

Imperial College Monte Rosa Massif Expedition Report

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Abstract

A team of six from Imperial College spent a month climbing in and around the Monte Rosa Massif region of the Valais Alps, Switzerland. The team faced poor weather consisting of almost unprecedented hot weather, with intermittent heavy snowfall leading to dangerous climbing conditions. The team did achieve success in furthering their ability to climb and travel in more exploratory scenarios.

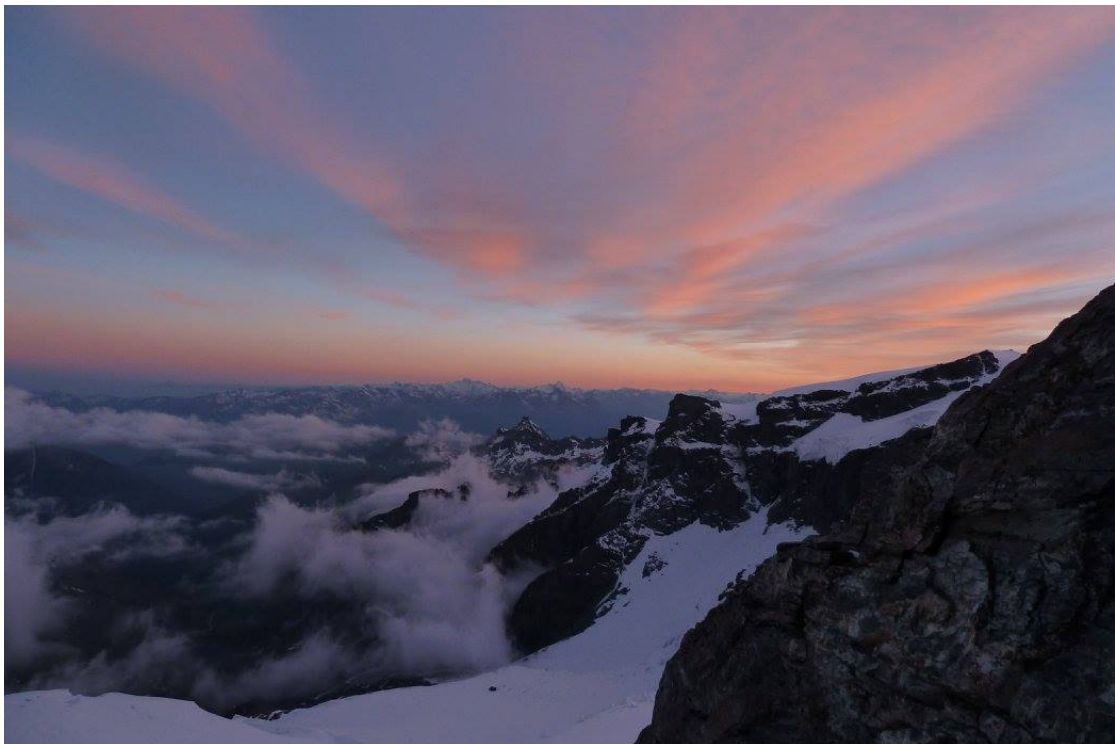


Figure 1: The view of the Sunset over the Italian Alps from the Rossi e Volante Bivouac Hut

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Figure 2: Ben, Knut, James, Tim and Tom in the Rossi e Volante Bivouac Hut

1 Introduction

This trip was proposed to be to an area where longer, more challenging routes can be attempted before a larger trip to a more exposed location could be conceived. The Monte Rosa area of the Swiss alps was chosen as our destination. It has the highest density of 4,000m peaks of anywhere in the alps and many of these require an additional day's walk in, as opposed to an early morning lift as we had become accustomed to in Chamonix.

The trip was planned to take place early in the season as this was the only time everyone was available and it was thought that higher levels of snow would be a better simulation of conditions on a larger expedition to come.

We camped in Täsch in the Zermatt valley. This location was ideal as a commute into Zermatt takes only 15mins and it is not far from the trails to the Domhutte and Täschutte.

2 Aims & Objectives

Our expedition aim was to enable members to further develop alpine climbing skills in a new environment.

In our proposal, we listed the following specific objectives:

- To explore more remote regions of the Swiss Alps
- To gain experience moving in higher altitude environments
- To gain experience in Expedition Mountaineering
- To prepare members for exploratory mountaineering in greater ranges
- To return safely

We feel we were successful in our objectives, in particular gaining experience in expedition mountaineering and in preparing for exploratory mountaineering in greater ranges due to the variable weather and route conditions faced, and in moving at higher altitude. It would have been a further benefit to climb in even more remote regions of the Swiss Alps, however the conditions we faced were not conducive of doing so safely.

