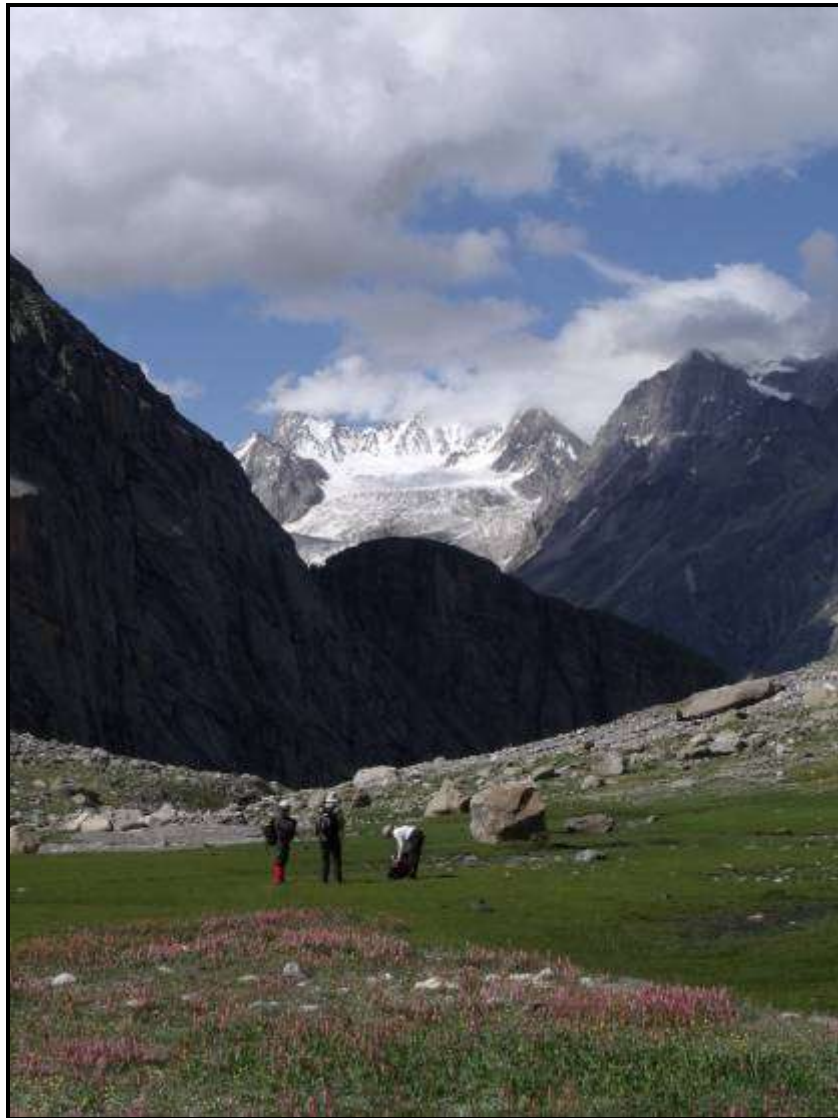


In At the Steep End

Three Weeks in the Indian Himalayas

02nd – 24th July 2011



Nicola Starkey

Contents

Acknowledgements.....	3
Introduction	4
Checked Shirts. 2 nd July - Heathrow Airport.....	5
Beep Beep! 3 rd July – Delhi to Shimla, 350km, 2130m	5
Welcome Alpine Garden Society! 4 th July - Shimla to Sarahan, 180km, 2200m.....	5
“Tea, Coffee?” 5 th July - Sarahan to Sangla, 90km, 2700m.....	6
Awe Inspiring Mountains. 6 th July - Sangla to Sangla Khunda, 3350m.....	6
Naturally Terraced. 7 th July - Sangla Khunda – Ranglati, 3700m	7
Eye of the Tiger. 8 th July - Acclimatisation and local botanising, 4000m	8
The Cold Snow. 9 th July - Walk to Rupin Pass, 4466m.....	10
<i>Arnebia benthamii</i> . 10 th July - Ranglati to Garwa Camp, 4020m	10
Primula Ledge. 11 th July - Lower slopes of Nalgan pass, 4500m+.....	12
Snow and Scree. 12 th July - Walk to Nalgan Pass, 4020m+.....	12
Downhill. 13 th July - Back to Sangla, 2700m	13
Into the Cloud Forest. 14 th July - Drive from Sangla to Khanag, 2600m	13
Off to Manali. 15 th July - Drive from Khanag to Manali, 2000m	14
Pile of Corpses. 16 th July - Lower ridges of Rohtang Pass, 3980m.....	14
Traffic Jam. 17 th July - Over the Rohtang Pass to Chattru Valley, 3350m.....	15
Meadow. 18 th July - Chattru to Chedagaru, 3850m.....	17
Paraquilegia. 19 th July - Chedagaru to Balugere, 4268m	18
Last Camp. 20 th July - Balugere to Panderopa 2800m	19
Goodbye to the Crew. 21 st July - Walk out of Panderopa, drive to Manali	19
Taj Mahal and Goodbye to India. 22 nd - 24 rd July - Manali to Delhi, Delhi to London	20
Comments.....	20
Bibliography	21
Photographs	22

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I would like to thank everyone that was a part of this trip. As one of the youngest members I was inspired at the knowledge, ability and determination of everyone. I hope that in thirty to forty years time I am scrambling up mountain sides, hoping over boulders, trudging through snow and wading through rivers; you've redefined what retirement means to me.

Thanks to Chris Haworth for all his support.

