

APOLOBAMBA



1988

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The Yorkshire Ramblers' Club 1988 Bolivian Expedition

The expedition was in the field from 22nd July to 4th September 1988 with the main aim of mountaineering in the Apolobamba mountains, South of the village of Pelechuco. Botanical collections and ornithological records were compiled. Visits were also made to the Cordillera Real and Cuzco.

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Abstract

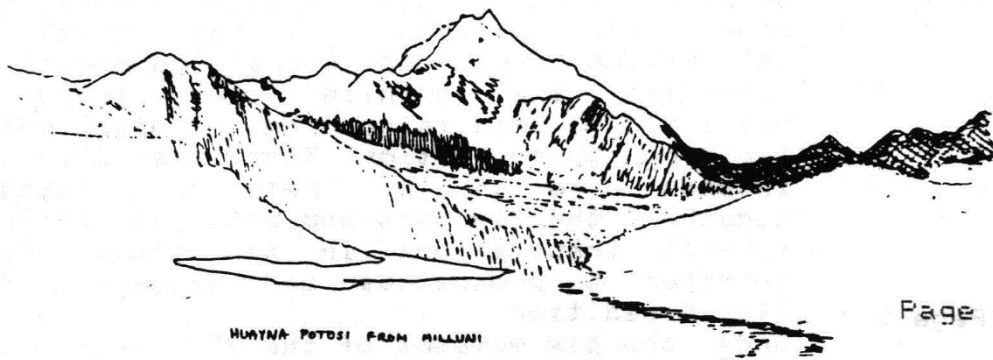
The 1988 Yorkshire Ramblers' Club Expedition to the Apolobamba range in Bolivia consisted of six members spending four to six weeks in the country. The intention was to provide an opportunity for classical mountaineering in a remote and little frequented area.

Following a week for acclimatisation the team established a base camp in the Nubi valley. From there the peaks of Cololo and Nevado Nubi were climbed, a botanical collection was made and ornithological sightings recorded. An exploratory trek was made around the peaks at the head of the valley. A sketch map of the area was compiled. Some difficulties with acclimatisation limited the number of peaks attempted but the opportunities for botanical collection exceeded expectation.

The ascent of Cololo by the West ridge is a new route and the third ascent of the peak. The route on Nevado Nubi is a second ascent. Both are first British ascents.

Later Illimani in the Cordillera Real was climbed.

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HUAYNA POTOSI FROM ILLIMANI

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Introduction

Following the decision of the Yorkshire Ramblers' Club to plan an expedition a search was made for areas that would provide a significant challenge to the classical mountaineer, be accessible enough for those with little time to spare, offer reliable weather in a remote mountainous region and yet still be off the beaten track. A few areas were recommended but Bolivia was chosen on the grounds that the leader had previously visited the region and was enthusiastic about its prospects.

Within Bolivia the Apolobamba area was selected for its relative lack of maps, guide books and previous visits. First hand information from Jim Curran and Pamela Holt confirmed the opinion that there were realistic mountaineering opportunities awaiting an expedition. There then started an intense period of research, gathering together the few maps and articles, including several translations in an attempt to put together a prospectus and itinerary for a Club expedition.

Once the six members of the YRC had committed themselves to the venture the objectives were finalised. These were to attempt a new route, to make a botanical collection and trek round part of the area. No specific climbing objective was set prior to departure as this depended on the ability of the party to acclimatise and on information gathered locally after arrival. As the leader on his previous visit had experienced some difficulty in obtaining supplies, the services of a local mountaineering agency were secured to provide transport, a camp assistant, base camp equipment, some food and the fuel.

Early in 1988 news of guerilla activity spilling over from Peru, and Foreign Office warnings of the inadvisability of visiting remote parts of Bolivia, gave some concern which was allayed by reassurances from contacts in Bolivia.

The lack of medical expertise in the party and confusing reports about conditions on the mountains meant that we equipped ourselves to be as versatile and well prepared as possible.

So it was a very mixed team that left Britain, well equipped and well researched, but still a little vague about what was before them. It is a tribute to their adaptability and perseverance that the team that returned felt a sense of achievement and that all the aims of the venture had been met to some significant degree.

Personnel

All six participants were members of the Yorkshire Ramblers' Club.

Michael Smith, 35, a teacher in South Yorkshire. A participant in trips to the Atlas, Tatra, Ladakh besides several visits to the Alps. Organiser of a previous tour of Peru and Bolivia. Leader.

John H Sterland, 60, a Cambridge accountant. A mountaineer and hillwalker with a wide experience. Deputy Leader, Treasurer and collector of botanical specimens.

Ian Crowther, 52, Lifting tackle consultant from Leeds. A mountaineer with experience in several countries. Organised medical aspects and maintenance kit.

David A Hick, 42, an engineer from York. A mountaineer and hillwalker with a wide experience including visits to the Alps. Organised transport arrangements.

Harvey Lomas, 43, a Settle businessman. Potholer and mountaineer with experience of expeditions to remote areas such as Turkey and Iran.

David Martindale, 46, an office worker from York. A mountaineer and hillwalker with several years experience including visits to the Alps. Recorder of ornithological sightings.

Others referred to in the text are:-

Bernardo Guarachi, mountain guide working from La Paz,

Francisco Chuquimia Huanca de Canaviri, camp assistant and part time employee of Bernardo,

Benanzio Vernon Huanca, campesino willing to work as arriero, from Quello.

Scientific Fieldwork

The botanical and ornithological aspects of the fieldwork are dealt with in their respective appendices.

The records of temperature and pressure were taken mostly for the interest of participants but may prove of some use to other groups visiting the same area. Details of the measuring devices are included below. The adaptation of the altimeter may interest those with access to a laboratory attempting to work within a tight budget.

The record of temperature.

Two household bimetal strip thermometers were used for general records of temperature. They were previously checked against a mercury in glass thermometer and found to be accurate to within half a degree Celsius throughout the range -18 to +20 degrees Celsius.

An electronic remote sensing thermometer with digital display and maximum, minimum record was used for air and water temperatures. This was calibrated in an ice/water mixture and checked for accuracy over the same range. Air temperatures were taken for a sensing point several centimetres above the apex of a tent, about 1.5m above the ground. The sensor was shaded.

The record of pressure.

Two cheap (£20) pocket altimeters were used, the disadvantage of these being the lack of range as they are intended for alpine use up to around 4000m (13000ft). However, the range of free movement of the mechanism proved to be much greater and remained roughly linear in deflection with respect to changes in pressure. So using an evacuated chamber containing the altimeters and attached to a mercury manometer, the scale of pressure was extended. This proved accurate to within 20m and would probably serve to around 7000m. Due to the lack of perfect linearity it would not have been sufficient to rotate the scale and 'add on' a few thousand metres. The dismantling and reassembly of the altimeters was a simple task and did not cause any harm to the mechanism.

The Weather.

Practically every morning dawned bright, clear and sunny. The air warmed steadily and it would be comfortable in the sun, which usually shone all day, and then as it set the temperature would fall quickly, well below freezing.

On many days the wind by noon was gusting strongly, sufficient on one occasion to collapse the mess tent, but usually not enough to be a real problem. This was often accompanied by cloud spreading over from the head of the valley and drifting South-West and evaporating after a few miles.

One day a brief hail storm passed over, leaving a short lived covering of white. On another a thin high layer of cloud gave us only hazy sunlight.

This settled weather proved ideal for mountaineering.

Logistical Report

Availability of Research Material.

The majority of the climbing reports are held by the Alpine Club and the remainder are in the Royal Geographical Society Library. The RGS's map room contains the maps of the Boundary Commission Survey but formal permission of the Librarian is required before the other papers relating to the survey can be made available. This additional material contains worthwhile outlines, survey sketches and photographs which would assist in recognition of peaks in the Northern part of the Apolobamba. It also describes some of the tracks and terrain.

The maps which accompany articles do little more than identify peaks. The most detailed are the RGS Border survey and the Imperial College Expedition map. The Landsat photograph 2223-13554 shows little more than the Bolivian IGM La Paz sheet 2. For the Cordillera Real maps covering the main peaks at 1:50000 are available from the IGM in La Paz or possibly from the GeoCenter, Germany

Diplomatic Clearance

No formal clearance or permit is required, though we did secure a letter of support from the Office of Tourism. The British Embassy and Consulate in La Paz were most reluctant to state that the area around the Apolobamba was safe and stressed the inadvisability of taking a party into such a remote area, far from assistance.

We encountered only minor difficulties with local people, none from the police and no guerilla activity. Indeed the local population were willing to offer what help they could. The employment of a Bolivian as assistant at base camp assisted communication and probably increased their confidence and our security. The only time that any member of the party felt threatened by anything worse than snarling dogs was at an overnight stop in Illo-Illo when there was a disturbance outside at night.

Insurance

Insurance with the New Hampshire Insurance Company was arranged by the brokers Alexander Stenhouse at a per capita premium of £110 for six weeks and £86 for four weeks. The scheme is called the Expeditions Travel Insurance Scheme and is dealt with by John Berridge in Southampton. Our claims under the Medical Expenses and Equipment sections amounted to over £700.

The cover could not be extended under this scheme to include the camp assistant or porters. This problem was avoided by using the services of a trekking and mountaineering agency who provided the personnel. The agency was thus the employer and so had to provide the insurance.

Travel, Transport and Freight.

Air travel was arranged, by David Hick, through Journey Latin America on VARIIG and Cruzieros flights. The London, Rio, La Paz route is more expensive than via Lima but avoids the need to cross Peru twice at a popular time. The equipment was transferred directly through to La Paz and despite being over 180Kg (the allowance for six people being 120Kg) no excess baggage charge was made. The hand luggage was carefully selected and packed to include a further 50Kg of material. So a small expedition, well equipped, managed to use ordinary flights without resorting to freight services. While the incurring of excess charges was a risk we would have no hesitation in advising others to use the same approach. It did not cause airline staff any surprise and in any case the difference between excess baggage charges and freight charges is not great when dealing in small quantities.

Customs, security checks and immigration caused little difficulty. Hand luggage had to be unpacked on occasion but usually one glance at the large mound of grubby sacks was enough to allow us to be waved through. The equipment was all packed with sharp points covered in padding and packed well inside. No items were strapped on the outside and rucksacs were placed in coarse sacks. On arrival in La Paz a request for visa stamps exceeding the usual 28 days met with an insistence that we pay \$10 each for the privilege. We were unable to ascertain whether this was an official payment or merely a payment to an official. However, it did save a further visit to the Immigration Ministry or possible difficulties when leaving.

We carried complete lists of equipment translated into Spanish. These were not required by any official.

Once in Bolivia a variety of transport was used. Taxis, Trufis (collective taxis on set routes), micros and buses were used in La Paz in descending order of comfort and cost. Taxi drivers, other than those who prey on tourists by waiting outside hotels, were helpful and cheap. Tourist coaches were used for sightseeing. When all the equipment was being moved a minibus was hired with driver. It was sometimes necessary to indicate the directions for the required route as the remoter ranges are beyond the experience of most drivers and there are no signposts. Two of our party used the only form of motorised transport available to the majority of Bolivians, the back of a loaded lorry. This was a slow, dirty, tiring, crowded but cheap experience that they described as unforgettable, unreliable and unrepeatable.

In the Field

The expedition was, with the benefit of hindsight, overequipped with climbing gear. The snowstakes and rock pitons were never used for their intended purposes, although if different routes had been attempted then they might have been. Clothing and sleeping bags were adequate and we were never cold. The tents performed well and were spacious enough for comfort. One Goretex bivvy bag performed well but a homemade version suffered badly from internal icing.

The dry weather meant that waterproofs were never required. The decision to buy food through the mountaineering agent was a mistake. Despite impressive lists the actual supplies were of inadequate quality, quantity and variety. The availability of food in La Paz markets and supermarkets is now sufficient to allow a team to assemble, in a single day, enough food for an expedition, at costs similar to, or somewhat less than, those in Britain. The only food items worth taking out are high calorie dehydrated meals.

Specialist Equipment

Apart from the items described in the Scientific Fieldwork section the only pieces of specialist equipment taken were snowstakes, jointed ski sticks and an ice axe monopod for photography.

The snowstakes were tested but not used seriously. The snow conditions were not as powdery as we had expected. In soft snow we used ice axes and on a few occasions a snow stake would have been preferable. The snowstakes designed were light, easily stacked and strong.

The sectioned ski sticks performed well both as aids to balance and when broken down as the four tent pegs required to tension the tent when pitched on ice granules. On the glacier ordinary pegs melted out during the day time. The arrangement withstood repeated assembly and disassembly despite being hammered into ice.

The mono pod was not frequently used but did allow photography in poor light conditions. The position of the protruding screw thread is critical if the head is still to be grasped firmly in a variety of ways. This adaptation was only carried out on the spare ice axe which was mostly used for glacier crossing.

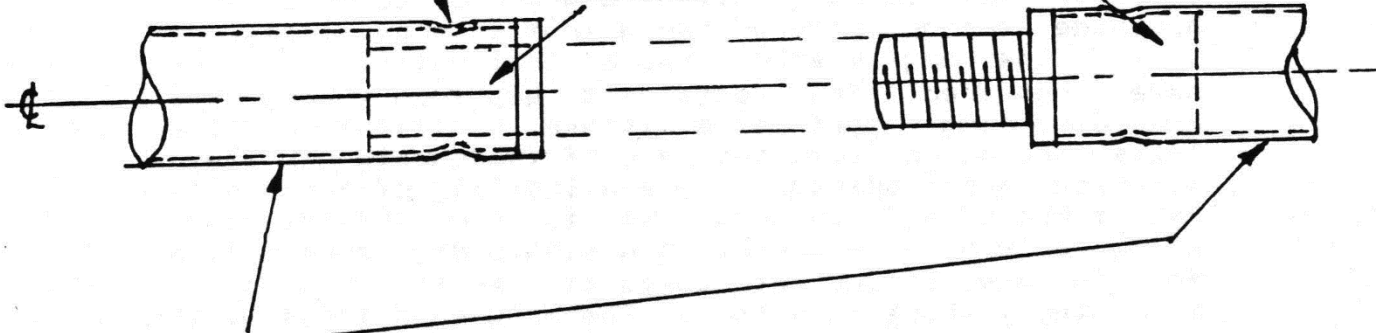
Photography

A range of 35mm cameras were used. All performed well up to the glacier. A camera manual shutter used with a 28-200mm zoom lens and selenium cell meter ensured that one member's camera did not suffer from cold batteries or moisture in the works.