3 Logistics

3.1 Travel

The Swiss Public Transport system made it very convenient to reach our campsite in Täsch. We used the IR route from Geneva Airport to Visp, then used the R route from Visp to Täsch. We purchased a Swiss Card (CHF201) which was both a valid return train ticket and a half-card which gave us a 50% discount on nearly all local transfers in and around Zermatt.

During the expedition period, there was limited mountain transport in the region. Only the Matterhorn Express (the gondola to Klein Matterhorn) and the Gornergrat Train were in operation, however these were sufficient for accessing a considerable number of routes in and around the Monte Rosa Massif. Other routes and areas were also accessible but required longer walk-ins.

Locally, we were able to travel between Zermatt and Täsch by using the regular Zermatt-Täsch shuttle train, which was CHF8.20 return. Regular trips to Zermatt were required to access some routes and mountain regions, but also for more mundane tasks such as purchasing gas cylinders and food.



Figure 3: The view of Trifyplateau from the upper pitches of Triftjgrat

3.2 Food

Food was purchased in the local Migros and Coop supermarkets. The food that was readily available was very European, and leant itself well to the activities undertaken. Food was found to be typically 30% more expensive than its equivalent in the UK, but Value ranges often available in UK supermarkets were not available, so it was difficult to eat cheaply. Due to Switzerland's high animal welfare standards, meat was a lot more expensive than in the UK. We brought cured meats (including Chorizo and Salami) as well as tinned meats (corned beef and tinned ham) with us to ensure we were consuming protein (apart from James).

As was expected, everything had to be cooked on a camping stove. Throughout the duration of the expedition the team developed some favourites including Rosti, a local dish, whatever-we-had Paella, and Corned Beef Hash (using - again- Rosti).

3.3 Accommodation

When sleeping in the Valley, we stayed in Alphubel Campsite in Täsch. This was in easy walking distance to the Täsch train station, and had good facilities (showers, dish-washing, clothes washing and an indoor refuge').

Whilst climbing in the mountain areas we stayed in tents or mountain huts. The mountain huts that had not yet fully opened had winter rooms that were well equipped with mattresses & blankets; stoves; and snow melting pans. The Rothon, Täsch, Monte Rosa and Margarita huts had fuel.

3.4 Training & Preperation

Each member of the team undertook a personal training program consisting of regular, middle distance runs and climbing sessions at the Westway climbing centre. Members of the team regularly went running together in Wormwood Scrubs and Hyde Park. As a team we competed in the Hyde Park relays as a team building exercise. It also provided an opportunity for us to directly compare our fitness albeit only over a 5km run.

As a group we completed the Welsh 3000s in May. Harry's car broke down before the start of the challenge adding 6km to a 30 mile walk. With 4km of ascent and descent and a total of over 35 miles covered this challenge pushed us physically and mentally. It proved the perfect preparation for some of the bigger alpine days we undertook.

James took a more scientific approach to his training that involved ascending dozens of flights of stairs laden with water as ballast and running up hills repeatedly to improve his cardiovascular performance. A typical session involved carrying a 17kg bag a vertical kilometer or more using the buildings lift to descend (to avoid joint wear). This was found to be highly effective and we are all looking forward to what a methodical training

approach can yield with a longer training period. While in Colorado for a conference James completed a multi-pitch climb solo as mental preparation and assessment of mind state.

Climbing partners frequently met up before their departure to practice their preferred systems and rope work. Doing so allowed us to minimise the time wasted roping up and left us more confident in our rescue techniques.

Unfortunately, Tom had a problem with a recurring tendon injury, which limited his ability to improve his fitness before departure.

3.5 Weather & Conditions



Figure 4: A classic Alpine view during one of our many wet weather days

While we were expecting typical June snow conditions and weather patterns, we could not have anticipated the Europe-wide heat wave that spanned the trip. A 3,800m freezing level, combined with snowfall typical for the time of year, created difficult conditions for climbing. This seriously hindered activity throughout the trip, because the repeatedly poor consolidation led to high avalanche risk. Whilst this greatly improved our assessment of avalanche conditions, it also prohibited our ability to climb the number, remoteness and difficulty of routes that were initially envisaged.

3.6 Equipment

This trip was a valuable opportunity to test different pieces of equipment and to better learn what systems are best suited for different climbing objectives. In obtaining equipment for this expedition we are indebted to the Harlington grant awards made to Imperial College Mountaineering Club, without the support of which this trip would not have been possible. In particular the newly acquired MSR Hubba Hubba NX tents. These lightweight tents provided an impressively comfortable and lightweight basecamp when not staying in huts, between a team of three they provided a good trade off between weight and space. Although not providing the five-season' durability of the older model Terra Nova Ultra Quasar, we are convinced that these tents will be perfect for the vast majority of future alpine climbing trips.