Introduction

This Alpine Garden Society tour was to follow in the footsteps of previous plant explorers, Ludlow and Sheriff, and Henry and Margaret Taylor, into Himachal Pradesh. Henry and Margaret Taylor travelled extensively in the northwest Himalayas using the same local crew that we were to travel with. We were to replicate two of their treks, with tour leaders David and Margaret Thorne, who supplied us with a list of the plants documented by the Taylors to aid us in our identifications.

My initial interest in alpinism came from seeing how they were displayed in small terracotta pots, troughs and walls. I found this intriguing and it led me to write a report about the concept of 'Alpine Lawns', as a way to display hardier species, for my RHS Certificate in Practical Horticulture. I wanted to go on this tour to see firsthand the alpine meadows and 'lawns' I had read about in my research and to gain an understanding of the habitats in which alpinism live. I also wanted to forge a relationship with the plants in the alpine collection where I work, so that they would become more to me than delicate plants requiring good drainage, but plants that I would forever have a personal association with. This was my first time in the mountains and my first experience botanising, but hopefully not my last.



The Alpine Garden Society Group and Crew

Checked Shirts. 2nd July - Heathrow Airport

I arrived at Heathrow Airport with apprehension for not only was I excited I was also nervous about going on this trip. I was worried that I was not fit enough, I'd heard Delhi Belly was inevitable, my doctor had not prescribed me anything for altitude sickness, and I was surely going to embarrass myself with my limited plant knowledge. Well if I wanted to learn more about alpine plants, then this was certainly throwing myself in at the deep end. With all this going on in my head I spotted the group immediately; a small huddle of people wearing walking boots and checked shirts. My nerves were eased a little when they recognised that I too was one of them and beckoned me over.

Beep Beep! 3rd July – Delhi to Shimla, 350km, 2130m

We arrived into a hot sticky Delhi at 9:30am and were cheerily welcomed to India by our tour leaders David and Margaret Thorne and our local guide, Tenzin. I felt extremely spoilt when we were ushered into an air conditioned coach with two seats each. Sleep was hard to come by though with the sound of constant beeping from the Delhi traffic, the passing images of a culture I'd not seen before, and my lolling head hitting the window frame every time I dozed off.

We drove through the hot Delhi plains and began ascending into the mountains through lush vegetation to reach our first destination of Shimla, 350km from Delhi and approximately 2130m high. We arrived at the Woodville Hotel at 9:30pm, 12 hours after landing, after an 8 hour flight. I was exhausted already and we hadn't even begun!

Welcome Alpine Garden Society! 4th July - Shimla to Sarahan, 180km, 2200m

The next day was another travel day, this time the group was split up into five taxis, travelling in convoy. The coach could not have navigated the precarious hillside twists and turns of a road carved out of the mountain side, with a lengthy drop down to the Sutlej River below. After a few hours of travelling the convoy stopped along the roadside and we clambered out to botanise on the rock face opposite. Not really knowing what to expect from the trip, I had to laugh at the sight of a group of westerners scrambling up the bank. "So this is what we do" I thought to myself.

The scramble up the northwest facing slope proved fruitful and we found our first *Anemone rivularis*. With an altitude range of 2100m – 3600m we were going to be seeing a lot of this plant. Turning over the white petals, held on long stalks, revealed the pretty purple undersides (fig. 8). Another plant found growing here, which was going to be with us for most of the trip, was *Potentilla argyrophylla* var. *atrosanguinea*, the red petals contrasting with silver green leaves. Margaret explained to us that the *Potentilla* that we would be seeing, *P. argyrophylla* (fig. 1) was a yellow form of the same plant and that we would probably see all shades (fig. 2 & fig. 3) from the yellow form through to this red variation (fig. 4).

The *Arisaema* enthusiasts amongst the group became excited to see three different species growing in close proximity under the shade of the pines. Discussion was had and it was concluded that these were *A. tortuosum* (fig. 6); with its black appendage standing erect from its green hood, *A. jacquemontii*; with its long green spathe tip, and *A. propinquum* (fig.5); with white and purple stripes and long thin appendage. We also saw lone examples of the lilac purple *Roscoea alpina* (fig. 7) and *Aquilegia pubiflora*.

At a 'pit stop' the 'ladies toilet' was decorated with cannabis (*Cannabis sativa*), a splash of yellow from *Oxalis corniculata* and a little further along the roadside, with fine pointed leaves and hairy stems, *Androsace languinosa* was identified. We stopped again in pine forest to discover more

Arisaemas, but no new species, and to photograph the flowering green and pink spike of *Epipactis helleborine* (fig. 9). We continued on the long hot journey taking note of *Agave* sp., *Eucalyptus* sp. and *Optunia monacantha*, growing in the heat along the edges of the dusty hillside.

It was a relief to arrive at our first campsite and be welcomed by the crew with a silk scarf and a much needed cup of tea. As we stretched our legs we enjoyed the sight of the mountains beyond, to our surprise the cloud lifted to reveal yet higher peaks (fig. 11) filling us with excitement for what we were about to embark on. The campsite was home to *Typhonium venosum*, not in flower but identified by its speckled stems. Beyond a wall a little above the campsite a striking blue *Delphinium roylei* (fig. 10) was found, but I waited until the morning to see it. We had our first camp meal together, chicken and chips followed by chocolate cake! Our previously prepared plant record sheet was ticked off for the day and more tea was had before heading to bed.

“Tea, Coffee?” 5th July - Sarahan to Sangla, 90km, 2700m

At 5:00am music blasted out from the Bhimakali Temple below the campsite, a sound not particularly welcome after all the travelling we had endured. We had our first ‘bed tea’, something that would become a welcome sight every morning; three smiling faces of the crew, at the door of the tent, with a cup of tea or coffee, followed by a bowl of washing water.