Anyone interested in photographs of the area should, in the first instance, contact the Leader

♂ + ♀ HALF COLLARS
ADDITIONALLY LOCATED
& SECURED INTO PLACE
BY 'DIMPLING' WITH CENTRE
PUNCH IN 2 PLACES

MACHINED ALLOY MALE + FEMALE
HALF THREADED (M10) COLLARS
PRESS-FITTED INTO CUT ENDS
& SECURED WITH 'LOCTITE'

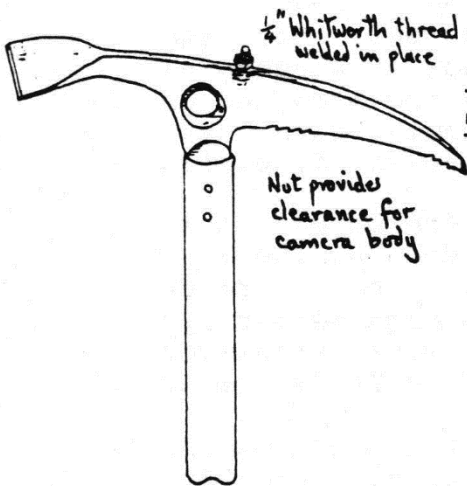


CHEAP ALLOY SKI - POLE
HACKSAWED NEATLY INTO HALVES

SCALE 1:1

W.C.I.C. 3.12.88

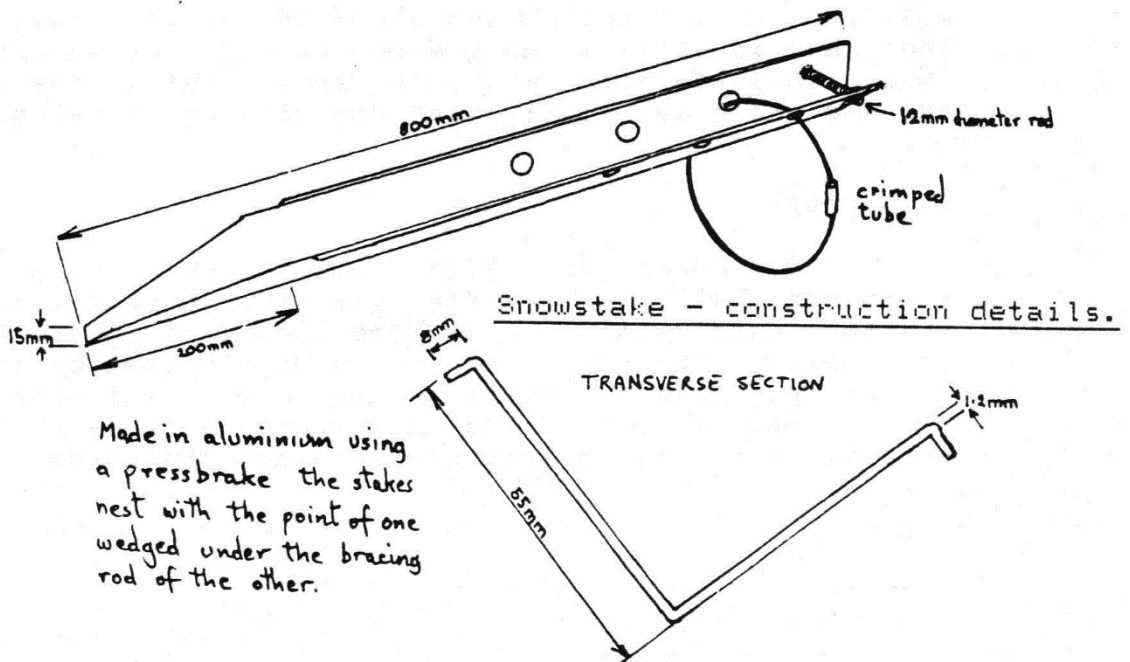
Jointed ski sticks - joint details.



1/2" Whitworth thread
welded in place

Ice axe modification for
use as a camera monopod.

Not provide
clearance for
camera body



Snowstake - construction details.

TRANSVERSE SECTION

Made in aluminium using
a pressbrake the stakes
nest with the point of one
wedged under the bracing
rod of the other.

Mountaineering

The list of successful ascents is as follows:-

Cololo (Cochuca) 5916m 19408ft West ridge, new route 3rd ascent, 1st British ascent.	9th Aug.1988 M.Smith & D.Hick
Nevado Nubi 5710m 18734ft West col and ridge 2nd ascent, 1st British ascent.	13th Aug.1988 M.Smith & D.Hick
Illimani 6460m 21200ft South Peak, normal route with slight variation.	27th Aug.1988 M.Smith & D.Hick

The detailed mountaineering record is divided as follows:-

- Huayna Potosi
- Cololo
- Nevado Nubi
- Other peaks in Apolobamba
- Illimani

Huayna Potosi

This is a popular climb from La Paz and guides, porters and transport were all readily available. We attempted this peak as an acclimatisation exercise a few days after arriving in Bolivia.

Day 1.

A few phone calls to local taxi firms secured a taxi with driver and mate for the two hour trip to the Zongo pass barrage. The cost was £25 as opposed to over £40 quoted by guides, tourist agencies and trekking firms. Adequate supplies of food were readily obtainable in La Paz. These were supplemented by dried main meals brought from Britain.

The driver was uncertain of the route across the altiplano and had to be advised. The barrage was beyond the top of the pass, by a cluster of huts. From here the route was adequately described in Pecher & Schmiemann's guide book though after good weather in the season the way was so clearly visible as to be easily followed.

Before crossing the barrage we picked out the point for leaving the aqueduct and making up to the lateral moraine. We camped on a pile of dried grass just before the moraine. The altitude gave us headaches and made our breathing laboured. Smith took Paracetamol. Lowest overnight temperature was -5.6C.

Day 2.

Breakfast and breaking camp took 2 hours. Off about 9am we were going very slowly up the crest of the moraine, carrying 56lb packs. Towards the top of this we broke off right to descend slightly to a boulder and scree slope up to the glacier in 2.5 hours. Steep hard snow and some ice patches meant we soon needed crampon. Later steep soft snow made for slow progress past seracs. We reached the level hanging glacier of Campamento Argentina, 5500m, with

time to set up camp by 5pm. Avalanche from the serac draped face beyond camp was alarming but not threatening as it was a kilometre away.

The air temperature was -6.6C at 6pm and fell to a minimum of -12.2C.

Day 3.

We started melting snow at 5am and were off by 7am; sunrise at 6.15 gave us views across the Altiplano to Illimani and the volcanic cone of Sajama.

Our progress was slow in powder snow as we were not fit. The route was dramatic, rising up the steep cornice back over a cornice onto a steadily rising section, threading through seracs and past crevasses. By noon we were only making several steps, less in deep powder snow, before needing a couple of minutes to recuperate. We decided to leave the sacks and rope and see how far we could get.

By 2pm we had reached the summit pyramid and prospected the bergschrund only to find that at 3m wide it was unbridgeable. A possible slope at the far right hand side was too exposed without the protection of a rope. We turned back, having passed the 6000m mark.

Altitude was taking it's toll and we were slow descending. One almost exhausted. Back at our tent we found a group from the German Alpine Club pitched alongside.

Lowest overnight temperature was -12.4C.

Day 4.

We started melting snow at 6am but the stove jet blocked before first melt was complete. Because of lassitude we couldn't be bothered to strip down the stove so packed in an hour and descended quickly. Reached the Zongo pass by 10am. David Hick's front tooth was painful, possibly abscessed.

By the road a large party was preparing for ascent. Their transport was a minibus which took us back to La Paz for £10. Had this transport not been available then we could have phoned for a taxi by walking back along the road to the Police checkpoint at Milluni. The mine workings at Milluni were now closed and hence were no longer a source of transport. Some days lorries do cross the Zongo pass.

Cololo (Ccachuca)

Following two reconnaissance trips, one approaching the glacier North-West of the summit and another ascending a 17000ft peak North of base camp the approach was decided. By this time we had had 11 days in Bolivia and 3 in the Apolobamba.

Day 1.

Heading South-East from base camp to a higher, level pasture, then turning East at the far end of it, we picked up a lateral moraine to the North (true right or left as approached) of the glacier. We followed this to its highest point and cached the lightweight boots. Loads were repacked as two of our team were helping the three of us; Ian Crowther, David Hick and Michael Smith.

Facing up the glacier we kept well to the left, the route being steep in only a few places and crevasses easily bypassed. The use of ski-sticks made balancing and resting easier. The surface of the glacier was covered in North pointing teeth of ice, angled at about 45 degrees and

ranging from 10cm to 1m in length. This late in the day they would not support our weight. As a level section was approached we headed more to the South (right).

A level site was cut out of a 15 degree slope, 2m by 8m to take two tunnel tents end to end. This cutting reduced the ice to granules making pegs useless. Halves of ski-sticks were used for pegging out. It was seven hours from leaving base to pitching tents. There was strong sun all day although the campsite was shaded from the evening sun. Minimum overnight temperature was -11.2C and we all suffered headaches. Two paracetamol relieved these.

Day 2.

Started melting snow at 6am and left the tents at 8am. Traversed in a clockwise arc across level section below the North ridge and then continued up through seracs. Progress was tiring due to the breakable ice teeth. The widest crevasses were crossed on sunken snow bridges. We travelled roped but axes were only needed on a couple of short steep sections.

A final level area leading South brought us to a 45 degree rock ramp that rose to the West ridge. From the top of this ramp the ice ridge was steeper but still covered in the ice teeth. The North side tended to be very hard ice and the South side powdery. Crevasses, bergschrunds and cornices required a zig-zagging route that kept close to the crest. Crampon were used on the ridge.

By mid afternoon we were all very tired and on reaching an enormous ice fang blocking the way we realised that little further progress could be made that day. To the North side was a steep icy face avalanched clean of snow but covered in hard grey ice teeth. The South side led to a vast crevasse below a formidable cornice. At 2.30pm we turned back down the ridge. Care had to be taken when a pair of classic hinged crampons broke. The sun was intense all day warming us except when we were in shade of the North ridge during the early morning and late evening.

Taking a slightly more direct route back through the seracs we were back at the tents by 5pm. Though very tired, to the point of staggering at times, a decision was made to return to base camp that evening. Tents, stoves, fuel and rope were left at the camp and mountain boots cached at the top of the moraine.

In the dark, as we were passing a hut on the high pasture, two dogs menaced Ian Crowther who ended up on his back fending them off with his feet. Back at base for 7.30pm.

Day 3.

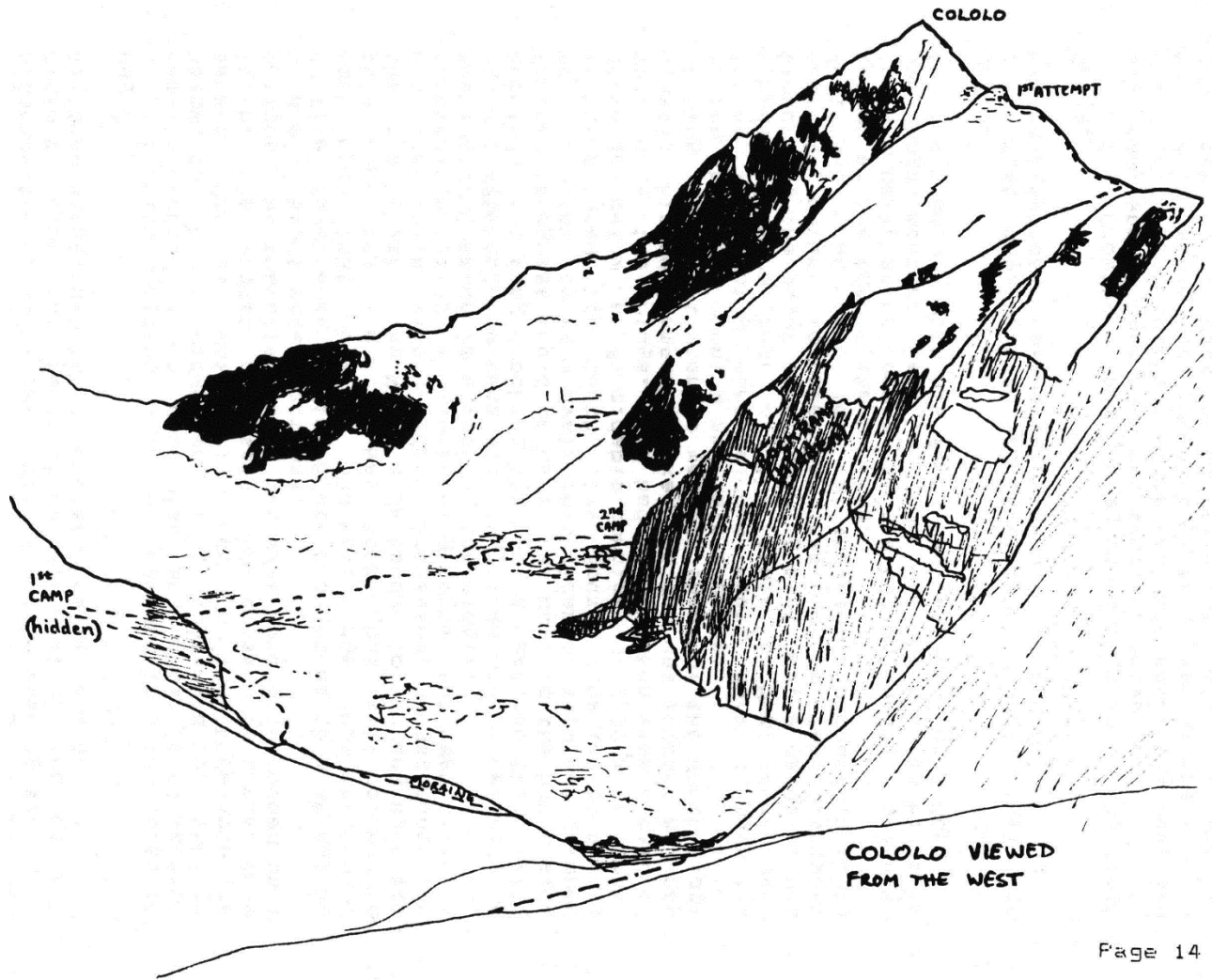
Rest day. Went to nearby village of Quello (Kelo) to dispense medical treatment to the wife of Andres.

Day 4.

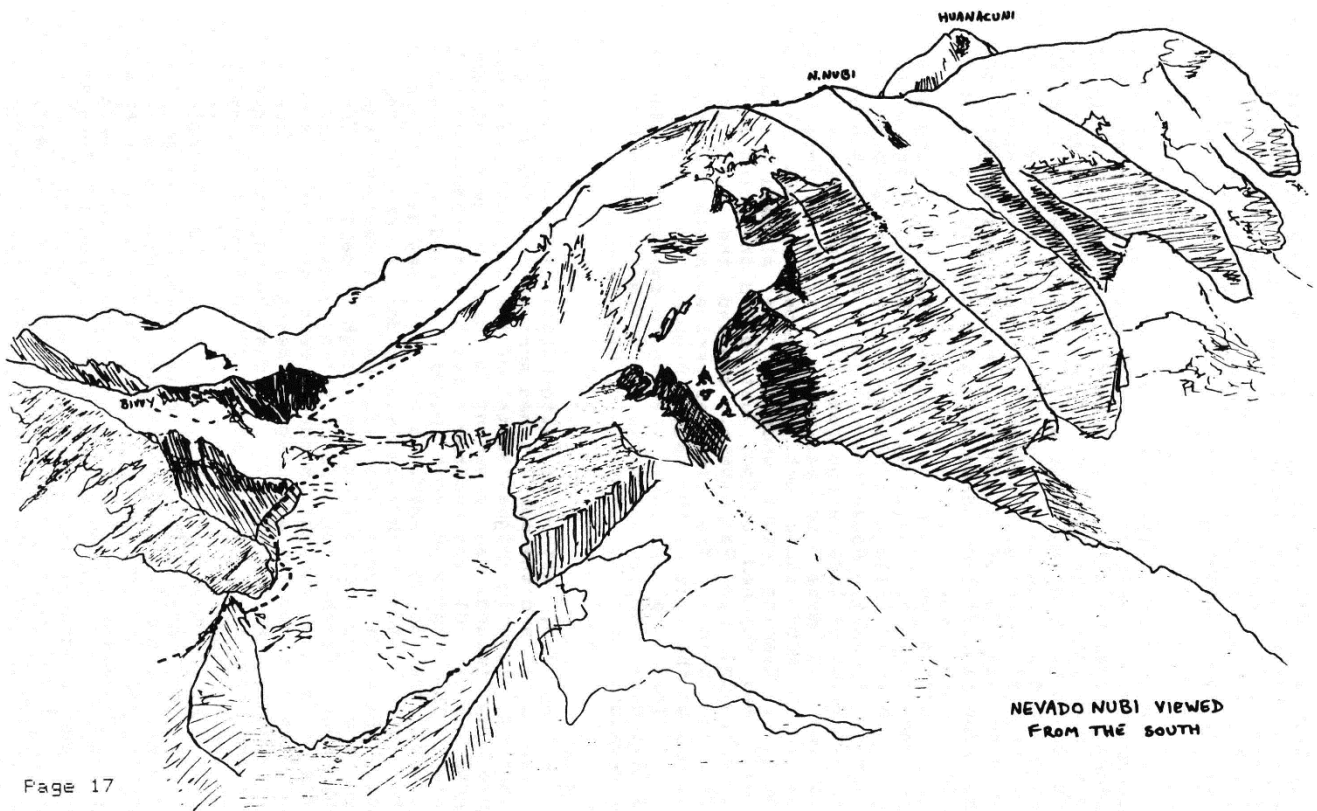
Ian Crowther and Harvey Lomas went up to the first high camp and brought down one tent and stove.