Different members of the trip used different clothing systems throughout the trip, based on personal experience and preference. We are happy to report there were no major problems at any point in terms of equipment malfunction.

It was found that the best clothing system to walk into huts (typical 2000m of ascent in hot sunshine) was running clothing and trainers. This allowed us to stay cool while adding the minimum extra pack weight. Boots and mountaineering clothing were put in or strapped to the outside of packs. Using this method Tim and James ascended almost all the way to the Rothern hut at 3189m before having to put boots on.

In terms of protective equipment it was found that a single set of alloy offset nuts, a gold cam and 4 slings along with personal glacier rescue gear was sufficient for routes upto AD+ on the rock in this part of the massif.

However we did regret not collectively bringing a petrol burning stove on this trip. Although our canister stoves were excellent on routes, a surprising lack of gas canisters in Täsch and general high cost would have made a cheaper petrol burning stove ideal for the long days stuck in the valley in bad weather.

4 Climbing Routes

4.1 Breithorn acclimatisation (PD) 31/05/2015

For our first climb of the trip we decided to take an opportunity to acclimatise by climbing the Breithorn (4164m) via the Central Summit to the West Summit. This was a straight-forward climb attempted from the Klein Matterhorn lift station. Conditions were excellent with the sole regret being that we hadn't taken a hint from the legion of ski-mountaineers and had to walk down from the summit! A highlight was the final section along the ridge from the central to west summit which became narrow and slightly icy. The climb was completed in 2.5hrs, far below the guidebook time of 4hrs. We then rested at the upper lift station (3883m) for 4hrs in order to get the maximum possible acclimatisation from our trip.



Figure 5: The view of the Breithorn Summit Ridge with the Matterhorn in the background

4.2 Alphubel attempt No.1 (PD-) 01-02/06/2015

We (Tim, Kip, Harry, Knut) set off, with heavy backpacks, to walk from the campsite in Täsch up to the Täschhut (2701m). We took it easy to save our energy for the following day. The plan was to go up Alphubel (4206m) and then descent to the Mischabeljoch bivouac hut to spend the night. After which Harry+Knut would head back to Täsch and Tim+James would attempt to climb the Täschhorn before return to Täsch. On our arrival in the hut, the three French ski tourers we met there are quite surprised that we walked all the way from Täsch when you can drive up to Täschalp (2205m), as they have done. Well, we didn't have a car and taxis are very expensive here. Plus we're fairly fit, so it only took 3.5h. The winter room of the hut is pretty luxurious and it turns out we carried sleeping bags, roll mats, gas and stove for nothing. We spent a relaxed afternoon on the terrace of the hut enjoying the views before having an early night. Sleeping turned out to be quite difficult. We were quite excited about the first proper climb of the trip and it was wonderfully warm in the hut.

The next morning we started walking at 5:00h with our head torches on. For the first 500m or so of ascent we are following the ridge of a moraine. Then it was time to put the crampons on and rope up. We walked up the southern arm of the Alphubel glacier, but breaking trail was very hard work due to the deep soft wet snow. The French ski tourers soon overtook us on the northern side of the glacier. We reached the Alphubeljoch (3771m) at around 8:30h. Unfortunately, very dark clouds were moving in and the wind picked up, so we made the frustrating decision to turn around here and go back down. The summit was still a good 500m of ascent away, and progress was very slow due to the snow conditions, although we were still ahead of maximum guidebook time at this point. Back at the Täsch hut we had a massive lunch before descending back down to Täsch. Alphubel was in the clouds for the rest of the day. Very frustrating but turning around was definitely the right call.



Figure 6: A photograph taken during the ascent of Alphubel

4.3 Alphubel Attempt No.2 (PD-) 04/06/2015

Harry and Knut decided to go back up to the Täschhut, this time with lighter backpacks, to give the Alphubel another go. It only took us 2.5h from the valley to the hut this time. In the car park in Täschalp we bumped into the French guys who we met on our previous attempt. Apparently they had been waiting for the weather to clear for 2h on the summit of Alphubel the day before, before deciding to descend in very poor visibility, confirming our decision to turn around the other day. In the early evening, two Swiss guys, who we also saw in the car park earlier, arrived at the hut. It took them 3h from the car park, as they carried ridiculous amounts of stuff, including 5l of water. There was quite a lot of food in the winter room left behind by other climbers and Harry and Knut had a bit of a feast.

