

Imperial College Explo Board

Alpine Climbing in Chamonix

July 2023



Figure 1: The team ignoring the backdrop of Chamonix Aiguilles and focusing instead on what sort of cheese they would have with dinner.

Overview

Following the success of the 2022 Alaska expedition, psyche was high for more alpine climbing. However, it was felt that everyone would benefit from a training trip before returning to more remote and exotic regions. We decided that Chamoni was a good location for this expedition, where the abundance of accessible alpine routes would let us climb a great deal of volume.

For the more experienced team members, it was an opportunity to hone existing skills and become more efficient in the hills. For the less experienced team members, it was an introduction to alpine climbing, which differs in many ways from the UK cragging that ICMC exposes people to. By the end of the trip, all of the team were more competent and better prepared for future expeditions to larger and more remote mountain ranges.

Given the changeable nature of alpine weather, it was important to have flexible objectives. Instead of aiming for a specific mountain or route, the team considered conditions on a short-term basis with the following goals in mind...

- ▶ To gain experience with glacial approaches.
- ▶ To complete long objectives to practise efficient movement.
- ▶ To complete multi-day objectives with bivouacs to build mental stamina.
- ▶ To summit a peak above 4000m to practise acclimatisation methods and understand our tolerance to altitude.
- ▶ To practise choosing safe routes by interpreting short-term weather forecasts, avalanche forecasts, and consulting local expertise.

Contents

Overview	i
Contents	ii
1 Team	1
2 Logistics	3
2.1 Training	3
2.2 Location	3
2.3 Equipment	4
3 Logbook	5
3.1 East Ridge of Pyramid du Tacul	5
3.2 Arete de la Table on Tour Glacier	7
3.3 Les Lepidopteres on the Aiguille du Peigne	9
3.4 Lion Ridge of the Matterhorn	11
4 Conclusions	18
4.1 Climbing	18
4.2 Camping	18
4.3 Food	19
5 Afterword	20
5.1 Acknowledgements	20
5.2 Contact	20
Appendix	21
A Risk Assessment	22

Isaac Blanc

- ▶ 4th year of Mechanical Engineering with Year in Industry
- ▶ Had led trad E2, Scottish winter V, alpine D
- ▶ Experience on long mountain routes in UK, Europe, Alaska and Bolivia
- ▶ Experience with altitude up to 6000m in Bolivia
- ▶ Trained in crevasse rescue (Conville Course) and avalanche awareness (ICMC winter tour with guide)
- ▶ Qualified level 3 outdoor first aider

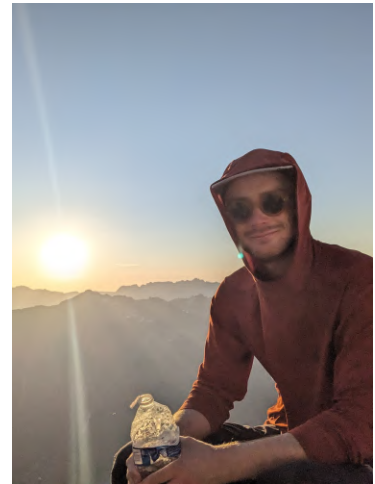


Figure 1.1: Isaac trying to hide his nerves at the bivi below the Cordier Pillar.

Ed Adams

- ▶ 4th year medical student currently studying remote medicine with interest in expedition medicine
- ▶ Snow experience climbing Cotopaxi, Ecuador (5897m) and completing the Annapurna circuit, Nepal (5416m)
- ▶ Outdoor sport 6c - Portland, Swanage, Wye Valley.
- ▶ Trad: seconding multiptich on sgurr alaisdair, Skye, V diff. Lead diff.
- ▶ Scrambling in wales and Scotland up to grade I including Crib Goch and Bruach na Frithe.

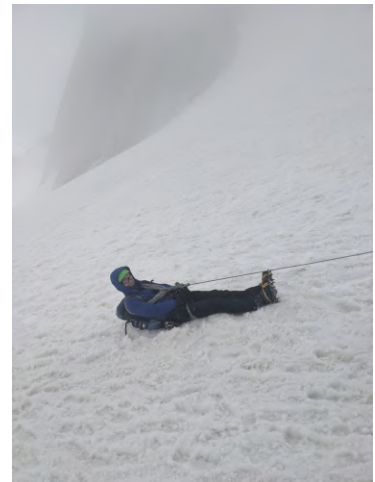


Figure 1.2: Ed pretending to fall in a crevasse while practising rescue techniques.

Ben Jones

- ▶ Medic, Remote med BSc alumnus
- ▶ Alpine experience to AD, 5.9, winter III
- ▶ Lots of experience climbing above 4000m, some experience above 5000m
- ▶ Trad up to E2, sport 7a+, and bouldering 7b.
- ▶ Competent alpine and winter lead.



Figure 1.3: Ben on top of the Matterhorn.

Sam Bakker

- ▶ 3rd year Physics
- ▶ Had led sport 6a, seconded trad VS, ski mountaineering to AD
- ▶ Experience with sport multi-pitch in Saas-Fee valley on Jegihorn (300m up to 4c) and in Vaud pre Alps.
- ▶ Climbed PD on Lagginhorn (4010m) and other 3000m peaks in the Swiss Alps.
- ▶ Avalanche awareness with Swiss Alpin Club



Figure 1.4: Sam thinking about fondue, and other important matters.