David Hick and Michael Smith took the remaining gear and more food along the previous route as far as the foot of the rock ramp. Just below this was a flat area above a long drop, just clear of rock fall and with water dripping from nearby icicles. This made a campsite with a good view of the sunset.

The sun gave way to a few small clouds that day and a gusting wind through the night made it seem much cooler than the actual minimum of -7.2C.



COLOLO VIEWED
FROM THE WEST



NEVADO NUBI VIEWED
FROM THE SOUTH

Day 5.

Starting at 8am we retraced our previous route up the rock ramp and up a steep ridge of snow brought us into binocular view from base. By 10am we reached the ice fang that blocked the way last time. Being less tired and with plenty of time we turned it on the left (North) by crossing a steep icy slope with a wave like surface. Some of these provided walkways with good placements for ice pegs. The average angle was 60 degrees and it took 30 minutes to cross this face to a col. There we took some food before tackling the steeper ridge to the summit.

The ridge was in three sections separated by overhanging cornices, the average angle being 45 degrees but the final section being much steeper, some 15m being 70 degrees. The snow sections proved difficult to protect adequately without snow stakes, but ice axes were just about adequate. The steeper sections were invariably hard ice and took ice screws and pitons. Climbing soon proved tiring and several rests were needed in each 80m climb as we led through.

By 1pm we had reached the narrow level section of the ridge that formed the summit and gained views in all directions except across the cloud covered jungle to the East. Descending carefully we stayed on the ridge even beyond the col, which we had reached by crossing the steep wave covered face. The crevasse at the far side of this was crossed by what amounted to a lower as footholds were fragile. The familiar lower sections of the ridge were crossed to be back at the tent by 4.30pm. Despite the lateness and the lengthening shadows, at 5pm we started a weary plod down through the icefall, traversed the glacier across crumbling ice teeth to the moraine. Above us were clouds brimming over the North ridge from the jungle but evaporating over our heads.

Here we were met by Crowther and Martindale who carried much of our load. We started our return to base in the dark.

Nevado Nubi

Day 1.

A 9am start from base, North up to the llama track, following this to a higher pasture and over several ridges of rock led us to the lateral moraine by the glacier below the South face of Nevado Nubi. We followed the moraine up the left side of the glacier until our path was blocked by a rock face. Leaving light boots cached here we turned left onto the glacier, steeply at first then levelling out. Progress being very slow on the breakable teeth of the surface we were driven back to the continuing moraine on our left. This was followed as far as possible before taking once again to the glacier in order to bypass a rock ridge. This led us into a South facing bowl of crevasses and powder snow. Progress up the steeper back slope was so slow that a route was chosen to gain the screes below the South-West ridge as quickly as possible. On the scree a little below the col a bivvy site was made. An ascent to the col gave views of the Northern peaks as far as Calijon.

The minimum overnight temperature was -9C and a comfortable night was spent in a commercial goretex bivvy.

Day 2.

A start was made across the scree by 8.30am to traverse below rocks then up to a higher, corniced col. This was the foot of the South-West ridge which was corniced on the South side in its lower reaches and on both sides higher up. The surface of the ice was covered in teeth like formations. Starting well to the West, the crest was later taken until cornices threatened. These led with few difficulties to the top of the face of Nevado Nubi as viewed from the valley. The ridge continued back some distance to a corniced summit. Approaching this along a narrow section which was hardly rising, each lead of the rope took one steep face or the other or even the crest depending on the state of the cornices. This section also required the crossing of an annoyingly deep crevasse cutting across our path which demanded a descent on the West face. The summit was reached by noon and on the return a diversion was made down part of the South-East ridge to look at the prospects for a traverse of the two ridges and a return to the bivvy col by a prominent horizontal ledge of ice underlying the South face. The plan was abandoned when one tumbling serac looked as if the crevasse above it would be unbridgeable.

A return was made along the ascent route over softer, shattering teeth of ice to reach the bivvy site by 2.30pm. The remaining gear was packed and a descent made to the head of the upper moraine by a notch in the rock ridge opposite the bivvy, level with the col. This was a gully on the far side, steep and icy but still easier than the glacier crossing. Base was reached by 5pm. The weather brought hazy cloud spreading from the North.

Other peaks in the Apolobamba

The rock peak West of base.

Approached directly from base this peak was climbed and descended by the broad ridge which was composed mostly of fine scree. A snow slope lay just below the summit. No technical difficulty was encountered. The summit gave views of the South face of Nevado Nubi and of Cololo as well as distant views of the Northern peaks.

The rock peak North of base.

Approached directly by ascending from base up the ridge immediately above. The route consisted of steep scree over shattered rock and gave similar views to those described above. Following the ridge Northwards a path to Pelechuco was crossed and a descent made via the valley to the West.

The rock peak South-East of base.

Approached first directly from base then traversing below a series of rock ridges forming its North flank, this peak is a lesser summit on the continuation of the West ridge of Cololo. The ridges and gullies were ascended with care due to the sections of loose rock and piles of scree and boulders. Sections included scrambling and short climbs on sound rock leading to the crest short of the summit and separated from it by a cleft. The ridge could be followed in either direction and a descent was made back to base from a col further to the East. The Ridge gave excellent views of the Cololo glacier and Nevado Nubi as well as a view of a peak further to the South, possibly Akamani.

Illimani

Illimani is a popular peak in the Cordillera Real. Guides, porters and transport were available in La Paz for ascents of the South summit. Local porters were available from Estancia Una, close to Illimani, but they were not equipped to go on the glacier.

Day 1.

Hick and Smith left La Paz by jeep at 10am, accompanied by Francisco who was acting as porter. This return transport and porter cost \$160. The four hour drive went out past Cota Cota and travelled across the grain of the country, crossing ridge after ridge to Palca. Then we drove by the Rio Wila Pampa, past Lacayani and then turned up through Quiahuayo, towards Illimani, to reach the hillside village of Estancia Una. This was slightly off the road, a left turn being made at a col with an aqueduct bridging the road.

Within an hour two porters had been found at \$5 for the day. So, travelling light we headed up the valley to reach the village of Pinaya and crossed through this towards Illimani. Above the village a house was passed on the plateau of Inca Lacaya Loma, at the far side of which was the old mine road leading to Urania mine. This track was in a poor state but gave closer access to the mountain. Bearing right crossing the plateau a camping ground was reached by 5pm, just beyond the point where a torrent, the Rio Pajchapata, crossed the road at the collapsed bridge. The site was perched above a 400m drop and was at the foot of the ascent proper.

The local porters, having no equipment, returned to Estancia Una for the night. At 4475m the minimum night temperature was +3.3C and the wind blew in gusts.

Day 2.

By 8am, with the site still in shade, we had broken camp and the porters had arrived from the village. Starting slightly right (South) of the torrent a path was taken up towards an apparent col high on the right hand ridge. This col was another campsite but without running water. The shattered rock ridge continued East directly towards the South summit. To the right was glacier and to the left a steep rock face leading down to complex seracs below Pico de Paris. The ridge was followed from the col for two hours to a flat area slightly below the last of the rock. Further on the ridge was encased in ice. This camp site was several hundred feet short of Nido de Condones but had the advantage of being a rock surface and so warmer than the glacier. The disadvantage that gave us concern was that it left almost 1200m (4000ft) of ascent for the next day.

As camp was established by noon, the afternoon was devoted to rehydration and relaxation. The view over towards the more complex North Summit or Pico de Paris was spectacular and our attention was caught by avalanche and serac collapses. A French climber and her Bolivian guide passed on their way to camp at Nido de Condones. They also intended to attempt the summit the following day.

The night was not cold for the altitude (5300m, 17400ft) and the temperature fell to -5°C by 4am.

Day 3.

We started to make the porridge at 3am and were off by 4.15am, up the West ridge. On the glacier there was a track, faint in places due to the ice teeth on the surface. It kept close to the ridge edge up to Nido de Condones where it crossed over cornices. In a bowl between two cornices was the French team's tent. Above this the ridge steepened so by 6am we were crossing crevasses on well frozen if thin bridges and belaying on sound ice.

The ground further on eased as we bore left (North) over a gentler slope to the foot of a much steeper slope which required a series of zig-zags to keep up even a halting movement. The route so far had been entirely in the shade and the temperature was still falling. For the first time on the expedition Smith needed to wear his duvet jacket while moving and was starting to shiver each time we stopped. This was often as, due to the altitude, we were taking some two or three dozen steps on the steeper sections before resting for a couple of minutes. On resting we noticed an unusual breathing pattern. Steadily the breathing rate slowed to normal deep breaths and the pulse rate gradually fell until all was almost normal after a minute or so. Then suddenly there would come a need to gasp for several great lungfull in rapid succession.

Well up the steep slope we arrived at the bergschrund whose upper lip was some 3m above the lower one and 1m back with an overhang. A spiral staircase of a snowbridge was so narrow that at one point a pair of hands would encircle it. We decided not to risk it and traversed right (South) and found a 2m wide steep snow bridge. The disadvantage of this variation on the normal route was that the slope above was much steeper and the ice harder. We traversed the slope upward and left, belaying with ice pegs and screws. The nervous energy expended kept us warm as the temperature continued to fall. The French team had followed our trail up to the bergschrund.

At 11am we had covered the last steep slope up to the almost horizontal summit ridge with its sunlight and welcome warmth. Turning right it was about 100m to the summit at 6460m, 21200ft.

The descent was made without the diversion to avoid the narrow snow bridge, so we found ourselves above the bergschrund with too steep a landing to try jumping and too frail a bridge to feel secure. An ice bollard belay secured the first man down, sacks were lowered and the second man tiptoed gently down the remains, belayed from below and using the ice bollard as a runner. The French team, we learned later, had turned back at the bergschrund because of the intense cold. The remainder of the descent was comparatively straightforward though clouds were boiling up and brimming over from the East side of the peak.

By 3.15pm we were back at the second camp, which we dismantled and removed down to the road by 5pm. Camping by the torrent the night was mild with little wind.

Day 4.

Off by 9am, it was necessary to retrace our steps across the now frozen torrent, over the high pasture, through Pinaya to Estancia Una by 11am. Later the Jeep took us back to La Paz.

Expedition Log

- Fr 22 Jul p.m. Yorkshire members met up in Leeds and travelled by minibus to London Heathrow terminal 3. The Cambridge member met us there having already had his photographic gear stolen. Checked in all expedition gear. Took overnight VARIG flight to Rio.
- Sa 23 Waited in transit. Lomas discovered his binoculars have been left on the plane. Took Cruzieros plane to San Paulo, Santa Cruz and finally La Paz. Met by Guarachi with minibus. Checked in at Residencial Sucre.
- Su 24 Discussed plans with Guarachi. Took taxi to Chasquipampa and walked round mud pinnacles. Sterland suffered a severe headache for two days.
- Mo 25 Smith taken ill with stomach bug. Hick checked transport and supply arrangements with Guarachi. Others started six day trip to Cuzco (La Paz to Puno by bus - Puno to Cuzco by train - Day visit to Machu Picchu - Day in Cuzco - Cuzco to Puno - Puno to La Paz).
- Tu 26 Climbed the Devil's Molar from Cota Cota and returned to La Paz walking along a mud ridge.
- We 27 Took a taxi over the Zongo pass. Camped on Huayna Potosi below the moraine.
- Th 28 Climbed on Huayna Potosi from its foot to Campamento Argentina. Camped there.
- Fr 29 Climbed as far as the summit slope of Huayna Potosi and returned to camp at Campamento Argentina.
- Sa 30 Descended to the Zongo pass and chanced upon a minibus due to return to La Paz. Returned to Residencial Sucre. Others returned from visit to Cuzco. Checked costings with Guarachi. Hick started suffering from severe toothache.
- Su 31 Jul Bought provisions in La Paz markets. Hick received dental treatment for abscessed tooth.
- Mo 1 Aug Travelled by minibus to the Apolobamba. Arrived at Nubi Pampa with Francisco, our camp assistant. Slept in old schoolhouse at Nubi village.
- Tu 2 Walked up valley to reconnoitre for base campsite. Returned to Nubi Pampa.
- We 3 Smith stayed with gear while others carried loads to base camp site. Hick and Martindale remained at base camp. Two animals were hired to carry one load up with handler, Benanzio Huanca and Francisco.

- Th 4 Lomas suffered altitude induced lassitude. Remaining gear moved up to base camp with Huanca's assistance. Martindale climbed 17000ft peak to West of base camp and photographed possible routes. Crowther and Hick followed Pamela Holt's route of approach to the Cololo glacier and checked for alternatives. At base the mess tent pole failed in a gust of wind.
- Fr 5 Crowther, Hick and Smith established and stayed at, a higher camp on the Cololo glacier with carry assistance from Martindale and Sterland. Sterland commenced collection of botanical specimens.
- Sa 6 From the high camp an attempt was made on the West ridge of Cololo. It failed. Climbers returned to base camp that night leaving high camp in place. Martindale undertook ornithological observations.
- Su 7 Crowther and Lomas reconnoitred the head of the valley. Smith and Sterland took medical supplies to Kelo. Checked the food supplies and discovered serious deficiencies.
- Mo 8 Crowther and Lomas went up to the high camp on the Cololo glacier and brought down one tent and surplus gear back to base. Hick and Smith moved the high camp up and across the glacier and camped below the West ridge then remain there.
- Tu 9 Hick and Smith climbed the West ridge to the summit of Cololo. Then returned to base camp with all equipment. Met on moraine by Crowther and Martindale. Earlier in the day Crowther borrowed a pole from Kelo to replace the broken mess tent pole.
- We 10 Lomas and Martindale left base for Pelechuco en route for La Paz and a return home. Huanca and animals transport their gear. Crowther and Sterland accompanied them in an attempt to reprovision base and trek around our group of mountains. Francisco went with them to Pelechuco.
- Th 11 Huanca and Francisco returned from Pelechuco to base, with some provisions obtained by Sterland and Crowther.
Crowther, Lomas, Martindale and Sterland explored the area around Pelechuco and collected botanical specimens.
- Fr 12 Hick and Smith climbed North to bivvy by glacier head at a col South West of Nevado Nubi.
- Sa 13 Lomas and Martindale caught the weekly truck from Pelechuco bound for La Paz. Huanca returned to Pelechuco and rejoined Crowther and Sterland for the trek back to base.
Hick and Smith climbed the South West ridge of Nevado Nubi to its summit and returned that evening to base camp.

