

# Apolobamba

## 2002

# Report



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# Introduction

By Gareth

A number of factors made Bolivia an attractive destination for an expedition. Most notably the combination of big, empty mountains and no bureaucracy, but also the chance to explore somewhere new both while in the mountains, and indeed during the whole expedition in that none of us had visited South America before.

This report documents the expedition and is aimed at many people; firstly those that would be interested in a 'diary' style account of the expedition, and secondly mountaineers. It is hoped that it will be both interesting and useful to all.



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## Team Members

### Gareth Gretton – Expedition Leader



At the time of the expedition, Gareth was between the third and fourth years of a Mechanical Engineering degree at Imperial College. In the time that it has taken to compile this report he has now graduated, and is currently a free agent, living in Fort William. In addition to mountaineering here and there, he is an avid off road cyclist, and has already cycled across various countries and along the Silk Route in Central Asia. Sea kayaking could be the next thing...

### Jonathan Ellis

Jon is currently working for the ‘troubled’ nuclear power company British Energy at various locations around the UK, including hilly Norfolk. He graduated from Imperial College, with a degree in Mechanical Engineering sometime during the expedition. As well as being a mountaineer Jon is a keen orienteer.



### Daniel Carrivick



Dan also graduated from Imperial while on expedition, with a degree in Geology. Rumour has it that he is currently studying for a PhD in Geology at Imperial, but evidence of this is thin on the ground. Instead he continues his legendary devotion to Imperial’s Outdoor club whilst organising a few more expeditions. When not climbing mountains at a sedate pace Dan is found running marathons over them, or adventure racing , or something.

### Catalina Llado

Cati finished a PhD in Computer Science shortly before the expedition and has since been employed as a lecturer at Palma university in her native Mallorca. When not basking on some sun drenched limestone in Mallorca, or attending academic conferences in some exotic location around the world, Catí occasionally finds the time to return to the UK to tell us how much she misses, amoung other things, the weather. It must be really tough.



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## The Expedition

### The Journey Out

It was the 6:03am alarm that finally awoke us. Dan had staggered the five alarms on his watch for every minute past the hour knowing that with only a few hours rest it would take more than one alarm to wake us up. A last minute decision to take some food out to Bolivia from the UK saw Jon, Dan and Gareth clearing the shelves in a 24 hour supermarket, at some early hour of the morning much to the bewilderment of the checkout assistant. Nigh on three and a half hours later the three of us were regretting having bought so much, as we struggled down to South Kensington tube station with more bags than we could comfortably carry. Two train changes later despite staying on the Piccadilly line saw us arrive at Heathrow. The bags were quickly got rid off at the check in desk and the area vacated before the authorities decided to charge us excess baggage charges.

Our flight to Miami was delayed several times but just before midday our Boeing 747 took to the skies and set about making up lost time. We took no time in making up for lost food by persuading the stewardess we were worthy of the spare meals. 3000 miles, nine hours, three films and a whole lot of food later we arrived in the hot and sticky Miami. A quick visit to the information desk revealed only two things to do: shopping or go to the beach. Having been reliably informed the beach was "real pritty" we left the comfort of the air-conditioned terminal and took a bus through Miami in the middle of rush hour. We found the beach, more by luck than judgment and although nice was nothing special. After a quick paddle and a short walk darkness descended and it was time to return to the airport. Gareth had problems with the security checks when they found a surgical scalpel in his bag; accidentally left in hand luggage and somewhat worryingly missed by Heathrow security. Our rest was broken only twice on the flight to La Paz, once to the smell of dinner and then again when breakfast was being served.

Having acquired our entry stamps, or in the case of Gareth an exit stamp, we were reunited with our luggage. We then commandeered a taxi to drive us down to the El Carrotel Hostel near the centre of La Paz. With bags deposited in our room sleep was put on hold for a few

hours as we joined the locals in front of a TV at 7:30am to watch Brazil play Turkey in the World Cup.

### Acclimatisation in La Paz

It was gone midday when Cati came and said hello (Cati having taken an earlier flight from Mallorca). We decided to wander down to the bus station to investigate transport to the Apolobamba, but half the ticket sellers hadn't heard of the place and the other half didn't have buses going there. That afternoon gave us a rapid introduction into South American culture as our lunch turned into a bitter feud about whether or not the squeezed orange juice had been watered down by the waitress. The debate escalated when other waitresses from different establishments joining in. Despite Cati watching the oranges being squeezed for her glass the waitress still had the nerve to add cordial to our diluted orange juices to make them look similar to Cati's orange juice. Later we were walking through a market when all of a sudden three police men with dogs pounced on a child no older than fourteen. The boy was thrust backwards into a stall sending candy everywhere across the pavement much to the protest of the stall owner. The dogs stood up with paws on the frightened boys chest while the officers searched the boys bag for stolen goods. A long climb up the cobbled streets took us to the cemetery where we found buses left for Pelechuco once or twice a week. We returned to the Hostel via several tour agencies to investigate the cost of getting a jeep to the Apolobamba.

Thursday started where Wednesday had ended. A visit to more travel agencies enabled us to get the cost of a jeep down from \$250 to \$125. We found useful maps in one such establishment and they organised photocopies to be available for us to purchase. A long trek up out of the city took us to the plastic container suburb and before long we had two five litre fuel containers each two thirds full of gasoline. That afternoon we booked a jeep to take us to the Apolobamba before returning to the hostel to see how our new stoves coped with the dirty Bolivian fuel. We were lured to the centre of La Paz again that evening by the sound of fireworks from the Manfred pre-election street party.

The following day saw us visit both the British and Spanish embassy's to register our arrival and tell them where we are going. Shopping pre-occupied us for the remainder of the day as we bought all the supplies we would need for

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our trip to the Apolobamba. Again another pre-election street party entertained us that evening, this time held by the McLean party. However we concluded that as the party was neither as big or good as the previous evening they would not be winning the election.

## The Apolobamba

Our jeep was booked early the next morning and our alarms went off even earlier allowing us time to squash the last remaining items into our rucksacks. With zips unable to close and bags bursting at the seems we loaded up the back of the jeep and set off out of the city. The tarmac soon ran out and when the cobbles did likewise we trailed a plume of dust. Naturally this was forgotten by the time we stopped and we jumped out only to choke on the cloud that inevitably engulfed us. Once passed lake Titicata our driver was unsure which roads to take. We found ourselves waiting at junctions for buses we had previously overtaken so we could find out what direction the buses destination was and then by use our maps to tell us which turning to take. In the villages we would ask anyone we could find where the road to Pelechuco was. They would point us on our way but we didn't always get it right and some u-turns were called for. It was 2:30pm when we reached a barrier across the road on the outskirts of Antaquilla.

With no sign of the guard in site we reversed up and went to a nearby football pitch where a local derby was well underway. Cati, Gareth and the driver hadn't gone far before being engulfed by the local inhabitants. Numerous conflicting stories were interpreted over the next hour as to whether we could or couldn't drive closer to our proposed base camp. The answer seemed to hinge on us paying 10Bs for a permit and 40Bs for a guide to show us the way. However all of a sudden they decided we couldn't drive closer so the shift of attention was made to the hiring of horses or mules. First there were none but then we found someone who had two, then someone else offered us a third. The driver wanted us to hurry up and make a decision as he needed to be heading back so we agreed on staying and found a secluded area outside the town in which to dump our bags and pitch tents. The jeep driver proceeded to talk to locals and watch the football for another half hour before departing. Bracing a few hail showers we joined the spectators on the mud banks around the football pitch and were soon eating curried llama with rice and salad.

A mixture of snow and hail battering the tents woke us in the morning. Shortly after 9am a man on a bike was spotted coming towards us, struggling to cycle in a straight line as he weaved a way through the rocky meadow. As the bike got closer we were amazed the man could cycle any distance on the bike for it had no pedals and both tyres were flat. Rags had been tied around the split tyre to try and keep it together. A chap with a national park badge on his jacket jumped off the bike and tried to persuade us to delay our departure for base camp by one day so the porters could enjoy election-day. We said we didn't mind as long as the price was dropped to 150Bs but he didn't like this and he settled on leaving in an hour or so. Half an hour later the park warden returned with some friends. The two horses we had been promised yesterday hadn't materialized and they could only offer us one mule and some porters to carry the rest. A price was named, we haggled a lower figure and after much debate we met somewhere in the middle. We gave them twenty minutes to return to the village to get some food knowing time was getting short if we were to make base camp before sunset. The national park warden returned on his own to inform us he was the only chap willing to go today, the other porters would help the following day and the mule was not available on either day. Frustration mounting, we agreed on three porters carrying our food supplies into base camp. The national park warden had just left when two locals came offering the services of a horse. We agreed a price and 7am meeting time the next day.