The next morning we got up at 3:30h and left the hut in the dark at 4:15h. Once on the snow, we followed our footsteps from the previous attempt. Ascending was a lot easier this time. We had left a bit earlier and the snow was a lot harder, plus we had already broken trail here two days earlier. We reached the Alphubeljoch (3771m) at 7:00h. So far, we ascended in the shade (on the west side of the joch), but now we stepped into the sun. It was so warm that we were too warm in just thermals and a soft shell. After a couple of power bars and gels and some water, we set off towards the summit. Progress slowed down dramatically, as the snow was soft again on the sunny side of the ridge. Once we reached the 'Eisnase' (ice nose), the steeper bit of the climb, walking became a lot easier. Harry was pushing pretty hard and we kept up a decent pace. We reached the summit of Alphubel (4206m) at 8:45h. After a quick break to take in the view and some panorama photos and summit selfies, we headed towards the north ridge. Snow conditions weren't ideal and the initial snowy/icy bit of the ridge was surprisingly difficult as the snow didn't provide a solid foundation for our footsteps. Once we reached the more rocky sections of the ridge, we kept on moving together wherever possible and belayed each other (via direct belays, i.e. rope around rock noses and spikes) down the more difficult or exposed sections. When we were about 100m above the Mischabeljoch bivouac hut (3855m), a small sports plane flew past below us. Unfortunately Knut didn't have the camera running at the time, it would have made for a pretty cool shot. The route down the ridge pretty much finishes in the bivouac hut and we sat down inside for a 15 min lunch break to scout out the hut facilities for a potential future attempt on the ridge up the Täschhorn from here, although that ridge looked pretty tough in the current conditions. We had reached the bivouac hut at 10:45h and left at 11:00h to descend via the glacier to the west (Weingartenglacier). We saw some pretty impressive crevasses (that we avoided). At some point Knut stepped into a crevasse with one foot but luckily he didn't break through the snow bridge. After about 45 min on the glacier we reached the point where we would down climb some slabs on the southern side of the glacier to avoid the steeper and more heavily crevassed sections of the glacier. We sat down for a moment de-layering and taking off our crampons. Descending the slabs covered in scree turned out to be the scariest part of the day (for me anyway, Harry

seemed fine/oblivious). We saw quite a lot of rockfall and small avalanches going off, so from the bottom of the slabs we legged it until we reached safer terrain. Some of our steps caused weird/unsettling noises under the snow cover, presumably as we cause snow to fall into covered meltwater streams. We then followed a moraine ridge down to just above Täschalp where we sat down for a proper lunch watching a group of ibex nearby. Before we set off again we switched into our trainers. Taking light trainers for the way up and down from where mountaineering boots are not necessary has revolutionised our climbing. On the way down from Täschalp, we tried to hitch a ride twice, but it doesn't seem to be the done thing here. Pretty knackered from a very long day, we reached the campsite in the early afternoon.

4.4 Zinalrothorn attempt (AD) 03-04/06/2015



Figure 7: A very excited Tim before the attempt of Zinalrothorn

Tim and James walk up to the Rothorn Hut with the aim to climb the Zinalrothorn. We found the path mostly clear of snow until near the top of the glacial moraine ridge which terminates at the hut. We left our details with the man who runs the cafe on the approach as Harry and Knut were climbing at the same time and he kindly offered to call rescue if we were over late on return. We needed to rope up to cross a 4m slope between the hut toilet and the main hut as we felt that despite its small size the avalanche risk was very high due to aspect, gradient, snowpack composition and the temperature profile through the day. This was the correct decision as medium sized avalanches were released as we crossed the slope. The hut was mostly buried in snow and a further dangerous

slope had to be crossed to reach the winter room, again we belayed across this slope to avoid been swept away by avalanche.

Once we had established ourselves in the winter room we inspected the approach to the climb. We found that there was no way to avoid crossing or walking up prime avalanche slopes on approach to the climb. We made the very difficult choice not to attempt the climb as even if it froze hard that night we would not be able to descend using those slopes. We looked over the guidebook for alternate routes such as the Ober Gabelhorn but nothing was possible without suicidal risk. During the night the temperatures never dropped below freezing and we were woken by the sound of further avalanches and rockfall. The return the Zermatt was fast and uneventful, with a brief stop at the Edelweiss cafe for lunch.

4.5 Monte Rosa Massif Traverse attempt (Nordend (PD) - Dufourspitze (PD+) - Signalkuppe (AD)) 05-08/06/2015

With a weather window till the 8th of June it was time to attempt the big traverse of the massif, this was partially successful with one big day of climbing and one very 'experience' day of retreating into Italy followed by a frustrating journey back to Täsch. This was undertaken by Tim and James. The first day we used the Gornergrat train to get to Rotenboden from there we descended to the glacier and walked upto the space age Monte Rosa hut. We slept very badly due to ski tourers coming in all night long waking us, some of whom only stayed for 2hrs. There was gas in the hut and also nearby flowing water.