We were to spend another day in the taxis, dropping back down into the hot valley. We followed the Sutlej River where a huge hydro-electric project is taking place. The hillside has been bored into and the road was dusty and grey but from this bleak sight we spotted the pink petals of *Incarvillea arguta*, hanging down from the cracks in the rock face. We reached the campsite in Sangla town in mid afternoon and were greeted by the ponymen and horses that were to be with us on our first trek to carry our equipment. Under the shade of a huge walnut tree (*Juglans regia* var. *kamaonia*), arranged in a circle around a rock were a number of *Arisaema flavum* (fig. 12), looking like they’d been planted that way. The construction work opposite the campsite eventually stopped allowing us to go to bed; we wondered what time the workers would be back on site!

Awe Inspiring Mountains. 6th July - Sangla to Sangla Khunda, 3350m

Setting out in the morning everyone was keen to get going. We headed first downhill through and out of the town and then uphill through grasslands towards the mountain ranges ahead. We spied more *Delphinium roylei* on an eroded bank as we headed uphill and continued on the road that was being constructed. We came to a field over a wall of showy pink *Pedicularis siphonantha*, the yellow *Potentilla argyrophylla* that Margaret had previously described, and the small white, yellow throated flowers of *Euphrasia himalayica*. *Pedicularis* was a new genus to me having never come into contact with any species before. It is a partially parasitic member of the Scrophulariaceae family and one that I was to become very familiar with over the coming days.

Various Lamiaceae family members peeked out from behind rocks but they were difficult to identify for sure. As we left the road and the solemn workers that were building it, with their own family members peeking out at our passing, we approached more level ground and I was excited to see a flowering clump of *Morina longifolia* (fig. 15 & 16), a plant I am familiar with from work. Its pink flower spikes were mainly on one side of the path that we walked along, the other side had much smaller plants with only the spiky foliage showing.

Passed dry stone walls, not yet above the tree line we continued our climb. Yellow *Corydalis govani* and *Oxyria digyna* (fig. 17) grew out of the holes in the walls whilst salamanders ran over them; it was almost, but not quite, like being in Yorkshire! It was over one such wall that we found a damp meadow full of a variety of species (fig. 18). A shallow dip in the meadow was full of the dense flower spikes of *Dactylorhiza hatagirea* and green/yellow *Herminium monorchis* (fig. 20). The latter being spotted by members of the British Orchid Council, otherwise they could well have been trodden on, being so tiny amongst the other plants. On a small mound, allowing adequate drainage, grew *Anemone rivularis*, *Phlomis bracteosa* (fig. 19) with small, wide purple spikes above large leaves (another plant to become a familiar companion), the already seen *Aquilegia pubiflora* (fig. 21), the now familiar *Pedicularis siphonantha* with its twirly nose, or what is botanically more correct “upper lip of corolla with a slender horn.”¹, and both red and yellow Potentillas made their presence known.

Narrow mountain streams trickled down the slopes providing necessary moisture to *Caltha palustris himalensis*. Upon seeing *Geranium wallichianum*, Margaret explained that it is the parent plant to most garden Geraniums, its single flower stem so much more delicate and refined than those in cultivation (fig. 22). We walked by the yellow form of *Anemone obtusiloba* and saw the tiny purple flowers of *Campanula modesta* almost hidden by blades of grass. We were very excited about our first sighting of *Meconopsis acutelata*, even if it was a scratty looking specimen, tucked into the rocks by a fast flowing stream and a little tricky to get to. These rocks also had *Thymus linearis* sprawled over them. A few sparse shrubs gave a little height; *Rosa macrophylla* and *Berberis lyceum*. A clump of papery flowered *Anaphalis nepalensis* var. *nepalensis* sat in the stream shingle alongside *Arenaria festucoides*, all of which we would see again.

After a good day botanising we sat eating biscuits, looking at the direction in which we had travelled, and we were filled with awe at the mountainous view (fig. 23); it was like looking at a painting and hard to comprehend the reality. I felt contented and very privileged at being chosen for the trip.

Naturally Terraced. 7th July - Sangla Khunda – Ranglati, 3700m

To assist our acclimatisation this was another relatively short day. We continued upwards along the northeast facing ridge seeing much of the same plants. In the morning a *Typhonium diversifolium* was spotted near a sea of *Arisaema jacquemontii*, this was the first time we had seen so many Arisaemas growing together. The Aroids were growing in quite an open spot but received a little shelter from a dry stone wall, close by was a *Podophyllum hexandrum* but we had missed its flowers. *Primula munroi*, with distinctive spoon shaped foliage, became a common sight beside rocky streams, proving difficult to photograph due to its long stem swaying in the breeze.

Meandering along I looked down at my feet to see that the green that we were walking upon was not grass but a mosaic of ground cover plants. *Sibbaldia cuneata*, *Fragaria nubicola*, *Lotus corniculatus*, and *Thymus linearis* covered the dry soil underfoot. In a moister patch was foliage of *Iris kemaonensis* (fig. 24) with just one large purple, blotchy flower amongst the group. I don't remember if I've ever seen a stemless Iris before, it was beautiful. We did find more in flower throughout the day.

¹ Polunin, O. & Stainton, A. (1984). *Flowers of the Himalayas*. Oxford: Oxford University Press.

Down by the Rukti Gad on our left a plant community of *Bistorta affinis*, *Sibbaldia cuneata*, and both Potentillas clung to a rock over the river, receiving spray from the tumbling water. The *Bistorta* would again be found frequently at higher altitudes.