It was 7:10am when a porter turned up on a bike and a horse could be seen heading our way. Yesterday's antics had shattered our confidence in whether anyone would turn up but this visible evidence renewed our hope and spurred us into a packing frenzy. With the horse loaded and several more bags tied to the bike we set off with just two porters, one pushing a heavily laden bike and the other running after a boy who had taken our fully laden horse for a walk. Our journey to Nubi Pampa was again one of frustration, as the bike appeared to be more trouble than it was worth. Dan and Gareth helped push it up the hills and at one point we were waiting so long for the chap with the bike that the horseman had to walk back and give him a hand. Some time later the horseman came round the bend riding the bike and the chap who had been pushing the bike took the reins of the horse. More stops ensued when the bags on the back of the horse became lopsided and roles were reversed once

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again. Gareth took over pushing the bike finding it more effective on his own. He jumped on at the first sign of a downhill stretch bringing the cries of "No brakes" from the relegated bike man.

We stopped in Nubi Pampa for lunch while the porter with the bike tackled the problem of a poorly distributed load and caught us up. Children peeped around walls to catch a glimpse of us as we made our way through the deathly quiet village. We passed around the north side of Lake Nubi where the wind whipped across its 5km length kicking up sizable waves. At the far end the bike was abandoned and the loads distributed around. A small waterfall was crossed to gain a route that took us high round the southern side of Lake Dadacorane and then down to the southern shores of Lake Pauolhe. At the far end of this third lake our horseman was unprepared to venture further due to a large marsh. Everyone was happy to agree with this as the location for base camp as the loads we were carrying had taken their toll on our legs, hips, and shoulders which all ached horrendously. A suitable location for camp was located near the base of a 200ft waterfall cascading down over the rocks and across the marsh into the lake below. The porters were thanked, fed and paid before tents were pitched and sites levelled.

## Base Camp and Early Explorations

A lazy morning allowed us to recuperate somewhat from the stresses and strains of the previous day. Cati, Gareth and Jon scrambled up the side of the waterfall behind base camp, finding a flat plain with a small hamlet. Unfortunately low clouds prevented them seeing the upper slopes of any of the mountains. Loose shattered rocks called for a careful descent but even this didn't prevent Gareth adding a block the size of a television to the pile of scree below.

A bad head and lethargic body was waiting for Dan in the morning, having spent the night making unpleasant sounds. As such, Cati, Gareth and Jon went on a reconnaissance walk up to the snowy col, which was located North West of base camp and separated two distinct groups of mountains – the Cololo and Nubi Massifs. This involved navigating a path around the marshy ground and then up the terminal moraine of a glacier that had clearly retreated significantly. When we reached the top of the col the cloud had yet again

descended, partially obscuring our view of the very peaks we had wanted to see. The return journey was much quicker, due both to the obvious factor of going downhill and the fact that we found a much quicker and more direct route. The marsh was actually composed of solid lumps of ground in a shallow pool, so it was actually possible to jump from one to the next and cut a path straight across it. This would save valuable time when navigating to the col on the approach to climbs. Meanwhile Dan had been resting at base camp and entertaining the locals, making contact with a porter who lives in Nubi and charges only 40Bs per day.

The next day was planned as a rest day. Daylight brought snows, which soon covered the grass, and clouds that engulfed the valley. Not knowing what was to come we sat out the storm reading books, playing cards, eating food and doing crosswords at base camp.

We had planned to climb up past the snowy col on the following day, but the sight of thick slabs of snow cascading down the outside of the tent when the door was opened put paid to this. When daylight arrived the snow was still falling thick and furious and the wind was picking up and starting to blow the thick covering on the ground around. Late that afternoon the clouds parted and the sun cooked the inside of the tents. Having been cooped up for several days in the tent, we just had to get out. Cati and Gareth went for an amble around the far side of the lake to determine the best way up the north side of the valley.

## Climbs Above the Snowy Col

Saturday brought better weather and by the time the sun started to rise the four of us were well on our way across the marsh. The dogs from a small farm building across the valley ensured we didn't come to close to there home. Tripping and stumbling on wobbly snow-hidden rocks we made our way up over the glacial moraines and on to the glacier. A long circular approach to the col allowed us to avoid steep and crevassed sections of the glacier. Once we had crossed the col it was clear that we would not have enough time to reach our prospective summit that day. Jon and Gareth decided they would carry on up as far as they safely could to check the route on peak C2 and search for any hidden difficulties. Meanwhile Cati and Dan headed off further east to look for feasible ways up the peaks further along the ridge. After skirting a

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corniced 12m high ice wall that stretched north for several hundred metres from a rocky buttress Cati and Dan gained access to the flanks of the peaks behind peak C2. The undulating slope led up to a small bowl at the foot of the steep back wall that led up to the ridge line and hence would have to be climbed if peaks on the ridge were to be climbed. With not enough time for such a serious venture we settled for a small peak on the shoulder of the ridgeline. From a small connecting col we climbed some 30 metres up a snowy crest on to an exposed knife-edged ridge that curved sharply in an s-shape. Forty metres further along the ridge we reached the high point; a rocky platform that gave amazing views down over the Pelechuco valley. Debatable as a peak in its own right, we were pleased to have made the effort to reach the top. A fast pace back down the glacier saw us round the ice cliff in little under an hour. Jon and Gareth were seen descending from their couloir and we met up back on the col to exchange stories. A long slog back down from the col in the slushy snow removed what little energy was left in our already weary legs.

Still suffering from our exertions the previous day we were sluggish to get up. The day saw a natural hole near the camp enlarged to form a temporary rubbish store, and more rocks were collected from the foot of a nearby crag to complete the wall / seat outside the tents. Cati's time was cut out talking to locals and introducing us. First it was a woman and her children out herding sheep, then a chap carrying a basket of supplies on his back from Nubi Pampa to the farmhouse across the valley and finally the same chap who had tried to communicate with Dan several days earlier. That afternoon Dan and Gareth addressed the problem of a very silty water supply by creating a silt catch and a drip pool from where we could collect water from in the future.

## The Ascent of Peak C2

By Gareth

*"Peak C2 was chosen as our first serious target, as had been the original intention. The desirability of this had been confirmed on the reconnaissance two days previously when C2 was seen to be an aesthetic snow covered peak. After a slightly belated start Cati, Jon and I made rapid progress across the marsh and up the glacier to the col. From this point we followed the route established on a previous day up to and over a boulder field. This took us on the North face of the mountain, from*

*where we planned to gain the West ridge and, eventually, the summit.*

*"The recent snow falls made the going tough but comparatively easy, as each footstep was secure. Towards the top of the face the gradient became steeper and the snow harder until we were front pointing up hard névé. We quickly gained the ridge and were afforded fantastic views to the south towards Cololo. The weather was, as ever, unkind and with clouds amassing to the North we continued quickly on. We began pitching the climb towards the summit, leading along beneath the ridgeline. The ridge itself was heavily corniced, and a fracture line was very obvious. After a number of pitches and after having got very close to the summit we retreated, having judged that it was not sensible to continue owing to the corniced slope and the weather. We quickly descended back along the ridge and the down the face, and eventually to base camp. Whilst we hadn't reached the absolute summit, we felt that we'd got sufficiently close so as to say that we had climbed the mountain."*

## Explorations Towards Cololo and More Bad Weather

Having had a day where the most energetic activity involved throwing snowballs in the direction of the llamas to ensure they didn't come to close to camp and more importantly our food, we were well recovered and ready for an exploratory visit to the peaks around Cololo. However the pinging of frozen precipitation against the side of the tent at 7am halted our plans. A few hours later the bombardment of frozen pellets ceased and we got up to assess the situation. The rest of the day was salvaged with a walk up the Cololo valley amidst lead-grey clouds threatening to dump more stuff on us. On gaining access to this elevated valley by scrambling up the waterfall behind base camp we found yet another marsh covered valley floor. The marsh was crossed and a sheep trail followed up and along the large pile of lateral moraine stretching the length of the south side of the valley. Hounded by a number of dogs we pressed on until they lost interest in us and ran off over the marsh. A few glimpses of peaks to the north of Cololo were seen before the cloud dropped and covered them. Routes up to them looked tricky as huge crevasse fields stretched across the lower part of the glacier, which was bounded to the north with a sheer rock face and to the south a 100m high poorly

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consolidated knife edged ridge of lateral moraine. Dan and Gareth made it to a low point in the ridge that stretched west from Cololo. A fierce wind greeted us and swirling clouds meant little was seen. The hail had returned and we were forced to retreat back to base camp. Snow showers continued throughout the remainder of the afternoon and evening and we went to sleep expecting to find a thick covering when we awoke.