We left the hut at 2:37 to climb Nordend which involved 1800m of ascent through mediocre snow. We accomplished this quickly outpacing all the ski tourers in the hut and moving far below minimum guidebook time despite conditions. The final ridge and scramble to the summit was most pleasing. From here we went back to the saddle and climbed the Dufourspitze which at 4634m is the 2nd highest mountain in europe. There was some congestion on this climb from ski tourers so we climbed up using a mixture of the fixed ropes and mixed climbing. The climbing up these ropes was surprisingly tiring, but the hardest (down) climbing was still to come!

We then descended the south east ridge (via Zumsteinspitze) where we encountered loose rock on partially snow covered slabs and very poor snow conditions on the final traverse to Zumsteinspitze. We arrived at the Margherita hut that is on the summit of Signalkuppe after 13.5hrs of climbing exhausted but satisfied with finally having a successful day of climbing, overcoming poor conditions in the process. At the hut was 1 kg of espresso coffee and stovetop coffee maker with gas which helped alleviate some of the tiredness. We received a text message from Harry informing us that there would be between 3 cm and 60cm of snow falling on the hut during the night and early morning. This meant that we did not eat much of our food as we would potentially be trapped in



Figure 8: The space age Monte Rosa Hut

the hut while waiting for this snow to consolidate. We set the alarm for 2:00 to continue the traverse via Lyskamm as forecasts are not always reliable, we awoke to heavy snowfall and continued to wake at 2hr intervals until 6:00 when the snow stopped. At this point there was too much snow and it was too late in the day to attempt to continue the traverse but only a few centimetres of snow had fallen so we could leave the hut.

At this point it is important to state some information about Swiss maps, firstly they cut off at the Italian border and secondly it is not possible to buy Italian maps in Zermatt, so for this part of the traverse there is a gap in the maps that we had. From the diagrams in the guidebook we had mistakenly thought that the south side of Lyskamm was a glacial plateau and we could walk the 8 km to the Klein Matterhorn lift station to get down (as walking down the glacier to the Monte Rosa hut is tricky and long). However the way across is interrupted by the 300 m tall south ridge of Lyskamm which we ended up on after crossing slopes that we would be unwilling to cross again due to gradually escalating avalanche danger as we crossed them. This left us with the choice to either wait on the ridge until the snow froze sufficiently to lessen the danger (with a bad forecast not a good idea) or attempt to find a route down to the Lyz glacier and Italy. We were successful in forging a route down to the Lyz glacier and ultimately walking down to the town of Staffal. We overcame the most loose rock we have ever encountered and a heavily crevassed, snow-covered glacier. Although this was a non ideal situation it was our abilities in the mountains that allowed us to overcome the dangers and not luck.

Fortunately Kip had 25 Euro to pay for huts so we took the bus to Gressoney at the head of the valley and then the train to Aosta. We arrived at 20:00 with the next bus



Figure 9: A photo from the top of Nordend showing Doufourspitz, Zumsteinspitze and the Margherita hut

to Martigny in Switzerland was at 11:35. So after pizza and fulfilling our desire for limoncello we found a quiet corner of the park and went to sleep (we were too filthy to stay in a hostel). Unfortunately we had not much sleep due to sprinklers turning on at 3:00 and ended up finding breakfast in a Carrefour in a daze at 6:00. We then passed the remaining time by looking at some ruins and drinking endless cappuccino in a local cafe. The journey back was uneventful apart from crossing the Swiss border without passports or any form of ID, the border guards after some discussion believed our story and let us through. If we had not been allowed to cross the border we would have had to cross at a mountain pass on foot, although at this point hygiene was becoming quite desperate 4 days in and with a heatwave. From Martigny we took the train to Visp and then Täsch arriving back at the campsite in the late afternoon.

4.6 Täschhorn Attempt (AD) 11-12/06/2015

Tim, Kip and Knut set out to attempt the northwest face of the Täschhorn, one of the classic snow and ice routes of the area. We followed the very steep path to the Kinhut on our way up for most of the way. Shortly before reaching the Kinhut, we turned off the path and ascended a bit further in the direction of our route for the Täschhorn, in order to make our climb a bit shorter the next day. We set up our camp in one of the amazing MSR Hubba Hubba NX tents just above a hydropower station at just under 3000m. Kip and Knut walked up along the moraine for a little while to recon the route for the next