2.1 Training

Ahead of the expedition, Sam and Ed applied to do alpine climbing courses funded by the Jonathan Conville memorial trust in Chamonix. This is a very popular and cost effective course for those wishing to get started with alpine climbing. However, their applications were unfortunately declined. So that they would have some alpine preparation training ahead of the trip, we arranged for them to spend two days in North Wales with British mountain guide Mark Walker. We found two additional climbers who were interested and found that, with the guiding fees four-ways, this option was even more cost-effective than the Conville course. They all reported that Mark was an excellent guide, not least because he had run Conville courses in the past so was able to teach similar content. It was felt by all that doing this training ahead of the trip had been very worthwhile.

2.2 Location

The team chose Chamonix for the large number of high quality alpine rock routes that are readily accessible from the town. This made it easy to form short-term plans according to weather forecasts and advice from other climbers and guides. Access to the routes was further aided by the excellent lift infrastructure, which reduced the approach time for routes significantly.

The most cost-effective liftpass is the 15-day non-consecutive. This is so cost-effective that the Mont Blanc resort are seemingly reluctant to advertise it. Indeed, only *some* of the lift station cashiers have even heard of it. But have faith: it does exist.

- 2.1 Training 3
- 2.2 Location 3
- 2.3 Equipment 4



Figure 2.1: Sam practising alpine skills in North Wales ahead of the trip.



Figure 2.2: Ed pulling up a multipitch route on Tryfan in North Wales as practise for the Alps.



Figure 2.3: Map showing some of the better alpine climbing locations that are easily accessible from Chamonix.

2.3 Equipment

The team used a variety of personal equipment and kit borrowed from the Explo Board or ICMC. A rough list of personal gear brought by each team member is given below, in Table 2.1. It should be noted that, for less experienced team members, buying high quality personal equipment was a significant expense and therefore a big benefit of Explo Board funding.

Table 2.1: Summary of the personal equipment that team members brought on the expedition.

Clothing	Climbing	Sleeping	Toiletries
Baselayers	Harness	Inflatable mat	Shower stuff
Midlayers	Belay plate	Foam mat	Toothbrush
Waterproofs	PAS / cowstail	Sleeping bag	SPF50+ sunblock
Gloves	Helmet	Headtorch	Moisturiser
Rock shoes	Walking axe		Blistex or equiv.
Approach shoes	Crampons		Contacts/glasses
B2 or B3 boots	Walking poles		Hand sanitizer
Cat. 4 sunglasses	Ice screws		
UV nose cover	Microtraxion		

Over the course of July, we climbed as many routes as we could. A few of these are recounted in detail below, while the full list is given in Table 3.1.

3.1 East Ridge of Pyramid du Tacul

During the first week of the expedition, we spent time getting to grips with the ins and outs of alpine climbing. Most of this involved day trips on the west side of the valley. The terrain was of a lower altitude than the eastern summits surrounding Mont Blanc, thus providing a more accessible playground to practice in. These long, sunny days were spent climbing routes, such as Papillons Arete, Chapelle de la Gliere and Hotel California. Sun blasted, dehydrated, and physically exhausted, we would spend the evenings in the quiet town squares and shady pubs of Chamonix.

When looking for a more challenging route to put our skills to the test, attention was drawn to the East Ridge of Pyramid du Tacul. This route lies inferior to the summit of Mont Blanc du Tacul and demands a long glacial approach followed by eight pitches of superb granite trad climbing.

At 5:30am, the alarm went off. Weary-eyed, we crawled out of warm tents and into the cold morning dew. After a quick peanut butter jam baguette and hot coffee, we grabbed our bags and hopped onto the bus. We planned to take the 6:30am lift, which would give us just enough time to grab some lunch at the local bakery (many many croissants). Still yawning, we arrived at the granite fortress lift station of the Aiguille du Midi. At 3800m the air was cold and thin, making our breathing heavy and laboured. We donned our crampons and ice axes in the dark granite corridors and roped up. A nervous excitement hung in the air. To reach the

3.1 East Ridge of Pyramid du Tacul	5
3.2 Arete de la Table on Tour Glacier	7
3.3 Les Lepidopteres on the Aiguille du Peigne	9
3.4 Lion Ridge of the Matterhorn	11

First-person account

The account of climbing the East Ridge of Pyramid du Tacul is written by Ed.



Figure 3.1: Climbing among the clouds on Papillons Arete.

glacier we left the lift station through an ice tunnel and descended the narrow snow arête. We climbed down the right side, gaining access to the glacier. After crossing the glacier, we stood at the bottom of the route and stared up at the imposing rock face.



Figure 3.2: A groundbreakingly original photo of climbers descending the Midi Arete. Never before has this sight been captured.

After careful navigation of the bergschrunds that guarded the bottom of the route, we took off crampons and ice axes and stowed our bags. A quick turnover and we were fully geared up. We made the decision to simul-climb the first few pitches to save time. Steepening terrain warranted the decision to start pitching. Isaac started enthusiastically on the first pitch and disappeared from the site. I belayed from a ledge, and it wasn't long before the rope went limp. The route had disappeared. In an effort to get back on track, Isaac hauled himself confidently up a few bouldery moves before making a delicate traverse to the left on minimal protection. I heard what I hoped was the word "SAFE!" shouted somewhere above and got going. Having still not located the route we were overtaken by the team behind and quickly realised our mistake. Another winding traverse back right and we were back on track. Two beautiful pitches of climbing followed.

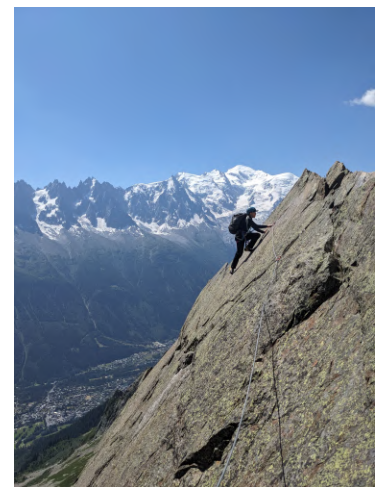


Figure 3.3: Half-decent views on the Chapelle de la Gliere route.