Surprised not to find more than a dusting in the morning we set about making plans for a walk up the north side of the valley that afternoon to set up a high camp from where we would attempt Nevado Nubi or a neighbouring peak the following day. All packed and ready to depart our plans were put on hold as the first sleet, hail and then snow started to fall. Throughout the afternoon snow fell relentlessly getting heavier as darkness approached.

A thick blanket of snow had engulfed base camp come the morning. Once we had dug ourselves out from our tents, time was spent clearing snow from around the immediate area so we could carry out necessities such as cooking. The resultant pile of snow was sculpted and after a head had been rolled and placed on top we had acquired a temporary fifth member to our expedition - a snowman. However thankfully the sun shone fiercely down on the valley for the rest of the day melting a fair amount of the snow and making prospects for walking up to a high camp the following day a reality.

## The Ascent of Nevado Nubi

By Dan

*"Saturday morning saw the snows continue to recede under a warm sun. After a big lunch full of carbohydrates we packed up and set off round the lake in search of a high camp under Nubi's south face. Around the other side of the lake we climbed diagonally up the south facing valley side. It wasn't long before we were wading through deep snows. Whilst the snows had melted quickly at base camp here they were sheltered from the sun's rays and the recent deposit of snow had only added to what was already there which had been accumulating since our arrival at base camp. Our route took us under the tongue of debris from a recent avalanche that had started from the rocky crags high above us and on up to a llama track that came up from the western end of the lake. This track was followed back*

*across the perilous slope and quickly over mish mash of avalanche debris. I watched as balls of snow dislodged from under my feet raced on down the slope carving a groove in the surface of the snow slope until it hit the rocks on the edge of the Lake hundreds of feet below. I was careful I didn't suffer the same fate and concentrated hard on not misplacing my feet.*

*"Having traversed out of immediate danger we stopped for a breather near a shepherd's hut that was perched high on a shoulder overlooking the valley far below. We found some fresh llama tracks and followed them through a jungle of rocks and snowdrifts. The tracks took us towards the base of a pyramid of rock on the west side of the glacier that runs down from the col west of Nubi. With dark clouds closing in fast we decided traverse to the snout of the glacier and set up camp there instead of climbing higher on the moraine and then trying to find a flat area to camp. Aching knees from wading through knee-deep snow meant the last thing we wanted to do was flatten snow so we could pitch the tent, but the threat of a downpour from the gathering clouds saw the task was quickly completed. A search for rocks to peg down the guy ropes was fruitless and in the end an assortment of axes and walking poles was used. With all four of us in the one tent there was no problem of staying warm.*

*"A deafening roar interrupted our game of cards. Disregarded as an avalanche our game continued until another one echoed around the valley shortly followed by a flash of lightening. The thunder and light show continued on into the evening gradually becoming more and more distant. A restless couple of hours sleep ensued as someone decided with so many in the tent it would be better to sleep width ways. With hindsight though I beg to differ!*

*"Having slept at the downhill end of the tent I awoke to find three bodies encroached on top of me. After such an uncomfortable night I had no problem getting up and the others soon followed. Gareth and I completed the statutory morning faff first and so lead the way up the snout of the glacier. I led kicking steps in the knee-deep powder until I hit a firm base below. Barely above the snout I froze as a loud crack reverberated outwards in the ice below me. A short discussion with Gareth ensued and it was decided to continue upwards as fast as possible to less steeply inclined slopes. Spurred on by an urge to get away from the danger area along with an unfamiliarity of*

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such glacial conditions I was soon suffering from my own pace and was forced to take frequent stops to recuperate, allowing Jon and Cati to catch us up.

"Having laid the path for everyone else to follow up the lower part of the glacier Jon took over trail braking. As if the deep snow wasn't bad enough Jon had to navigate a route through some ice cliffs and across hidden crevasses. Climbing over the lip of one such wall proved most problematic as our axes had nothing to purchase on and our feet kept slipping downwards with nothing firm to stand on. Our pace was frustratingly slow and I was just beginning to wonder if we could still reach the top when an exuberant voice from Jon told us he had found firm nevé. We trudged on up to the col where Jon was, pleased with the knowledge that strong winds had blown all the recent snows off the ridge leaving a firm base on which to stand.

"The ridgeline that rose up to the east of the col was our pathway to the summit of Nubi and Jon continued to lead the way. We were just beginning to enjoy the sustained slope of nevé close to 45° when we hit a patch of bad ice. Dinner plates were sent cascading down in the direction of the col as we gingerly made our way up searching for the best route to the nicer nevé some fifty metres higher. Frequent breathers were taken as our calves burnt under the strain of constantly being flexed. I became increasingly annoyed as every time we got within striking distance of what we thought was the top another two or three hundred feet of featureless ice would greet us. Comfort was drawn from gaining a greater and greater height above the col, which became little more than a dot between the legs. Eventually Jon and Cati, who were above Gareth and I disappeared above the increasingly convex slope. This decrease in gradient had to signal nearing the top and hence I pressed on to reach the easier ground. Cati and Jon were sat on what they thought was the top eating much needed energy bars. Gareth and I joined them and as I tried but failed to squeeze my glacier glasses on under my helmet, the clouds parted and what looked like a slightly higher piece of ground lay further along the sinuous ridge.

"Having given so much and come so far we didn't want to miss out on the top and so we pushed on another few hundred metres along the ridge keeping well below the large cornice on the north side. Summit photos were taken as close to the top of the cornice as we dared get.

The ridge continued dropping by some fifty metres before climbing up to Huanacuni less than a kilometre to the north east however given our fatigued state, the lateness of the hour and the increasing exposure of the ridge turning around was a unanimous decision. Our crampon prints were retraced back along the ridge and the long descent down the sustained nevé slope commenced.

"The further we descended the more my fatigued mind wandered and the less attention I paid to what I was doing. It took a slip and a rather fortunate recovery to shock me back to reality. Unnerved by my near miss I concentrated on every step I took and drew comfort from the fact the col was getting closer and closer reducing the length of a potential fall. Within arms reach of the col Gareth had led me around the patch of rotten ice only to find we still had to traverse its lower tongue to gain access to the col. Kicking hard to no avail we gingerly manoeuvred over the steeply inclined brittle ice. Several small slips as the ice buckled under the two pairs of points on which all my weight was balanced unnerved me further. Unable to find anything solid for my axe I kicked my way across keeping moving until the ice ran out and I was forced to step down plunging into a cavity up to my waist. Expelling most of what little energy I had left I hauled myself out with my axes and climbed the small rise to the col where a long rest was required.

"Gareth however was keen to keep going and before long we were tripping and stumbling back down our deep footprints we'd made earlier. I got my rest when crampons were removed as they were more a hindrance than a help in such deep snow. Only moments after having removed the spikes from our boots we were presented with the first obstacle we had overlooked. The crampons would have enabled us to descend down around the ice walls safely but not wanting the hassle of getting them out again I set up a body belay allowing Gareth to glissade down the slope. He did likewise at the bottom for me and after overshooting Gareth's track into a bank of snow I waded back to our footprints where we continued down. At the snout of the glacier Cati and Jon could be seen already back at the tent removing their crampons. Our knees almost voluntarily collapsed at the thought of another steep downhill so we slid on our backsides, snow ploughing our way down the front of the glacier until the angle of the slope eased and we came to an abrupt end in a snow drift only yards from the tent.