The mountainside we walked along had been naturally terraced by the grazing animals that had long been coming to and fro, making walking easy for us. The terrace edges were spattered with a combination of the yellow and orange *Lotus corniculatus*, tiny blue flowers of *Gentiana carinata* and pink blooms of *Androsace sarmentosa* (fig. 28), making for a very pretty walk. The air was filled with the scent of *Thymus linearis* released when we brushed by. Examples of natural variation could be seen in *Gentiana carinata* with the occasional pink plant amid the blue (fig. 26 & 27).

The terrain remained similar as we ascended but new plants would pop up here and there. The pink flowers of *Geranium donianum* (fig. 29) could be seen but the area was still dominated by *G. wallichianum*. *Cyananthus lobatus*, an interesting blue Campanulaceae, with five perfect light blue petals and white hairs in the throat (fig. 30) proved another plant difficult to photograph. We saw one flowering stem of steely blue *Gentianella pendunculata* (fig. 31) but it did have a dozen or more buds waiting to burst. There were a few more nearby in the dry ground but they too were only in bud. I would have like to have seen more open as it was a very pretty flower. More pink *Androsace* were seen here and there and it became a bit of an issue trying to sort out exactly which species had been seen when completing the plant list at the end of the day, but we opted for *Androsace muscoidea*. Another new plant we saw sprawling on the ground was *Oxytropis mollis*. When not in flower I imagine that this would be easily walked by without giving it a glance but the large purple and white pea flowers stretched out on leaf stems begging for attention. We also began to see a lot of a purple flowered daisy, possibly *Aster diplostephioides* or *A. ledinii*. We were to continue seeing this over the coming days but without certainty as to which. I can find no descriptions of *A. ledinii* so will go with *A. diplostephioides*, although the description of a 'robust and handsome plant'² did not always apply.

Camp was recorded at 3811m but further exploration was had a little above camp in the rocky ground. An *Aquilegia fragans* (fig. 32) was growing, paler than *A. pubiflora* but larger, and we saw a *Meconopsis aculeata* with 5 open flowers along its spiky stem. This *Meconopsis* species has been the only one recorded by Henry and Margaret Taylor³ with a distribution from here heading west to Pakistan but is not found further east. The light began to fade and it was off back down for dinner.

Eye of the Tiger. 8th July - Acclimatisation and local botanising, 4000m

Having learnt early on that I had nothing to worry about regarding my fitness levels, I was able to just about keep up with Tim Lever, a previous 'Merliner' and alpine enthusiast. He took Adam Bowley, the other Merliner on this trip, and I further up the mountain slopes. Going higher than the others meant that we could cover more ground as a group and get a fuller picture of the flora in the region. With a slight difference in leg span between a 6ft 5" Tim and a 4ft 11" me, I did find the going quite tough, and I think it was probably at this point that the song 'Eye of the Tiger' popped into my head as my motivational tune, it stayed in my head onwards from here. Once up the steeper ground

² Ibid, page 183

³ www.meconopsisgroup.com Stevens, E. "The species of *Meconopsis*" The *Meconopsis* Group. 2004 – 2009. <http://www.meconopsis.org/species/aculeata/aculeata.html> (accessed 17 Sept. 2011)

we were rewarded with a number of plants we had not yet seen at lower altitudes. I particularly liked the chocolate colour pea flowers of *Thermopsis barbata* (fig. 33). There were a number of these plants just growing in one area, probably no more than 6m². They did not look typically alpine, being relatively large and dense perennials and with a large cluster of flowers above trifoliate hairy leaves. We were to find a few more clumps as we moved further along the higher ridge. Scrambling towards a large outcrop *Allium carolinianum* (fig. 34) lent forward away from the boulder and looked like flowering chives. Around the edges *Morina longifolia* was clustered and in the nooks and crannies of the rock we found more *Meconopsis aculeata* (fig. 35). *Lilium nanum*'s murky pink flower head grew alongside *Morina* seedlings, *Silene edgeworthii*, sprinklings of the tiny blue flowers of *Myosotis alpestris*, which we had seen lower down, and with a *Gymnadenia orchidis*, just coming into flower. We found our second Pedicularis species by the boulder edge, identified by Tim as *P. bicornuta* (fig. 36). The yellow spike this time matched the given description of a 'robust handsome plant'⁴.

We rejoined the others on the lower path and made our way to the first snowbridge to explore the northwest facing slopes on the other side of the river. In my naivety I presumed this would mean crossing a bridge of some sort over the snow, not realising that snowbridge meant a bridge made of snow. Once the snow melts accessibility to the other side becomes almost impossible but safely over the next challenge was negotiating a recent landslide. It was hard to know exactly how it should be navigated; the slide was just that, a sloping crevice of loose sand like particles and nowhere to get a good foothold. Trickily making our way across we were greeted with alpine shrubbery of *Cassiope fastigiata* and *Rhododendron anthopogon* var. *hypenanthum*. The delicate pale yellow clock- faced petals of this *Rhododendron* were being squashed by the rain. Above the shrub area a wall of rock rose into the sky; it needed exploring (fig. 37). Taking my lead again from Tim and Adam we went ever steeper. In the open *Anemone polyanthes* (white form) and *Doronicum falconeri* dotted the slope, but where the hillside met the vertical rock face *Cortusa brotheri* and *Bergenia ciliata* took refuge from the elements. We also saw our first *Primula obtusifolia*, with pink petals, white eye and broad farinose leaves and the unusual *Picrorhiza kurrooa*, its long stamens protruding from hairy petals (fig. 38).