The sun was shining over the expansive glacier as we pushed ourselves higher up the rock face. Looking down from above the size and exposure of the alps was incomparable to anything we had experienced in the UK. Isaac led the next pitch pulling himself up through a narrow chimney before tackling an overhang. This is the crux pitch beyond which the climbing becomes consistently cruisy. After dodging some loose rubble, I followed, enjoying the physical exertion at such a height. We paused at a large spike just beyond the overhang to check the time. It was 2pm and the last lift to Chamonix leaves at 6pm. We realised that the time taken to finish the route, abseil off, and trek back uphill across the glacier, would cut us short. Reluctantly we made the decision to head home.

Bailing back down the route took roughly two hours using tat on spikes, bolts and abandoned gear. Once at the bottom we threw on crampons, gloves and took coils. A quick check of the time showed we had just under two hours to march back uphill. The thought of spending a hungry night sleeping in the lift station toilets didn't appeal, so we made a speedy yet soul-sucking slog back across the glacier without stopping to rest. We made the last lift with minutes to spare and collapsed into the seats exhausted. As the lift floated downward the icy cliff faces were replaced with luscious green woodland. Exhausted, sweating and euphoric, we spent the evening sipping fresh beer and eating wood-fired pizza back in the comforts of the valley floor.

3.2 Arete de la Table on Tour Glacier

To compensate for two consecutive rest days, the team decided that a two day route was in order. We would climb the Aiguille du Tour via the Arête de la Table, with a bivouac above the Albert Premier Hut.

We took a cable-car from the town of Le Tour, saving us from three hours of unappealing slog. Two hours later, we arrived at the Albert Premier hut. A Coca-Cola

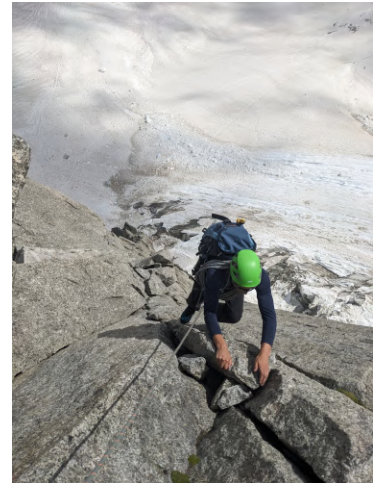


Figure 3.4: Ed zooming up the East Ridge of Pyramid du Tacul.



Figure 3.5: The hideous slog back to the Midi lift station.

First-person account

The account of climbing the Table Arete on Tour Glacier is written by Sam.

never feels as refreshing as after hiking in the sun with a heavy backpack. As it was still relatively early in the afternoon, we decided to keep on going. We were worried that there might be many people climbing the Arête de la Table from the hut, so hoped that a head start would mean fewer people ahead of us on the route.

After some 20 mins of walking across broken ground, we set foot on the Glacier du Tour. Carefully managing the crevasses, we kept on walking to finally find a decent bivouac spot where everyone could fit. After a small ration of pesto pasta (mind you, only 125g per person), we went to bed. It was a cold and cloudless night.



Figure 3.6: A room with a view on the Glacier du Tour.

Waking up at 3:30am, we could already see quite a few headlamps on the path over the glacier. I was worried that this might block things on our route. Luckily, we saw later that all these people were heading to climb the Forbes Arête instead. With uncharacteristically little fuss, we were on the move by 4:00am. Walking to the base of the couloir in the pre-dawn darkness was tedious but we were glad to feel hard refrozen snow beneath our feet. The couloir itself was fairly steep, but went without any trouble. Two climbers overtook

us then and dislodged some rocks on the first chossy part of the climb. We waited a while to avoid being in their fall-line.

Afterwards, the rock quality improved and the climbing became more enjoyable. The table is a remarkable feature; a rock standing only on 3 points and jutting outwards from the top of the Aiguille. The move onto the table is the hardest of the route, but went without too much difficulty. The rest of the route is enjoyable and easy going, with a long ridge traverse and really nice views on the Rhone valley in Switzerland. We descended via the East Face of the Aiguille du Tour and setup our bivi kit at Col Superior du Tour.

With many hours of daylight remaining and glad to have lighter packs, we then attempted to climb the South Ridge of Aiguille Purtscheller. However, a mistake reading the topo and quickly deteriorating weather dampened our enthusiasm so we bailed from the second anchor. Isaac skillfully avoided rope jams by reciting the Lord's Prayer while pulling - a trick he had learned in Alaska. Back at the bivi site we melted snow, drank hot water and crawled deep into our sleeping bags as the wind whipped across the col.

Sleep quality varied significantly throughout the group, depending on sleeping bag quality and local shelter. The following morning, we returned to the Albert Premiere hut where everyone enjoyed cake, hot chocolate and sun before descending the rest of the way to the campsite.

3.3 Les Lepidopteres on the Aiguille du Peigne

Following a few days on Tour Glacier, which had involved a great deal of walking and relatively little climbing, we were keen to get back on rock. Sam and I planned to climb Nabot-Leon: a crack route on the Red Pillar of Aiguille de Blaitiere. Our guidebook described the area as "a granite paradise" so we woke early and caught one of the first lifts, hoping to dodge the crowds.

