at this point, was most probably the cause of the high rate of cold injury.

The individual who developed third degree frostbite had been wearing her plastic boots (Scarpa Alphas, and not Omegas like the majority of the expedition), and an extra pair of socks, which most probably resulted in a critical compromise of blood flow to the toes of her right foot. She developed numbness in all the toes of her right foot after a day's snow and ice training. On inspection, all the toes of her right foot were affected down to the metatarsophalangeal joints, with toes 1-3 displaying signs of third degree frostbite, and toes 4 and 5 having second degree frostbite. The toes had clearly undergone spontaneous rewarming (most probably overnight whilst in her sleeping bag), but an attempt was made to completely rewarm them in the field. She was casevaced the next morning by skidoo to Longyearbyen hospital. She was treated with diclofenac and nifedipine (20mg bd) and had daily dressing changes. On discharge she was also given a course of penicillin V. Repatriation was organized by ISOS.

All cases of second degree frostbite were treated in the usual manner: washed in antiseptic solution with aloe vera, clear blisters deroofed with sterile needles, and loose sterile dressings applied with padded buddy strapping to adjacent non-affected digits. Dressings were changed every 48 hours. All cases of second degree frostbite healed well, with healthy new skin appearing at one week post injury.

Four individuals were affected by hypersensitivity and dysaesthesia post cold injury. All had bilateral foot involvement, and had only suffered frostnipped toes at most the previous week. Symptoms seemed to develop anywhere from 4-7 days after cold insult, and were particularly problematic at night. Individuals complained of a burning and throbbing sensation on the sole of the foot particularly centred around the MTPJs, and shooting pains extending up to the ankle. Weight bearing and activity in some cases made no difference to the pain, and in others seemed actually to improve it. Symptoms were largely resistant to paracetamol and ibuprofen, but seemed to respond at least partially to codydramol and diclofenac. One YE stayed at base camp for 5 days on account of this problem, and experienced pain particularly resistant to the analgesia carried. She was commenced on an incremental dose of nifedipine, which was stopped after 4 days due to resolution of symptoms. The speed of onset of this secondary allodynia and neuropathic pain, and its development after a minor degree of cold injury was surprising and is not well documented. Fortunately all symptoms resolved after a maximum of one week, and there were no further sequelae.

Interestingly only one of the individuals who had suffered from second degree frostbite of the finger tips at the start of the expedition developed transient mild hypersensitivity symptoms approximately 6 weeks later. These responded to simple analgesia and resolved very quickly.

Two of the female YEs developed chilblains on their cheeks, and one on their thighs. These were sore and itchy during their initial stages, but quickly became painless. Topical Sudocrem gave some relief of symptoms. In one of the individuals the chilblains on her cheeks persisted throughout the expedition, but did begin to fade during the later stages.



## 2. Cystitis

Cystitis is a common problem on expeditions, particularly amongst females. One individual reported 48 hours' of urinary frequency and mild dysuria, but no other secondary symptoms of a UTI. She was advised to increase her fluid intake to promote diuresis, and to double void. Her symptoms resolved in 24 hours. Three male YEs also reported short-lived mild cystitis symptoms.

One individual with known previous renal problems was treated with ciprofloxacin for a UTI.

## 3. Biceps tendonitis

One YE experienced recurrent upper left arm pain after a period of particularly heavy pulking. This resolved after rest, load lightening, and regular diclofenac and codydramol.

## 4. Lateral epicondylitis

Numerous YEs reported mild tennis elbow symptoms throughout the trip, none of which were serious enough to warrant specific medical intervention. This was most probably due to gripping the ski poles excessively tightly when pulking, and might perhaps have been avoided by a little more instruction in the use of poles at the start of the expedition.

## 5. Gout

On the second day of the expedition one of the leaders experienced an acute attack of gout affecting the left first metatarsophalangeal joint. This was treated with rest, diclofenac and paracetamol, and resolved after approximately 4 days. Fortunately it did not recur during the rest of the expedition.

## 6. Snow blindness

Luckily only two individuals during the whole trip developed mild snowblindness. One was due to defective sunglasses which allowed a lot of light to get behind one lens after they had been broken and then repaired so that they sat at an awkward angle.

## 7. Blisters

Superficial blisters were common, as is typical on most expeditions. Numerous individuals experienced them on the medial arches of one or both feet as a result of wearing *Scarpa* Omegas (with a variety of footbeds). Fortunately only two YEs developed cases requiring medical intervention with inadine dressings which were changed every 48hrs (none needed antibiotics). Both healed well after a few days' rest from walking/ skiing.

## 8. Whiplash

One person experienced mild whiplash after falling off a skidoo. No head injury was sustained.

## 9. Respiratory Tract Infection

Six expedition members were affected by a RTI at the start of the expedition. Two received antibiotics due to severity of symptoms and clinical findings. As mentioned previously, I suspect that the expedition's retreat to the bunkhouse provided a more effective environment for viral transmission than if we had remained in the field.

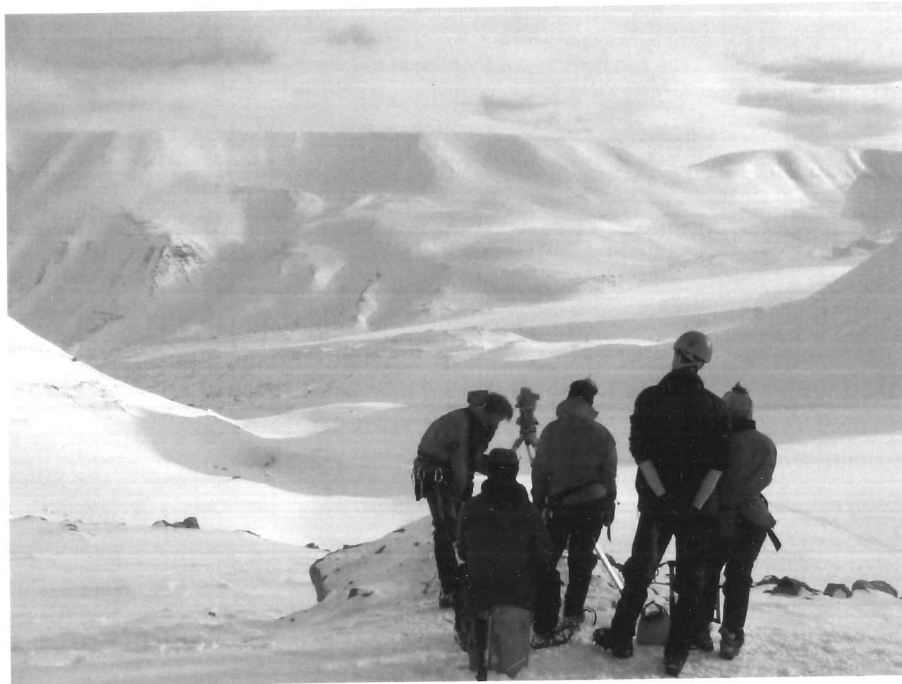
## Medical Tips

1. Test all items of kit in a freezer prior to taking them out – many plastics become extremely brittle.
2. Ointments are more resistant to freezing than creams.
3. Take a good supply of needles for the purpose of de-roofing clear frost bite blisters.
4. Ensure that all kits have a large supply of diclofenac and intermediary analgesia such as codydramol or co-codamol. These are essential in the treatment of neuropathic pain resulting from cold injury. The doctor should also carry a good quantity of stronger analgesia such as tramadol for particularly resistant cases.
5. A large collapsible bowl for the purpose of rewarming hands and feet is essential.
6. Inadine dressings are a useful component of the snatch bag (although these can be improvised with betadine and melonin), and are good for dealing with superficial wound infections.
7. EHIC (European Health Insurance Card) – Any treatment at the hospital must be paid for by the individual and then claimed for retrospectively. For this a letter is required from the treating physician.
8. Heat packs, which are initiated by "snapping" a metal disc in their centre, have a tendency to spontaneously initiate in sub-zero temperatures and therefore need to be regularly checked and re-boiled if required.



**SCIENCE PROGRAM**

Foreword by Ade Harris Chief Leader



Listed below is the intended science program, as proposed and written by the Chief Scientist, for the Expedition. However, the conditions in Svalbard were not favourable and only the Glaciology Program really produced any significant levels of fieldwork in which the Young Explorers could engage. The results of this work, on the Foxbreen analysed by Bruce Manning are included, those from the Blackbreen survey work have not, as yet been provided by the Chief Scientist. For future spring expeditions I would recommend a science program that included glaciology, paleobiology, ornithology and botany. This would provide simple, useful and interesting fieldwork in which the Young Explorers (YEs)- could engage and see some clear, measurable results.

The problems with the other programs were as follows:

**Sea Ice Monitoring.** No sea ice formed on the west coast of the archipelago during the winter of 2006

**Arctic Mars Analogue Svalbard Expedition.** No snow algae were found.

**Psychology Program.** To carry out the test certain conditions were required, however, it proved all but impossible to produce these conditions in the bustling chaos that was Base Camp.

**Disappearing Arctic Lakes.** The lake in question was out of reach of the Expedition due to the lack of sea ice.

**Fossil Hunting.** We had an additional task to find fossils in relation to the Permian Mass Extinction, however, snow conditions made this impossible. It is of note though that two very useful fossil areas were identified during the Expedition and will be exploited in the future.