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*"Fed and water we hurriedly emptied the tent and packed our rucksacks as the clouds gathered and hail started to sting our cheeks. The tent was taken down as thunder clapped overhead and no matter how much we wanted a rest we knew we had to descend to base camp before conditions got any worse. We set out, snows in our face, crossing the bands of rock and ploughing through runnels in between filled with snowdrifts. An eagerness to get down saw us drop too far and a small climb was required to gain the level of the shepherd's shelter on the shoulder overlooking the main valley. The mere thought of uphill persuaded Gareth and I to try and cut down the valley side. We found a gully (no more than Scottish grade I) and slid down between columns of water ice on a snow covered icy floor. The gully took us down to the easier slopes above the lake from where we traversed down, around and back across the marsh to base camp. By the time Jon and Cati arrived half an hour later we had their tent almost put up and some hot water for a nice cup of soup.*

*"I couldn't believe it when my alarm rang out at 6:15am. I hadn't slept a wink that night and been wishing for morning to arrive to put an end to my miserable night. Considering the exertions of the previous day I should have slept like a log but my eyes hurt every time I closed them. I had lain there all night staring at the tent ceiling wanting to tear my eyes out, desperate for some sleep. My eyes didn't like the sun when it came up and so I hid them behind a pair of sunglasses. As if this wasn't bad enough my nose decided to run continuously so I spent the day cooped up inside the tent, hiding from the sun with a tissue stuck up each nostril. The others laid their gear out so it would dry in the blazing sun and then drank chocolate milkshakes."*

## Climbs on the Cololo Massif

We set off the next day in two groups with separate targets. Cati and Jon were trying to find a way up the Cololo glacier and, if possible, attempt to climb Pk 5640 (C12) on the other side of the col to the north of Cololo. Gareth's objectives lay a little closer on the ridge to the west of Cololo and the col we had gained a week earlier on a reconnaissance mission. The route we took followed that of trek to the col near Cololo. Once round the bottom of the high scree slopes and before we got to the col we ascended easier ground towards the ridgeline. Grass soon gave way to

scree, which became increasingly covered with hard nev . With each false summit gained we found the slope continued yet higher but slightly set back. Kicking into the hard snows soon took its toll and our ascent was slowed to a more sustainable pace.

A choice of a couple of peaks saw us decide to carry on up the slope to what we thought was a summit before heading west along the ridge to gain another top. Once on the first summit, it looked more like a slightly elevated shoulder on the ridgeline that split and rose to a higher summit set further back. Our disappointment at the insignificance of point we had climbed was overcome by the splendid panoramic given over the Cololo massif. A deepening snow slope was descended and Gareth commented on how the snow was probably more stable than the loose scree they covered and therefore less dangerous. Having dropped a couple hundred feet we skirted a deeply filled bowl of snow before entering a diagonal gully on the north side of the ridge. We were travelling lightweight in an attempt to travel fast, however constantly plodding through up to shin deep snow meant our feet started to get wet and painfully cold in just approach shoes. The gully was ascended with us keeping close to the gully sides in order to avoid the deepest snow.

At the top we scrambled up on to the rocky ridge and clambered over it as far as we could. Sensing we were nearing the top Gareth decided to mount a rocky step not much higher than him instead of wading through the snows around it. He went to pull himself up with his left hand when a block, over a foot in length, came off in his hand. The rock collided with Gareth's left foot, causing him to yelp and hop frantically before disappearing in the snows below. By the time Dan reached Gareth he had his shoe and sock off and was inspecting the damage. On seeing a small amount of blood and a disfigured toenail it was quickly dismissed as nothing more than a bruising and wanted to press on. A short walk up the ridge took us to the summit, where Gareth sat feeling slightly dizzy and nauseas, a clear indication of clinical shock.

Continuation along the ridge appeared to get very technical and with Gareth's condition unsure we were forced to retreat. A snow free scree slope was identified as the quickest and easiest descent route. Care was required at the top as we weaved a route down the scree in between rocky buttress. Once out onto the open slope our pace picked up and we dropped

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some 250 vertical metres in little over five minutes. The jungle of large boulders at the foot of the scree slope proved more problematic for Gareth as he struggled to put weight on his injured foot. Concerned about an increasing amount of blood seeping out from his shoe Dan graciously took his rucksack in a hope to speed our progress back along the valley. However Gareth slowed further as time went on and it took a frustrating hour to gain the marsh below.

The weather had deteriorated since we had been on the ridge and snow started to fall from the skies. Getting cold from my inactivity Dan pressed on to find a route across the marsh but Gareth had difficulties hopping from one island of floating vegetation to another. Once across the marsh Gareth lay flat on his back struggling to cope with the pain. Down by the waterfall Dan would stop after every two steps to check Gareth was coping with the difficult terrain.

Back at base camp our most experienced first-aider Jon took over. The injured limb was inspected, cleaned and dressed before we discussed what action should be taken. Gareth's condition was monitored throughout the evening. With blood continuing to seep from the wound it was clear we would have to evacuate him from base camp as soon as we realistically could.

## Leaving Base Camp

Cati and Dan were up the next morning and well on their way to Antaquilla in search of a horse to carry Gareth out from Base Camp before daylight surfaced. Just a wallet and a few rations ensured we travelled fast. We reached Nubi Pampa before breakfast and were surprised by the large number of people there. They were building an irrigation channel to provide the village with a water supply from the lake. We met our friend and porter Canelon who told us where we could find a chap who owned two horses. Unable to locate the building he had described, we asked other people and sent in conflicting directions. Continuing on to Antaquilla we passed through a hamlet called Okhe Morokho. A few horses in a paddock saw us stop to enquire about hiring them but the owner wouldn't help saying they were too young to support an adults weight.

Antaquilla was a ghost town when we arrived at 11:30am having made good time. After knocking on a few doors we waited for an

owner to open a shop and then set about phoning an agency in La Paz to send a jeep out to take Gareth back there. However the phone only took cards, which the owner had run out of and more would not arrive until a bus came in late the following day. Somewhat despondent at being unable to find a horse or phone we sat down and ate lunch while considering our options.

Back at Nubi Pampa Canelon asked how we had got on. He offered to assist by carrying a rucksack and bringing a wheelbarrow in which we could cart Gareth back to Nubi Pampa. We agreed on a fee and arranged to meet him early the following morning. With darkness encroaching fast we started the slog around the first of the three lakes with base camp still 10km and a couple of hours away. At the far end of the first lake we stopped for a much-needed drink and were surprised to find a chap not far behind us and even more surprised to see he was trailing a horse. The man was on his way to Pelechuco, which he was happy to delay for a day by meeting our plea. Cati knocked him down to half his original asking price and we fixed an 8am meeting time. We wearily walked back around the next two lakes trying to come to terms with how lucky we had been to get a horse. That evening saw us clear up base camp and get ready for a departure in the morning.

Another 6am start was called for if we were to be ready by the time Canelon and the horse arrived. The tents were taken down, the various pits we had dug filled in and every last item squashed into our bulging rucksacks. At 8:45am two porters were seen coming over the crest of an undulation in the valley side and there down by the lake a third man led a horse along the rocky shores. Jon helped Gareth onto a very frightened horse sustaining deep cuts to several fingers on the sharp saddle in the process. Once fingers were plastered, the two porters shouldered their loads – Gareth's rucksack and a kit bag, and we left base camp for the final time.

The trek to Nubi with heavy loads soon took its toll on Cat and Dan after their efforts on the previous day. Slippy snow slopes were carefully traversed high above Lake Nubi before we could descend to easier ground along the shoreline. The horse and porters waited for us at the end of the last lake along with two National Park wardens who had heard of Gareth's accident and had brought off road motorbikes up to see if they could assist us. Cat happily gave them her rucksack for the

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remainder of our trek across a widening plain to a collection of small buildings. Here a camion was waiting to take us to Antaquilla.

After waiting for over an hour the word had got round that the camion was leaving and people started to appear from nowhere to join us. With bicycles tied to outside and no less than 30 people in a space no bigger than 2x4m it was a little squashed. Even as we pulled out of Nubi more people ran and jumped on the back hanging on precariously. Large potholes, big boulders, several fords and a large bog meant a slow journey, and the ten kilometres to Antaquilla took the best part of an hour. We were followed for the first section by two cyclists who were more than able to keep up.

An old football pitch turned rubbish dump was found where we could camp and set up our tents. A night in the town followed as we ate out and then drank beers while watching a local volleyball match in the centre of the town. Canelon offered to get up at 4am and walk the two hours to the next town to reserve a place on the bus for us. We went to bed feeling lucky to have met such a helpful chap. The only disturbance was by four children, the eldest no older than ten who successfully raided our porch in order to obtain 2lt of Cola.

Canelon returned the following morning at about 8am with our tickets. We packed up and moved into the village square awaiting the arrival of our bus. A couple of hours later not one but two turned up and confusion reigned as we attempted to find the right bus, get our luggage put on the roof and sit in the right seats along with two coach loads of other people. The rest of the day was spent bouncing endlessly up and down on a spring-less seat passing through a small village every so often allowing a few locals to jump on or off.

It was late evening by the time we reached La Paz. The bus terminated in a busy street and we were thrust with our gear in the middle of it. Fortunately the next vehicle was an empty taxi so we threw the bags in the back and unable to close the boot or side doors we held on tight until we could rearrange the load somewhere a bit quieter than in the middle of the highway.

## Back in La Paz

The following morning we were up early so Cati could take Gareth to the hospital before it got busy. The diagnosis was multiple fractures in his left foot and for a small fee of 120Bs (or

£12) had the damaged limb put in a plaster cast. Sunday saw most things closed so Cati, Jon and Dan headed out of the city to Amor de Dios where we joined the locals for a spot of difficult crag climbing on the conglomeratic El Penon.