- Su 14 Lomas and Martindale arrived back in La Paz. Crowther and Sterland trekked with Huanca from Pelechuco to Illo Illo Estancia and spent the night in the schoolhouse. Their sleep was interrupted when a suspected intruder lurked outside.
- Mo 15 Crowther and Sterland trekked with Huanca from Illo Illo Estancia to base camp. Smith scrambled up 17000ft peak South East of base camp. Hick reconnoitred the head of the valley. Lomas and Martindale visited Tiwanacu from La Paz.
- Tu 16 Hick and Smith took a camp up to the head of the valley beyond base camp. Following failure of the stove at this high camp they retreated back to base camp. Lomas and Martindale flew back to Rio.
- We 17 Sketch maps collated into a single map. Gear sorted and packed.
- Th 18 Crowther, Hick, Smith and Sterland traversed the 17000ft peak to North of base camp.
- Fr 19 Base camp was dismantled and removed to Nubi Pampa with Huanca's assistance. Slept in the meeting room by the school. Crowther returned the borrowed pole to Kelo and noticed the first onset of mouth ulceration.
- Sa 20 Returned by jeep from Nubi Pampa to La Paz.
- Su 21 Lomas and Martindale arrived back in Britain. Guarachi paid for hire, supplies and transport.
- Mo 22 Hick departed to visit Puno. Smith was ill with a stomach bug.
- Tu 23 Visited museums. Hick visited the Uros indians on Lake Titicaca.
- We 24 Crowther was in a poor state of health due to undernourishment arising from severe mouth ulcers. He started on a five day course of intensive medical treatment. Hick returned from Puno to La Paz.
- Th 25 Hick and Smith, with Francisco as assistant, went by jeep to Estancia Una, then helped by two local porters set up camp below Illimani. Sterland flew to Cochabamba in an attempt to visit the Botanical Gardens and a Naturalist.
- Fr 26 With assistance from porters, Hick and Smith moved the camp almost up to Nido de Condores on Illimani. The porters then returned to village of Estancia Una.

- Sa 27 Hick and Smith climbed to the South summit of Illimani and returned to Nido de Condones. Broke camp and descended to the foot of the peak to camp.
- Su 28 Hick and Smith returned with Francisco to Estancia Una and caught a jeep back to La Paz.
- Mo 29 Crowther considerably recovered. Day spent in La Paz.
- Tu 30 Party flew from La Paz to Rio by Cruzieros, via Santa Cruz and Sao Paulo.
- Th 1 Sep Climbed Pico da Tijuca in Tijuca National Park, Rio.
- Sa 3 Party flew back from Rio to London.
- Su 4 Arrived back in Britain.

Conclusions

The conclusions drawn from this expedition are divided into the following sections:-

the area,
this expedition,
future possibilities.

The Area

The area was entirely suitable for mountaineers, providing a satisfactory base site, ready access to the peaks, interesting glaciated peaks with routes that offer an attainable challenge for competent 'club' level mountaineers.

Access was fairly easily arranged. Previous reports indicated preference for the approach via Peru and Juliaca. This is slower and relies on local transport to mines secured only by luck and a good working relationship with local people. Twelve hours from La Paz in the relative comfort and security of your own transport seems preferable. The only disadvantages are higher air fares and the greater difficulty in visiting Cuzco and Machu Picchu.

On no occasion did bad weather restrict climbing. There were a few cloudy days, one brief snowstorm and a brisk wind blew for several days. As we were well protected from the harsh sunlight and accompanying ultra-violet and insulated from the cold, the weather posed no problems.

Several of the local people were friendly and offered assistance in as much as they were able. They produced animals to transport gear, a replacement improvised tent pole, temporary accommodation and small quantities of food. They freely gave what information they had about paths and routes. Others, especially most women, kept their distance and avoided contact unless we made a point of seeking them out.

There was some confusion over place names in the area. Confusion between names used at the turn of the century, names on maps and those currently used by various local people. By discussion with several local contacts the following consensus was achieved. It is not a definitive statement of correct names. However it may assist in attempts to arrive at a nomenclature consistent with that used in the area.

Lakes:- The three lakes East of Nubipampa village are named

Lago Nubi
Lago Dadacorane,
and Lago Pauoche in ascending order of

altitude.

Villages:- The spelling of village names varies considerably.

Nubipampa was the schoolmaster's version, though Nubi Pampa was written over the school door. Nove and Nubi were used locally. Nuve was used on one map.

Quello was used on maps along with Quillo and Khellu. Kelo, Kello and Kelo Pada were used locally.

Hichocollo and Hichucollo were both used.

Mountains:- Requesting local people to name the peak

standing in front of them usually yielded an answer that remained the same when the request was repeated later on. However trying to name other peaks or areas lead to confusing inconsistencies.

Cololo has been used by Dr. Echevarria, in the American Alpine Journal, recently in preference to Coachuca or Cachuca. Locally Jachavaracha was used for the summit peak and Mamavlepane for the whole mountain complex. Mamavlepane may have been used by some for Nevado Nubi and Huanacuni. Cerro de Cololo (or Coalolo) was used to indicate the part of the Apolobamba South of the Paso de Pelechuco and North of the Illo Illo to Ulla Ulla track. This matches the naming of Lago Cololo and Rio Cololo which are the names for the large lake and it's inlet and outlet rivers immediately below that group of peaks. One Bartholomews map uses the name Cololo for a 17930ft peak North of Pelechuco.

This Expedition

The expedition was over equipped. Gear was only required by one rope of climbers. The tents performed well and the cold weather gear was more than adequate. The use of expensive waterproofs was unnecessary in view of the dry conditions. The commercial bivvy bag worked well and would make for lighter loads. The failure of the fuel feed pipe in the MSR stove was probably due to old age rather than faulty design. The failure of mini flares caused those who tried to use them to no longer have faith in them as being worthwhile. The 500 candle power paraffin pressure lamp failed after a few days and defied all attempts to adjust it to work for more than half an hour. A simpler type of lamp would have been more useful.

La Paz markets and the few supermarkets permit the purchase of all usual materials for an expedition. It is important to ensure a sufficient quality, variety and quantity of foods to encourage people to eat enough to maintain good health. Transport and hired help are readily available.

A plentiful supply of antibiotics, codeine phosphate (for coughs & diarrhoea), paracetamol, throat lozenges and skin creams were our main medical needs. Vitamin supplements may have helped some members stay healthy. A surplus supply of the same medicines would prove valuable to the local population.

In the small villages payment for services was either in Bolivianos or kind, not US\$.

Future Possibilities

The valley includes several lesser peaks or points on ridges that await first ascents. Some of these offer a challenge to the mountaineer. There is one such domed peak rising steeply between two glaciers below the East face of the Nevado Nubi-Huanacuni ridge. This and the icy gullies or more difficult buttresses of the face itself looked interesting and tempting. Other possibly easier tops are located at the head of the valley. There are a string of them between the foot of the North ridge on Cololo and Huanacuni. An approach can be made along a rock rake across the North-west facing rocks at the

head of the valley. This leads easily onto the glacier a little to the South of the col. As far as we could see approaches to peaks on either side would be technically easy.

The North ridge of Cololo has not yet been climbed and looked feasible despite including a couple of rock steps. An ascent of this ridge would make a traverse of the peak possible.

Given a different crevasse configuration to that we encountered a traverse of Nevado Nubi, up one edge of the South face and down the other should present few difficulties.

The steep ridges and gullies on the West face of Huanacuni looked very difficult but may be possible as single day ascents from a camp in the desolate valley immediately North of the upper Nubi valley.

The Pupuya group at the south end of the Apolobamba looked inviting from the road. Their steep, broad faces were plastered white with complex hanging glaciers.

Far to the north were the apparently straightforward domed summits of Chupi Orco and Salluyo. Further to the west stood Annanea and Calijon, the latter apparently having only been ascended by gentler slope on the western side.

Most of the rock we encountered was shattered and friable. Some steeper sections were sound. The glacier surfaces were covered in teeth of ice ranging from ten centimetres to a metre in length. These were angled at about 45 degrees to the surface and if solid made it difficult even to stand. If more fragile then much energy was wasted raising one's bodyweight high enough to stand on the top to break it. In bowls below south facing slopes deep powder snow gathered. Often the ice was sound and took ice pitons or ice screws well. Generally the North facing slopes were very well consolidated and South facing ones were powdery.

It is too early to draw any conclusions from the botanical material collected. During the research phase no botanist was found who could contribute anything useful. Pamela Holt was optimistic about the chance of finding specimens, other botanists were positively misleading in indicating that it was the wrong season for collecting in the Bolivian Andes.

Acknowledgements

We wish to acknowledge the following for their contribution to the success of the expedition:

In the planning stage:

Famela Holt
Jim Curran
Belinda Swift-Howe
Royal Geographical Society
Alpine Climbing Group

By supplying medical equipment:

Robert Bailey & Son plc,
Smith & Nephew Medical Ltd.,
Cuxson Gerrard (Dressings) Ltd.,
Vernon-Carus Ltd.,

By helping in the field:

Bernardo Guarachi,
Andreas Barrera.

and many Members of the Yorkshire Ramblers' Club.

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Appendix 1

The Agreement

The following is a copy of the agreement between the Yorkshire Ramblers' Club and each participant. Such an agreement was considered necessary to ensure that there was no misunderstanding as to what the Club was offering to its members or the obligations of participants.

THIS AGREEMENT is made the day of
..... One thousand nine hundred and
eighty eight between

1. of
.....
(The Participant), and
2. The Yorkshire Ramblers' Club (The Club).

WHEREAS

1. The Club has agreed to sponsor an Expedition to Bolivia by certain members and friends in July and August 1988 by the provision of a grant of £1500 for the purchase of equipment and in part payment of necessary expenses for the expedition, with the proviso that the ownership of any equipment purchased out of the sum of £1500 or the proceeds of sale thereof remains the property of the Club.
2. The Club has appointed of to lead the expedition.
3. The objects of the expedition include the exploration of the Apolobamba area of Bolivia, the pioneering of new routes on various mountains in the area, to study the alpine and other plants in the area and the provision of reports by the participants on these activities and other matters of geological, geographical, cultural and meteorological interest.
4. The participants will be entitled to have access to and to take copies of all reports, maps and photographs produced by other participants, to the use of communal transport and accomodation arranged for the expedition, to the use of communal equipment and the mutual support of other participants.

IT IS AGREED as follows

1. The Club agrees that

- a) it will make such part or all of the £1500 grant available as required to the treasurer for the time being of the expedition after it has satisfied itself that the participants have made adequate arrangements with a reputable insurance company for the insurance of such communal and corporate risks, including third party risks and those attached to the employment of guides and porters as it deems desirable, and that adequate personal sickness, medical and accident insurance as approved by the leader has been arranged for each participant, preferably with the same insurance company
- b) it will provide such reasonable advice on the organisation and administration of the expedition as may be required by the leader or his deputy
- c) it will allow application to be made in the Club's name for all necessary insurances, botanical import and export licences, and other official documentation deemed necessary by the leader.

2. The Participant agrees

- a) to use his best endeavours to ensure that the objects of the expedition are achieved
- b) to pay his proportionate share of such payments as may be required in advance or otherwise by the treasurer to meet communal expenses and travelling expenses on the dates specified by the treasurer
- c) in the event of cancellation of the expedition to pay his proportionate share of non-cancellable dues of the expedition
- e) at his own cost to take out adequate personal insurance in accordance with paragraph 1 hereof and for this purpose to provide to the leader or his nominee such information as may be necessary for the arranging of such insurance and communal insurance, and he accepts and recognises the hazards involved in the expedition and that he and his dependants will have no claim against the Club in respect of uninsured risks and in this respect he is entitled on request to be provided with a copy of the policy or policies covering the risks set out in paragraph 1 hereof to satisfy himself of the adequacy of the insurance cover

- f) to take with him adequate currency or credit facilities to provide for his personal expenditure and requirements
- g) to take all necessary health precautions including immunisations as shall be agreed with the leader and to inform him of such precautions taken and any relevant information relating to health, mountaineering and problems which may have a bearing on the expedition
- h) to arrange for personal passport, visa and any other documentation as may be required for travelling on the expedition
- i) not to engage in any activity or behaviour deemed by the leader or his deputy to be prejudicial either to the objects or organisation of the expedition or to the reputation of the Club or that might lead to any delay in the clearance of the expedition in any customs, police or immigration checks of the expedition
- j) to accept and act upon the reasonable instructions of the leader and in cases of dispute in any matter relating to the expedition the decision of the leader or his deputy
- k) to provide suitable written reports after return from the expedition as may be reasonably requested by the leader or the Club
- l) not to publish any report on the activities of the expedition without first offering it to the Club for publication in its journal
- m) to inform the Club of all lectures and publications which he proposes to make relating to the expedition, to submit details of such lectures and publications to the Club for prior approval, to acknowledge the Club's role in the Expedition in those lectures and publications and to donate one half of any payment therefor to the Club, and to allow the Club free of charge to take copies of any drawings and photographs used in the lectures and publications.

..... Participant

..... For the Yorkshire
Ramblers' Club

..... Date

Appendix 2

The Equipment

The equipment lists are arranged under these headings:-

- Communal equipment taken from the UK
- Communal equipment obtained in La Paz
- Medical Kit
- Botanical Kit
- Personal equipment

Communal equipment taken from the UK

- Two man tents, 3 Phoenix Phalcons with added snow valence, 2 others
- Climbing rope, 3 50m, 10.5mm
- Ice screws (12)
- Ice pegs (10)
- Pitons (8)
- Snowstakes (4)
- Spare ice axe
- Sectional ski sticks (2 pair)
- Lightweight stoves (2)
- Priming paste
- Lightweight Fan sets (2)
- Dried meals (20)
- Mini Flares, two sets of six
- Altimeters, pocket type (2)
- Thermometers, 2 bimetal, 1 electronic
- Maps and photocopies
- Repair kit

Communal equipment obtained in La Paz

- Mess tent (hired)
- Base Camp stoves, paraffin (3)
- Large pans and kitchen utensils
- Folding stools (6)
- Paraffin Pressure lamp
- Candles
- Paraffin, 30 litres
- Methylated spirits
- Water-proof matches
- Toilet paper
- Shovel
- Non specialist food

Medical Kit

- as per Brathay Exploration Group booklet
 - Base camp Kit (1) in red cross case
 - Personal Field Kit (6)
- Additional personal items taken by individuals e.g.
 - Imodium, Codeine Phosphate,
 - Paracetamol, anti-biotics etc

Appendix 3

The Finances

The breakdown of costs in these accounts is only approximate as the various items were paid for in a variety of currencies and by different people at different times. When paying for several goods and services at one time bartering and bargaining reduced the cost but made exact accounting for each item impossible.