**Science Plan**

By Eric Silverman Chief Scientist

**Glaciology Program**

This portion of the science program has been designed in conjunction with the Scott Polar Research Institute at Cambridge University. The Institute has been pursuing research into the behaviour of small-scale valley glaciers on Svalbard; most of this research has focused on Midre Lovenbreen in the north-eastern portion of Spitsbergen. Our research will examine the behaviour of similar glaciers in the region of Isfjorden, looking for similarities and differences between these different varieties of small-scale glaciers.

The research will be performed via the use of surveying equipment to measure the pace of glacier movement in the area; this will also serve as a method for classifying each glacier that is studied. We will supplement this data with additional information gathered from studying the snowpack on top of each glacier. This data, when fed into a computer model provided by Cambridge, will allow us to attempt to predict the future movement and behaviour of each glacier, and from this draw further conclusions about the glaciers' potential reactions to climate change.

**Sea Ice Monitoring**

This study was designed in conjunction with the Scott Polar Research Institute at Cambridge University. The study aims to monitor the deformation and break-up of sea ice in the Isfjorden area, providing data that will add to a continuing catalogue of long-term measures of changing patterns of sea ice formation. This data is also important for the ongoing monitoring of the ecological effects of the continued reduction in sea ice formation throughout much of the Arctic.

This study will be performed using digital photography in combination with topographical mapping and GIS data. By overlaying oblique photographs of the sea ice under study on top of a topographical map of the area, we can monitor the break-up of the sea ice area by area, and compare how differing landscape features influence the behaviour of the ice.

**Arctic Mars Analogue Svalbard Expedition**

This research has been organised in conjunction with members of the AMASE project, a joint venture of the Universities of Leeds and Oslo together with NASA Astrobiology. We will collect samples of snow algae and microbial colonies from cryoconite holes for the AMASE project, and these samples will be used to study the survival mechanisms for these species that live frozen for extended periods. This data will help AMASE to refine their designs for detectors for future Mars probes, which will search for similar microbial colonies on the polar ice caps of Mars.

This sample-collection will be performed using sterile sample tubes to gather batches of snow algae from snowfields, as well as samples of both the water and microbe-laden sediment of cryoconite holes. Each sample will be marked, the pH and temperature of each will be recorded (along with the geographical position and elevation of the collection site), and then they will be stored and conveyed to UNIS in Longyearbyen, where they will be stored until AMASE members pick them up for analysis during their expedition in August 2006. Protocols and sterile gloves will be given to all participants in the sample collection to avoid contamination of the samples; the microbes and algae themselves are not dangerous to humans. All sample-collection materials and equipment will be provided by AMASE.



### Psychology Program

This study, designed in conjunction with the Institute of Psychological Studies at the University of Leeds, aims to measure the impact of stress upon expedition members. Previous studies have been done to examine the effects of membership in isolated microcultures on Antarctic bases, but little study has been done of similarly isolated expedition groups. We will be looking for psychological reactions to stress as well as any effects upon attention and memory performance.

The study will proceed via self-report surveys for participants that classify their stress coping styles and examine the effectiveness of those coping mechanisms by studying their psychological reactions to the stress of the expedition via analysis of their self-reports. Periodic studies of attention and short-term memory will also be performed on a bi-weekly basis to look for these more subtle effects. All participants will be voluntary and will be giving informed consent, and no stressful situations will be created or simulated during the course of the study; we will only be measuring response to pre-existing stresses.

### Disappearing Arctic Lakes

A small lake north of the site of our third base camp on Spitsbergen has recently disappeared, leaving a sizable hole at the site where it previously existed. Ongoing research at the University of Fairbanks in Alaska has catalogued the widespread disappearance of small lakes throughout the Polar Regions, which seem correlated with the gradual warming of underlying permafrost. Our presence in this area will provide a rare opportunity to examine one of these sites directly.

This study will involve visiting the site and examining certain aspects of the lakebed. Such catastrophic disappearances are usually precipitated by a sudden shift or crack in the underlying permafrost, so armed with data regarding local subsurface hydrology we will search for signs of this activity. Alternatively such disappearances may be caused by characteristic formations in the underlying limestone, so we will attempt to classify the geological nature of the lakebed via examination of surface features.

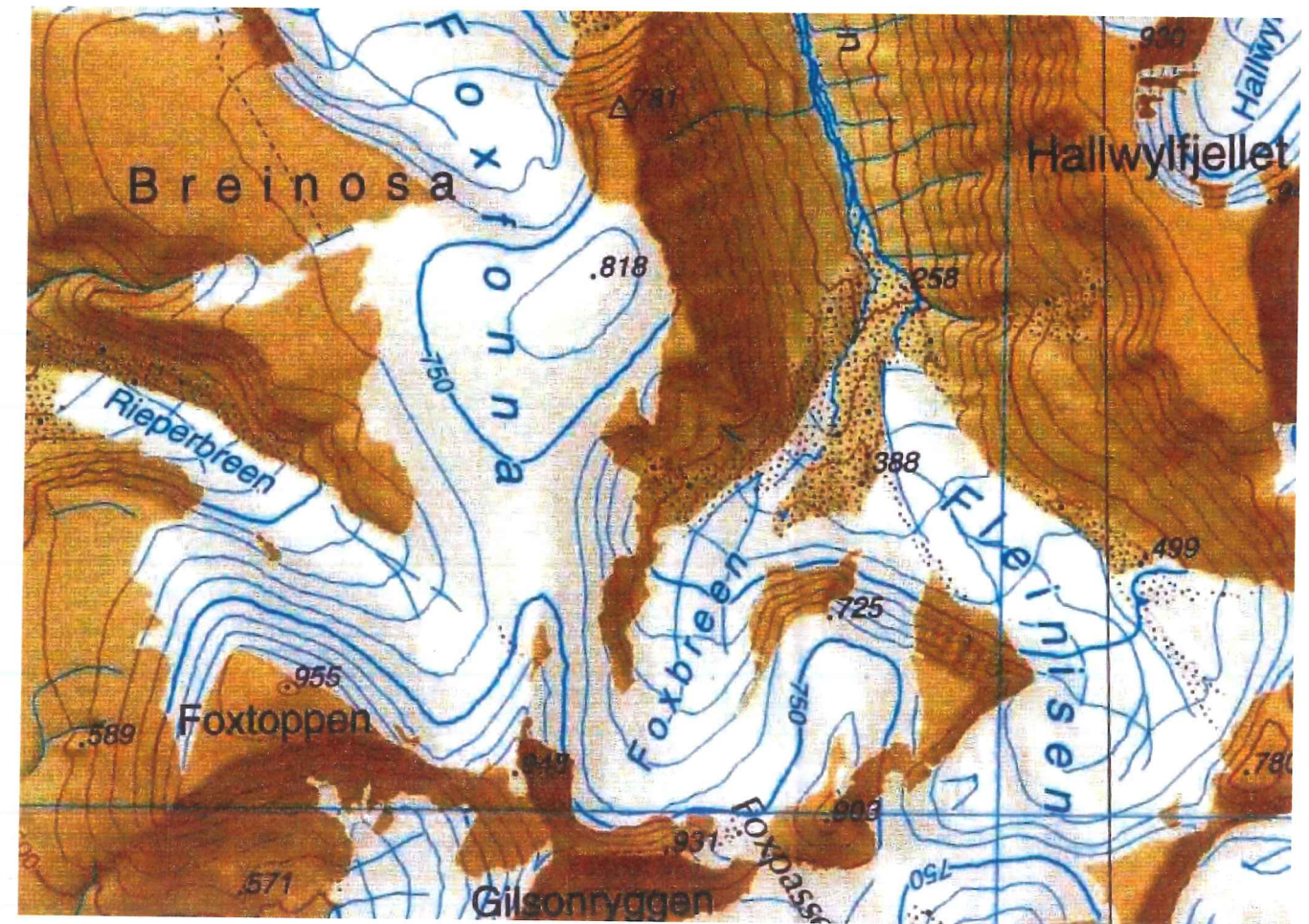
### Young Explorer Participation

The Young Explorers will be given opportunities to participate in all aspects of these studies, with the exception of those who elect to participate in the psychology study; in that case, only those who abstain from participation can assist with data collection and analysis. All equipment is safe and easy to use in each case, and proper briefings and training appropriate to each study will be given prior to each science excursion.

### Foxbreen Survey 2006

By Bruce Manning Chief Mountaineer

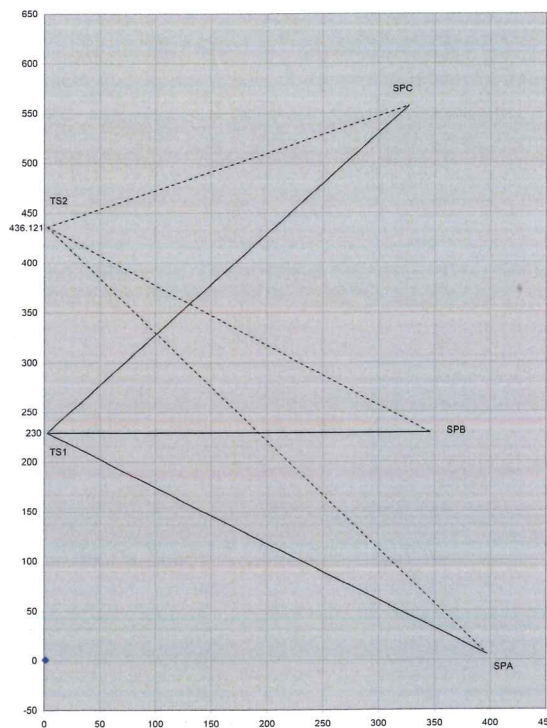
In the spring of 2006 the BSES expedition to Svalbard set out to measure the movement of a glacier. After studying the Spitsbergen map the Foxbreen glacier lying just south of Adventdalen was chosen, since it was clearly separate from other ice masses and was readily accessible. The intention was to monitor the movement of three points, close to the centreline of the glacier and relative to fixed points on adjacent rock. Approximate coordinates for these points were chosen from the map.