The next few days saw frustrations mount as Gareth struggled to get his return journey sorted out, but after re-visiting the hospital to have the cast removed in order to fly and faxing the relevant documents the insurance company, seemed to get things moving. Gareth then got the privilege of flying first class from Bolivia to Scotland.

Cati, Jon and Dan turned to the closer ranges of the Cordillera Real to occupy the remainder of the time they still had left in Bolivia along with satisfying our thirst for more summits. Having said farewell to Gareth we packed up and headed for Illimani. A long and tiring scramble up to high camp, enhanced by our quest to be self sufficient and not use porters, brought its reward when we reached the summit the following day having had the whole mountain to ourselves. Delighted in setting an altitude record for us all, we collected rubbish on our 2000m descent, happy to be doing our bit for the environment after all it had given us. A misunderstanding of pick up times saw us only just make our rendezvous with our jeep and hence get a lift back to La Paz.

Road blockades around the city of La Paz prevented us from getting anywhere near Condoriri in the following few days. With not enough time left to make a successful attempt on the peak Jon and Dan headed for 'the world's most dangerous road' where they descended 3500 vertical metres over 65km on mountain bikes. Starting up in the mountains we rode down the dirt tracks at unbelievable speeds struggling to keep hold of the jostling handlebars, ending down in the tropical rain forests. We squeezed in an awesome rafting descent of the Corioco river the next day, struggling to stay in control of the raft over the grade IV and V rapids. Meanwhile Cati had taken a bus up to Cochabamba where she enjoyed the picturesque delights of Lake Titicaca. With a flight a day earlier than ours, Cati was on her way home by the time we returned to La Paz from the jungle. A late night savouring the delights of the city saw us rise early the next morning, still weary eyed, to pack and take our taxi through the city for the final time, to the international airport on the Altiplano.

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## Images



Figure 1: Loading up our mule for the trek in to base camp from Antaquilla



Figure 2: View of Nubi and the shepherd's house from above base camp



Figure 3: View of north face and west ridge of Pk C1 from approach slopes



Figure 4: Jon reaching the ridge between peaks C1 and C2 (picture looks NW)



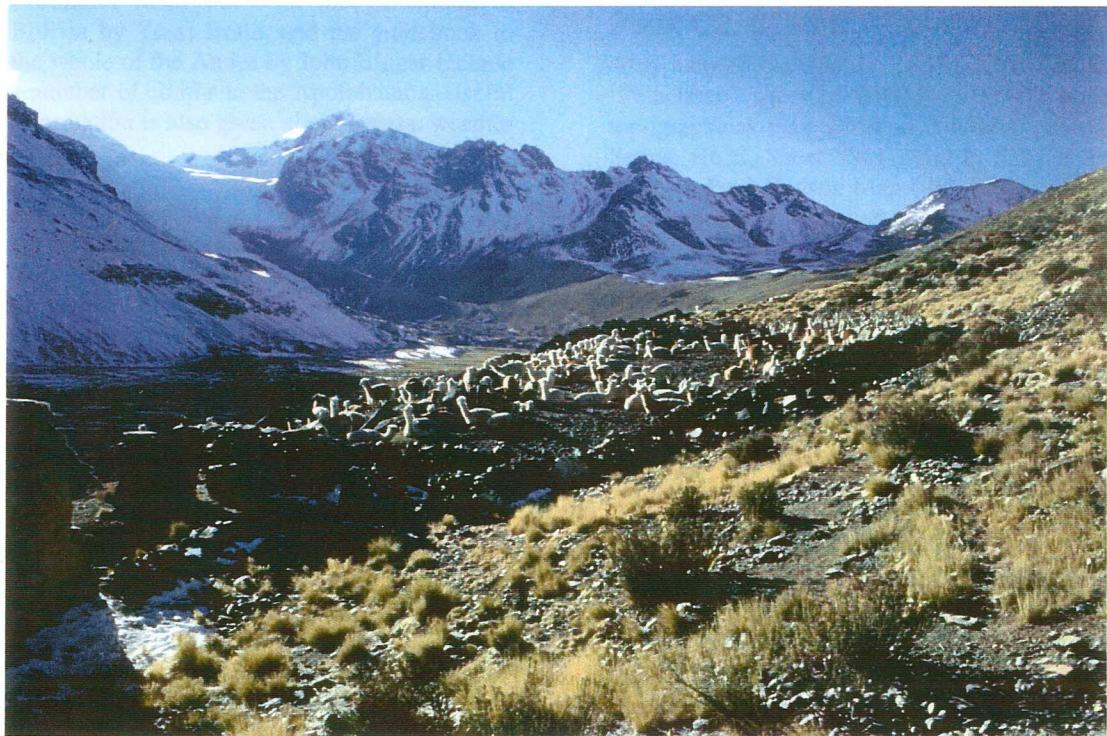
Figure 5: Base camp after heavy snowfall



Figure 6: Looking at Lago Pauoche, Lago Dadacorane and Lago Nubi from the approach to Nubi



**Figure 7:** Steep and deep snow on the climb up Nubi



**Figure 8:** Llamas in the early morning sun, above base camp

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# Mountaineering Report

## The Apolobamba

The Cordillera Apolobamba is the northernmost of the Bolivian mountain ranges and lies close to the Peruvian border, north of Lake Titicaca. Many expeditions have visited the area, but it remains very quiet in comparison to the Cordillera Real. It appears to be either no or very little 'tourist' climbing in the area, most probably because of the remoteness and the fact that the mountains are smaller.

The climbing season is May-July inclusive. After this time the area is subject to poor weather and heavy snows, leading in turn to avalanches. While the expedition was in the field in early July there were heavy snows, leading to some fears of avalanches. We understood that this was relatively unusual.

The Apolobamba is less well covered than the Cordillera Real, but both the guidebook to Bolivia by Yossi Brain, and the guidebook to the whole of the Andes by John Biggar include a number of climbs in the Apolobamba. Useful information is also given about access, weather etc.

For this expedition access from the UK was via La Paz, from where we hired a jeep to take us to Antaquia in the Cordillera Apolobamba (8 hours in 4x4). This was arranged by Gonzalo of High Camp Bolivia at a cost of \$130. Alternatively the Pelechuco bus can be taken, which leaves from the 'Cemetery District' of La Paz. (up to 14 hours). At Antaquia it was possible (but difficult) to hire a mule to transport all of our food to base camp; everything else was carried by the members of the expedition. Base camp was one day's trek from Antaquia.

Antaquia is host to a small number of shops where basic foodstuffs can be bought. The supply is likely to be highly variable however and it is clearly sensible to arrive in the Apolobamba (if not Bolivia) with the food required for the expedition (see later chapter). Antaquia also has a phone, but its use would not be sensibly relied upon.

## Approach to Base Camp

The expedition walked in from Antaquia. First head directly south out of the town, fording the river to the south of Lago Cololo and the smaller lake to its south before heading on a bearing of approximately 110° to reach Nubi Pampa. Jeep access to this point is feasible, although the route would not be obvious from the 'main' Pelechuco road. From Nubi Pampa, follow the northern banks of Lago Nubi to reach its eastern end. Cross the stream flowing in to Lago Nubi from Lago Dadacorane, and then follow the southern banks of Lago Dadacorane and then Lago Pauoche. We made our base camp near the easternmost end of this lake, close to the base of the waterfall.

## Mountains

Three summits were reached, all from a base camp at the far eastern end of Lago Pauoche, one utilising a camp higher on the mountain (Nubi):

### Peak C2, 5480m

Also named: Nevado Jacha Huaracha (as on "Pelechuco" sheet of BIGM 1:100,000 scale topographical map (Edition 1-NIMA (IGM), Series: H632, Sheet 3041)) and Pt 5527 or Pt 5488 on Paul Hudson Map (the exact position more accurately described by BIGM map).

First British ascent by a new route, 8<sup>th</sup> July 2002: Jonathan Ellis, Gareth Gretton, Catalina Llado. Climbed free, AD-.

Approach via the broad snowy col visible from Base Camp at the head of Lago Pauoche on a bearing of 39 degrees, and northern slopes to point where Figure 3 is taken. From this point traverse the scree covered slopes in the foreground of photo to reach the north face proper. Climb the north face (800m) to reach the lowest point on the ridge between Pk C1 and Pk C2 (from where Figure 4 is taken). Continue along this ridge to reach the summit. Maximum height reached was a few metres below the absolute summit, which was not approached due to it being corniced.