Income	From participants	£6600
	Donation from YRC funds	£1500

		£8100

Expenses

In the UK

	£
Air Fares	4704
Minibus to & from airport	170
Insurance	613
Tents & Underlay	420
Ropes, pitons & screws	350
Altimeters, Thermometers, Flares	56
Polaroid cameras & film	25
Medical Kit	87
Stationery, Postage	33
Botanical Licence	25

In Bolivia

Visa Extensions	50
Airport Tax	25
Accommodation; La Paz	110
Nubi Pampa	3
Pelechuco/Illo Illo	17
Meals;	
La Paz	200
Pelechuco	30
Transport;	
Huayna Potosi taxi	45
for Apolobamba	300
for Illimani	90
for arriero	45
Taxi fares	15
Porters	50
Postage	20
Food purchases; in La Paz	25
base camp bulk buy	170
in Pelechuco	70
Equipment purchases in La Paz	35
Hire of base camp equipment	100
Base assistant	100
Paraffin	20
Phone, Bus, Tips, sightseeing	85

	£8100

At the time of the expedition the following exchange rates were in operation:-

1 Boliviano	=	25 pence
£1 sterling	=	4 Bolivianos
£1 sterling	=	1.7 US\$
1 US\$	=	2.4 Bolivianos

Appendix 4

The Addresses

Bernardo Guarachi,
Plaza Alonso de Mendoza
Edificio Santa Anita,
Local Nr 314, 3-piso
P.O. Box 20886, La Paz, Bolivia
Telephone La Paz 320901

Benancio Huanca,
Kelo Pada, Ulla Ulla,
Bolivia.

Michael Smith
80 Towngate Road,
Worrall,
Sheffield.
S 30 3 AR

John H. Sterland,
Ivyfold
Broad End
Elsworth
Cambridge
CB 3 8 JD

Alpine Club,
74 South Audley Street,
London
W1Y 5FF

Royal Geographical Society,
Kensington Gore
London
SW 7 2 AR

Insurance, Divisional Underwriter,
John Berridge,
Alexander Stenhouse U.K. Ltd.
Richmond House,
College Street,
Southampton,
Hampshire SO9 4ZB

Club Andino Boliviano,
Casilla 1346,
La Paz.

British Embassy,
Casilla 694,
La Paz.

Internationales Landkartenhaus, GeoCenter,
Postfach 80 08 30 D-7000
Stuttgart 80
Germany

Instituto Geographico Militar,
Saavedra Rafael Subrieta,
La Paz.

Journey Latin America,
16 Devonshire Road,
Chiswick,
London W4

Dentist in La Paz, Dr. Raul Burgoa,
Avenida Camacho 1277,
3er. piso Sala 301,
La Paz
Tel. 365851 320058

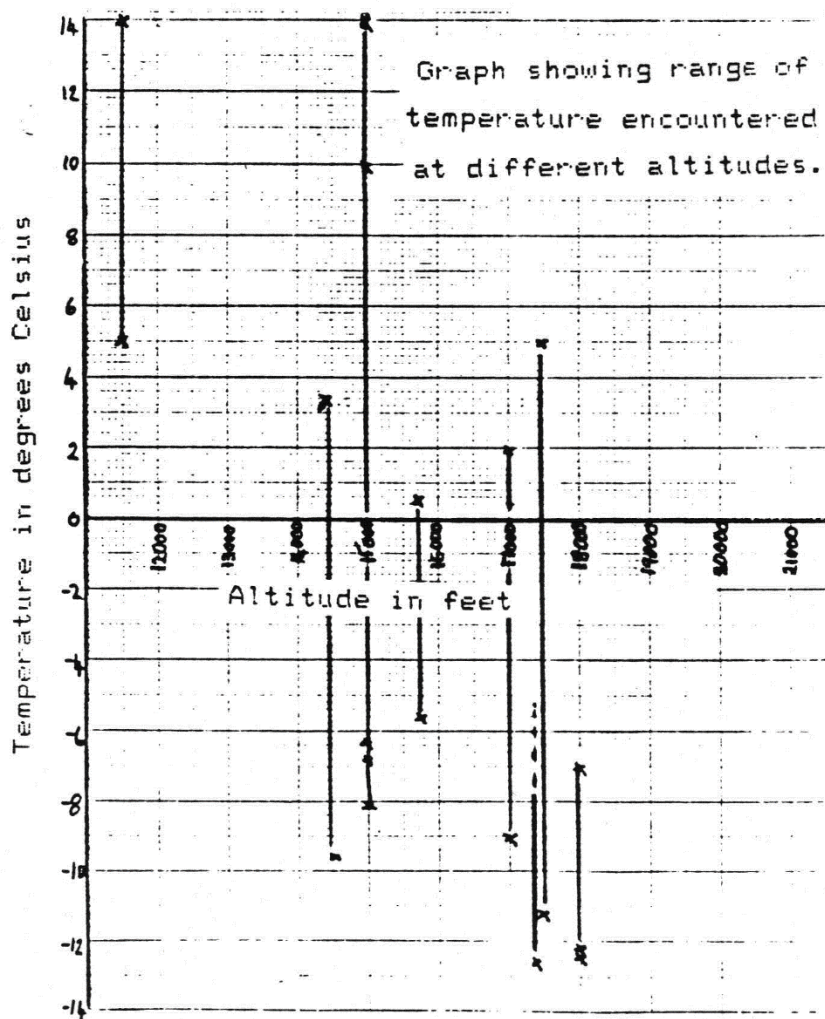
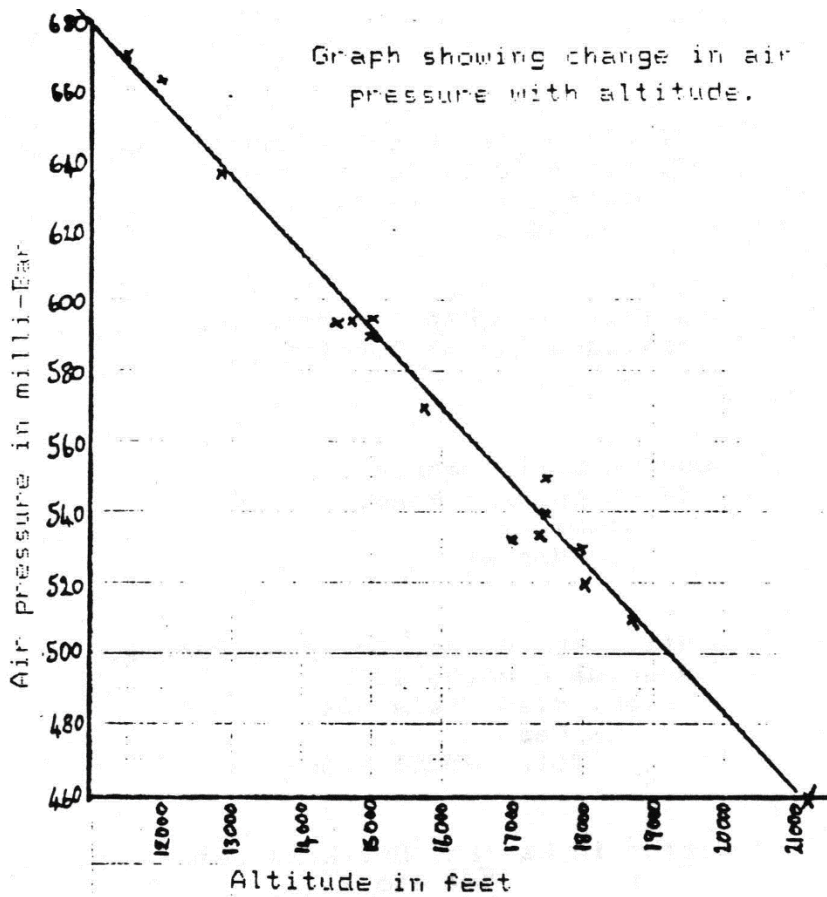
Doctor in La Paz, Dr. Luis Jesus Garcia,
Edificio Scala 6to Piso,
La Paz
Tel. 370369

Appendix 5

The Record of Temperature and Pressure

General table of air temperatures and pressures at different locations.

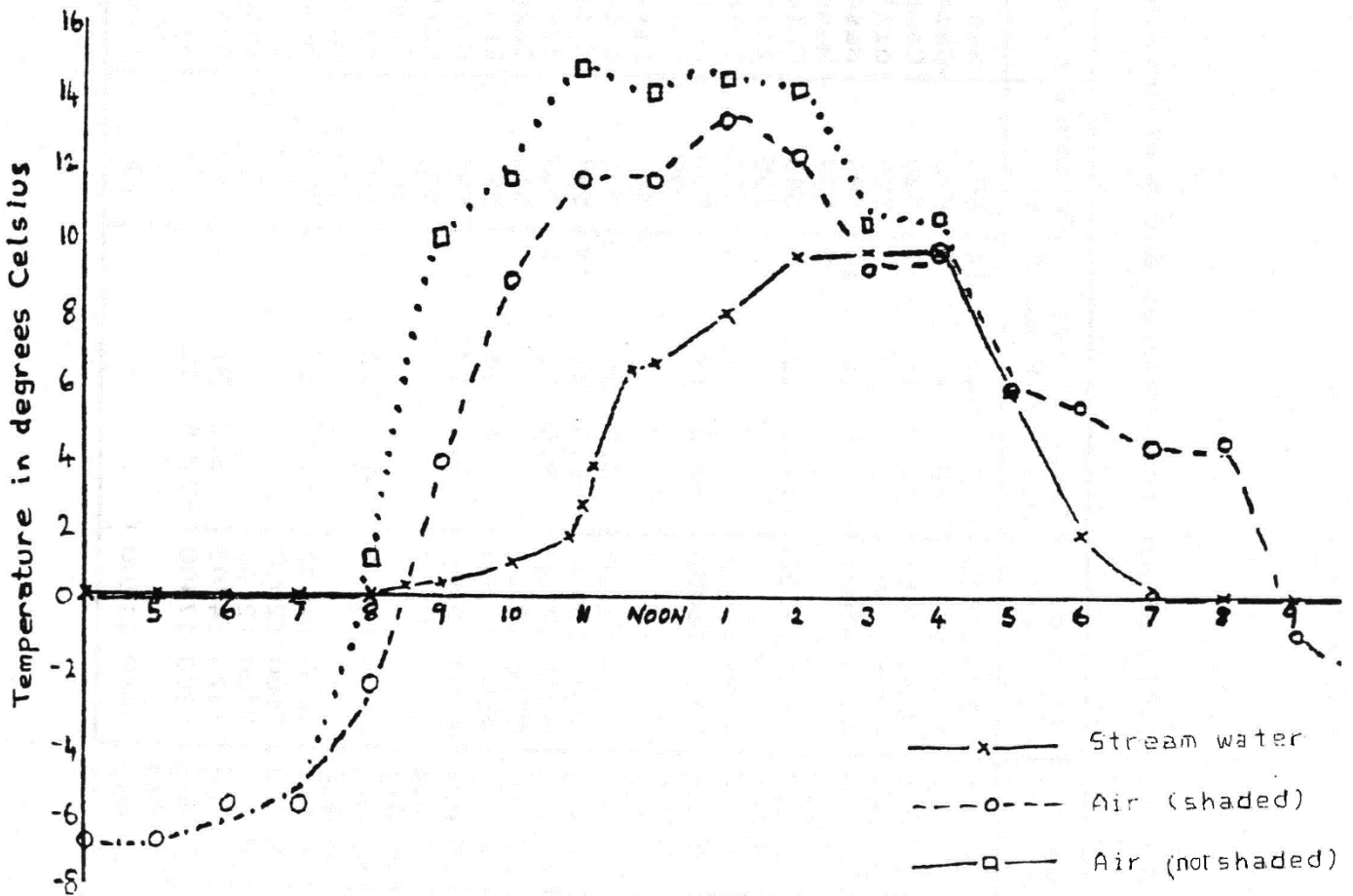
Date	Altitude m ft	Temperatures min C & F max C	Pressure mB	Location
26 Jul	3500 11500	5 41	670	San Pedro, La Paz
27 Jul	4800 15750	-5.6 22	570	Camp at foot of Huayna Poyosi
28 Jul	5500 18050	-12.2 10	520	Campamento Argentina
29 Jul	5500 18050	-12.4 10	520	ditto
4 Aug	4550 15000	-6.8 20	590	Base Camp, Apolobamba
5 Aug	5350 17500	-11.2 12	538	Head of Cololo moraine
5 Aug		5	540	Cololo Camp below North Ridge
8 Aug	5350 17500		505	1st attempt high point, Ice Fang
8 Aug	5500 18050	-7.2 19	550	Cololo Camp below North Ridge
9 Aug			530	Cololo Camp below West Ridge
9 Aug			495	Col below narrow ridge, Cololo
9 Aug	4550 15000	-6.8 20	580	Base Camp Apolobamba
10 Aug	4500 15000	-6.3 21	590	Base Camp, Apolobamba
11 Aug	5200 17000	-9.0 16	595	ditto
12 Aug	5710 18734		532	Bivvy West of Nevado Nubi
13 Aug	4550 15000	-9.4 15	510	Summit Nevado Nubi
14 Aug	4550 15000	-8.1 17	590	Base Camp, Apolobamba
15 Aug			590	ditto
15 Aug			540	Rock peak South East of Base
16 Aug			560	Camp on rock shelf, valley head
17 Aug	4550 15000	-7.8 18	590	Base Camp, Apolobamba
18 Aug			550	Rock peak West of Base
19 Aug	4460 14500	-9.6 15	595	Nubi Pampa, Apolobamba
25 Aug	3600 12000		663	Estancia Una
25 Aug	3900 12800		636	Pinaya
25 Aug	4475 14700	3.3 37	595	Camp at foot of Illimani
26 Aug	5300 17400	-12.5 10	534	Camp near Nido de Condores
26 Aug			480	Bergschrund, Illimani south peak
26 Aug	6460 21200		460	Summit, Illimani south peak



The Changes in Temperature during a Day at Base Camp.

Base Camp was at about 4570m (15000ft) a few metres above the outflow of Lake Pauchoe (the third of the Nubi Lakes). The sun's rays did not strike the site until 0740 and left it by 1700. Record taken on 11th August 1968.

Hour	Small Stream Temperature degrees C	Air Temperature in shade degrees C	Air Temperature not in shade degrees C
0500	0	-6.8	-6.8
0600	0	-5.8	-5.8
0700	0	-5.8	-5.8
0800	0	-2.4	0.5
0830	0.3		
0900	0.4	3.8	10.0
1000	1.0	8.4	11.6
1040	1.7		
1100	2.6	11.6	14.6
1110	3.7		
1140	6.3		
1200	6.5	11.6	14.0
1300	7.9	13.3	14.3
1400	9.5	12.2	14.1
1500	9.6	9.1	10.3
1600	9.6	9.6	10.4
1700	5.7	5.8	5.8
1800	1.8	5.5	5.5
1900	0.2	4.2	4.2
2000	0	4.3	4.3
2100	0	-1	-1
2200	0	-2	-2



Appendix 6

Botanical Report

One of the objects of the Expedition was to collect specimens of flowers and seeds from the Apolobamba area. Although late July and early August did not coincide with the most suitable time for such collecting, a botanical survey was carried out on thirty seven varieties of flower (plus seven from Peru), and seeds from eighteen of these varieties were brought back to this country, together with thirty one pressed flower specimens. Photographs were taken of all specimens. The seeds were imported under the authority of a Ministry of Agriculture licence for private collection. They were stored in Glassine Seal-Easi bags and all seemed to be in good condition on return to this country.

The flowers studied comprised collections from two areas in the Apolobamba which differed significantly in height and climatic conditions. The first area covered was around the expedition base camp between 15000ft and the snow line at 17000 to 17500ft. The temperature range in this area was about -9C at night to 20C during the day. The genera collected ranged from cacti-type plants, succulents and bulbous plants to alpine-type flowers growing near the snow line on the moraines of the Cololo, Nubi and Huanacuni mountains. The second area covered was around the mountain village of Pelechuco, which is situated on the North Eastern side of the Cololo-Huanacuni mountain range. This is at a height of between 11000 and 12500 feet where the climate is somewhat less extreme than around the expedition base camp, coming under the influence of air movements up from the Bolivian tropical forests. Flowers collected were of the temperate and bordering on the sub-tropical variety, although almost all were growing in dry soil and rocky situations on the sides of the steep-sided valley in which Pelechuco is situated.