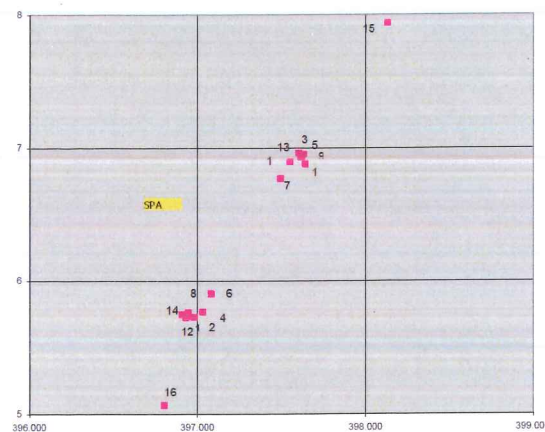
On the 2<sup>nd</sup> April 2006 the Polar Rev Fire entered Foxdalen and set camp just below the frozen river at the base of the glacier. The Fire took with it a considerable bulk of survey equipment including a total station (an advanced form of surveyors theodolite), targets, tripods and various other pieces of essential equipment in pulks. The following day, in near white-out conditions, the Fire hauled all the equipment up onto the glacier and began to mark out the approximate positions to be monitored (SPA, SPB and SPC) using handheld GPS – see the layout below. There had been considerable debate as to how to mark the positions but, in the end, suitable aluminium tubes were obtained by sacrificing the traces on one of the pulks. These tubes were hammered in until their tops were level with the glacier surface. Bamboo wands were placed nearby to assist in finding the tubes each time their location was surveyed. All the time this work progressed, team members remained roped together due to the uncertain nature of the glacier surface and the ever present danger of falling into a crevasse.



Layout



period 6<sup>th</sup> April 2006 to 15<sup>th</sup> April 2006. Measurements were recorded on pre-prepared forms to ensure that the information, often measured in difficult circumstances, would be understandable on our return. Back at base camp a few days later, the hand recorded results were typed into our laptop in preparation for analysis.



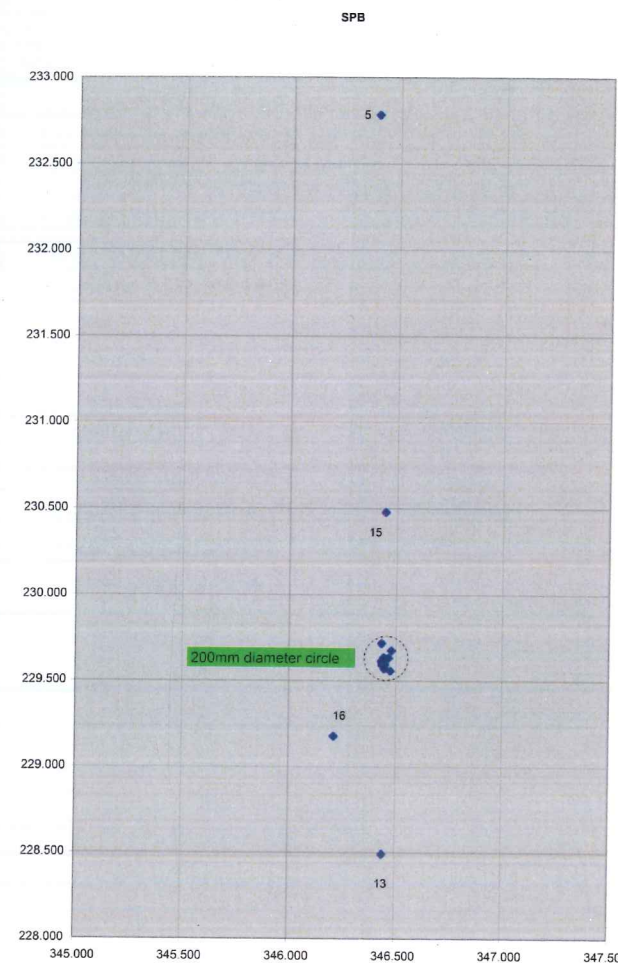
reviewing a newly acquired total station that a possible reason was identified. There are many different total stations on the market, each with advanced electronic analysis capabilities, such as the ability to correct laser distance measurements for slope distance. What would the results be like if the measured distances were, in fact, horizontal distances and not slope distances as assumed? The results were re-analysed and plotted to provide a totally different picture. Out of the 16 complete sets of readings, if up to 4 readings were discarded due to natural measurement errors, the remaining points grouped tightly within circles of about 200mm diameter at each survey location on the glacier. This represents a high degree of accuracy and consistency considering the conditions and inexperience of all concerned in the survey.

The next task was to locate and mark survey stations on relatively stable ground adjacent to the glacier. This proved a far from an easy exercise. Accessible points were either impossible to mark due to the frozen or unstable nature of the ground, out of site of the points on the glacier or immediately under a west facing snow field which, it was judged, could avalanche at any time. This, plus the ever changing and seldom good visibility resulted in the Fire working extremely hard for more than four days. Eventually, with the aid of steel tent pegs and scribed marks on large rocks, two stations TS1 and TS2 were established from which to fix the location of each point on the glacier.

Polar Rev, now at the end of its allotted time at the site, completed one set of readings from each of the fixed stations to the three survey points on the glacier and handed over to Isbjørn to continue the survey. After a few days of measurements Isbjørn in turn handed over to Rein. In total, measurements were taken on most days over the

On return to UK, the results were analysed, plotted and shown to some of the participants at the post expedition get-together held at the Norwegian Embassy in London. The results were somewhat disappointing, as the calculated coordinates seemed to group around two locations at each of the three survey points. In fact, at each survey point on the glacier, the individual points making up a group were found to have been measured from the same fixed survey point indicating a systematic error, which could not be identified.

It was not until some six months later when



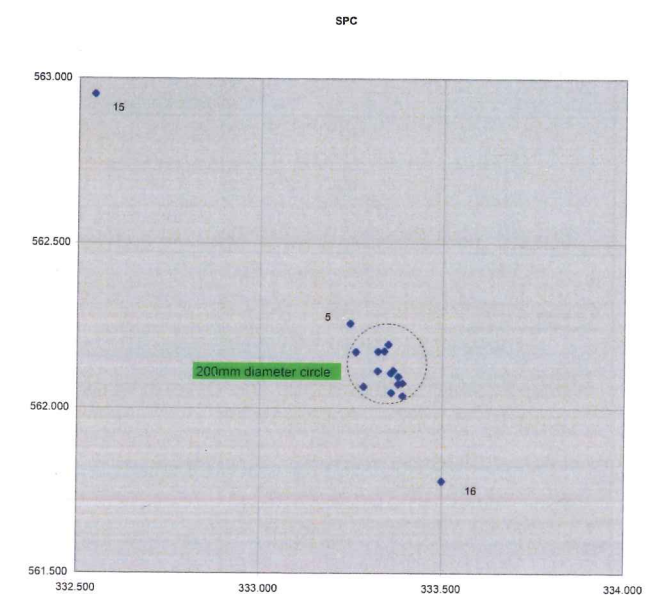
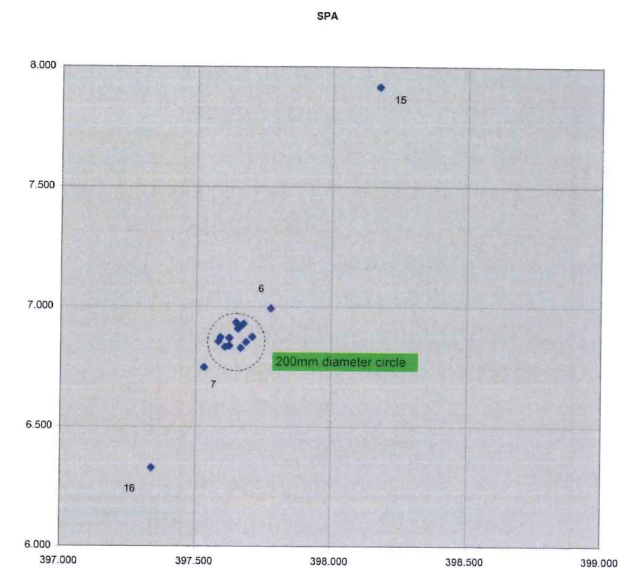
Reviewing the survey data of each of the points there was no identifiable direction of movement over the nine days of the survey. This result in itself is not particularly surprising but leads to some conclusions for future expeditions.

Measurements need to be taken over a significantly longer time period and possibly a survey exercise should be undertaken over a series of expeditions and over a number of years. To make best use of such an exercise, BSES should tie-up with one of the glacial research organisations so that the best use could be made of the ongoing data. Clearly a lot more advanced planning is required and the survey method refined. The latest post processed GPS survey techniques may be more appropriate than the methods used, but they are likely to be significantly more expensive and not necessarily meet the wider objectives of a BSES expedition.

In conclusion, the survey was a considerable success from several points of view. We learned about survey techniques in common use, how to work together safely and communicate in difficult and often potentially dangerous circumstances. Whilst we didn't contribute greatly to the body of knowledge about glacier movement, we did get to understand how we might do so in the future. Thanks to everyone who worked so hard to achieve what we did.