### Nevado Nubi, 5710m

Climbed 14<sup>th</sup> June 2002: Daniel Carrivick, Jonathan Ellis, Gareth Gretton, Catalina Llado. Climbed free, AD. Previous ascents not recorded, but peak is mentioned in Biggar [1999].

This peak was climbed with the use of a camp (Camp 1) located just below the south-west glacier of the mountain. Approach to this camp was made via the llama track on the scree slope on north side of Lago Pauoche (Figure 6) and by traversing east to foot of west ridge. From this camp climb the west ridge (Figure 7) to summit, reached after ascending the south-west glacier. Approximately 600 metres from foot of west ridge to first summit.

### Peak C17, circa 5500m

Unnamed peak, most close to Pt 5490 on Hudson map.

Climbed 16<sup>th</sup> June 2002: Daniel Carrivick and Gareth Gretton. Climbed solo, F. No recorded ascents, but probably climbed by indigenous peoples.

Ascent via east ridge; approached by scrambling up to the left of the waterfall (looking in) to a high plateau with llama pens. Approximately 300 metres of scrambling.



Figure 9: Looking south south east on the approach to Pk C2

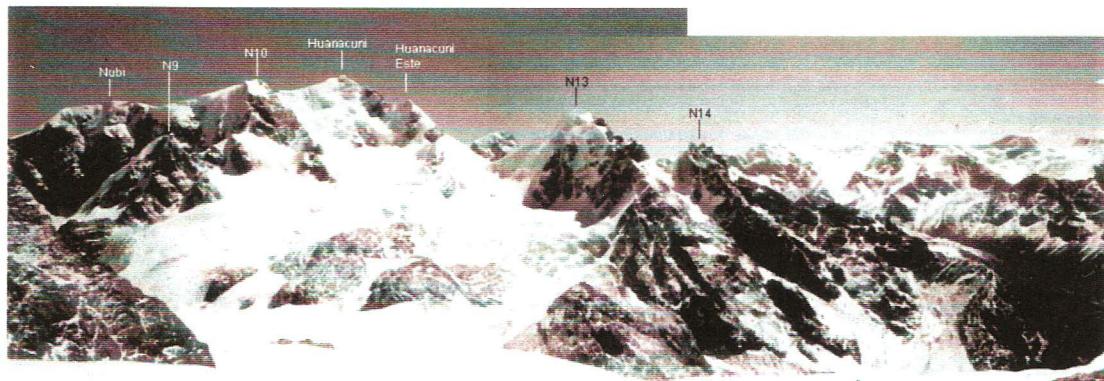


Figure 10: The Nubi Massif, looking north west from Pk C3

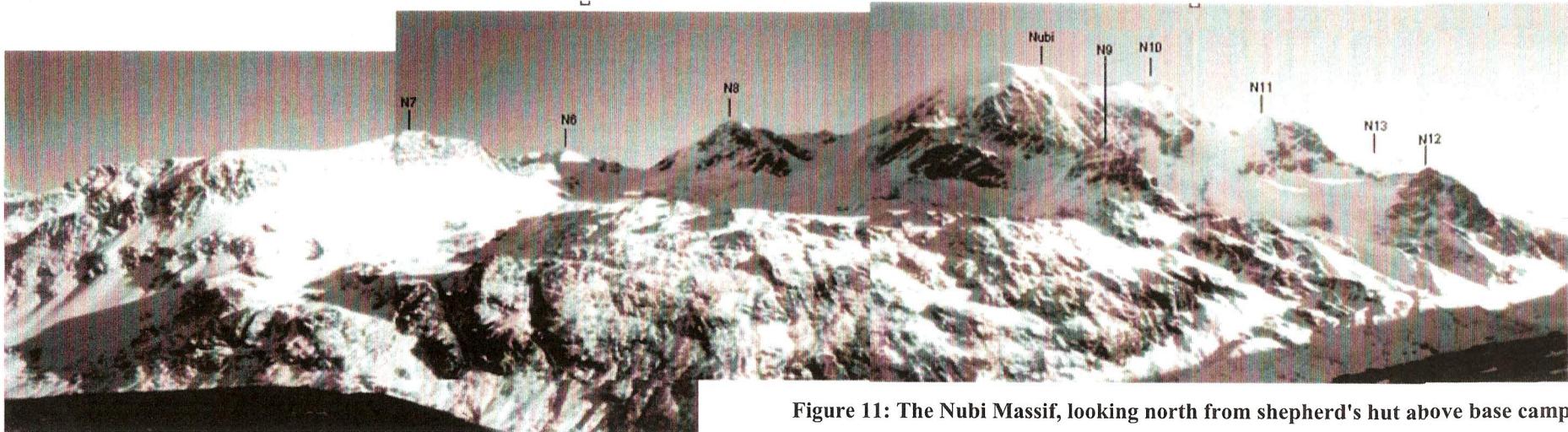


Figure 11: The Nubi Massif, looking north from shepherd's hut above base camp

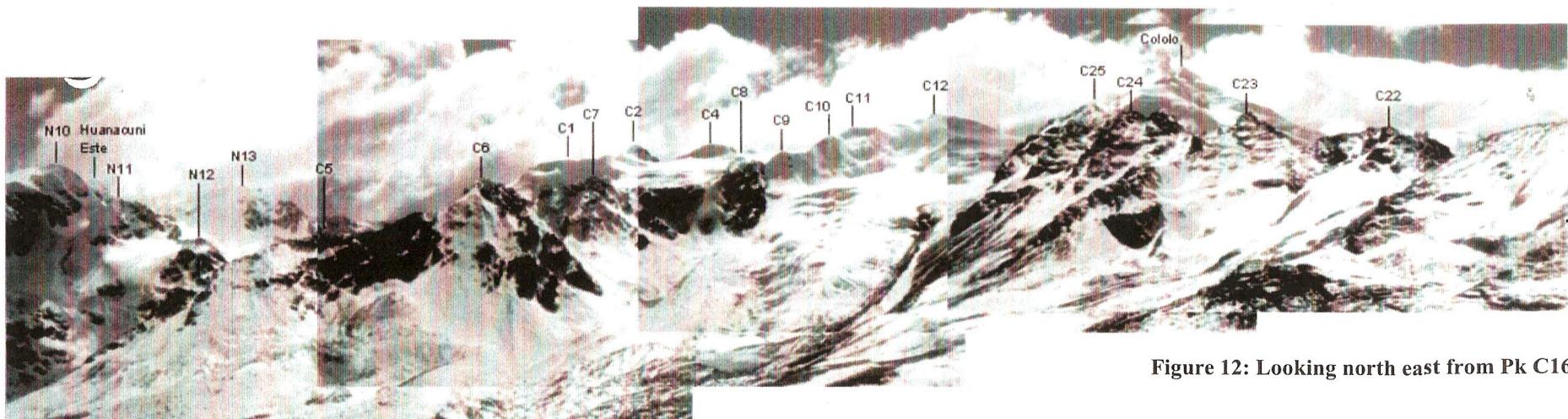
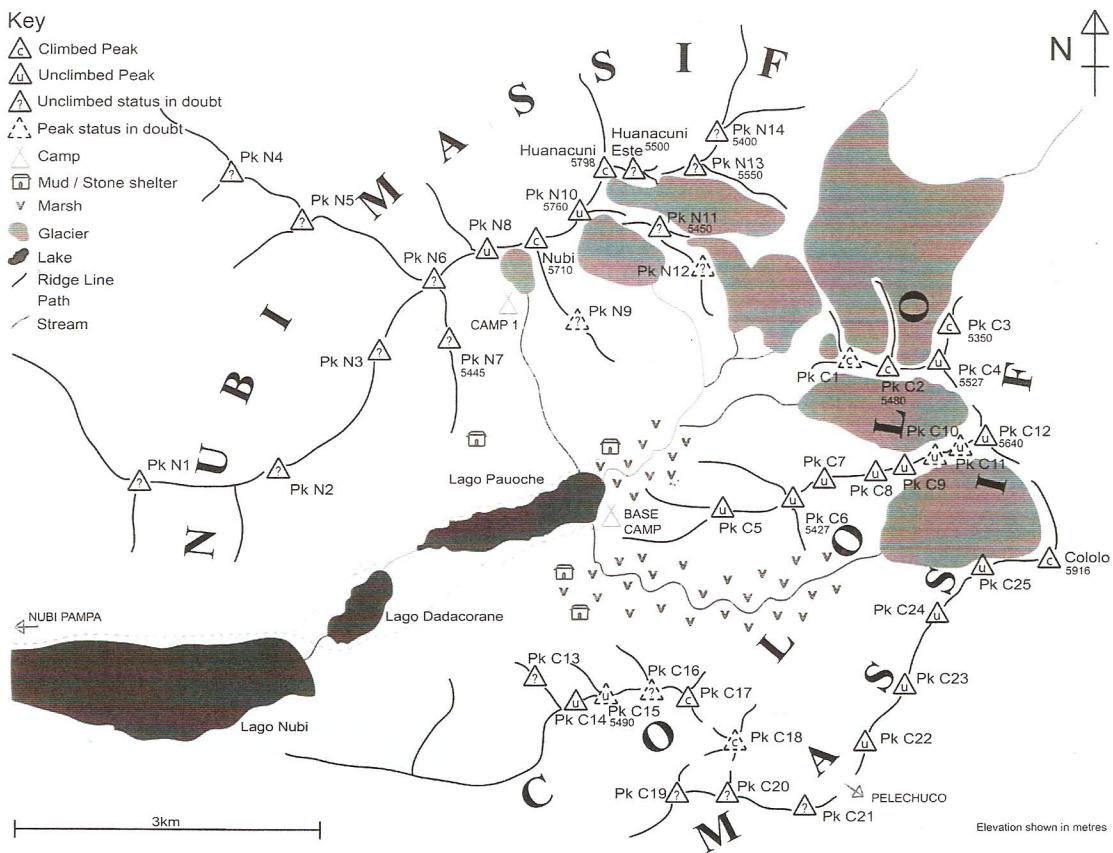