Figure 10: The MSR Hubba Bubba in use the night afternoon before the attempt of the Täschhorn

day. We had a pretty cold night in the tent, even though it was three of us in a two man tent. To save weight, we didn't bring sleeping bags, thinking our clothes would provide sufficient warmth. The next morning, we had a very early start and set off at 02:35. First along the ridge of the moraine, then on the northern side of the glacier. At some point we had to cross the glacier to its southern side in order to meet the via ferrata that would allow us to avoid the very steep and heavily crevassed section of the glacier a little further up. The glacier was already fairly heavily crevassed down here, and the crossing to the other side was pretty exciting/nerve/wrecking. We were quite happy we had brought the more technical tools this time, as we made good use of them climbing over crevasses. On the other side we followed the rock band upwards, hoping to find the via ferrata. Unfortunately we couldn't find any sign of the via ferrata. We tried to make our way up following the edge of the glacier, but it soon became too dangerous with huge crevasses, fragile snow bridges and hanging seracs. It was now becoming light and we walked back down along the rocks to look for the via ferrata. We still couldn't find the via ferrata and decided it would be safest to go back down. From where we were now we saw a flatter section of the glacier that didn't look as crevassed so we decided to cross back to the other side there. Knut was going last now, but broke through a snow bridge until he was stopped by his arms that he had spread out in reflex. The others pulled him out, but in doing so also started breaking through different snow bridges. After this we kept the rope very tight between us and were quite relieved when we reached the moraine on the other side of the glacier. We were back down in Täsch before some of the other campers even got up.

4.7 Pollux SW Ridge (PD) 17-18/6/2015)

This route was undertaken by Tom, Ben & Konstantin; Tim & James.



Figure 11: Ben climbing one of the more interesting sections of the SW Ridge of Pollux

Following the 5 days of precipitation/heavy cloud we decided to attempt a safe route to gauge conditions. We decided on climbing Pollux by the SW Ridge from the Rossi e Volante Hut. This route is graded at PD. After a slow approach to the Hut the previous day, we left at approximately 03:45 to approach the route across the glacier. The snow was poorly consolidated, as would be expected after 5 days of snowfall and limited consolidation time, so the glacier crossing took guidebook time, instead of the 60-70% of minimum guidebook time that we tend to achieve. The small initial snow slope to reach the rock ridge was straightforward. The rock ridge itself had more snow than is typical, however did not present any insurmountable challenges. The ridge offered nice climbing, with a good range of rock, ice and mixed terrain. The final UIAA III pitch was climbed using the fixed chains to reach the final snow ridge, which although soft, was stable. The wind had picked up considerably, making the summit ridge and the summit rather uncomfortable places. Upon completion of the climb we went back to the bivi hut and entertained ourselves with endless card games while the predicted afternoon snow started.

We had intended to complete the full traverse of the Breithorn summits the next day but the weather was poor with zero visibility at times and fresh snow making the rock climbing on the traverse likely very difficult. After having woken up to inspect conditions at 03:00 and then at dawn at 05:00, we had to abandon the plan so we walked back to

the lift station and went back to the campsite.



Figure 12: The team traversing below the ridge on the Normal Route up the Dom

4.8 Dom, Normal Route (PD) 21/06/2015

The team (Ben, Knut, James, Tim, Tom) set off the day before to ascend to the Domhutte, an elevation gain of 1,500m. This took 3 hours. Tom, who was broken after the walk-in, did not attempt the ascent. The team of four set off from the Domhutte at 03:00 and ascended to the glacier, and followed the ridge, as outlined in the guide-book. Unable to find the critical via ferrata section, and facing inclement weather, the team decided to turn around. The team descended pretty quickly and were back in the campsite by 11:00.

4.9 Breithorn East & Central Summits (PD) 22/06/2015

With a one-day weather window there are very few route options from the valley. Tom & Ben decided to take the first lift on the Matterhorn Express to Klein Matterhorn, and approach for an eastern half-traverse of the Breithorn, graded AD. We approached the route to find that the short section of ice was 100m of rotten ice. We therefore changed route, and decided to climb the standard East Summit on to the Central Summit (PD), before descending back down to Klein Matterhorn. This was a frustrating excursion as

we had hoped to undertake a more challenging route, but this was clearly a recurring theme.

4.10 Triftjgrat (D-) 25/05/2015

This was undertaken by Ben & Tom. After ascending to the Gandegg Hut the previous day and inspecting the approach as well as the beginning of the route itself, we woke up at 03:00 to descend to the glacier and then crossed it, before climbing the first steep snow slope to Triftjcol. We did this in 1.5 hours, 30 minutes under the 2 hour guidebook time. There was considerable debris on this initial snow from previous avalanches, but this was not a challenging obstacle. We continued up the snow slope, crossing the shoulder onto Triftjplateau in an additional 1.5 hours - putting us an hour under the 4-hour guidebook time to Triftjplateau. This second section contained steeper, more exposed climbing on some of the best snow we experienced throughout the trip, however this was still not as good as we have experienced on pretty much every other alpine trip undertaken.