### Communications Equipment Report

By Raph Morton Comms







### Overview

This report summarises the effectiveness of various electrical and communications equipment used by the expedition.

This includes detailed comments on:

- Robin 650 generator
- QMAC HF radios
- Personal GSM mobile phones
- Motorola 9505 satellite phones using the IRIDIUM network
- Cobra UHF 2 way radios
- Uniross AA fast chargers
- Unbranded solar panels
- Panasonic toughbook laptop PC
- Custom made 12v battery box

Recommendations.

### Detailed Comments

Equipment	Reliability	Effectiveness	Comments
<b>Robin 240v/12v Generator</b> This generator was used by base camp for all its power needs, and for recharging the Fires' field equipment such as satellite phones and radios.	Excellent	Excellent	The 12v output is not stable – can spike up to 20V. It, therefore, should not be used to power sensitive equipment. Very quiet for a generator. Runs on same fuel as stoves. Fuel consumption difficult to measure, but used 8 litres in three weeks. <b>Recommendation 17</b>
<b>QMAC HF Radios</b> The expedition ran a daily HF radio net for capturing situation reports and social discussion. This was extremely popular with the YEs.	Excellent Except for connecting leads.	Excellent	<b>All</b> power leads and microphone leads suffered from reliability issues. These were due mainly to construction standards, but also prolonged use in this environment. Polar Rev's radio experienced problems caused by a battery that would not sufficiently hold charge. Radio performance was perfectly satisfactory laying antennae directly on snow. Cable repairs could only be effected using precision screw-drivers and a soldering iron. The radios were reprogrammed with additional channels in the field using the provided software. The power leads caused the fuses in the battery box to blow. One should investigate whether it is possible to choose an appropriate fuse for the cable that will blow in preference. This is for ease of access to the fuse. <b>Recommendations 1 to 7</b>



Equipment	Reliability	Effectiveness	Comments
<b>Personal GSM Phones</b> A significant proportion of the expedition area was served by the local GSM networks. In addition personal phones were invaluable during the advance party.	Excellent	Excellent.	<b>Recommendation 12</b>
<b>Motorola Satellite Phones</b> The expedition used Motorola satellite phones as a back up to the HF radios and for communications back to the UK. The phones were used for: Voice calls. Text messages (between sat phones). Email (with a PC). Text message to email (and vice versa).	Unsatisfactory	Moderate	A number of issues were encountered that reduced the effectiveness of this method of communications. The base camp satellite phone would drop voice calls regularly after about 3 minutes. The delivery of text messages was extremely unreliable often arriving three days later if at all. It was noted that often a text message would only be received if the receiving phone was used to make or receive a voice call. Text to email appeared to be very reliable. Charging the phones directly from the solar panels was unreliable as the phones appeared to turn on (as an alarm) in poor lighting. This would run the battery down! Charging direct from the 12V battery box or 240V mains OK. Transmission and receipt of emails using the <i>zap</i> compression service was satisfactory though on occasion emails were "lost" or the data call was interrupted part way through requiring restart. <b>Recommendation 13</b>

Equipment	Reliability	Effectiveness	Comments
<b>Cobra UHF radios</b> The expedition made use of UK band consumer UHF two-way radios for short range communications.	Satisfactory	Satisfactory	Satisfactory performance for short range. <b>Recommendations 14 &amp; 15</b>
<b>Uniross 12V fast AA charger</b> This was used to charge the expedition's AA batteries (for GPS) and personal batteries.	Satisfactory	Little used	Each Fire was issued a charger for field use, using the solar panels. However, when used it was mainly at basecamp with the chargers being powered from the generator. It should be noted that strictly the solar panels are not rated for powering this <b>fast</b> charger. This may adversely affect charging and battery life. Charging by plugging directly in the 12V battery box is OK.
<b>Unbranded solar panels</b> A flat semi-flexible solar panel was issued to each Fire in order to maintain the charge of their 12V batteries.	Satisfactory	Moderate	The panels worked OK, and did maintain battery capacity. However, most times the batteries were charge at base camp from the 240V generator. One totally flexible/rollable Iridium brand panel was used, and seemed as effective at charging. This panel was a more popular design because of its weight and compact nature.
<b>Panasonic Tough Book notebook PC</b> This was used for the expeditions administration.	Excellent	Excellent	This model proved to be very reliable is demanding conditions. An external power supply is essential as battery life is limited. The fact that the unit does not have an RS232 serial connector proved troublesome. The USB to serial adaptor worked for use with the satellite phones, but would not interface to the QMAC radios.



Equipment	Reliability	Effectiveness	Comments
<b>12V Battery box</b> The expedition constructed four custom 12V power supplies comprising a 12V lead acid battery, charging regulator, and battery meter. It included a standard cigarette lighter plug for charging and a standard fused cigarette lighter socket as an output.	Satisfactory	Satisfactory	The units proved to be reliable, robust and simple to use. They were a little bulky. Polar Rev's unit suffered from reliability issues, being unable to hold charge. It is believed that this is due to the battery performance, rather than a design or construction issue. However this needs to be tested. <b>Recommendations 8 to 11</b>

### Recommendations

The following recommendations are put forward to the committee.

	Recommendation	Benefits	Priority
1.	Replace all HF radio power leads ideally with commercially manufactured units.	Increased HF radio reliability.	Mandatory
2.	Replace all HF radio microphone leads ideally with commercially manufactured units.	Increased HF radio reliability.	Mandatory
3.	Consider use of super-flexible cables and connectors for the HF radios. An example is power leads using silicone insulation.	Increased HF radio reliability.	Optional
4.	Restock the radio repairs kit and ensure that it contains: Gas powered soldering iron (with solder and gas). Precision screwdriver set. Long nose pliers and cutters. Low cost multimeter.	Enables field repairs to radio kit, only manageable on this occasion through personal kit. (Low cost Maplin kit will suffice.)	Mandatory
5.	Investigate fusing the QMAC power leads with a lower value fuse that will blow in preference to the battery box fuse.	Ease of access and repair.	Optional

	Recommendation	Benefits	Priority
6.	Replace microphones with units that include a DTMF numeric pad, and enable the advanced features (easy buy software) of the radio.	Easy programming of frequencies in the field. Ability to call/beacon a specific radio making comms watches easier and provides back-up for poor comms system.	Optional
7.	Copy QMAC radio software from the Panasonic Toughbook to a reliable storage (CD).	This is believed to be the only copy in existence and is extremely useful for configuring the QMAC radios. Note that this software is simple to use, and radios could be configured by BSES staff.	Mandatory
8.	Investigate use of a lower capacity lead acid battery.	Reduced weight and volume.	Optional
9.	Provide a hand charger to augment the solar charger.	More reliable charging independent of conditions resulting in more reliable communications.	Optional
10.	Permanently adopt the new style 12v battery box as the expedition standard. Commission rework, and design changes necessary. Raphael is willing to service current units, document design, and construct a limited number of additional units	Believed to be a more reliable and versatile system.	Optional The committee will have to request that the current kit is restored to its previous design.
11.	Purchase 12V to anything cigarette lighter convertor.	This can interface to the battery box and provide an output DC voltage suitable for most equipment. (Cost £10) For additional cost one can also power laptops. (£30)	Optional
12.	Provide tri-band GSM phones to the expedition advance party with local SIMMs (local phone number).	Cheaper and more reliable communications when a GSM network is available. The PDAs provided to BSES by Detica are ideal, and will also enable email if the GSM network supports it.	Mandatory
13.	Consult with the IRIDIUM supplier over the issues encountered and withhold part of payment (e.g. for all text messages).	Improved service, lower costs.	Mandatory



	Recommendation	Benefits	Priority
14.	Standardise the two UHF radio models to one type that uses AA (rather than AAA) batteries.	Ease of base camp store management and procurement of batteries.	Optional
15.	Consider use of marine band VHF radios as opposed to UHF	Longer range communications. Ability to hail craft – safety. Probably has licence issues.	Optional
16.	Investigate increased use of broadband satellite communications such as the Inmarsat Regional Bgan (not suitable for Svalbard)	Such a system for base camp will provide: Cost effective voice (via services such as SKYPE) and email. Richer content (photos, video and written accounts) for the BSES website. This is attractive from the perspective of marketing BSES, a family/friends portal, and for BSES sponsors.	Optional
17.	Investigate use of a base camp power system based on wind and solar power.	Light weight wind generators are available and the system <b>may</b> be lighter, more self-contained and more environment friendly.	Optional
18.	Supply appropriate tools in the Fire repair kits.	This does not relate to communications and electronics, but provision of a multi-tool (screwdrivers and pliers). Damaged was caused by use of inappropriate tools, and leaders suffered undue wear and tear to their personal kit.	Mandatory

**KIT PROBLEMS**

By Ade Harris

**Ski poles:**

All but 5 pairs are much too long, needing hands to be held high and getting cold and sometimes frostbitten. The poles need to be shortened or replaced. Some pairs were shortened during the second stay in Longyearbyen, following several cases of frostbite.

**Stoves:**

There were many cases of stove failure caused by ice crystals forming in the fuel. The only way to solve this seems to be to warm the strainer on the fuel supply over another stove, boil the ice out of the fuel bottle and decant the good fuel off the top of the ice crystals – this is a slow process. Adding meths to the fuel would possibly absorb the water. Suggest that fuel bottles are not washed out with soapy water before travelling.