Figure 12: Looking north east from Pk C16

# Map of the Nubi and Cololo Massifs



## Notes on the Map

This map is based on the Paul Hudson map (1993), a photocopy of a 1:100,000 contour map bought from a tour guide agency in La Paz (High Camp Bolivia), waypoints recorded by GPS, compass sightings of peaks from other peaks and our photos taken during the expedition. Spot heights have been taken from the Paul Hudson and 1:100,000 maps as we found no evidence with both GPS and altimeter watch to suspect any inaccuracies. Whilst every attempt has been made to make the map as accurate as possible there will no doubt be some errors. The area outside the Nubi valley watershed should be viewed with extreme caution, while areas we never visited within the valley should be regarded as an approximation to the true geography of the region.

Climbed peaks are those which have documented ascents either in the Yossi Brain book or from previous expedition reports. If any doubt exists as to whether a peak has been climbed it is marked by a question mark. The lower peaks to the west, which lie down the valley are marked with question marks because they are easy walks from the valley floor and it is likely locals have scaled their summits. Evidence for this was seen high on the flanks of Pk21 where lama tracks were found in the snow and man-made rock cairns had been built on the ridge. All other peaks that failed to meet the above criteria are marked as unclimbed peaks. Peaks that only have a small vertical drop between them and a neighbouring peak are marked by a dashed-line triangle because it is unclear whether they have the necessary 100ft vertical drop to classify them as a separate peak.

The Paul Hudson map is apparently erroneous in the region to the east of Huanacuni Este. I have drawn this area as we saw it while out there but I am unsure which heights correspond to the peaks drawn on my map as they are all similar. There is evidence to suggest that Pk 5550, Pk 5400 and Pk 5450 from the Hudson map have all been climbed. It is thought these peaks correspond to Pk N13, Pk N14 and possibly Pk N11 respectively.

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## Financial Report

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<b>Income</b>	
Imperial College Exploration Board	3753
Mount Everest Foundation	500
British Mountaineering Council	800
Imperial College Department of Mechanical Engineering	500
Old Centralians Trust	250
Personal Contributions	2000
<b>Total</b>	<b>7803</b>
<b>Expenditure</b>	
Transport (International)	2913
Transport (Other)	450
Equipment	2385
Food (purchased in UK)	204
Photography	119
Research (inc. Books & photocopying)	110
Insurance	753
Bolivian expenditure, excluding jeep transport	865
<b>Total</b>	<b>7799</b>



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## Equipment Report

New Mountain Hardwear Ultra Trango tents were used on the mountain and they certainly seemed very sturdy although we did not have any extremely high winds. Mountain Hardwear tents are generally very quick and easy to put up, but the pole at the front across the porch on the ultra Trango is quite fiddly and it took us a while to get it right. The zip stitching on the inner came undone but caused us few problems. We were impressed with Snow and Rocks after sales care which quickly and efficiently provided us with a replacement.

The Primus Himalaya Omnifuel stove worked well with both the dirty Bolivian fuel and at altitude. It was by far and away the best all-round stove we have cooked on at altitude, in terms of its lightweight, durability, ease to prime, and the range of fuels that can be used with it. The cleaning tool is rather delicate and the fine needle for clearing the jet soon broke. A tooth brush proved to be a better alternative for unblocking the jet.

We were very impressed with the Garmin Etrex Summit GPS, which although wasn't needed for navigation proved very useful for mapping the area. While altitude readings proved to be a bit inconsistent, especially down in the valleys, distances and bearings were spot on. There was no problem with the GPS finding satellites and this helped to keep the battery consumption down to just four AA batteries for the whole expedition.

Rab down jackets were worn extensively around base camp in the morning and during the evening. The high valley walls meant the sun had a long way to come up before the valley warmed up and also disappeared by about 16:00 hours every afternoon, when the temperature plummeted. Apart from keeping us warm and comfortable, the durable, water repellent outers prevented the down getting

damp in the sometimes quite heavy snow showers. Rab Summit 800 sleeping bags were plenty warm enough for the chilly nights.

A small lead rack was taken but was not used, as the routes around base camp didn't require such equipment. The rock climbing we did around La Paz was bolted, but this is limited. With lots of undeveloped rock there is plenty of scope for traditional climbing. The glaciers were generally quite firm, but all the routes undertaken were done alpine style with one axe and hence no protection was placed. Deep soft snow collected on sheltered glaciers, such as that at the foot of Nubi, which again was crossed alpine style.

Day time temperatures while mountaineering in the sun were quite high and often we wore just a thermal top and bottoms with gaiters. However as soon as the cloud gathered a fleece or waterproof top was required to provide that extra warmth. Mountain Equipment Ultra Fleece Jacket and trousers worked very well providing a good balance between their warmth, wind-resistance, breathability and weight. Waterproof trousers were definitely required as well as gaiters for the lower glaciers on Nubi.

We found that a 2 litre Trangia pan held enough food, sufficient to serve two people. Washing the Trangia pots in the icy cold meltwater streams made the hands numb very quickly. A pair of rubber gloves are recommended to help combat the severe hot aches we experienced. Iodine droplets were used to purify the melt-water we drank, even at base camp where Llama droppings were a potential source of disease.

Our thanks goes out to all those Companies who supplied the expedition with equipment, especially BCH Camping in Bath who were the main suppliers of the expedition equipment.



## Food

Instant mashed potato or couscous provided the basis for our main evening meals while on the mountains. Both foods require just boiling water (no cooking or simmering) and hence fuel carried above base camp could be kept to a minimum. At base camp these meals were replaced by pasta, easily obtainable in Bolivia but given its unappetizing taste and stodgy texture we would recommend importing pasta from home if at all possible. Fresh carrots, onions and tomatoes made the bases of pasta sauces with packet sauces only being used once fresh supplies had run out after the first few weeks. A tray of eggs were hard boiled before we left our Hostel in La Paz. The majority of these survived the horse journey to base camp although we would suggest they might be better carried by a person rather than tied to a horses back. The eggs were used as a source of protein and added to pasta sources for the first few weeks after which tuna and salami took their place. Packet soups were drunk before each main meal and were often made up quite weakly (2 pints of water to every sachet instead of the recommended 1 pint). The Colman sauce sachets were used to flavour the instant mash and couscous and again they were watered down to make them go further. By having separate sauce and soup sachets and by not flavouring the instant foods with the soups we were able to ensure adequate rehydration occurred during meal times. For a change at base camp a roux sauce was sometimes made (instant milk, flour and oil instead of butter) and cheese added, making the pasta almost tolerable. Tomato puree was used to enrich the tomato flavour in sauces while instant mash turned out to be an ideal sauce or soup thickener.

Puddings were eaten not on a regular basis but just every so often at base camp. Both jellies and Angel Delights set successfully when

placed in a nearby melt water stream. An Angel Delight sachet weighed four times as much as an instant jelly sachet and only made *half the quantity of dessert*. However despite this inefficiency we found Angel Delights made a nice change from jellies and could be watered down to make excellent milk shakes.