As the rain began to pour and the mist closed in we decided to head down, this was easier said than done. Even with a closed umbrella in one hand and a walking pole in the other, trying to gain some stability, it was still very hard going on the knees. We were descending through the low growing *Rhododendrons* at a particularly acute angle, unable to see where we could put our feet. With knees, ankles, umbrella and pole going in all directions I came down on my bottom, a technique I would use frequently thereafter. We could hear other members of the group whistling below to indicate their presence and the theme tune in my head change from the upbeat 'Eye of the Tiger' to the more worrying '999' from the 1990's television series. At last I saw the bright red poncho of one of our group waiting below.

Relieved to be on flatter ground we soon discovered that this was going to be no easy walk to cross the Gaddi bridge that would take us back over the other side to the same camp. The lower 'path' was made up of small rocks with *Bergenia ciliata* growing amongst them, disguising large holes between. A concentrated effort was put into every footstep making the going slow. Before reaching

⁴ Polunin & Stainton (1984) op cit page 299

the Gaddi bridge we saw the tall purple flowers of *Polemonium caeruleum* var. *himalayanum*, a little unappreciated by a tired group.

The Gaddi bridge is a shepherd's bridge, used by them to move their flocks into the next valley. It was quite a surprise to see the 'bridge' for the first time. A long metal pole was placed across the two sides of the river, with silver birch branches resting upon it and the river's edge opposite, at a 45° angle. Holding the birch to the pole were flat stones from the area, increasing in size to create a walking platform held up by the pole and the branches (fig. 39). When I arrived some of the group had already made it across with the help of the crew, so although a little nervous I knew I could make it (fig. 40). Whilst we waited, those of us across offered encouragement to the next person tackling the bridge. With just a few more people to go, one member, reluctant to use the hand of the crew, lost his balance, and although he was alright, he sent the bridge tipping to its side and it had to be rebuilt. Tensions were high! After a long uphill struggle back to the campsite everyone was thoroughly exhausted.

The Cold Snow. 9th July - Walk to Rupin Pass, 4466m

It had been decided we'd split into two groups to tackle the Rupin pass. At 8:30am seven of us, able to keep up a fast pace, set off in the rain and the wind. Taking the same route as the day before, only now sticking to the lower path, we marched towards the pass, crossing several watercourses as we went. As we got closer, the cold from the unmelted snow really began to take hold and the rain drove hard at us. If we'd been able to look up, the rain not allowing us to do so, we would have seen sheets of *Androsace muscoidea* adorning the route. We came to a ridge and saw *Primula macrophylla* var. *moorcroftiana*, identified by thin pointy leaves (fig. 41). Satisfied that we had at least seen something we made the unanimous decision not to continue over the pass; it was just too cold and wet. Having nowhere to shelter for lunch from the harsh conditions we each took a potato in hand and headed back the way we had come to find the others receiving rest bite from the elements in a small cave. We arrived at our new camp at 2:30pm but had to wait for it to be erected as we were back earlier than expected (fig. 42). The main tent was put up for us all to sit in and we listened to the sound of falling rock from the other side of the valley. Tenzin said that this was the worst weather he had ever experienced on trek. That evening after everyone was dry and fed, we had cake for Hugette's birthday. Hugette was one of the seven of us to try to make the pass and although we did not make it, we did make 4466m, significant for Hugette, as it was her 66th birthday.

***Arnebia benthamii*. 10th July - Ranglati to Garwa Camp, 4020m**

Hearing that *Leontopodium himalayanum* had been seen around the campsite I was eager to see it, being a plant I knew! Adam and I bounded uphill to the edge of a small stream where it was sited, a little too quickly, for although I was having no problems with altitude sickness, hurtling up a mountainside at 8:00am, straight after breakfast, made me feel a little queasy.

The next part of the trek meant going back across the Gaddi bridge and further up into the opposite valley to take us over the Nalgan pass. The crew members were sent ahead of us to rebuild the bridge again, to make doubly sure no one was going to fall in. As we set off we saw a large pink flowering *Podophyllum hexandrum*, this time with a brown speckled variation on its leaves (fig. 43). It was sheltered under an angled boulder growing amongst smaller rocks where it would receive shade and protection.

After crossing the bridge we faced an area of huge vertical boulders, all stacked askew on top of one another, luckily there was an accessible path to the side. The precarious rocks created inlets for a number of elongated *Primula obtusifolia* (fig. 44). Both flower stem and foliage were longer than previously seen leading Margaret to wonder if they were a cross with *P. macrophylla*. The lower blocks were carpeted mainly with *Rheum moorcroftianum*, and the occasional *Cicerbita macrorhiza*.

After a short but steep climb the ground leveled out and we came across a small number of *Betula utilis* var. *jacquemontii* sprawling out horizontally over the east facing ridge and joined by the large leaved *Rhododendron campanulatum*. This must have been where the branches for the bridge had been obtained. The area of shrubbery was only small and we were soon back out and steadily climbing in the open. I spotted a lone purple *Anemone obtusiloba* at the side of the path and through blades of grass we spotted a small white *Aletris pauciflora* with tiny bell flowers. Covering the ground was a sea of woolly *Androsace muscoidea* (fig. 47), this time a more typical example of the species than the ones with longer stems we had previously see, with *Anaphalis nepalensis* var. *nepalensis* giving height to the scene. *Primula minutissima* (fig. 46) was found, a short mat-forming primula; pink with yellow-eyed flowers above tiny leaves, alongside the mat forming *Potentilla microphylla*.