Fuel pipe failure at the joint with the stove, split swage. This can lead to a fuel fire outside of the stove and can be dangerous. These swages need to be examined closely.

2x cases of the burner housing shearing so that the burner housing is not secured in the stove. Causative factors; fatigue. Perhaps aggravated by the fact that the stop valve becomes stiff and then when the fuel is turned on if the stove is not held by the grip significant torque is created on the burner housing.

**Fuel bottles:**

We had problems with the seals freezing and thus fuel leaking, perhaps a low temperature seal needs to be investigated.

**Skis:**

9 bindings broke on the first occasion that they were used. All failures were at the front binding with the aluminium alloy failing in what appears to be a stress fracture. These failures all occurred when using plastic boots as the bindings would not adjust large enough to use with Sorels. A lot of time was wasted at BC1 botching bindings to fit large Sorels. The bindings then continued to break at the rate of about two bindings a day for those travelling reasonable distances. Many more botches were needed to keep them in service as it was just about impossible to travel without skis.



## TOP TIPS

### General Top Tips

Don't start the main party of the expedition until the end of March, in 2006 the cold and wind in the first week of the expedition presented a lot of problems. Although the weather in April is still pretty extreme it is not as bad as March.

Don't assume that there will be sea ice. You will need a reserve plan for if the sea ice doesn't appear and this will present a lot of additional logistical problems – for example waste disposal. Be prepared to re-plan your expedition on a daily basis.

UNIS are not prepared to help at all so don't expect them to do so. They were approached for help with the cold storage of snow algae samples, assistance with IT and assistance with a problematic theodolite in all cases UNIS were not prepared to help.

Norsk Polar Institute do not monitor HF radios.

A sheltered toilet is an absolute must for the prevention of cold injuries. We used a Hyperspace outer staked out with pulk trace extensions and this worked very well. A separate place was allocated for urine, whilst faeces were collected in a washing up bowl lined with a bin liner. Once full the liner was removed and allowed to freeze before being sent out. All human waste was moved back to Longyearbyen by skidoo and trailer. Snow wall toilets worked later in the expedition when it was warmer and when there was less spindrift.

It takes forever to sort out problems such as repatriation with ISOS, indeed it took our Expedition doctor 3 days to repatriate one frostbite victim. It would be easier and a lot cheaper for this to be done by HQ London – as ISOS have an office in London.

Do not rely on satellite phone text messaging for daily sitreps or general communication, it is not reliable enough. On two occasions Search and Rescue procedures were nearly activated as a result of "missing" text messages. Voice communication is better, but still not reliable enough that it could stand alone.

### Equipment Top Tips

Duct tape does not retain much stickiness when left over winter in Svalbard. String and labels are the solution for identifying barrels.

If barrels are labelled with packing tape in UK – the tape will come off due to the cold.

Fresh duct tape does not work in the cold, below -5°C or so, but does if items warm and once temperature increases.

4 washing up bowls for counting food into e.g. nuts, chocolate, tissues etc.

Marker pens at least 4 for writing on boxes of food, making labels.

A5 soft notebooks are a good size and still easy to store.

In warm weather, when bacterial problems more likely, use bleach for hand washing – 3 drops in a bowl of water then air dry hands. Bleach solution kills bugs so no need to change the solution after every hand wash – daily sufficient. Similar concentrated solution for washing cook pots, bowls and utensils.

The ski bindings will break at the toe straps. A good modification is to fit a webbing toe strap secured by the rear two screws of the Stubai toe binding, this gives better control and does not break.

### Base Camp tool kit needs to contain:

Gerbers essential for leaders for fixing just about everything, suggest BSES issue them. Large cross head and flat blade screw drivers for repairing the skis which break on a daily basis. Plug spanner and spare spark plug for the generator.

Base Camp "bits" bag needs to contain:

A roll of thin, malleable wire.

String essential for lots including tying the old food boxes up with rubbish (much easier to skidoo boxes of rubbish than bags).

Accessory cord for each Fire and base camp – for fixing pulks, tent guys etc. It is less bulky and so easier for some jobs and lighter than prussic cord.



**INCIDENT AND NEAR MISS REPORTS**

- A. Time and date.
- B. Time and date of incident.
- C. Team member Zapp codes.
- D. Nature of incident.
- E. Details of injuries sustained (if appropriate).
- F. New controls in place (if appropriate).

**INCIDENT 1.**

- A. 6<sup>th</sup> May 2006, 20.00.
- B. 6<sup>th</sup> May 2006, 19.55.
- C. Zapp 10007.
- D. Accidental discharge of bear trip flare in pulk, leading to damage to pulk cover, sallopettes and dry bag.
- E. None.
- F. All Fire leaders made aware of the incident which was the result of incorrect positioning of the safety pin in the flare breech. The cocking ring had been removed, leaving a redundant hole lower than the actual safety hole and so the breech was live even though it appeared to have been made safe.

**INCIDENT 2.**

- A. 10<sup>th</sup> May 2006, 09.00.
- B. 10<sup>th</sup> May 2006, 09.00.
- C. Zapp 10101.
- D. Accidental discharge of bear trip flare into a Sorel boot liner that was drying on the same ski. This led to a contained explosion of much greater intensity than is usual for a fulminating cartridge and occurred at head height.
- E. Temporary hearing loss and ringing in ears.
- F. All Fire leaders made aware of the incident and the risks of drying equipment on the bear trip flare posts highlighted.

**NEAR MISS 1.**

- A. 19<sup>th</sup> May 2006, 11.00.
- B. Throughout early stages of expedition.
- C. All.
- D. "Plastic" bear trip flares fail to initiate.
- E. Nil (near miss).
- F. The problem only occurred with the old plastic type of fulminating cartridge. These cartridges were BSES stock and of unknown age and regularly failed to initiate when installed in the bear trip flare breeches. They did, however, initiate in the flare pen devices, probably due to the heavier spring. The problem was resolved by using new "metal" fulminating cartridges in the bear trip flare breeches and reserving the old "plastic" cartridges for use with the flare pens, where their failure would be immediately obvious as the user would not be sleeping. It is recommended that BSES keep a note of the age of their pyrotechnics and destroy out of date items

**NEAR MISS 2.**

- A. 19<sup>th</sup> May 2006, 11.00.
- B. During first expedition outing from Longyearbyen.
- C. All.
- D. Illumination flares provided as bear trip flares.
- E. Nil (near miss).
- F. It became obvious during the early stages off the expedition that the green military trip flares (BSES stock) were not suitable as bear trip flares. These flares make very little noise and, due to the 24 hours of light have very little potential for waking a sleeping tent group. These flares were withdrawn from service as soon as the problem was identified.



**EPILOQUE**

By Ade Harris

To me Svalbard is a victim of it's own success. It is no surprise that many people wish to visit the Archipelago, it really is one of the last great wildernesses. However, it is becoming harder and harder to escape from the effect of these visits, the more so with the recent attention given by various television programs.

The skidoo is a self-perpetuating intrusion, in that to get away from the skidoos one needs to use skidoos to access the more remote areas before proceeding on ski. If the skidoos were not there then one could set off from Longyearbyen, on ski with pulks and the adventure would start there, but sadly this isn't the case. To ski from Longyearbyen along the road to Gruve 7 and along the first 10km of Adventdalen would be sheer purgatory. Furthermore, as spring turns to summer an unpleasant amount of rubbish, broken glass and empty cases are exposed by the retreating snow; a sad reflection on the previous visitors to the area.

If you are intending to visit Svalbard then you need to do so in the reasonably near future.

**APPENDIX 1****FIRE MEDICAL KIT AND GENERAL INSTRUCTIONS**

By Dr. Sally Staton

**If in doubt what to do always ask the Medic****Dressings etc**

**Gauze swabs** General dressings and wound cleaning. Can use a big pad with elastoplast or crepe bandage as a field dressing on large bleeding wounds.

**Triangular bandage** (1) Use either as a sling or to hold a dressing

**Elastoplast tape** (1)

**Micropore tape** (1) For those allergic to elastoplast

**Crepe bandages** (1 wide, 1 narrow). Support sprains and hold on dressings

**Steri strips+ Leucostrips** (3 wide, 2 narrow) Adhesive 'stitches' to hold cuts together. Skin edges must be dry for them to stick.

**Mepore** (6) Breathable adhesive dressings

**Release dressings** (10) Non stick dressings. Place shiny side against skin/wound.

**Jelonet** (5) Greasy dressings for burns and bad grazes

**Cotton buds** (6) Getting things out of eyes and wounds

**Polybags and salt** Put bag into a mug to make a clean pot of saline for washing wounds. 1 teaspoon salt per pint of boiled, cooled water.

**Betadine paint** (1) Wound antiseptic. Paint on undiluted. Don't use brush in pot. Decant small amount into spare bag and spread with cotton bud.

**Flamazine cream** (1) Antiseptic. Burns and dirty grazes

**Safety pins**

**Sam splint** Use to immobilise fractures. Bend into a gutter shape to make more rigid.

**Paper clip** Use to make holes in bruised fingernails. Ask Doctor for instructions.

**Digital thermometer** Normal temperature 37deg C or 98.4deg F. Press button to switch on, place tip under tongue, close mouth. Bleeps when ready.

**Pen and Paper** It helps to write down and pass on what has happened and been done.

**Luggage label** Attach to patient to be evacuated, a la Paddington Bear with personal details and drugs given plus vital info.