Fully documented samples of the seeds, with relevant photographs for eighteen of the flowers, have been delivered to the Cambridge Botanic Garden for identification and cultivation. At the present time the Alpine division has only been able to positively identify two species, but contact will be maintained with the gardens by John Sterland. It was intended to deliver a similar set of seeds to Kew Gardens, but it proved impossible to make suitable arrangements for monitoring progress on identification and cultivation, due mainly to the fragmentation of responsibility for these activities which prevails at Kew. It was therefore decided to send the remaining specimens to the Alpine Garden Society.

Since only one example of each pressed flower was obtained, the pressings were retained by John Sterland, but are available for reference and identification.


List of Botanical Specimens from Peru.

1. Purple lupin-type flower, 9 inches high, found near Cuzco
Flowering in July.
Located at about 13000 feet on North Facing slope.
Growing in dry conditions near metamorphous rocks.
No seeds.
2. Head of numerous blue flowerlets on bush about 3 feet high, found near Cuzco.
Flowering in July.
Located at about 13000feet on South facing slope.
Growing in dry conditions among metamorphous rocks.
No seeds obtained.
3. Red lupin-like flower 9 inches high, found near Cuzco.
Flowering in July
Located at about 13000ft.
Growing in dryish conditions in metamorphous rocks.
No seeds obtained.
4. Yellow gorse-like flower on a 3 foot high bush, found in the Cuzco area.
Flowering in July
Located at about 13000 feet in the open.
Growing in dryish conditions.
No seeds obtained.
5. Yellow flat flower, very much like potentilla, found growing on a bush about 3 feet high, near Cuzco.
Located at about 13000 feet on South facing slopes.
Leaves very much like Lupin leaves.
Growing in dry soil conditions.
Seeds obtained.
6. Red-trumpet like flower, about 9 inches high, found near Cuzco.
Flowering in July
Located at about 13000 feet.
Growing on limestone on a South facing slope.
No seeds obtained.
7. Similar to No. 6 but it is a slightly less red trumpet-like flower about 9 inches high, also found near Cuzco.
Flowering in July
Located at about 13000 feet on a South facing slope in limestone type soil.
No seeds obtained.

List of Botanical Specimens from Bolivia.

Base Camp area:-

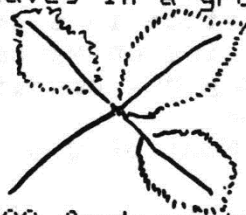
8. Succulent, about 5 inches high.
Red flower about 1.5 inches long. Multi petalled (about 30), the outer side of the petals turning yellowish on the interior.
Leaves spiny in golden whorls.
Located at about 15000 feet on the slopes adjacent to Lake Nubi. Growing on dry North facing slopes.
Only immature seeds obtained.
9. Yellow succulent, 5 inches high, growing adjacent to No. 8. See also No. 19.
Name later ascertained as Espanoza.
Numerous yellow petals.
Leaves grey green spines.
Seeds obtained.
10. Small white prostrate flower 1.5 inches high, growing in abundance on both sides of the Nubi Valley.
8 white petals with yellow base, petals being alternately large and small.
4 stamens.
Located at about 15000 feet in very spiky wet moss.
It seems, for the existence of this flower, it has to grow amongst the moss, and it would seem that it is a day flower. It seems probable that it grows better on South facing slopes (See also Nos. 11 & 12).
No seeds obtained.
11. White flower 1.5 inches across, in the spiky moss mentioned in No. 10.
8 white petals.
Numerous stamens. Large seed box.
Located at 15000 feet on South facing slope in wet conditions.
Seeds obtained. No photograph obtained.
12. A pale blue variety of No. 10.
10 petals, yellow at the bottom.
4 stamens.
4 sepals having thick brown stripe.
Located at 15-16000 feet in wet conditions.
13. Yellow flowers composed apparently of multifarious stamens, on low growing bush about 1-3 feet high, near Lake Nubi.
Located at 15000-15500 feet in dry conditions, adjacent to rock on North facing slopes, but it seems it will also grow on South facing slopes.
Seed-heads like dandelions.
Seeds obtained.

14. Succulent with red trumpet-like flowers from 12-15 inches high.
Flowering season almost finished in July.
6 petals, green at tips, white inside.
6 stamens, 1 stigma.
Located at 15500 - 16000 feet in a niche against sheer rock face, facing North in shaly conditions.
Seeds obtained.
15. Yellow flower, prostrate plant, on path up to Mount Cololo.
Numerous stamens.
Apparently no leaves!
Located at 16000 feet on North facing slope in very dry conditions.
No seeds obtained.
16. Low growing small-leafed ground cover, with apparently no normal flower-head, but seed-heads were collected being attached to the plant stem.
Located at 16500-17000 feet, on glacial lateral moraine, in very dry conditions on North West facing slope.
17. White daisy-like flower, fairly prostrate.
Flowers surrounded by sheath of semi-succulent leaves, almost filiform.
Located at 16500-17000 feet in very dry conditions on North West facing slope of a glacial lateral moraine.
No seeds obtained.
18. Low growing blue lupin-type flower, 3 inches high.
Growing at 16500-17000 feet on glacial lateral moraine on North West facing slope in very dry conditions.
Seeds obtained.
19. Yellow succulent (See also No.9).
Numerous yellow petals.
Hundreds of stamens surrounding about a dozen stigmas.
The name is Espanoza according to a local Indian.
Located near the second Nubi Lake at 15000 feet on North facing dry slope.
Seeds obtained.
20. Small white flower-head, comprising many small white flowers.
4 petals, each with one stamen leading to a long seed box.
Growing on a small bush about 9 inches high in crevices on open rock, North facing at 15000 feet.
About 1/2 inch long; 
Leaves somewhat fleshy, grey green 1/4 inch long, entire turning in on themselves vertically.
Twiggy bottom growth.
No seeds obtained.

21. Yellow antirrhinum-shaped flower, 1/8 - 1/16 inch across, plant 1.5 inches high. Only one example seen in a crevice on a steep crag at 16000 feet, East facing, overlooking Lake Kelo. Dry conditions. See also No. 38. No seeds obtained.
22. Red succulent flower, not yet in seed, 3/4 inch across. Located at 15000 feet on North facing shady slope near Lake Nubi.
23. Yellow succulent. Seeds not ready for collection.
24. Bell-flower similar to No.14 but on a bush about 2 feet tall. Succulent leaves in clusters. Found on shaly rock face at about 15500 feet on North facing slope. Large seed boxes.
25. Lupin-like yellow flower on plant 9-18 inches high. Flowering season just finished in early August. Found in one location in a small colony halfway up a glacial moraine on Nevado Nubi. Growing at 16500 feet in very dry conditions on a North West facing slope. Seeds obtained. Pods of 3 or 4 seeds.
- 25A. Taken on trek to Pelechuco from Nubi. Prostrate pale Yellow flower with deeper yellow stamens. Growing in arid conditions in full sun at 16000 feet in rocky, shaly soil on plateau. No seeds obtained.
- 25.B Taken on trek to Pelechuco from Nubi. Prostrate deep yellow with (about) 8 petals. Growing in arid conditions as No. 25A. No seeds obtained.
26. Very small white flower. Plant about 1-1.5 inches high but flower-head apparently prostrate, being level with the spiky moss with which it seems to be growing as an integral part at the bottom of the moraine. 5 petals and, under a magnifying glass, apparently many yellow stamens. Growing at about 16000 feet at the bottom of the moraine on North West facing slope. No seeds obtained.

Pelechuco Area:-

27. Belladonna (possibly) - blue star-shaped flower with green berries turning black.
28. Orange (and yellow) marigolds.
29. Vinca minor.
30. White compositae.
31. Red succulent same as No. 22.
33. Bulbous orange flower 1.5 inches long. Plant 9 - 12 inches tall.
6 petals.
5 yellow stamens protruding below the petals.
Found at 11500 feet on North facing slope with many stones.
Bulbs obtained.
34. Yellow semi-pendant flower 1 inch across on 6 inch stem.
5 petals.
Numerous, brown tipped stamens. Numerous stigmas.
3 dentate leaves in a group alternate.





Found at 11500 feet on dry stone wall North East facing. Subsequently found on a South facing wall.

No seeds obtained.

35. Pendulous red trumpet flowers in clusters 2.5 - 3 inches long, 4 petals, star shaped.
8 stamens, pale orange tinted green at tips. One stigma longer than the stamens.
Stalk about 9 inches long, protruding from the moss.
Growing on East facing and North West facing slopes at 11500 feet.
Some seed boxes were obtained though the flowering season had only just ended in mid-August.
36. Aromatic herb collected by the locals for cooking. Smells very similar to Rosemary. White. Found on bushes up to 2.5 feet high with twiggly growth. Grows universally near Pelechuco at 11500-12500 feet. Found almost anywhere in the steep sided valley in dry stony and sometimes shady conditions.
4 stamens, purple tipped.
No seeds obtained.



37. Purply-red Flower 1.2 inches across.
8 petals, serrated at ends.
Plants grow on thorny twiggy growth up to 6 feet high.
8 stamens, golden brown with green tips.
Flowering mid-August in open conditions in full sun. Also seen growing in a more stunted form on mossy rock.
Generally speaking, grows in a dry rocky soil around 11500 feet.
Leaves glaucous on independent stem, lanceolate, 1.5 inches long.
Seeds obtained.
38. Yellow snapdragon-shaped flower 3/16th inch across on stems 5 inches high.
Purply leaves in pairs, 1/2 inch long.
Growing at 12000 feet on East facing slope in a dry, narrow, stony valley.
Only one or two plants seen.
Same type of flower as No. 21. Possibly the same plant.
No seeds obtained.
39. Yellow sacchote or hooded flower on bushy plant with semi-twiggy stems.
Flowers 1/2 inch round, grow in clusters.
Twin stamens shaped thus: 
Pale orange in colour.
Leaves obtuse, rather sage-like, shaped as below and faintly sticky and aromatic. 
Bush grows at 11000-12000 feet and is up to 2 feet high. More prevalent on dry slopes or walls facing in any direction. Will grow apparently anywhere.
Seeds obtained.
40. Yellow flower in loose clusters, about 3/4 inch across. Plant grows up to 2 feet high.
11-13 petals.
Dryish leaves about 2 inches long, elliptical and dentate in shape, alternate with the flower-heads growing from the same joint.
Found at 12500 feet on North East facing bank by a mountain stream.
Airborne seed obtained in large seed-boxes about 1/2 inch deep.
41. Pink flower, very much like bell heather, 3/16ths inch long, about 6 inches high, with dry stems.
Leaves very thick, leathery, lanceolate, alternate.
Located at 12000 feet on East facing vertical rock face on side of mountain valley.
No seeds obtained.

42. Purple flower, very much like English Bugle, with numerous snapdragon-shaped flowers on 1.5 inch stem, the individual flowers being about 1/4 inch wide.
The plant is 1 foot high having stiff stems. Leaves trifoliate.
Located at 12500 feet in rocky habitat on East facing dry valley side.
No seeds obtained.
43. Violet flower 3/8 inch across on stalks about 5 inches long.
5 petals.
5 stamens.
Leaves growing in pairs on the opposite side of the stems with flowers from the stem joint. Leaves serrated with several on the same stem alternate.
The plant also has an unusual stem which is separate from the flower stem, having a sword-type stigma which does not apparently lead to the seed box. This is green, drying to brown. Only one plant seen at 12000 feet on South facing dry wall.
No seeds obtained.
44. Red bell-shaped flower about 1/4 inch long on plant 3 inches high, growing amongst ferns and other clinging plants.
Leaves thick, leathery, oricular, 1.5 inches long, alternate as below.
Found at 11500 feet on South facing shaly, sunless, vertical terrace wall.
No seeds obtained.
45. Red poppy-coloured 'open' snapdragon-shaped flower 1/2 inch across.
4 yellow stamens. 1 green stigma.
Leaves 1 inch long, serrated pinnate, in clusters.
Growing at 11,500 feet on South facing dry terrace wall.
Seeds obtained.
46. White multi-petalled prostrate flower 3/4 inch across. Plant prostrate, merging into ground. Many yellow stamens. Many stigmas of paler yellow.
Found on trek back to Nubi from Pelechuco, growing at 16000 feet in full sun on arid open slope in shale.
No seed obtained.



47. Yellow flower 1.2 inches across with very large centre 1/2 inch across.
Numerous yellow stamens.
All foliage is silver green including sepals.
Leaves very thick and furry, being alternate with the flower stems from each node. Leaves 1 inch long.
Plant 6 inches high.
21 petals widely spaced.
Found at 17000 feet on the mountain to the North East of Base Camp in a rocky cleft facing East. Extremely dry, shaly and rocky conditions, not likely to get any sun after mid morning.
No seeds obtained.
48. White flower, purple on outside, 3/4 inch across. Plant growing 1.5 inches high in the shelter of other plants and stones. Flowers and leaves grow from ground level.
13 petals.
Many yellow stamens.
Leaves narrow, green, tipped with purple, one inch wide and 1/16th inch white curled inwards on themselves.
Found at about 16500 feet on West facing slope of about 30 degrees in clayey-type soil with pebbles but dry conditions.
No seeds obtained.

Appendix 7

The Medical Report

Prior to departure the participants had a general dental check up and some underwent a general health screening. Inoculations against Yellow fever, Polio, Tetanus, Typhoid and Hepatitis 'A'. One member took advantage of anti-rabies vaccine. By coincidence this was also the only member to be seriously threatened by dogs.

On arrival in La Paz some discomfort was experienced by everyone. Lassitude, headaches, restless sleep, lack of appetite and some nausea. This lasted for between two days and two weeks depending on the individual.

Within the first week all had experienced intestinal complaints ranging from mild diarrhoea and sickness to dehydration resulting from severe diarrhoea. These cleared up without treatment or by use of Imodium or Codeine Phosphate. Balanced salt and sugar solutions eased dehydration. Such attacks occurred occasionally later and were invariably associated with eating out.

Acclimatisation to the altitude so that physical performance approached that normally expected took from a week to two weeks. During this period the complaints were of sore throats, rasping coughs, nose bleeds, feeling tired when starting physical tasks, lack of appetite, headaches, pounding pulse when trying to sleep and at higher altitudes a sudden gasping for breath and feeling of suffocation when drifting into sleep. Cuts, cracks and burns were all very slow to heal. Towards the end of a month above 12000ft there was some deterioration of performance. This may have been due to other factors such as poor diet, loss of body weight or lack of variety of activity. No drugs were used to attempt to offset the effects of altitude though Paracetamol were used to alleviate the headaches.

Dental problems were to be expected and two arose. An abscess in a capped front tooth which required draining, cleaning and recapping. The dentist listed in the addresses had an assistant who spoke English, offered immediate treatment of a good standard and was available on a Sunday. Luckily this complaint was treated before our departure from La Paz. The use of a course of antibiotics prevented a recurrence. The replacement cap eventually worked loose and had to be recemented in place. The second problem was a painful and throbbing tooth with some swelling. This was treated from an early stage by a course of antibiotics and did not develop into anything more serious.

Local people around base camp requested treatment and while we did what we could with the materials available to us, we wished for more suitable medications and greater expertise. The usual complaints were of headaches, backaches, swollen and painful joints, coughs, sore throats, eczema and the usual cuts. One man requested treatment for his wife who had severe pains in the lower abdomen, associated in some degree with urination. Prolonged discussion eliminated many possible causes and suspecting some minor infection causing urethritis we prescribed a course of antibiotics and were relieved to hear two weeks later that she had recovered. The husband related that medical treatment could be obtained in La Paz but this required the patient to endure a 24 hour journey on the back of a crowded lorry. The alternative was to walk to a clinic in Peru, a round trip of several days.