Figure 13: A leaders-eye view of the approach to Triftjplateau from Triftjcol

The final, 55 degree steep snow slope proved a lot more challenging, and due to the poor snow conditions, we decided to pitch some steeper, unprotectable sections (as the snow at the edges of the snow slopes was more rotten, we decided it was too treacherous to frequently traverse to place protection). We failed to take the easier, left-hand exit of the route (as described in the guidebook), instead taking the rockier finish of the Bethmann-Hollweg Route, as we deemed this to be more protectable, and for the rocky finish to be more stable.

We climbed the remainder of the route in well over the guidebook time, however still topped out in just under 8 hours - which was within guidebook time. We felt that this was a significant achievement, as this was the hardest snow route that we had climbed

at the time, and it was renowned for being long, with 1400m gained, difficult route-finding, and was in less-than-ideal conditions. We also experienced the trauma of very low-passing fighter jets, which seemed at times to sound like explosive avalanches, which did not help us deal with exposure.

5 Journal Summary

5.1 May

29 Kip, Harry and Knut arrive in Täsch
30 First acclimatisation hike for Kip, Harry and Knut; Tim arrives in Täsch
31 Cable car up Klein Matterhorn for an acclimatisation climb up the Breithorn from there

5.2 June

01 Ascent to Täschhut
02 First attempt on Alphubel
03 Harry & Knut go back up to Täschhut; Kip & Tim ascend to Rothornhut for Zinal-rothorn
04 Harry & Knut: success on Alphubel
05 Rest day for Harry & Knut; Tim & Kip start Monte Rosa traverse
06 Harry & Knut: bad weather day; Tim and & Kip Monte Rosa Traverse
07 Harry & Knut: bad weather day; Tim & Kip retreat from Monte Rosa Traverse
08 Harry & Knut: bad weather day; Tim & Kip return to Zermatt
09 Rest day
10 Rest day
11 Tom & Ben arrived
12 Tom & Ben attempted to climb the Mettelhorn, reached 2700m.
13 Wet weather (walked towards Kinhutte, then walked up to Zermatt)
14 Wet weather (went for a run)
15 Wet weather (went on a cycle)
16 Wet weather. Prepared for Rossi e Volante hut
17 Walked to Rossi volante. Arrived at 2pm
18 Pollux after 03:30 start
19 Walked back to campsite. Prepared for Dom.
20 walked to Domhutte. 1500m in 3 hours
21 Attempt of Dom. Knut and Tim left and returned to the UK.
22 Kip flies back to UK. Tom & Ben climb Central & West Summit of Breithorn
23 Wet weather. Rest day. Prepped for Triftjgrat.
24 Tom & Ben ascended to Gandeggutte.
25 Tom & Ben climb Triftjgrat.
26 Rest day and pack up campsite
27 Tom & Ben fly back to UK.

6 Finance

6.1 Expenditure

6.1.1 Transport

Return flights to Geneva cost up to GBP 35-GBP 150 return (as James used Avios Rewards to fly cheaply, whereas some members had to pay significantly more for their flights), extra baggage was purchased to carry the quantity of equipment required at a cost of for GBP 139. The total spent on flights was therefore GBP 797.05.

All members purchased a Swiss Card at CHF201 (GBP 138.70) for transit from Geneva Airport to Täsch, as well as providing a 50% discount on most local transport and lifts. In the valley members spent GBP 742.63 on a combination of local trains, gondolas and mountain trains.

6.1.2 Accommodation

The total spend on camping was GBP 773.49 which is an average of GBP 6.67 per person, per night.

The total spend for mountain huts was GBP 456.54, plus the GBP 162 reciprocal rights membership that was required to stay in most of the mountain huts. Therefore accommodation came to GBP 1392.03.

6.1.3 Food & Fuel

The total spend on food came to GBP 757.34. The only fuel used was gas for our lightweight camping stoves, which came to GBP 64.57 in total. Therefore GBP 7.09 was spent per person per day on average on food and fuel.

6.1.4 Equipment

As proposed, we purchased guidebooks and maps locally, these cost more than expected and came in at GBP 121. However, we did not purchase a base camp tent. Instead we flew an old Imperial College Mountaineering Club tent and binned it at the end of the expedition.

6.2 Income

Every member contributed GBP 402 to the expedition, with Imperial College Exploration Board contributing an additional GBP 402 per member. Please note that this has been adjusted to reflect the underspend (see below).

6.3 Summary

It has been noted that the expedition came in significantly under budget. The differences are as follows: Flights GBP -32.95; Transfers GBP -89.90; Local transport & lifts GBP -57.27; Camping GBP +3.49; Huts GBP +96.54; Food GBP -1002.66; Equipment GBP -325.