**Rubber gloves** 2pr

**Small ziplock bags** Hand out pills in them and to hold Betadine.

**Antibiotics**

**Erythromycin 250mg** (20) One tab 4 times a day. Ask Dr

**Amoxicillin 250mg** (21) One tablet three times a day Ask Dr

**Ciprofloxacin=Ciproxin 250mg** (20) One twice a day. Ask Dr

**Tenkorex=Cefalexin 250mg** (20) one four times a day. Ask Dr.

**Metronidazole 400mg** (15) One three times a day. Ask Dr

**Flagyl= Metronidazole suppository** (1) Insert rectally about one finger's length. Use rubber glove. Ask Dr

**Flucloxacillin 250mg** (20) One tablet 4 times a day. Ask Dr



**Pain killers**

**Codydramol (50)** Moderate pain. 2tab 4hourly. Max 8 daily.

**Diclofenac 50mg (50)** Painful joint(s). One three times a day with food. Do not take if there is a history of Asthma or indigestion or stomach ulcer.

**Gastrointestinal**

**Ranitidine tablets 150mg (30)** One twice a day. Bad or persistent indigestion

**Loperamide 2mg (40)** Diarrhoea. 2 immediately and then one with each loose stool. Maximum 8 per day.

**Buccastem 3mg (10)** Vomiting. One tablet three times a day. Place between the gum and the cheek and allow to dissolve. Don't swallow the tablet, it will work less well.

**Buscopan 10mg (20)**. Cramping abdominal pain. Two tablets three times a day.

**Rehydration sachets (6)** Dilute with water as per instructions on packet. Dehydration, especially diarrhoea.

**Senna (15)** Constipation. Two tablets every evening.

**General**

**Salamol=Salbutamol=Ventolin Inhaler (1)** Asthma.

**Prednisolone 5mg (30)** Asthma or severe allergic reactions. 6-8 daily in one dose. Always ask Dr.

**Neoclarityn (20)** One daily. Allergic reactions.

**Clotrimazole pessary (1)** Vaginal thrush. Applicator and instructions included.

**Levonelle2 (1pack)** Post coital contraception. One tablet immediately and the other in 12 hours. The first tablet must be taken no later than 72 hours after intercourse. Inform Dr.

**Creams**

**Triadcortyl cream (1)** Twice a day. Messy infected rashes. Ask Dr

**Eyes/Ears**

**Amethocaine eye drops (2)** Painful eye(s) Always ask Dr.

**Atropine sulphate eye drops (2)** Snow blindness, Iritis. Always ask Dr.

**Chloramphenicol eye ointment (1)** Eye infections. 4 times a day. Ask Dr

**Gentisone HC ear drops (1)** Ear infection. 2drops 4 times a day. Ask Dr.

**Injections**

**Adrenaline 1:1000 injection (1)** Life threatening allergic reaction. Inject into front of thigh.

**Claforan injection (1)** Severe infection or suspected meningitis. Dissolve with 4ml of water and inject into front of thigh. Always ask doctor.

**Voltarol= Diclofenac 75mg injection (2)** Severe pain. Inject into front of thigh. Repeat 6-8 hours. Ask Dr.

**Syringes 10ml (1) 5ml (1) 1ml (1)** check volume of injection. Use Blue needle (3)

**Orange needle (1)** use to remove splinters!

**APPENDIX 2****MEDICAL SNATCH BAG CONTENTS**

By Dr. Sally Staton

**Resuscitation**

Guedel airways (sizes 3 and 4)

Ambubag and mask

Cervical collar

Tourniquet

Venflons (3 brown, 3 green, 2 pink)

Needles (5 green, 5 blue, 5 orange)

Giving sets (x2)

Giving set insulator

Normal Saline (500ml x 2)

Gelofusin (500ml x 2)

Syringes (20ml x 2, 10ml x 5, 5ml x 5)

Portable suction (+ catheter)

**Injectables**

Adrenaline (500mcg x 2)

Diclofenac (75mg x 2)

Tramadol (100mg x 2)

Cyclizine (50mg x3)

Diazepam (10mg x 2)

Hydrocortisone (100mg x 2)

Chlorpheniramine (10mg x 2)

Ceftriaxone/ ceftazidime (2g x 1)

Lignocaine 1% (5ml x 4)

Lignocaine 2% (5ml x 2)

Marcain 0.5% (10ml x 1)

Sterile water flush (5ml x 2)

NaCl flush (5ml x 2)

**Oral**

Aspirin (300mg x6)

Prochlorperazine (3mg x 10)

Codydramol 10/500 (30)

Diclofenac (50mg x 21)

Diarolyte sachets (5)

Prednisolone (5mg x 28)

Tramadol (50mg x 10)

Cinnarizine (15mg x 10)

Nifedipine (5mg x 90)

Paracetamol (500mg x 20)

Ibuprofen (400mg x 20)

**Inhalers**

Salbutamol x1

Beclomethasone x1

**Creams and drops**

Amethocaine eye drops (4)



Atropine eye drops (4)  
 Fluorescein eye drops (30)  
 Flamazine (1)  
 Aciclovir 5% cream (2g tube x 1)  
 Aloe vera (1)

**Dressings and suturing**

Betadine paint (x1)  
 Polythene bags  
 Cling film  
 Cotton buds  
 Crepe bandages (1 wide, 1 narrow)  
 Field dressings (x2)  
 Elastoplast tape (x2)  
 Micropore / Transpore tape (x2)  
 Mepore dressings (x10)  
 Jelonet (x10)  
 Release dressing (x10)  
 Gauze swabs  
 Sterile field pack  
 Salt  
 Steristrips (large and small)  
 Triangular bandage (x2)  
 Safety pins  
 Suture kit  
 Suture (4x 3.0, 5 x 4.0, 4x 5.0 ethilon/ 2 x 5.0 vicryl/ 2 x 2.0 silk)  
 Eye pads (x2)

**General**

Foil blanket  
 Lolly sticks (x3)  
 SAM splints (2 large, 1 finger)  
 Re-usable handwarmers (x4)  
 Duct tape  
 Cotton gloves (1 large pair)  
 Rubber gloves  
 Luggage labels (x2)  
 Scissors  
 Scalpel  
 Sphygmomanometer  
 Auroscope/ ophthalmoscope  
 Stethoscope  
 Notebook and pen  
 BNF  
 Medical books (2)  
 Dental kit  
 APPENDIX 3

Casevac and Medivac plans  
 Large cable ties (x4)  
 Glucostix  
 Pregnancy test kit  
 Collapsible bowl  
 Foley catheter (x2)  
 Instillagel (x2)  
 Aquagel (x2)

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## APPENDIX 4

**EXPEDITION SPARES KITS**

By Raph Morton

**Radio Spares Kit**

Battery tester  
 Multimeter  
 Gas powered soldering iron ( can purchase rope cutting head)  
 Refilling gas cylinder x1 full  
 Pre-fluxed solder of smallest gauge possible – approx 2mm diam  
 Set of precision screwdrivers  
 Small long nosed pliers  
 Dipole feeder element x1  
 Microphone x1  
 Power connector x3  
 Qmac power lead x1  
 Co-ax cable x1  
 HK 90 manual  
 Lighter  
 Electrical tape x3 full,  
 10 amp car fuses, blade type x15 (very difficult to purchase in Lybn)  
 6 amp inline, glass tube type, x10 (very difficult to purchase in Lybn)  
 Very small, various coloured cable ties – ideal for marking antenna etc  
 Cable ties  
 Selection of nuts and bolts M4 M6

**Base Camp Stove & Tent Kit**

Stove pricking wire – coil of  
 Stove pads -1pkt / 2 pads  
 Stove pipe x5  
 Stove fixing kits x5  
 Flame spreaders x4  
 5ml syringe for fuel x10  
 20ml syringe for fuel x1  
 Funnels small with filters x2  
 Straps for tent pole ends to fit in  
 Small reels of sewing thread x10  
 Needles straight and curved  
 Zips (unknown length, unsure what they will fix!)  
 Eyelets x5  
 Tent material patch kits x4  
 Pole repair tubes x2  
 Pole cutters x2  
 Cable ties  
 Super glue  
 Crampon strap x41  
 Strap clips x3

**Fire Stove & Tent Repair Kits**

Straps for tent pole ends x2  
 Self-adhesive material patches x1  
 Material tent patches, flysheet, inner and ground sheet  
 Pole repair tube x1  
 Eyelets x2  
 Sewing needles straight and curved  
 Stove fixing kit x1  
 2.8 stove fuel nozzle  
 Stove pricking wire  
 Stove fuel pipe x1  
 Stove pads 1 pkt/2pads  
 Small sewing thread reels x2  
 Cable ties – small  
 Cable ties – large  
 Instruction sheet  
 Crampon straps x2  
 Small funnel with filter x1  
 Chrome leather straps x2  
 Length of accessory cord approx 100m  
 Duck tape  
 Superglue  
 Zips (unknown length, unsure what they will fix!)





# Recommended Expedition Kit List

## BSES Svalbard Spring

By Ade Harris



### CONTENTS

Introduction  
Kit List and Information  
Further Information and Discussion  
Packing Advice

**BSES Expeditions**  
at the Royal Geographical Society, 1 Kensington Gore, London SW7 2AR

### Introduction

Do not rush out and buy new gear until you have read this very carefully.

The average temperature for March is -15C, whilst the lowest temperatures will be around -25C. During April and May the temperature will rise steadily, most of the snow cover will melt and it will no longer get dark at night. The cold and the wind are your biggest enemies initially (polar bear attacks are very rare). As the seasons turn the cold and the wind are not as severe but you will need protection against the wet (from above and below).