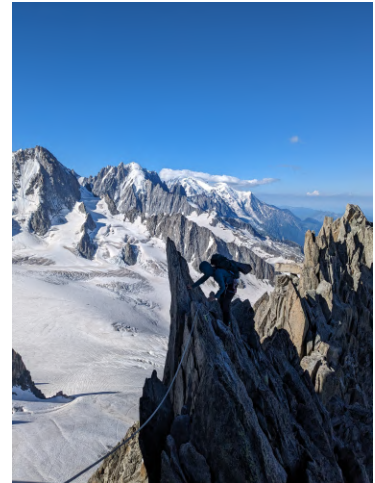


Figure 3.7: The joy of climbing with bivi kit.



Figure 3.8: Ben leading across the final ridge traverse.

First-person account

The account of climbing Les Lepidopteres on the Aiguille du Peigne is written by Isaac.

Sam, being Swiss, possessed basic common sense and knew how to read a map. Unfortunately, I was leading the way. He humoured my efforts at navigation for a little while until I tried directing us to the wrong Aiguille. After that, Sam went in front.

Approaching the base of the Red Pillar, we saw two things that worried us. Firstly, it was obvious that parties had bivied there the night before. A tent stood on a patch of cleared ground and sleeping bags were cast elsewhere. We certainly wouldn't be first on route. Secondly, the approach led up the middle of a snow slope. Our crampons and axes were back at the campsite. I had recently learned how hard (impossible) it is to arrest a snow fall without an ice axe, so we scrambled up the boulders that encircled the snow field. This was the right thing to do, but it slowed us down considerably.

A comical sight greeted us when we finally arrived at the base of our route. Three separate parties were already leading the first pitch, narrowly avoiding entanglement. Another three parties waited below, their ropes and racks at the ready for any chance to get on the route. Straightaway, we knew that sticking to our plan would mean missing the last lift back down. In a mix of frustration and amusement, we agreed we should walk back to the lift station and climb Les Lepidopteres instead, which was an easier route on the nearby Aiguille du Peigne.

The boulder fields below the Chamonix Aiguilles are a nuisance even when you find the path. We attempted a shortcut straight to the Peigne and consequently spent three miserable hours hopping between lumps of choss.

Eventually, we stood below the Slabs of the Peigne. The angle looked easy enough but the rock was very compact. I knew of some harder routes to the left with a reputation for tenuous friction climbing and upsetting runouts.

Sam led the first pitch and I took the rest. The route followed a series of cracks and corners up easy-angled slabs. Compared to the harder routes on the left, it



Figure 3.9: We did later return to Nabot-Leon.

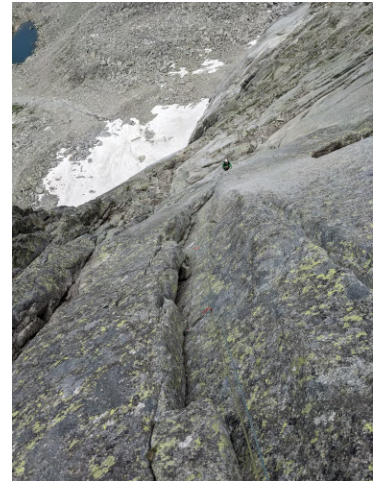


Figure 3.10: Cracked slabs of the Peigne.

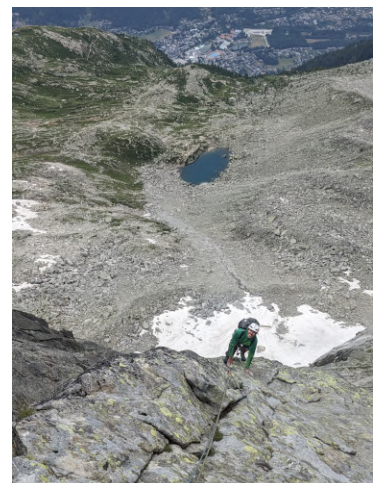


Figure 3.11: Sam running up the final easy pitch.

would be unfair to call this "friction climbing" but it still took effort to trust our feet. As is typical for granite, the second pitch felt stiff for the grade and we later decided it had been the crux. As is typical for me, I wasted quickdraws on pegs I didn't trust and only just finished the pitch before I ran out. Climbing higher, the going got easier and we made fast progress. Ashamed as I am to say this, French bolted belays are pretty convenient. On the penultimate pitch, we looked up to see Ed and his climbing partner above us on Papillon's Arete. They shouted that we should hurry, because it wasn't long until the last lift.

After topping out, the abseil descent went so smoothly that it almost made up for the appalling approach. Walking (not even running) back to the lift, we texted the others and agreed to meet in Poko Loko. Their chef is a good bloke but he's always on smoko, no joko.

3.4 Lion Ridge of the Matterhorn

Day -1

Isaac called an early morning (midday) meeting at the operations room (bakery) to discuss plans for the coming days. He promised a 'very well thought out plan' and warned to 'prepare for unprecedented levels of sensibleness'. These planning meetings were beginning to garner a reputation as hours long research sessions usually resulting in more questions than answers. The bakery was fantastic, though, so everyone was happy to oblige.

He suggested attempting the Matterhorn via its Lion Ridge from the Italian side. The route is technically more challenging than the popular Hörnli ridge (AD) ascending the Zermatt side but considered safer and more worthwhile as it is known to be much less busy and take in more sustained, interesting and exposed terrain. It is given AD+. The Hörnli ridge was to offer a slightly less technical descent, and the opportunity to experience both routes.



Figure 3.12: Isaac and his burger and Poco Loco.

First-person account

The account of climbing the Lion Ridge on The Matterhorn is written by Ben.

Extra team members

For this part of the trip, we were joined by some other friends from ICMC (George, Chorley, James) and Isaac's girlfriend (Miranda).