Category	Amounts in GBP
Income	
Exploration Board Contribution	2,412.63
Member Contribution	2,412.63
<i>Total</i>	<i>4,825.26</i>
Expenditure	
Flights	797.05
Transfers & Half-fare cards	910.64
Local Transport & Lifts	782.63
Food & Fuel	821.91
Accommodation	1,392.03
Equipment	121
<i>Total</i>	<i>4,825.26</i>

It has been noted that the expedition came in significantly under budget. Most significantly: food was GBP 993.09 under budget; equipment was GBP 325 under budget (as we didnt purchase a base camp tent) and Flights were GBP 370.64 over budget (due to us having to purchase extra baggage).

The largest differences were the savings made in equipment purchase (by not purchasing a base camp tent), as well as our overestimation on food spend. We are quite impressed we managed to live in and around Zermatt for GBP 7 per person per day, however this contributed to a large difference between our budgeted and actual spend.

7 Future Plans

This expedition was envisaged as an important opportunity to train and develop as climbers, we view the trip as having been a significant and successful stepping stone on the road towards more ambitious mountaineering objectives.



Figure 14: Some of the team in front of a view of the Italian Alps

Climbing in an entirely new area of the Alps, outside of the main climbing season, challenged us in a number of ways. Assessment of weather forecasts and conditions on route became all the more important with no previous tracks to follow. Reading route descriptions was obviously vitally important, but unlike on previous trips these weren't supplemented by up to date condition reports or on the ground' advice.

Whilst this was obviously not a remote expedition environment it was a very useful learning experience. The group has now been thinking about how we can build on the skills learnt here and choose a suitable objective for a future, more exploratory, expedition. We are also actively considering the skills and experience we need yet gain in order for any future expedition to be successful.

By going to a higher range than on previous trips we have realised that our approach to training for Alpine climbing so far hasn't been as good as it could have been. We were happy with the routes we completed and the time and style we did them in, however some members felt that their performance at this higher (or indeed any) altitude would have been improved by following a more rigorous training plan prior to departure. A training plan that focused on endurance to a greater extent than we have done previously.

After reflecting on our collective experience following this trip we have considered several areas that we think we need to focus on before any future expeditions. We feel that to accomplish more technical alpine routes in the best possible style, all members of the expedition would benefit from additional ice and mixed climbing experience. Whilst Scottish Winter climbing is undoubtedly preparation enough for many, we feel that we would benefit from the more consistent conditions offered by a European destination. In addition, any mountain travel in a continental European winter will provide valuable training in many cold weather skills that are appropriate to an expedition environment. If appropriate alpine routes could be attempted concurrently this would also be a very beneficial learning experience before considering an expedition objective.

8 Conclusions

The aim of this expedition was to prepare us for future exploratory expeditions in the greater ranges. We wanted to gain experience in route planning, route finding and decision making. In this respect, we think our expedition to the Monte Rosa Massif was successful for the following reasons.

The decisions that have to constantly be made on the mountain are heavily influenced by the weather, snow and ice conditions, crevasses and other objective dangers and timings/progress of the group and require a great deal of experience. These decisions are further based on information and knowledge attained prior to starting the climb or even the trip. Both the fact that we were climbing early in the season and not in a place such as Chamonix with great infrastructure for climbing meant that we carried a lot more of the decision making responsibility on this trip. Conditions were often different to the conditions described in the guidebook and we had to reassess the feasibility of any given climb en route. Due to the ever changing conditions of glaciers for example, route descriptions of glacier crossings are always to be taken as a possible route rather than the only right way. As we were the first in the season on many of our climbs, we couldn't simply follow in the literal footsteps of previous climbers. Further, we were often the only climbers on the mountain and in the huts, eliminating the chance for valuable exchange of information on conditions and routes with other climbers. The hut books often showed that the routes we were attempting hadn't been climbed in months (at least not via the hut). The guide's office in Zermatt was also closed for most of the duration of our stay.

In conclusion, we gained a lot of valuable experience in the previously mentioned areas of route planning, route finding and decision making. Especially the difficult but important and safety relevant decisions such as the decision to turn around due to adverse (but maybe not impossible) conditions require a lot of experience. We feel that we have all progressed as mountaineers and furthered our ability to responsibly plan safe routes in the mountains, experience that will be important on bigger expeditions.

9 Acknowledgements

We'd like to thank the Imperial College Exploration Board for their support in this expedition. In particular we would like to thank Dr. Lorraine Craig and Dr. Phil Power for their ongoing help and advice.



Figure 15: The Rossi e Volante Bivouac