Observing brown areas of recent snow melt Tim informed me that it can take about 4-5 weeks for seeds to germinate and the area to regenerate. The season for the flora is very short with snow still present in areas in July, as we were witnessing, and fresh snowfall coming in September.

After reaching camp Tim, Adam and I decided to explore the rocky terrain above, through his binoculars Tim spotted something interesting. With an object of purpose we ascended the increasing gradient, watching the Griffin vultures circling above our heads, until we came to a small watery trickle where a number of plants of the 'woolly candle'⁵ *Arnebia benthamii* were protruding from the slope (fig. 48). With soft furry leaves and a tall inflorescence made up of pink, purple and blue flowers this really was a star plant (fig. 49). One of my objectives for coming on the trip was to forge relationships with the plants seen, and now I will always think of *Arnebia benthamii* as mine, Tim's, and Adam's plant, for we were the only ones to see it. It is a rare plant, seed having been collected illegally for medicine, making the sighting all the more remarkable.

We headed smugly back down to enjoy the sun coming out and a rainbow stretching over the valley. As the night fell the sky became clear and the stars came out. It had been a perfect day.

⁵ Taylor, M & Taylor, H (1989). "Flowers of the Baspa Valley" *The Rock Garden* 104: p200

Primula Ledge. 11th July - Lower slopes of Nalgan pass, 4500m+

We split into 2 groups again, four of us in the faster group (fig. 52) with one crew member to explore the higher slopes leading to the Nalgan pass. Crossing areas of snow and recent snowmelt we saw the yellow flowers of *Oxygraphis polypetala*, and *Trollius acaulis* contrasting with the brown soggy earth (fig. 51). Tim identified another Pedicularis, *P. cheilanthifolia*, with short deep pink spires growing in carpets of *Sibbaldia purpurea* and *Androsace muscoidea*. Amongst large rocks the protective puffy bracts of *Saussurea obvallata* (fig. 53) provided a delightful contrast to the other tiny plants around us, a highlight of the trip. As we headed down to meet the rest of the group we found them frantically photographing the only Fritillaria we had seen, the yellow green *Fritillaria roylei* 'Nalgan Dwarf' (fig. 54), in amongst the grass.

On reaching the pass we climbed to a rocky outcrop that we named 'Primula Ledge'. The wet ledge consisted of a community of Primula species growing in shade. The community was made up of *Primula elliptica* (fig. 56) with a distinctive yellow eye and toothed foliage, *P. macrophylla* var. *moorcroftiana*, with a white eye and long thin foliage, someone else spotted the flowerless stems of *P. minutissima* and the tiny leaves of *P. reptans* (fig. 57), and again here was *P. obtusifolia*. My head was all a swirl with Primula identification and I don't think I'll ever look at a Primula in quite the same way again. Margaret informed us that it was very rare to see this many Primula species growing side by side at the same time.

Back down the slope more *Saussurea obvallata* (fig. 58) stuck out from long since fallen rocks. We walked back over the scree following the line of snow and took a lower path back to camp.

Snow and Scree. 12th July - Walk to Nalgan Pass, 4020m+

The fast group went on ahead to tackle the Nalgan Pass. It was a sunny day and the charge straight after breakfast made me feel queasy once more, I was wondering if I really deserved my place in this faster group. Yellow *Primula stewartii* sat with its feet in the fast flowing rocky mountain stream, which I had begun retching over, and scattered all about were more *Saussurea obvallata*.

Although I soon recovered, trudging through snowfields and clambering over scree was extremely hard work. With a short leg span and a lack of confidence I found it difficult hopping from boulder to boulder and had to be led by hand by our guide, Nawang, much to the amusement of the others. Henry Taylor described this area as 'an evil boulder field'⁶ (fig. 60) which I think sums it up perfectly. Where the snow and the scree meet placing your foot becomes treacherous, as the snow can no longer take the weight here. After misplacing my footing and cracking my knee on a rock I realised I had reached my limits. The pass ahead was a concave wall of snow (fig. 59); there was no getting over it, so I found a suitable outcrop where I could rest, whilst Tim and Adam gained higher ground on the mobile scree nearby. Whilst waiting for them I potted around finding the small hairy domes of *Saussurea gossypiphora*, pinky purple *Corydalis meifolia* var. *violacea*, and what I took to be the new buds of *Oxygraphis polypetala* just emerging from the edge of the snow (fig. 61). I watched as the clouds continually flowed over the pass, one minute it was a cold eerie place, the next it was a clear blue sky full of sunshine. Tim and Adam returned within an hour and down below we could see the rest of the group slowly making their way over the snowfields and scree (fig. 62). Like a mountain Indian Jones (we sang the theme tune as we watched him go) Tim made his way

⁶Ibid, page 206

back down and over to them to let them know that the pass was actually impassable, and then back up to join us to relay the decision that we'd all reconvene and botanise lower down, he was barely out of breath.

Back over the snow and scree, still holding Nawang's hand we met the others where we discovered a colony of *Androsace delavayi* happily softening the edges of the rocks. It was everywhere but could have so easily been missed in the expanse of the valley. Poking through the white flowered cushions were more *Pedicularis cheilanthifolia* and protruding though another patch, a *Saussurea gossypiphora* (fig. 63 & 64).

With an easier walk back, only having to avoid the Yaks, David thought he could see *Paraquilegia anemonoides* high on the ridge opposite through his binoculars. It was a plant I wanted to see as we have a very small specimen at work but which isn't big enough to flower. I could not tell if it was there or not so hoped we'd come across it again soon.

Back at camp firewood had been collected and a shower tent had been erected. With a bucket of hot water I had my first 'shower' since leaving Shimla, it was a glorious treat.