The group were under no illusions that this would give a very different feel to AD+ compared with many Chamonix classics of the same grade. Nevertheless, all were keen to at least attempt it. 'What's the worst that can happen?' became the refrain of the meeting. Google confirmed that the worst was indeed very bad, surprisingly commonplace on the Matterhorn, and probably quite painful.

Day 0

After a night of packing and discussing logistics, the group departed Chamonix through the Mont Blanc tunnel, driving through the Aosta valley before ascending winding Italian mountain roads bound for Cervinia, the alpine town in the shadow of Cervino (the Matterhorn's Italian name). Delays at the tunnel, and a frantic 30 minutes finding an ATM, meant only half of the party made the lift to the Abruzzi hut, whilst the rest had to hike the steep mountain track.

Those walking were keen to point out that this represented a 'true' ascent, from valley to summit without relying on modern frivolities or excesses. They arrived at their en-suite room in the beautiful Abruzzi hut (2802m) with pride intact, joining the others for 3 courses of home cooked Italian hut food, knowing deep down that they were doing the Matterhorn properly.

Day 1

Early starts saw a staggered exit from the hut to avoid queues and danger from dislodged rocks. This was the first day of ascent, with the aim being to reach the Carrel hut (3830m)- a basic, unmanned hut perched on the ridge. The route progressed from steep alpine trails, to exposed snow patch and moraine traverses, before tackling the ridge by a mix of scrambling and a final few fixed ropes.

The first step of difficulty was the beginning of the ridge proper. Roughly a grade 3 scramble, various op-



Figure 3.13: Focaccia was necessary for planning.



Figure 3.14: Sam breaking in his new ultra-light B2s.

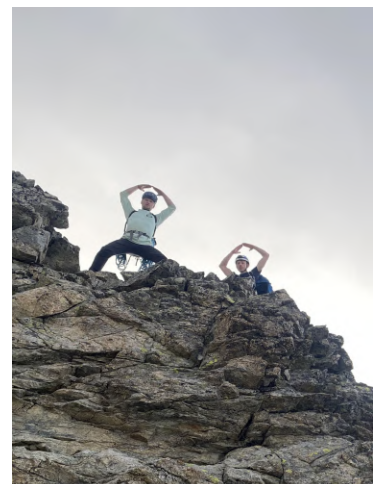


Figure 3.15: "Turbopunters".

tions were possible. Some took a winding route to find weaknesses in the shoulder, whilst others preferred to continue direct, where scrambling gave way to climbing. The climbing was heavily featured and fun in big boots, exposed but not sustained at any difficulty.

Perhaps 20 minutes from the hut, clouds began to roll in. Starting up the fixed ropes, a front of strong winds and sideways snow began to buffet Ben and George. Crampons on. The ropes were all of a sudden rimed up with ice crystals. Progress slowed. An hour or more behind the others, all parties were finally safe inside the Carrel hut.

After refilling water and cooking some soup on the ancient gas stove, conversation turned to conditions. The ridge is most often climbed relatively dry and later in the season, with crampons only infrequently necessary. This new unconsolidated snowfall, and a greater than normal covering of consolidated snow and ice, were sure to combine to make the route more challenging, and treacherous, than it would have been otherwise. In addition, the Matterhorn has a tendency to collect verglas; fine and often invisible coverings of hard ice on apparent dry rock. A summit attempt, already ambitious, seemed unlikely now.

At this point, Sam decided to bow out. He wanted to climb in good conditions, which these simply were not. The risk of verglas and slow progress, as well as lack of mixed climbing experience, probably made this a very wise decision. Ed, although on the fence regarding an attempt, resolved the summit would have to wait, as he and Sam would need to either summit or retreat as a pair. Whilst disappointing, finding themselves halfway up the Matterhorn having that discussion was a testament to how well they had taken to alpine climbing, having only completed their introductory course a couple of weeks prior.

Day 2

Another staggered exit, the climbers departed the hut roped and with crampons. Scrambling and bottlenecks

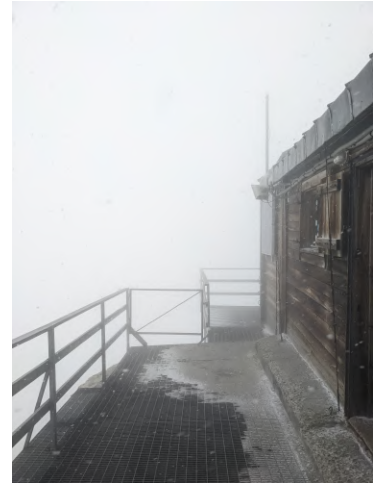


Figure 3.16: Stunning views from the Carrel Hut.



Figure 3.17: Contemplating life, love, mortality.



Figure 3.18: Prior to preparing dinner, we conducted a thorough whisk-assessment.

of fixed gear occupied the first hour or so. The ridge was bypassed at the first difficulty, and all teams arrived together at the first snow slopes.

A big, steep, exposed traverse on hard snow, sometimes ice, rock thankfully within reach for protection, followed. Sporadic fixed gear and steep mixed terrain returned to the ridge of Pic Tyndall. Rock gave way to snow and ice here, as teams negotiated the fantastic undulating ridge and snow slopes of this lesser summit. This section was by far the highest quality: free of fixed gear, technical and exposed, but never difficult. Until this point the view of the Matterhorn had been obscured by a combination of cloud and Pic Tyndall, but now caught incredible glimpses of it through breaks in the light cloud cover. Words would not do it justice. Pictures come closer.



Figure 3.19: Starting the snow traverses.