Crowther, who suffered loss of appetite most severely, started to develop numerous large mouth ulcers, a problem he endures occasionally in Britain but to a much lesser degree. These ulcers did not respond to the treatment usually prescribed in Britain. Again it was fortuitous that return to La Paz was imminent, as the failure to feed properly culminated in the need for frequent skilled medical attention. He required several days in bed with vitamin supplements, twice daily injections, intravenous drips of saline solution, laxatives and mouth washes. He made a good recovery in a week.

Thankfully there were no mountaineering accidents. Weight loss varied from half to one and a half stone (10kg).

Appendix B

Ornithological Report

In 1958, in a foreword to his book, 'Living Birds of the World', E. Thomas Gillard wrote: "This great area (South America) which has the largest number of families and species of any continent, cries out for an illustrated handbook, so that visitors and residents alike can identify the birds and study their habits".

Thirty years later the definitive book is still to be written, although there are several which have filled some of the gaps. Two of these I attempted to obtain on returning to the U.K., having been asked if I would be prepared to try and identify any birds seen on the expedition.

I would like to make the point that I am not an ornithologist and have had no previous experience of taking field notes but was prepared to 'give it a go'.

The two books which I thought would assist in identification were 'South American Land Birds', by John Dunning, published in 1982 (Water birds not included) and secondly 'The Birds of the Department of Lima, Peru' by Maria Koepcke, Published in 1969. I managed to acquire the first book from my local library and although there were illustrations of around 1000 birds I did not recognise any that we had seen. The second book was unobtainable, even from the British Library.

This second book is due for a re-print in 1989 and should become more easily available. Also due out in 1989 is a book 'South American Birds' (previously 'Birds of Interior South America') which will include water birds.

Early in the trip, during the acclimatisation period, several members of the expedition visited Puno, Cuzco and eventually Machu Picchu. According to Alden and Goodens in their book 'Finding Birds around the World' we were in a very productive bird-watching area. In a chapter on Cuzco they list 200 birds seen during July and August and a chapter on Puno lists 64 seen at sea level. Unfortunately, we spent most of the daylight hours on this trip looking out of train windows, not the ideal way of bird watching! The part-time bird watcher, on reading these lists, with no previous experience of South America, would probably have heard of perhaps no more than 15 of those listed. Such is the diversity of avian South America.

Not all was gloom however, even without the aid of books, several sightings of Andean Condors were made. Apparently, once a Condor has discovered carrion, it may be joined by birds from many miles distant, attracted by either super eyesight or some telepathy not yet understood.

Flamingoes were seen at the Southern end of Lake Titicaca during the outward journey to the Apolobamba. There are three species of flamingo in the Andes, the rarest of these, the James' flamingo was thought to be extinct until re-discovered in 1957.

We were fortunate to see a pair of Torrent Ducks as we descended from the heights of the Katantica range into Pelechuco and during our stay there we had two sightings of a white-capped dipper.

At Nubipampa village an unidentified bird which had the appearance of a woodpecker, busied itself on the outside walls of the huts in the absence of trees in the landscape.

Giant Coots were seen on the lakes. These can be up to 20" long and one species actually builds a nest of stones in the absence of vegetation.

The humming bird which I saw feeding one day at the lakeside would, I thought be easy to identify, but to date I can only identify it as one of the 319 species of humming bird found in South America.

Mountain Caracaras were much in evidence. This is a black and white bird which is a carrion eater and may be seen in the company of condors.

We were visited at the base camp by birds of prey on several occasions, but again I could not guess what they were.

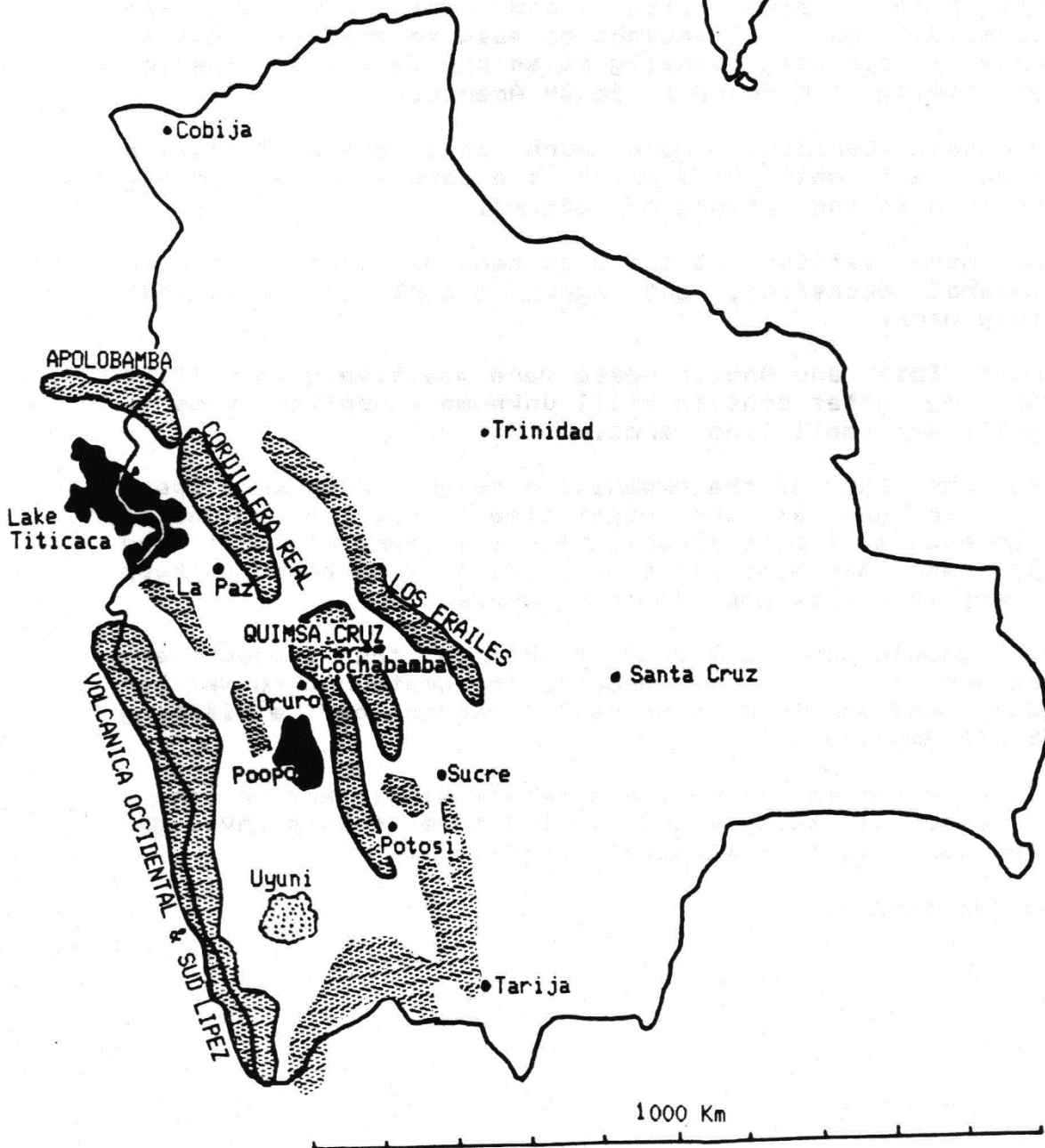
Puna Ibis and Andean Geese were positively identified but my notes contain still unknown sandpiper, waders, gulls and small land birds.

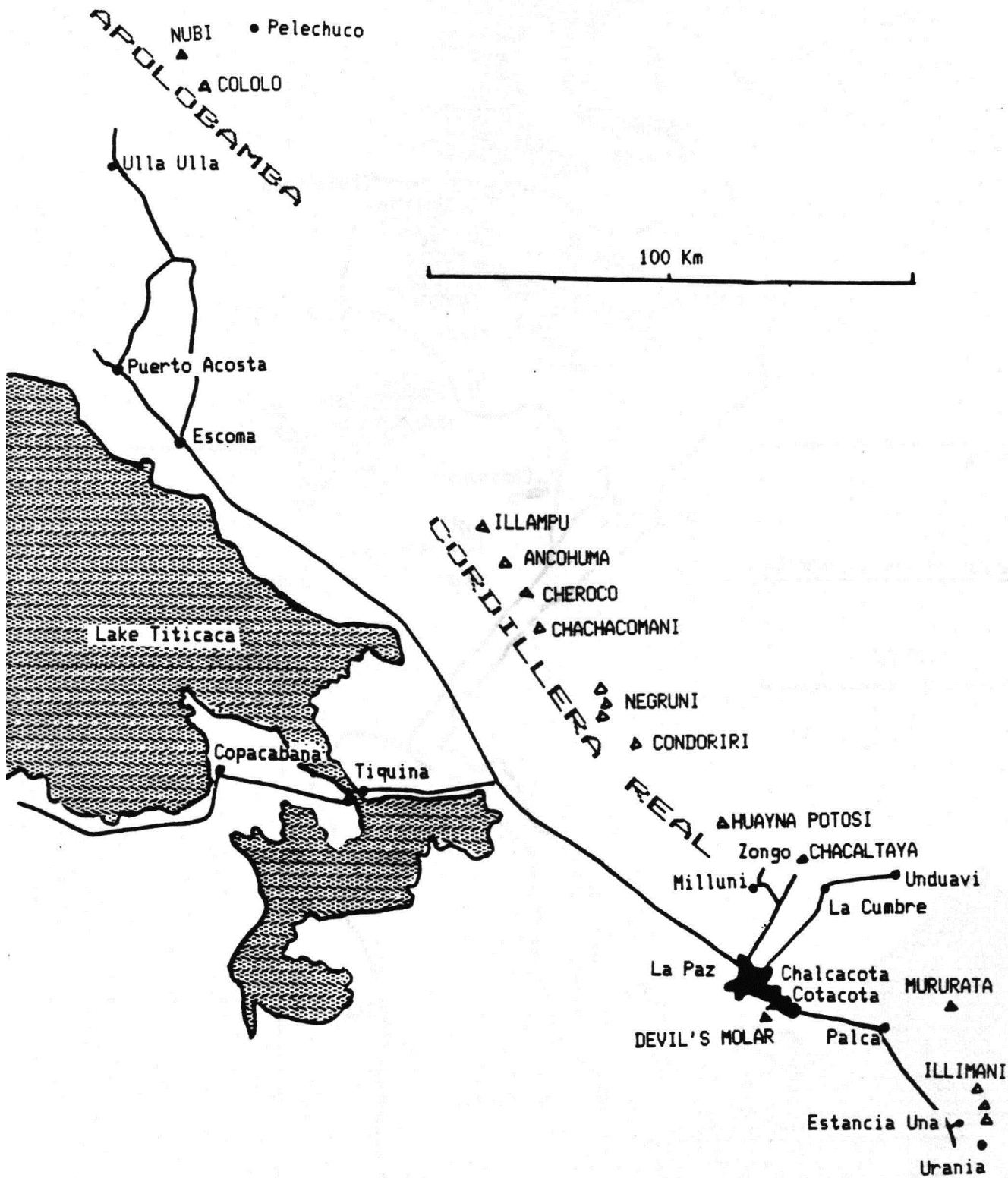
At the end of the expedition several days were spent in Rio and at the right time of year the Botanical Gardens must be a paradise for twitchers who will need to wear his binoculars on a chain if he hopes to keep them; this also goes for his camera.

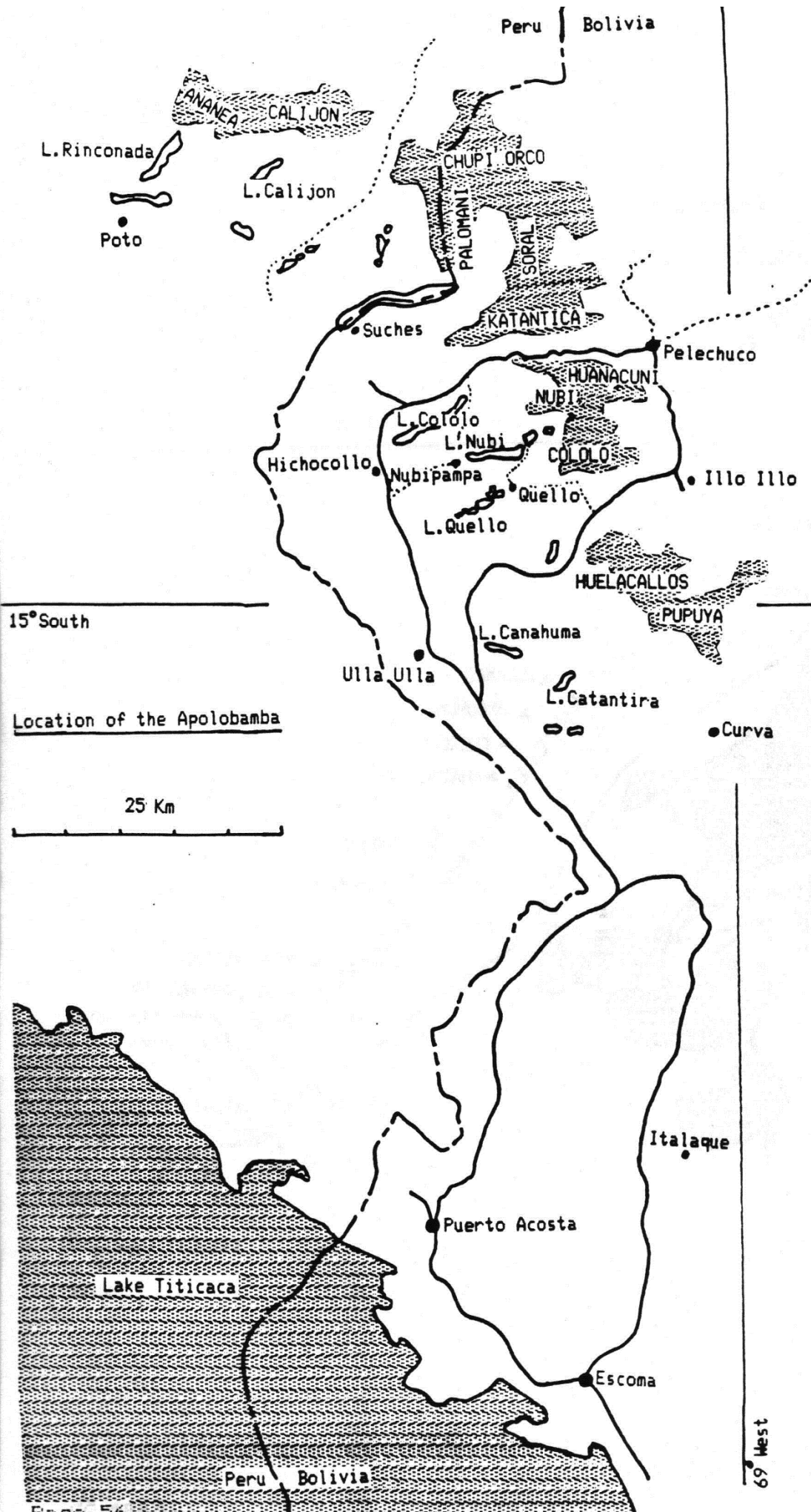
In conclusion, although books on the subject are rather thin on the ground, the amateur bird watcher can, and should do some useful reading before visiting South America.