At Base camp porridge was eaten for breakfast. Although time consuming to cook we found it most beneficial to have a substantial warm breakfast. Our fuel and food supplies also allowed us to have a pasta meal at midday at base camp. This meant we could reserve the snack foods (limited due to their weight) for mountain days and undergo effective 'carbo-loading' while resting at base camp.

On the mountain porridge was not eaten in an attempt to limit the amount of fuel carried and to allow an early start. Snacks were eaten throughout the day encompassing breakfast and lunch, and usually consisted of two chocolate bars, one nut bar or some nuts, one cereal bar, some dried fruit, a jelly and half a packet of biscuits per person. We often found not all snacks were eaten and these "leftovers" were usually rolled over to boost the next day's mountain rations or enjoyed as extras back at base camp.

Water was treated with iodine and drank with meals and on the mountain. Hot tea was drunk occasionally - a result of us not being very enthusiastic tea drinkers and being unable to get a decent supply of cheap tea bags in Bolivia. Hot chocolate was drunk but the weight of powder needed to make a good cup meant we only had the supplies to drink it every now again and is not recommended on the basis of weight efficiency. Table 1 (below) details the foods taken and consumed during the different stages of the expedition.



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## Miscellaneous Legal Bit

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# Appendix 1 – Equipment

Personal Equipment			Group Equipment		
<b>Climbing Gear</b>			<b>Ropes</b>		
Harness	1	Sleeping bag	1	Accessory cord 5mm x 25 metres	1
Quickdraws	1	Sleeping bag liner	1	Ropes 8mm x 50 metres	4
Prusik Loops	3	Sleeping mat	1		
Belay Plate	1	Survival Bag	1		
Slings	3	<b>Footwear</b>			
Screwgate Karabiners	5	Mountaineering boots	1	Primus multifuel stoves	2
Helmet	1	Approach boots	1	Fuel bottles (1ltr)	1
Ice axe (adze)	1	<b>Camera</b>	1	Jerrycans (5ltr, 2/3 full)	2
Crampons (pair)	1	Camera	1	2 ltr pans	2
Ice screw	1	Camera film	6	Fryingpans/lids	2
<b>Other Gear</b>		Spare camera batteries	1	<b>Tents</b>	
Trekking poles	2	<b>Drink</b>		2/3 man tents	2
Large rucksack	1	Water bottle	1	<b>Carrying</b>	
<b>Clothing</b>			Duffle bag 100 ltr		1
Fleece trousers	1	Camelback/platypus	1	<b>Navigation</b>	
Thermal leggings	1	Iodine drops	1	GPS	1
Thermal top	1	<b>Toiletries</b>		<b>Climbing Gear</b>	
T-shirt	1	Toothbrush & toothpaste	1	Nuts (1-10)	1.5
Thin fleece	1	Biodegradable soap	1	Rockcentrics (5-9)	1
Thick fleece	1	Trek towel	1	Friends (1 & 2)	1
Waterproof salopettes	1	Sun cream	1	Quickdraws	4
Waterproof jacket	1	Lip salve	1	Ice pitons - DMM Bulldog	2
Down jacket	1	<b>Navigation</b>		Ice Pitons - Warthog	2
<b>Underwear</b>		Compass	1	Ice screws	2
Underpants	?	Head torch & spare bulbs	1	Snow stakes	4
Thin socks	2	Batteries	4	Ice axes (hammer)	2
Thick socks	2	Personal first aid kit		<b>Spares and Repairs</b>	
<b>Other Clothing</b>		Documents & Passport		Adjustable spanner	1
Hat	1	Money	1	Gaffer tape (20m)	1
Balaclava	1	Watch	1	<b>Misc</b>	
Thin gloves	1	Book	1	Cigarette lighters	4
Thick gloves (waterproof)	1	Notebook & pencil	1	Matches (boxes)	4
Gaiters	1	Penknife / Leatherman	1	Plastic bags	
Sunglasses	1	Spoon	1	Playing cards	
Goggles	1	10m 4mm Cord	1	Group first aid kit	

## Appendix 2 – Food (4 people for 21 days)

PRODUCTS	Unit mass (kg)	Number	Total mass (kg)	Used	Leftover
ITEMS TAKEN FROM THE UK					
ANGEL DELIGHT (1/2 pint)					
Chocolate	0.06	6	0.36	3	3
Raspberry	0.06	6	0.36	5	1
CEREAL BARS					
Blueberry	0.033	12	0.396	7	5
Blueberry	0.037	8	0.296	8	0
Raisin & Hazelnut	0.033	12	0.396	11	1
Strawberry	0.037	8	0.296	8	0
Tangy Citrus	0.033	12	0.396	9	3
Wild Berry	0.033	12	0.396	10	2
CHOCOLATE BARS	0.049	60	2.94	41	19
COUSCOUS	0.5	8	4	7.5	0.5
FREEZER BAGS (zip tie)	0.005	40	0.2	40	0
JELLY - INSTANT (2 pint)					
Orange	0.025	2	0.05	0	2
Raspberry	0.025	4	0.1	2	2
Strawberry	0.025	2	0.05	0.5	1.5
JELLY - WHOLE	0.135	16	2.16	9	7
POTATO MASH (Instant)	0.432	8	3.456	6	2
SALAMI	0.2	3	0.6	2	1
SAUCE PACKETTS					
Cheese Sauce (1/2 pt)	0.055	12	0.66	6	6
Parsley Sauce (1/2 pt)	0.055	8	0.44	5	3
Chilli Con Carne (3/4 pt)	0.05	4	0.2	3	1
Coq au Vin (3/4 pt)	0.05	4	0.2	2	2
Shepherds Pie (3/4 pt)	0.05	4	0.2	4	0
Tuna & Pasta Bake (3/4)	0.05	4	0.2	3	1
SOUP (1 pint sachets)					
Asparagus	0.064	4	0.256	2	2
Carrot & Coriander	0.05	4	0.2	2	2
Chicken & leek	0.05	5	0.25	0	5
Chicken Noodle	0.033	4	0.132	2	2
French Onion	0.05	1	0.05	1	0
Golden Vegetable	0.05	4	0.2	2	2
Minstrone	0.05	5	0.25	2	3
Potato & Leek	0.064	3	0.192	2	1
Spring Vegetable	0.05	2	0.1	2	0
TOMATO PUREE	0.2	6	1.2	4	2
VEGETABLE MIX (dried)	0.5	2	1	1	1
<b>TOTAL</b>			<b>22.18</b>		
ITEMS BOUGHT IN BOLIVIA					
BREAD ROLLS	0.02	21	0.42	21	0
BISCUITS	0.2	14	2.8	12	2
CARAMEL NUT BARS	0.04	40	1.6	32	8
CARAMEL PEANUTS	0.03	10	0.3	7	3
CARROTS	0.115	20	2.3	20	0
CHEESE	1		0.5	1	0
CHOCOLATE BARS - milk	0.036	10	0.36	10	0
CHOCOLATE BARS - nutty	0.036	10	0.36	10	0
CHOCOLATE BARS - white	0.036	10	0.36	10	0
DRINKING CHOCOLATE	0.2	3	0.6	3	0
EGGS	0.035	27	0.945	27	0
FLOUR - PLAIN	1		0.5	0.8	0.2
GARLIC SALT	1		0.05	0.2	0.8
LIGHTERS	0.045	4	0.18	4	0
MATCHES (Sm box)	0.02	10	0.2	6	4
MILK PWD. (made 19.2 Ltr)	2.5	1	2.5	0.8	0.3
OIL (VEGETABLE 1Ltr)		1	1	0.8	0.2
OLIVE OIL EX. VIRGIN		1	0.25	1	0
ONIONS	0.125	12	1.5	12	0
ORANGES	0.05	20	1	20	0
OREGANO	1		0.05	0.9	0.1
PAN SCRUBBERS	2		0.05	2	0
PASTA	0.5	12	6	12	0
PEPPER	1		0.05	0.3	0.7
PORRIDGE OATS	0.5	7	3.5	7	0
RAISINS	0.5	3	1.5	2	1
SALT	1		0.25	1	0
SOAP (bar)	1		0.25	1	0
SUGAR	2	1	2	1	0
TEA BAGS (Box of 20)		1	0.15	1	0
TEA LEAVES (Bag)	0.125	1	0.125	0.2	0.8
TOFFEE	0.4	4	1.6	4	0
TUNA	0.17	8	1.36	8	0
TOMATOES	0.05	20	1	20	0
TOILET ROLLS	0.05	12	0.6	8	4
WOODEN SPOONS	0.05	2	0.1	2	0
<b>TOTAL</b>			<b>36.31</b>		
<b>GRAND TOTAL</b>			<b>58.49</b>		