This expedition is to an environmentally sensitive area. ***Thus there will be little or no opportunity to dispose of rubbish so everything that you take, including packaging, must be carried out.*** At every stage, flying in, walking to base camp and in your tent, space will be limited so keep your kit to a minimum; bear in mind that you will be carrying it.

Svalbard is a remote, barren area and you will be in the field for 3 months without the opportunity to replace anything; it is essential, therefore, that your kit is adequate. Equally, it is important that you do not take anything that you do not really need.

Remember that it is often possible and certainly cheaper to borrow items you do not have. Ask the member of staff at your school responsible for Outdoor Pursuits if he/she can direct you towards assistance from the Local Education Authority or Outdoor Pursuits Centre; your Cadet or Adventure Scout Unit may also be able to help. Local sports shops sometimes help with donations of clothing or equipment and some shops offer discounts to BSES members. However, it is not worth accepting unsuitable kit even if it is free. Inspect everything critically and try it out in good time - particularly your footwear. It is not a good idea to purchase ex-military clothing as it tends to be heavy and slow drying, not to mention very heavy when wet. The current thinking is to work on the layering system, more advice about this follows later. Although this may seem more expensive, it will see you kitted out for many years. Mark all your kit clearly as there will be a lot of similar gear around.

Remember the following:

1. You may be carrying all your kit and the terrain can be difficult. All the personal kit you take will have to be carried by yourself with the addition of half a tent, stove, science or climbing gear and food for several days. Although some spare kit may be left at Base Camp, think light!
2. Work on the layering system - layers of clothes are much better than thick clothes, and zips to regulate ventilation are often better than over-the-head clothes.
3. If you are in any doubt, wait until the briefing weekend before purchasing any clothing and equipment. Your leaders will be able to answer all your questions then.
4. Give some thought to what sort of outdoor activities you will do after the expedition. This will often help you to decide what to buy.

### Travelling Home Kit

Each YE MUST have a clean set of clothes (socks, underwear, trousers (lightweight) t-shirt, sweatshirt) to travel home in and a bag clearly marked with their name to put the clothes and their showering kit in. These will be stored in a container in Longyearbyen until the end of the trip. Arrangements have been made for all YEs to shower before changing into clean clothes. It is **essential** that you have these clothes but they can be your traveling out ones.



**Kit List and Information**

Everybody has different priorities and you may think of things that you must take that are not on this list. Do not omit anything in normal type.

Items in *italics* are not essential but you may wish to take them if you have space and weight available. Please be ruthless in your decision making.

Clothing is largely a matter of personal preference but please make sure that you have tried it all out before the expedition in all weathers and that the combinations you have chosen work for you.

More information and discussion on options and recommendations follows all items marked +.

**Bags/packing**

Rucksack +	70-80 litres, robust, with a good padded waist belt.
Rucksack liner	Dry bag or heavy-duty plastic bag.
Stuff sacks/dry bags	To separate clothes etc. A variety of colours and sizes. Can double as hand baggage on the plane.
Hold all/bag	Robust for storing excess kit at Longyearbyen, can double as hand luggage or if putting rucksack in a large, tubular bag for flight you can use that.
Bungi cords/straps x2	Useful for strapping things, especially rifles and skis, onto rucksack.

**Sleeping**

Sleeping bag +	4/5 season, synthetic or down but remember down doesn't dry well.
Sleeping bag liner	A fleece liner and/or a silk liner.
Bivi Bag +	Expensive but essential.
Sleeping mat +	Full length closed cell foam roll mat <b>and</b> inflatable Thermarest – type

**Inner Layer**

Thin socks x 3 pairs	Wool, Nylon-wool mix or meracilon. No uncomfortable seams.
Underwear x 3 sets	Comfortable. Preferably go for sports type bras.
Long-johns x 1 pair	Quick-drying.
Tracksters x 1 pair	"RonHills"/leggings.
Short sleeved thermal top x 2	
Long sleeved thermal top x 2	
Inner gloves x 2 pairs	Thin, thermal or cotton/synthetic mix. Good for fiddly work.

**Mid layer**

Thick socks x 3 pairs	Walking socks with no uncomfortable seams.
Fleece salopette	To be worn under windproof/waterproof layer.
Powerstretch or similar	
Fleece midlayer	
Fleece jacket	
Gloves x 2 pairs	Windstopper gloves to wear over inner gloves.

**Outer layer**

Boots +	The MOST important item of kit. Make sure they fit and you really wear them in.
Gaiters	Tough, clip on traditional-style are fine. Yetis tend to tear on rough ground and rough ice but you will have dry feet.
Waterproof Jacket +	Goretex, robust, large map pocket, storm cuffs and a wired hood.
Waterproof trousers	Need to be large enough to wear over fleece salopettes.
Down Jacket	Essential for rest times when not traveling.
Hat	Warm, and big enough to cover your ears.
Mitts	Waterproof overmitts.
Scarf	Head-over (neck gaiter) e.g. Polar Buffs are good.
Balaclava	Make sure it fits properly, should be fairly snug and meet the edges of your ski goggles so that you are not exposing any skin.
Facemask	May need modifying.
Sun glasses	Good quality UVA and UVB block with side protection from glare.
Ski goggles	Orange Lenses work well in bad visibility.
Glasses case	Strong enough to sit on without damaging your glasses.
Sun hat	<i>If prone to sun burn. Must provide protection for ears and back of neck</i>
Trainers (old) /approach shoes	<i>These are alternative footwear for camp / travel</i>

**Cooking and tent living**

Tent Booties	Usually made of down, can be worn in the tent at night.
Strong plastic bowl	To eat out of.
Mug	1 pint, plastic NOT METAL.
Spoon x 2	Mark clearly with your name.
Pen-knife	Preferably with good blade, scissors/nail file and tin opener.
Fuel bottle	Tie to a lanyard.
Head-torch	1 litre metal e.g. Sigg. MUST BE CLEARLY & PERMANENTLY MARKED FUEL. If it has ever held fuel of any type it must be thoroughly washed out using cooking oil so that it is not a hazard in flight.
Water bottle	LED ones are good.
Thermosk Flask	1 litre, strong plastic e.g. Nalgene.
Pot scourer	1 litre minimum, stainless steel, wrapped in karimat.
Fire steel	Green scratchy one cut into 2.
Spare boot laces	Always works, learn how to use it and make it personally identifiable as only 2 or 3 types on the market.
DuckTape (5m plus)	Or a couple of metres of para cord.
Mending kit x 1	Strong fabric sticky tape.
Washing line	e.g. Mini sewing kit plus safety pins, velcro, spare buckles, glue and patches.
Tent brush	<i>The elastic ones are good.</i>
	<i>V. useful - for scrubbing, brushing off snow and removing dust from tent zips etc.</i>

**Food**

Emergency pack +	Not more than 500g. Only for REAL emergencies or end of the Expedition.
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**Toiletries**

Bag	Use the smallest stuff sac you can find.
Small Towel	
Flannel	
Soap	Small bar. In plastic ziplock bag
Detergent	Biodegradable, small bottle/tube for washing clothes.
Toothpaste	1 x 50ml tube will do.
Toothbrush x 1	Some keen mountaineers saw the handles off to reduce weight.
Feminine Hygiene	Enough supplies for 3 periods. Pack in a watertight container.
Pee bottle	You know it makes sense.
Feepee/Whizaway	For girls
Toilet paper	BSES will supply this but take a few sheets for transit days.
Spare glasses	In a robust case. Contact lens wearers must also take a pair of glasses
Comb/hairbrush	Nothing fancy, just to reduce the mop effect and for going home.
Pocket mirror	If you are vain. Some compasses have an integral mirror.
Shaving gear	It is sometimes nice to go home clean shaven.
Hand wash	Small bottle.

**Medical**

The expedition doctor will supply each fire with an emergency medical kit but you should bring a small personal supply of standard items. Always keep the directions for drugs with your kit.  
**If you require regular medication, discuss this with the expedition doctor.**

Pain killers	Paracetamol and Ibuprofen.
Antiseptic Cream	Small tube e.g. Savlon or Sudocrem.
Fungicidal cream	e.g. Canesten for feet and if you are prone to thrush.
Sun screen	High factor UVA and UVB protection. Screw lids are more secure.
Moisturiser	For chapped face, hands and everything. Nivea/ E45 are good.
Lip balm 2 tubes	Sunscreen or sunblock type.
Zinc Oxide tape	1 roll, non-elastic, as wide as possible.
Blister kit	Moleskin/second skin/ compeed.
Elastoplast	Or a selection of different sized plasters.
Throat lozenges	A few, e.g. Strepsils.
Tubigrip esp.	If you are prone to knee or ankle problems.

The expedition doctor will be available to answer questions at your briefing.

**Leisure, Art and Writing**

Pencil x 2	Cut in half is good, for diary and science work.
Notebook	1 or 2 for diary etc. A6 size is good. Consider hard backed and ring bound.
Eraser	If you are prone to making mistakes.
Camera +	Most people take small automatic cameras rather than SLRs
Film/memory card	
Batteries	Remember that these run down faster in cold conditions. Try to keep it to AAs for recharging.
Paperback book	If everybody takes 1, you'll have a whole library between you.
Sketch pad x 1	Or combine with note book above.
Paints	Small water colour set, if you are keen.

**NO PERSONAL STEREOS – no space, no batteries and no need!****Travel Documents**

Passport	Must be valid for 6 months after the expedition return date.
Visa	Non-EU citizens check with the Office.
Air tickets	Will be issued to you by BSES at the airport.
Money	Pocket money only - will be discussed at the briefing.
Address labels	For <u>all</u> your sponsors and friends. Don't take your address book, you might lose it!