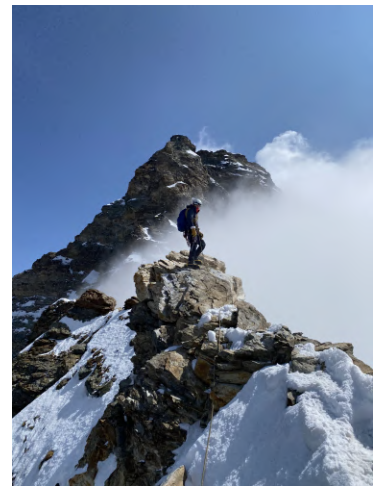


Figure 3.20: On Pic Tyndall.

Figure 3.21: Big exposure on the final fixed ropes before the summit.

A small awkward col marked the beginning of the true summit ridge. This was dotted with the thick marine ropes encountered earlier, thankfully dried by now. The awesome exposure increased dramatically here, with thousands of feet of space below some sections. Although the ropes helped with navigation, they became strenuous quite quickly. The ridge probably contained over 100 metres of fixed ropes, often sparsely attached, meaning a large amount of weight was forced onto the arms, as it was difficult not to get pulled out from the rock. Still, it made for faster progress, and before long Isaac and Miranda, followed by Ben and George, had their turn on the Italian summit.

Knowing the hours long Hörnligrat awaited, there was time only to refuel and take some victory photos. They had paid the price for their reliance on crampons and axes over terrain that is ideally tackled in drier conditions. It was difficult to tear themselves away from the Italian summit. To the north, vast snow slopes seemed to extend thousands of metres unbroken down to Zermatt. To the south, the summit dropped into thin air, tumbling endlessly towards Cervinia. A broken fin-like snow ridge yielded the Swiss summit, before the snow slopes descended into the Hornli. Isaac narrowly avoided a slide on these slopes as he left the Italian summit. Lucky. Arresting a full fall seemed improbable here.

Seemingly never-ending steep, rocky snow slopes gave way to fixed lines (scary in descent) and finally the true ridge. A combination of abseils, precarious down climbs and ridge scrambles were used in an attempt to invent a route that was enjoyable and efficient, but in the end turned out to be neither. James and Chorley, well ahead by this point, dodged the last of the day's guided parties, trying to stay well clear of less experienced boots on the loose terrain. At one point, an ill-equipped soloist began rag-dolling down the mountain close to them, nearly taking a roped party with him. Luckily the team held fast and the man was saved by their rope, unharmed.

Hours passed, and as the light faded Chorley and James



Figure 3.22: Cool, but obviously not Stange.



Figure 3.23: Ben asking (very loudly) what mountain we were on.

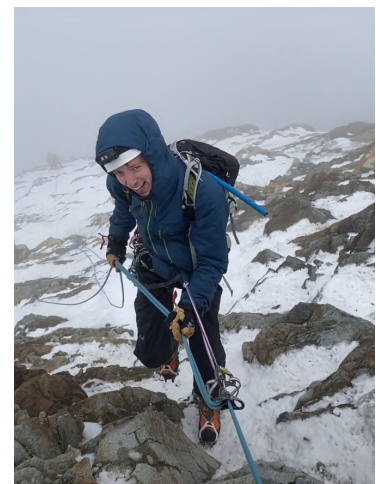


Figure 3.24: Starting down.

were joined by Miranda and Isaac, and finally Ben and George long after head torches were necessary, at the Solvay hut. Technically, this hut is reserved for emergencies- but in reality the 10 or so bed spaces (3 beds, floor, cupboards, table etc.) house people who don't make it down to the Hörnli hut in good time. This is not good practice, and ideally should have been avoided by turning around, or speeding up - not least because it is perhaps better described as a sardine tin bolted to the mountain. The group managed to commandeer a cupboard with a single mattress. For six. This seemed the worst form of torture, on the one night people most needed to sleep.

Day 3

Excited to lose altitude and salvage remaining kidney function, the teams set off early to tackle the increasingly straightforward, though loose, descent. All arrived safely at the Hörnli hut, finding a table facing out across the mesmerising vista of the famed northern aspect of the mountain. Sitting alongside tourists in trainers in the afternoon sun, they finally felt able to breathe. Litres of water and cold coca-cola were consumed at great expense. Worth every penny.

A gentle path led to the lifts, and with some difficulty, Isaac negotiated a series of free, then heavily discounted (though still 'Swiss' price) lifts and connections all the way back to Cervinia! Cheap AirBnB booked, and all reunited at last, everyone headed into the town for dinner and drinks, ending up in a cosy Trattoria. Pastas, pizzas, and traditional Aostan dishes such as Aostan Polenta concia (with fontina cheese) and Carbonade Valdostana (beef stewed in red wine with juniper) perfectly concluded a draining 72 hours.



Figure 3.25: Morning sun shines into the cupboard where 6 spent the night.

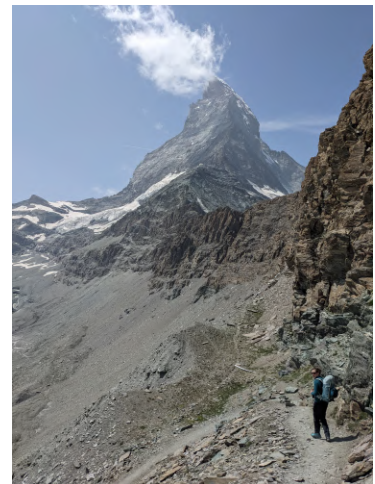


Figure 3.26: Strolling back to the lifts with Mont Blanc in the background.

Table 3.1: A list of all routes that were properly attempted by the team. Of these, only three were left unfinished. These are the East Ridge of Pyramid du Tacul, the Cordier Pillar and Les Diamants du President.