Downhill. 13th July - Back to Sangla, 2700m

Having spent time slowly acclimatising on the way up, now it was just a day's walk straight back downhill to Sangla, a distance of 18km.

As we passed the same areas a week later more things had come into flower. A small number of *Pedicularis bicornuta* we had tried to look at previously, but were hindered by a tractor working on the new road, had now become a sea of yellow. No doubt there would have been more if the hillside had not been sliced into for the road. The road was being created as we had walked upon it and now its length had been extended. We were witnessing habitat destruction and after spending time in tranquil isolation with these plants it was saddening to see.

The pale yellow nodding bells of *Codonopsis rotundifolia* were almost hidden by ferns, *Pedicularis siphonantha* and *P. bicornuta*, near to the damp meadow we had previously explored. We left a marker of its whereabouts for the rest of the group but they still had to call out to us to help locate it. Making a nice change we came across pink flowered *Potentilla nepalensis* in amongst the grass.

As we descended, approximately 1300m, we could feel the change in temperature. Muscles that had not been used going up were now getting a thorough work out and this was the only time I gained a blister. With hours going downhill the last stretch in the town was uphill to the campsite, having no idea how far we had come from the locals laughed at our exhaustion. That evening we said goodbye to the ponymen and horses of Sangla for we would be meeting another group to take us on our second trek.

Into the Cloud Forest. 14th July - Drive from Sangla to Khanag, 2600m

The taxis arrived in the morning, camp was dismantled and luggage packed. We were driving back down the dusty road passed the hydro-electric scheme along the Sutlej River, crossing it and heading north. There was again a contrast in temperature to the temperate mountains we had come from,

and the passing flora was lush and tropical. Agaves hung to the mountain ridges but it was a relief to escape the heat and head into the cloud forest of Khanag.

The vehicles could not make the last turning into camp due to a landslide from a heavy downpour just before we arrived. Leaving the vehicles at the side of the road we carried our luggage over muddy ground to the opening in the forest before returning to help carry chairs and equipment. The air was refreshingly misty and damp, and the ground under foot was spongy and sodden. Taking a walk alone I found many species of mushrooms growing in the undergrowth and on bark (fig. 66 & 67). *Roscoea alpina* and *Arisaema jacquemontii* were growing in the shade of *Pinus roxburghii* and *P. wallichiana* amongst others. As the light began to fade and the canopy closed in the sound of insects filled the air.

Off to Manali. 15th July - Drive from Khanag to Manali, 2000m

On leaving the forest campsite we spied a small patch of *Iris milesii* (fig. 68) in a small moist clearing that we had all walked past the day before; it was easy to miss with only one in flower. Rock fall had been heard in the night so our initial route was slightly altered and we took a higher road to avoid any blockages further down. At the Jalhori Pass (3100m) we left the vehicles to walk down the road to scrutinise the wet rocks of the high road side. Nestled in amongst moss, lichens and ferns was the one sided purple flowering spike of *Wulfenia amherstiana*. The other side of the road sloped downwards with a forest of conifers, broadleaf trees and epiphytes. The damp misty air gave the trees an ethereal quality and an atmosphere far removed from the open mountains of previous days (fig. 69 & 70). Both *Arisaema propinquum* and *A. jacquemontii* were thriving in these conditions and *Anemone rivularis* was in abundance, its white flower heads back to a larger size after being reduced at higher altitudes. We saw another swathe of *Iris milesii*, with more of its lilac flowers on show before being collected further down the pass. Pulling over again we examined the lush plants growing from a cliff edge just outside of a town (fig. 71). Again the rocks were wet here but there was less shade, allowing an abundance of species to thrive. Deep purple tubular flowers of *Strobilanthes urticifolius* clambered over *Sarcococca* sp., Ginger, *Zingiber officinale*, sprouted from the edge as a centre piece (fig. 72), a delicate white *Thalictrum* sp. twinkled above *Bistorta runcinata*, whilst *Parochetus communis* found room to display its bright blue pea flowers along the bottom.

Heading north we arrived in the tourist town of Manali by late afternoon. We had time to have a look around and hand in our, much in need of doing, laundry before dinner and bed in the Mayflower Hotel.

Pile of Corpses. 16th July - Lower ridges of Rohtang Pass, 3980m

The comforts of the hotel were short lived when my alarm clock went off at 5:30am for the 7:00am start; it was necessary to set out early to tackle the Rohtang Pass. This translates in Tibetan as 'pile of corpses' and one of our group had read a description that the road up to the pass was treacherous. Looking at various websites now, the traffic jams we were to encounter were inevitable.

The area is popular with tourists from India who come to ski. Along the windy road stall after stall of 1980s ski suits are available to hire, and although the stalls were numbered they weren't in numerical order, an interesting yet puzzling sight.

Our speedy start gave us time to hop out of the cars and see the tall spikes of yellow stars of *Ligularia fischeri* behind a low bridge. Further along we saw a number of white bells of *Primula reidii*, high up under an overhang, proving very difficult to photograph, and *Androsace sarmentosa* spread its red stolons over the rocks.

We stopped at a clearing before crossing the bridge which would take us up to the Rohtang Pass where there were a number of parked cars, a few hawkers, one with a giant rabbit in his arms, and a few food stalls. We were to wait here whilst the drivers went to find out if we could travel any further, although it was not the intention to go over the pass, whilst we dedicatedly botanised the region just above the 'car park'.