**Science and Adventure**

Compass	Silva type.
Ortlieb map case	The only map case that actually works.
Whistle	Plastic, on a string.
Survival bag	Orange plastic bag type.
Wrist watch	Cheap, must have an alarm, preferably waterproof. Make sure the battery (if required) is new.
Karabiners	3 pear-shaped, screwgates, 2500kg load. Colour code yours with electrical tape.
Thermometer	Small and reliable to aid protection against the cold.
Hand lens	Can be useful for science work.
Small binoculars	Wonderful if you've got the space and cash. Great if you are in to birds.

**BSES will provide ice-axes, helmets, harnesses, crampons skis and ski poles etc.**



**Further information and discussion on items marked with +****Rucksack**

Your rucksack must be tough but it is also important that it fits you. Don't be afraid of being fussy, even if you are borrowing or being given one. Test it out with weight in it (ask the shop assistant to fill it with climbing rope etc) before you buy/accept it. Costs are likely to be in excess of £90.

Most modern rucksacks have an adjustable back system with an internal frame. These are much better than the old style, external framed, packs. If you are small and/or female it is worth looking at the women's back systems because they are better for narrower shoulders and short backs. Womens' rucksacks tend to have a smaller capacity (60ltrs rather than 70/80ltrs) but if you are selective with your kit and pack well you should still be able to fit everything in.

It is important to have a good load-carrying belt with a quick-release buckle. Again, if you are slim, make sure the belt is small enough to fit you even if you only wear a T-shirt.

Check all the clips and buckles to assess their durability, remember you won't be able to buy any spare parts in the field if they break.

Pockets on rucksacks are a personal thing. A large top pocket with a stout zip is a great asset. Side pockets can be good but they also limit what you are able to carry in the side-compression straps. Detachable side pockets can be a good compromise but make sure the fixings are strong and easy to use.

Whatever the manufacturers say, no rucksack is completely waterproof. Don't be tempted to pack without a waterproof liner.

Please don't strap anything to the outside of your rucksack for transport on the aeroplane except if your sleeping mat won't fit inside; fix it securely in the side compression straps of your rucksack, not underneath or on the lid.

Lots of other people will have the same rucksack as you. A small label of colour flash on the top carrying loop will enable you to spot it easily in a big stack. If you write your name on it in big letters it won't get stolen.

**Sleeping Bag**

A 4-5 season bag will be required for this expedition. A fleece liner will increase the warmth of your bag by about 1 season but at the cost of increased weight and bulk. If you can afford it, a silk liner is very small and light and adds more warmth than cotton.

Sleeping bags are expensive items and it is worthwhile getting a good quality one. You may be able to borrow one but as with rucksacks, make sure that you get what you need.

Look at the width, length and shape of the bag. Ask to try it out in the shop, most outlets will have display models for this purpose. Some manufacturers make special shorter length bags which save small people from having to carry the extra weight they don't need. If you like to be able to move about, or are planning on having a thick liner, look for a wider cut bag. Another thing to look out for is a good hood and shoulder baffle.

Often, seemingly similar bags are sold at very different prices. This is often because they are quilted in different ways. The better bags will have seams at different places inside and outside

the bag so that cold can't seep in though the seams and the filling doesn't become too compressed in one place. Most outdoor equipment catalogues explain this in greater detail.

Look for a bag with a strong zip, double ended (if it is full length) and an internal baffle to stop cold air entering along the zip. Try the zip out to check that it doesn't get caught in the fabric. Bear in mind that bags with zips are heavier, colder and more difficult to compress but do help you to regulate temperature.

Compression stuff sacks can reduce the packed volume of your bag considerably. Check the size of the bag when compressed.

Always pack your sleeping bag inside a plastic bag, dry bag or bivi bag in your rucksack.

**Synthetic vs Down**

Synthetic bags have improved considerably in the last few years and are now much more compressible than ever before but they have also got more expensive. The main advantage of synthetic bags over down is that they remain warm, even when wet. Down bags, in general, are considered to be lighter, warmer for their weight, longer-lasting and more compressible. They are also much more expensive, difficult to dry and useless when they get wet.

If you chose a down bag, you MUST also have a breathable, waterproof bivi bag to keep it in.

**Bivi Bag**

An essential item of equipment. They can be a source of added warmth and are useful for snow-holing or nights that you want to camp out under the stars without your tent.

Your bivi bag should be waterproof and breathable. Most will not cope with all the condensation produced by you breathing all night inside it so try to keep your face outside. They can be very expensive items but you will not need a top of the range one and if you keep your eye out in sales and army surplus stores you might be able to pick one up more cheaply.

**Sleeping Mat**

The important thing with sleeping mats is that they are full length and insulate you from the ground. Closed cell foam mats are good and come in a variety of thicknesses, colours and prices, 12-15mm works well. Combined with a Thermarest you have a warm and comfortable system even on ice, snow or rock.

**Boots**

For this expedition you will need two pairs of boots. After extensive research the best option is going to be a plastic double boot for the mountaineering phases of the trip and a Sorel boot for the skiing and science work.

Some of you may already own a pair of plastic mountain boots, which may be suitable, but you should ask the advice of your leaders. Hopefully, the whole expedition will use the Scarpa Omega boot. Once you get these boots try them on with the socks that you intend to use on the expedition, do this at the end of the day (when your feet are at their largest). Wear the boots around the house from when you get them until you leave on the expedition, this will ensure that the inner boot moulds to your foot.

A deal is also being sought for the Sorel boots, but these will not require wearing in.



**Waterproof Jacket**

This is the outer shell that will protect you from the weather. It should be big enough to fit your warm clothes underneath but not so big that it swamps you when you only wear your thermals.

There is a lot of very flashy and expensive mountain gear on the market. You do not need a top of the range jacket but you do need it to be functional.

It should:

- be made of strong, breathable material
- have tough zips with large tabs so you can use them with gloves
- have storm cuffs
- have a wired hood (ideally not a fold away one)
- have a large map pocket
- have all internal seams well taped
- have accessible, useful outside pockets (bear in mind that when you are wearing a climbing harness you will have no access to hip pockets)
- be a good length. This is a matter of personal preference but make sure it is long enough not to expose your middle when you raise your arms and short enough not to restrict walking.

**Tops**

Almost everybody prefers a different combination of upper-body clothing, but it is important to build up layers of thermal tops and fleeces.

The main message is that you must decide on the combination that works best for you, think about the conditions you will be experiencing and try your clothes out in all weathers before the expedition.

**Emergency Pack**

This pack has a serious purpose. It should weigh no more than 500g but contain enough calories to sustain you in an emergency for 24 hours. You must not eat anything from your pack unless you are in an emergency situation or you are back in "civilisation" at the end of the expedition. Some people include food that they don't like so that they won't want to eat it but it is more fun to include your favourite sweets, chocolate, nuts and dried fruit etc. so that it is a treat at the end of the expedition.

Wrap your package up well in layers of plastic and tape so that it stays dry and in one piece (and so you are less tempted to open it).

**Camera**

Again, this is a matter of personal preference. Cameras are NOT insured under the BSES policy so make sure you have adequate insurance to cover yours in case of damage, loss, theft etc.

Whatever type of camera you take, make sure it is in a suitable case or cover to protect it from the damp.

**Packing Advice**

Obviously, it would not be sensible to pack your rucksack for the first time the day before you are to leave for the expedition. Assemble all your personal items together and divide them into three piles:

Essential/must pack

Probable/should pack

Possible/could pack

Then pack your rucksack. If it all fits, you can lift it and then carry it, and it is within the airline weight limit of 20 Kg - fine. If not, re-allocate your three piles, packing only from Essentials and Probables. If it still will not fit, pack only the Essentials. You will appreciate that certain items will change their priority during this process, and that it would be sensible to do this well in advance of the departure date.

After this, work out what you could leave at base camp. Does this leave enough space for your share of the stove, tent, food, climbing kit, rifle etc? If not, then something has to be sacrificed.

Do not have items dangling from the outside of your sack - it is untidy and in any case you may lose the items in the plane on the way out. Tape down all straps to prevent snagging in airport baggage chutes etc. There must be NO aerosols, camping gas, meths, lighter fuel or other inflammable liquids or gas lighters packed into rucksacks which will travel in the freight compartments of the plane. Please pack all knives, including your penknife, in your main rucksack for travel, not hung on a belt or in your hand luggage where it will be confiscated by airport security.

Use a stuff sack or day sack for personal in-flight kit (hand luggage), camera, travel documents etc. This should not weigh more than 5Kg.

**Expedition Briefing**

At the briefing weekend (December 2007) we shall be holding a clothing and equipment forum. If you are in any kind of doubt about what to purchase hold off until you have had time to discuss it with your leaders.

**Final Points**

Survival is paramount and comfort is a great bonus - any fool can be cold and miserable in Svalbard. Be prepared.

Good sleep is essential - the right gear has a lot to do with it.

Hot food and drink on a regular basis is very important both physically and psychologically. Proper use of the stove and the rations is required from the start. Don't forget the flask.

Natural fibres like down and wool are good for insulation but man-made fibres are generally more practical (my opinion).

We are recommending lots of good kit. Disadvantages include bulk, weight and expense. Be rational in your selection. Seek the advice of people who have experienced the conditions you will encounter, not the spotty nerd in the gear shop who has never been further than the South Downs.