Name	Grade	Location
Arete a Laurence	PD 4b	Aiguille du Midi
Traversée des Crochues	PD+ 4a	Aiguilles Rouges
Hornli Ridge	AD	Matterhorn
Pointes Lachenal Traverse	AD 2	Aiguille du Midi
Arete des Cosmiques	AD 3	Aiguille du Midi
Traverse of the Perrons	AD 4a	Les Perrons de Vallorcine
Southeast Ridge of L'Index	AD 4c	Aiguilles Rouges
Arete de la Table	AD 5a	Aiguille du Tour
Clocher-Clochetons Traverse	AD 5a	Aiguilles Rouges
Lion Ridge	AD+	Matterhorn
Mic est Maousse	AD+ 5a	Aiguilles Rouges
East Ridge of Pyramid du Tacul	AD+ 5a	Mont Blanc du Tacul
Modern Times	D- 5a	Aiguilles Rouges
Le Gateau de Riz	D 5b	Aiguille d'Argentiere
Les Lepidopteres	D 5b	Aiguille du Peigne
Hotel California	D+ 5a	Aiguilles Rouges
Papillons Arete	D+ 5c	Aiguille du Peigne
Brunat-Perroux	D+ 5c	Aiguilles Rouges
Chapelle de la Gliere	D+ 6a	Aiguilles Rouges
Nabot-Leon	TD- 5c	Aiguille de Blaitière
Les Fontes de Jouvance	TD- 5c	Aiguilles Rouges
Cocher Cochon	TD- 6a	Aiguilles Rouges
Frison-Roche	TD- 6a	Aiguilles Rouges
Catyoucha man	TD 6a+	Aiguilles Rouges
Les Diamants du President	TD 6a+	Aiguille de Blaitière
Cordier Pillar	TD+ 6b	Charmoz Grepon

Conclusions

4

Broadly speaking, our research and training prepared us well for the trip. However, there were still extra things that we learned along the way. These tips are given below, for the benefit of others planning a similar outing.

- 4.1 Climbing 18**
- 4.2 Camping 18**
- 4.3 Food 19**

4.1 Climbing

- ▶ On very long routes, consider carrying a sleeping bag as a safety measure.
- ▶ Carry a couple of pegs and lots of tat so you can backup in-situ abseil anchors if necessary. To a British climber, placing new pegs may seem blasphemous, but this was recommended by the Chamonix guiding office. Apparently you can knock one in even with the most lightweight of axes (eg: Petzl Gully) although it takes a while.
- ▶ If there is any chance you'll walk on snow, take an axe. Snow patches can survive for a while after the rest of an area has thawed and are treacherous in the afternoon heat. Without the means to arrest yourself, you pick up speed very quickly when sliding down a snow patch. There are usually lots of pointy rocks waiting at the bottom.
- ▶ Lightweight B1s or B2s are better than B3s.



Figure 4.1: In hindsight, we wish we had taken a few pegs to backup abseil points.

4.2 Camping

- ▶ The Argentiere campsite (Camping du Glacier D'Argentiere) is excellent.
- ▶ If you plan to be away from the campsite for a few days mid-way through your stay, for instance when bivvying in the hills, you can pack down your tent and tell the campsite owners. If you



Figure 4.2: The best vehicle ever created.

haven't already paid, they will take the days off your bill. If you have already paid, they will move the days to the end of your booking, effectively extending it for free.

- ▶ When the campsite say “no refunds”, they mean it. If you book and pay for a pitch until the end of July but leave early, you are not getting your money back.
- ▶ At the campsite, there is a recycling bin reserved for half-empty gas canisters. You can get all of your gas from this bin, so there is no need to buy any.
- ▶ The Citroen Dispatch is the greatest vehicle ever created. Contrary to other suggestions raised in the report, this particular conclusion is objective fact.
- ▶ The Grand Montets ski lift car park seems like a good place to stay if you are living in your vehicle. It is very large, free to use and much less crowded than other spots in Chamonix that are popular among van-dwellers. Furthermore, it is close to the Argentiere campsite, where you can pay to use just the facilities for 5€ per day.

4.3 Food

- ▶ Instant soup powder is a real treat for cold bivis. It weighs very little and is nicer than drinking hot water. If you want some calories, break stale baguette into it.
- ▶ Think carefully about water sources on long climbing routes. Check whether there is still snow for you to melt.
- ▶ Fondue offers the best taste-to-cookware ratio of any camp food. It requires only four ingredients, one pan and a tent peg for stirring. The mix can be bought at great expense from local supermarkets.
- ▶ If eating fondue in the presence of Swiss people, do not suggest improvements.
- ▶ After eating fondue, eat fiber.



Figure 4.3: A romantic dinner with one of the locals at Camping du Glacier D'Argentiere.



Figure 4.4: An appealing pot of onion soup.



Figure 4.5: Ben enjoying campsite fondue.

5.1 Acknowledgements

We are very grateful to the **Imperial College Explo Board** for their advice during the planning stages of this trip and for their help in funding it. In particular, we wish to thank Dr Lorraine Craig and Philip Power for their correspondence with us.

We would like to thank **Mark Walker (IFMGA)** for providing two days of alpine prep training in North Wales. He is a superb guide who we have now hired twice. We look forward to the third occasion.

We would like to thank Isaac's friend **Brian** for lending us several guidebooks and selling a very cheap pair of B2s.

This report is formatted with the **kaobook** \LaTeX template, developed by **Federico Marotta**.

5.2 Contact

Feel free to contact the team, especially if you are planning a similar trip yourself.