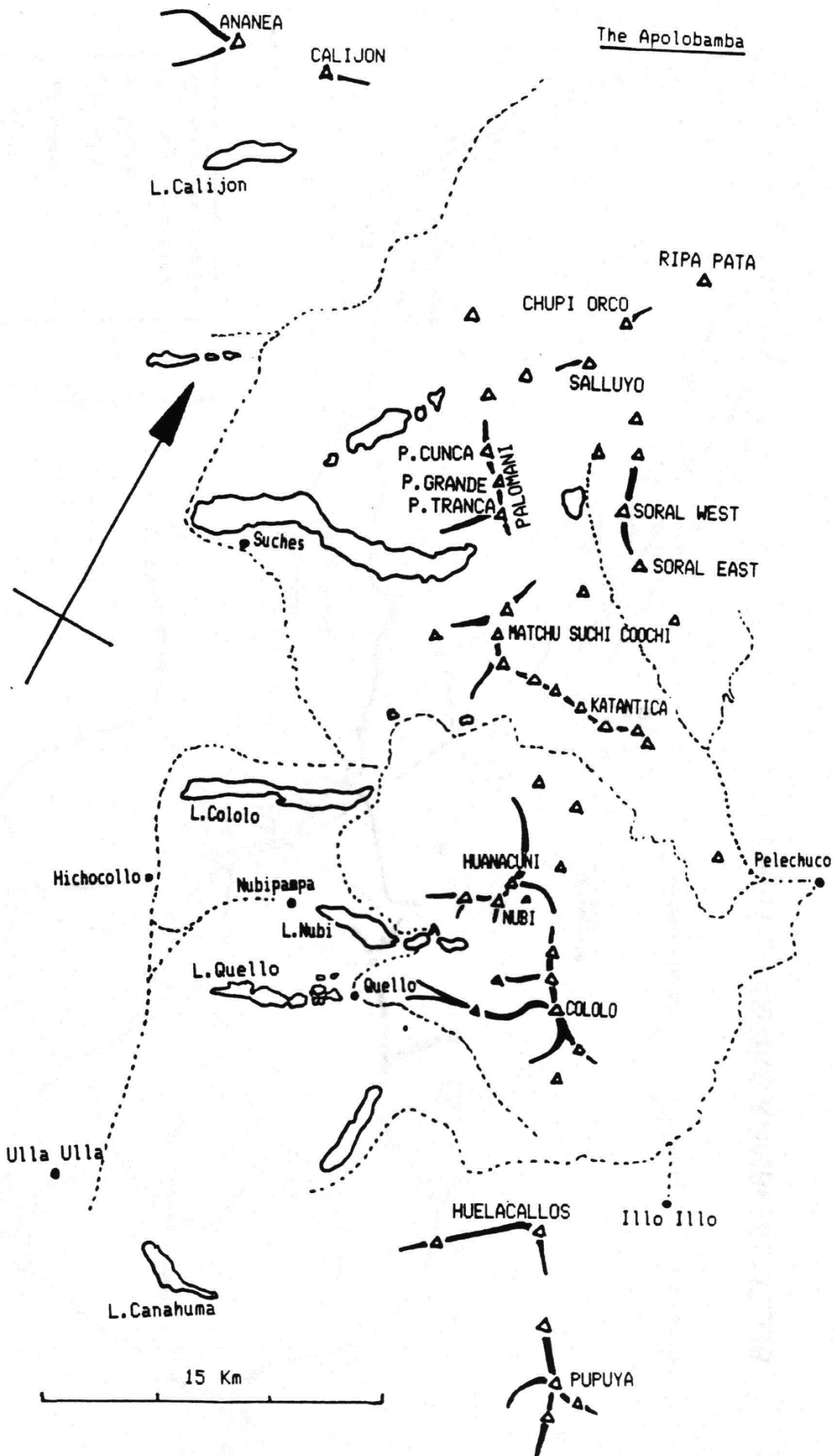
I have not mentioned the types of binoculars or camera I used as this depends on the type of trip envisaged and can only be a personal choice.

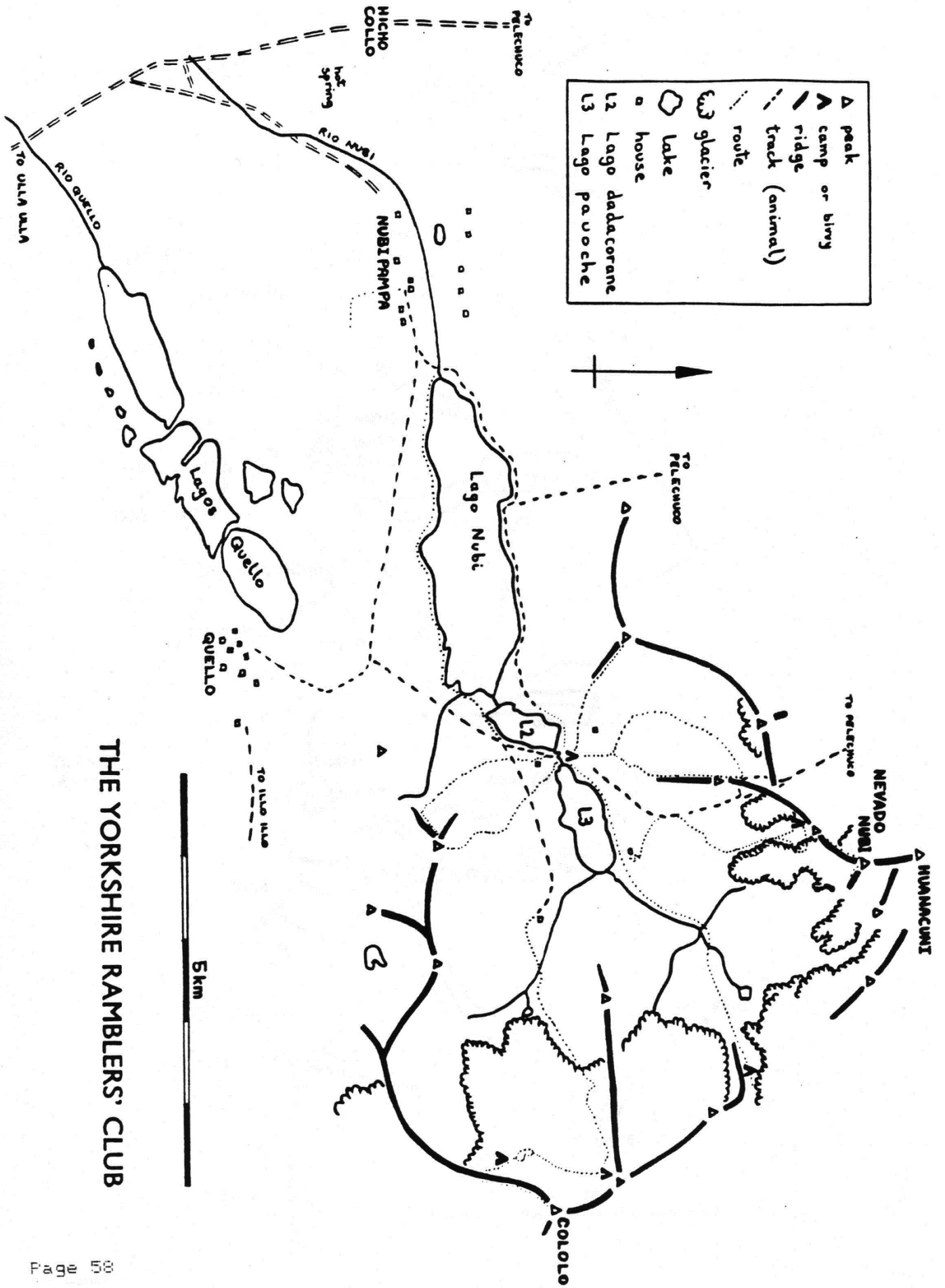
Bolivian Mountain Ranges











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Instituto Geographico Militar; 1:250000 No 15 Apolo 1:500000 Dept.de La Paz 1:50000 5748 I Khata	Apolobamba and area to North Apolobamba and roads (sheet 2) Southernmost (Ulla Khaya, Akamani)
Johebuch des D.A.V.,Bd83,p107 1:500000	1957 German Expedition All Apolobamba
Revista del C.A.I.,1982,p367	Ridge map Apolobamba Boliviano
Mountains of the World,p729 1:300000	Based on Landsat photo 2223-13554 Southern peaks
Royal Geographical Society,Peru-Bolivia 1:250000	Frontier,Peruvian Boundary Commission, Sheet 1. All Apolobamba
Hispanic America series 8/1 1:1000000	S 19 E Puno - Rio Beni S 19 D La Paz

Miscellaneous

ILLINGWORTH,R.N	(1979) Expedition Medicine, a planning guide Brathay Exploration Group Booklet
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Flyer:

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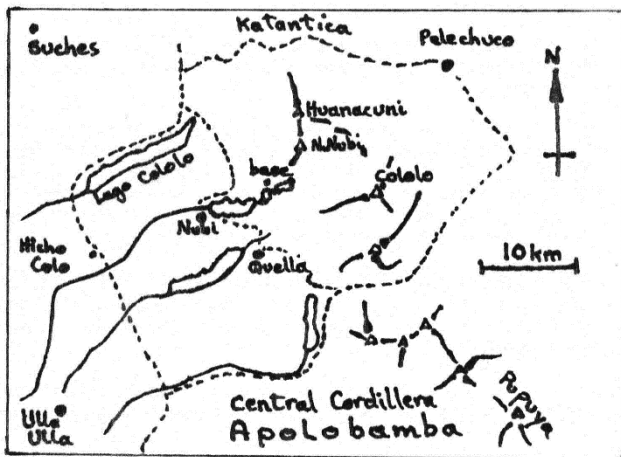


Outline report of the 1988 YRC Bolivian Expedition

The expedition consisted of six Members of the YRC spending up to six weeks in the field during July/August 1988. Three weeks in August were spent in the Apolobamba, a range of glaciated peaks at the Northern end of the Cordillera Real, close to the Peruvian border. The activities included mountaineering, botanical collection, ornithology and sketch mapping. Parts of the Cordillera Real close to La Paz were also visited.

Participants:-

Michael Smith	Leader
John H Sterland	Deputy Leader, Botanist & Treasurer
David A Hick	
Ian Crowther	
Harvey Lomas	
David Martindale	Ornithologist



Cololo (Ccachuca) 5916m 19408ft was ascended at the second attempt by D.Hick & M.Smith on 9th August via a rock ramp followed by the West ridge. This is thought to be a new route and a first British ascent of the peak. This, the highest peak in the Bolivian sector of the Apolobamba, has been climbed twice before, by the Austrians in 1957 and the Japanese in 1965. The route is a natural and elegant line estimated to be about equivalent to Scottish grade III.

Nevado Nubi, 5710m 18734ft was ascended by D.Hick & M.Smith on 13th August. The route taken from the West col is probably the same as that taken on it's only previous ascent by the Austrians in 1957, directly up the West ridge.

Meanwhile a four night trek was made from base camp, North to Pelechuco, East below the peaks as far as Cololo then crossing back over the range to Nubi Lake and base camp.

Over forty Botanical specimens were recorded, photographed and had their seed collected. These are being catalogued.

The bird species seen in the area around base were recorded and described. These are being listed.

Acclimatisation following arrival by plane in La Paz, Bolivia, was for a period of eight days at the end of July. This was used either to visit Cuzco (Peru), Machu Picchu and Lake Titicaca or to climb on Huayna Potosi, a local 6000m peak.

The attempt on Huayna Potosi failed partly due to the carrying of excessive loads of unnecessary equipment and partly because of an unusually wide and unbridged bergschrund tantalisingly close to the summit, at the foot of the final slope. This ascent, six days after arrival, also revealed incomplete acclimatisation.

The Nudo de Apolobamba is a chain of 5000m peaks which are rarely visited because of the long approach road. Its concentration of high peaks with glaciers, compact and steep, produces some magnificent scenery. The area is 150km North of Lake Titicaca (68°W, 16°S).

The 270km journey from La Paz to Nubi Pampa village in the Apolobamba took 10 hours by jeep. Several agencies in La Paz can organise such transport though it is essential that the expedition can recognise it's destination as there are no indications where tracks might lead. The journey is mostly on unsurfaced roads across wild, rugged country with few townships. The final track to Nubi Pampa is very rough, passable only in the dry season and barely discernable where it crosses the braided river. This section is best tackled in daylight.

Horses, mule and donkey are available for hire in the area round Nubi Pampa. The valley can be followed up past three lakes to a col between Cololo and Huanacuni peaks. There is ample opportunity for camping and an adequate water supply among the llama pastures. Our base camp was at about 15000ft by the outflow of the third lake, this being the highest point with clean, running water near flat dry ground for camping.

Ascents were made from base by placing higher camps or bivvy sites at 17000/18000ft. These were suitable for climbing the local peaks which are all below 19500ft. Following an ascent the higher camp would invariably be removed and a return made to base camp late the same day. Glacier crossings were made tedious by the surface flutes or teeth, some one metre long, that frequently broke once weight had been placed on them.

A detailed sketch map was prepared of the upper parts of the Nubi valley showing those features of principal interest to mountaineers.

Following the expeditions return to La Paz an attempt was made on Illimani by the two climbers still in good health. Illimani is the massif that overlooks La Paz and the highest in the area. This ascent made use of local 'porters' in the lower sections and took a different route to the usual road head avoiding the now badly damaged parts of the mine track.

Illimani, 6460m 21200ft was climbed by D.Hick & M.Smith on 27th August to the South Peak by the normal route with a slight variation. Camps were placed at the road side and somewhat below Nido de Condorez.

Apart from the usual round of minor complaints the only medical problems were an abscessed tooth and an unusually severe attack of mouth ulcers.

The weather was dry, cool and sometimes windy by day, sometimes clouding over in the afternoon. Nights were cold, clear and calmer. Temperatures fell to -14C at one camp and were lower on the higher climbs.

We wish to acknowledge the following for their contribution to the success of the expedition by providing or modifying equipment;

Robert Bailey & Son plc,
Smith & Nephew Medical Ltd.,
Cuxson Gerrard (Dressings) Ltd.,
Vernon-Carus Ltd.,
Graham Hobson,
and numerous individual Members of the Yorkshire Ramblers' Club.

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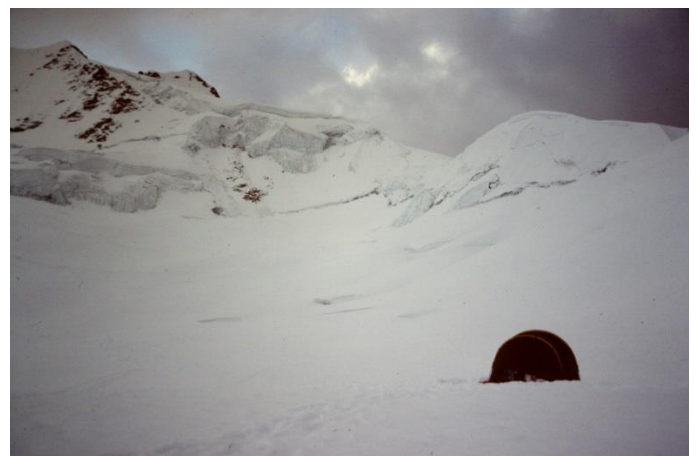
Tel. (0742) 864328

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Approach from Nubi pampa to Basecamp



Cololo



Nubi / Huanacuni