Isaac	+44 7530 369990	zakblanc@gmail.com
Ed	+44 7810 304466	edadams1357@gmail.com
Samuël	+41 7927 08825	samuel.bakker1804@gmail.com
Ben	uncontactable	

5.1 Acknowledgements 20
5.2 Contact 20



Figure 5.1: A collection of Alpine Club guidebooks lent to us by Isaac's friend Brian.

Appendix

A

Risk Assessment

Attached below.

Table 8: Risk assessment for alpine climbing

Hazard	Cause	Control
Minor trauma	Multiple	Appropriate provision in medical kit. Calling for help should be an available option, with a low threshold for this.
Major trauma	Multiple	Helmet use. Teams will carry trauma focussed first aid items, which can be used prior to help arriving if safe to do so and within competencies. Immediate contact with emergency services and mountain rescue.
Crevasse fall	Snow bridge collapse, poor navigation, slip while crossing	All team members will be trained in crevasse rescue and carry the equipment necessary to haul someone out. The team will aim to approach routes in rope teams of four, which makes it significantly easier to arrest and recover a crevasse fall. Furthermore, local advice will be followed regarding crevasse conditions.
Serac collapse	Travelling under a serac in hot conditions or after recent rainfall	The team will altogether avoid routes that are exposed to serac collapse.
Wet avalanche	Rain or high temperatures	The team will be trained in avalanche awareness and will avoid travelling in avalanche-prone areas where possible, especially during the hotter hours of the day. This will require starting routes very early.
Dry avalanche	Sustained negative temperatures and sudden deep snowfall, or the formation of windslab due to sustained wind	Dry avalanches are now very uncommon in the Alps, due to increasing temperatures and a lack of snowfall. However, if conditions for dry avalanches do occur, the team will carry avalanche transceivers, probes, and shovels. The team would also avoid travel on avalanche-prone areas.
Small rock fall	Climbers dislodging loose rocks	All team members will wear helmets whenever climbing or otherwise in areas will lots of loose rock. Team members will shout to notify other climbers if they accidentally dislodge rock. Well-travelled climbing routes have been chosen, since these usually have less loose rock (other climbers have already dislodged it).
Large rock fall	The permafrost that holds together alpine mountains melting	The team will consult local guides and consider recent rockfalls in an area when choosing routes. If guides stop taking clients on a particular route, the team will not climb it. In particularly hot conditions, the team will climb in sub-alpine regions, where permafrost has already melted and rockfall has stabilised. The team will start routes very early, to avoid climbing in the afternoon heat.

Protected climber fall	Attempting to climb something too hard, a hold breaking or coming loose	The team will carry suitable rock protection to protect harder pitches of climbing. Therefore, a protected climber fall should result in the climber being caught by the rope. Rock routes have been chosen over snow or ice routes, since they are much easier to protect. We have also chosen routes that we believe to be within our ability. Such falls are usually safe and to be expected.
Unprotected climber fall	Tripping or pulling on loose rock when soloing on easier ground	All team members will be trained in simul-climbing, which is much faster than multi-pitch climbing. This skill will be used to move quickly on easier terrain, to reduce the need for soloing. Therefore, soloing will be avoided except for on very easy terrain (i.e. walking, very easy scrambling). Furthermore, the team will not expect to climb routes that include snow aretes or other sections of cramponing that require cold weather. Cramponing on this sort of terrain in the warm temperatures of recent alpine summers increases the likelihood of a fall.
Hypothermia/frostbite	Prolonged exposure to cold without proper clothing	All team members will take suitably warm and waterproof clothing, as detailed in the Equipment section. Members will also be trained in outdoor first aid, so will be able to recognise the symptoms of hypothermia. Short-term weather forecasts will be consulted before attempting any route. Immediate warming/descent and call for rescue
Hyperthermia	Prolonged exposure to heat, especially while dehydrated	All team members will carry appropriate quantities of water when climbing. This is detailed further in the Food section. Members will also be trained in outdoor first aid, so will be able to recognise the symptoms of hyperthermia. Short-term weather forecasts will be consulted before attempting any route, and team members will not climb in extreme heat. The team will start routes very early, to avoid climbing in the afternoon heat.
Sunburn	Exposure to the high UV alpine environment	All team members will carry and apply SP50+ sunblock. Nose protectors and long-sleeved UV-resistant clothing will also be used.
Snow blindness	Exposure to the high UV alpine environment	All team members will bring Category 4 sunglasses, as detailed in the Equipment section.

Dehydration	Not drinking enough water	All team members will carry appropriate quantities of water when climbing. This is detailed further in the Food section.
Starvation	Not eating enough food	All team members will carry appropriate quantities of high-calorie food when climbing. This is also detailed further in the Food section. First aid kits will contain chocolate or sweets, to treat the condition. The only risks from this during the objectives we plan to attempt are discomfort and loss of performance
Road traffic accident	Driver error, road conditions	Drivers will only drive when well-rested. Vehicles used will have quality seat belts and airbags. Road conditions will be monitored ahead of driving, and the team will not drive in dangerous conditions. Vehicles will carry chains, in case of deep snow, although this is very unlikely for summer in the Alps.
Infectious disease	Multiple	The team will carry means of wound care. High quality professional medical help is available in the Alps and will be sought if necessary.
Covid-19	Airborne transmission if exposed to contagious person	Follow the advice of local and national authorities. Monitor throughout the expedition.
Acute Mountain Sickness - mild	Altitude	Appropriate acclimatisation. Stop ascending/Descent. Paracetamol + rest overnight.
Acute Mountain Sickness - severe	Altitude	Appropriate acclimatisation and vigilance for symptoms. Immediate descent to lowest altitude possible in shortest safe timeframe possible.