Above the litter line there were many plants of interest. As well as seeing different shades of *Meconopsis aculeata* growing in close proximity, there was a solitary tall dark purple eyeless *Primula macrophylla*, and I was drawn to the bright pink flowers of *Rhododendron lepidotum* spilling over a ridge (fig. 75). Following a watercourse to gain height, blue *Corydalis cashmeriana* and *Corthusa brotheri* (fig. 74) were seen poking out between ferns, and *Primula denticulata* sat happily by the flowing water. We had been given a time limit to explore, but what took a few minutes to get up, took longer to get down. Walking back down the watercourse seemed like the quickest option as on both sides was thick fern foliage with little to act as a foothold. On seeing a couple of inexperienced westerners, Adam and I, making a meal out of a mountain, a shepherd kindly pointed out an easier, less wet route a couple of yards away. We were grateful, yet slightly embarrassed.

The drivers brought news of a landslide on the road up to the Rohtang Pass so we weren't going any further. After lunch we continued to explore the same ridge a little more, seeing our first *Primula rosea* sat in the open, not requiring the shade necessitated by some of the other Primulas we had already seen. *Gymnadenia orchidis* was open this time, displaying pale purple flowers on its long stem. We saw *Potentilla argrophylla* var. *atrosanguinea* growing with *Phlomis bracteosa*, the red and purple combination would be seen again but here the spikes of Phlomis were shorter than those at lower altitudes.

The rain began to pour and we were all in agreement to head back to the hotel.

Traffic Jam. 17th July - Over the Rohtang Pass to Chatru Valley, 3350m

Yesterday's situation had been assessed and it was decided that in order to get us over the pass a 4:00am start in the cars would be necessary. We made quick time past the ski suit stalls and at 6:00am we came to an abrupt standstill. The rumour on the Rohtang was that there had been another landslide overnight. Still half asleep we stayed in the vehicles, occasionally moving a couple of inches forward. Outside the road surface was actually a thick gloopy mud causing the vehicles to slide forward rather than drive forward when the time came. Further up the hill in the traffic jam the edge of the road gave way under an unsuspecting motorcyclist, luckily he was unharmed but the Tibetan translation was looking particularly accurate. A plan was hatched by our guides to leave the vehicles and walk over the pass, something that was within our capabilities. Buses coming from the

other side in Chattru would be sent to collect our luggage and then us. This was going to be achieved by the crew carrying our main luggage by hand through the muddy slop, uphill to meet the bus. I could not believe the lengths they would go to.

We bundled our way up the grassy bank until we got to the road higher up. Trudging through the mud we were commended by fellow travelers for our prepared clothing; we weren't going to be losing our footwear in the sticky mud as clearly others had done. We battled our way though, passing people trying to fix the road and those trying to navigate it (fig. 77). The long line of stationary carrier lorries added a touch of glamour to the otherwise grim scene with their bright colours and decorations (fig. 76).

On the bank edge above us I spotted something we had not seen before, the deep purple blue spires of *Lagotis cashmeriana* (fig. 78). With heads bowed some of the group had missed it, concentrating on their footing, it was not often I found something before anyone else making the slog through the mud quite rewarding for me!

As we continued up the winding road we walked by walls of unmelted snow still clinging to the sides of the mountain (fig. 79). Approaching the open pass the Indian Army went by in trucks, each soldier gave us a smile and a wave. Thinking they were on their way to help disperse the traffic jam we laughed when they simply joined the end of the line and took pictures of the chaos.

The pass itself was strewn with litter and as this was a busy route where people found themselves stuck for days with no ablutions, it was not always a pretty sight. Nevertheless bright and cheery *Cremanthodium ellisii* peeked out from between large rocks and we found a colony of *Dracocephalum wallichii* carpeting a rock that had to be hauled on to in order for the lilac flowers to be seen. A small number of *Primula macrophylla* var. *moorcroftiana* hid in a damp corner amongst a carpet of moss whilst *Meconopsis aculeata* and *Bistorta affinis* gave splashes of blue and pink to lead us further into the pass proper. Growing in the silt around the stepping stone rocks was with another patch of *Primula macrophylla* var. *moorcroftiana*, this time out in the open ground (fig. 80). *Pedicularis oederi* stood out with its lemon yellow flowers and red tip on its upper lip (fig. 81). It grew here with *Androsace sempervivoides* and *Potentilla argyrophylla*. We dispersed amongst the ridges of the pass and as I walked alone I found another clump of the white flowered *Androsace delavayi*, hugging the edges of a natural rockery with more *Pedicularis oederi* and the yellow flowers of *Corydalis meifolia*, identified by its blue-grey foliage.

David rounded everyone together for it was uncertain whether our luggage and equipment would be making it. As we reconvened on the roadside few vehicles were passing us, a sign that the road was still some way from being usable. The few that did pass gave us a glimmer of hope until we met a gentleman who said that his coach had been trying to get through the traffic jam for 44 hours! His other passengers were making their thanks at the prayer flags at the top of the pass (fig. 82).

Sitting at a roadside stall, the sunny sky turning a little misty, we waited with apprehension for news of our equipment, without it we would have to head back into Manali. David received a phone call; the crew was on its way with two buses and our entire luggage, they'd be with us in half an hour! I still have no idea how they achieved this, there was only one road, with traffic backed up in both directions. These guys were good.

We cheered and boarded the buses for a very welcome, squashy, and bumpy ride into Chattru. A few hours later we came into camp in the Chattru valley and immediately went exploring. The ground was dry and sandy, having an almost beachy feel next to the gushing river, with *Thymus linearis* as the main ground cover; a white form was spotted growing amongst the usual pink, and alongside it grew *Astragalus rhizanthus*. *Rosularia rosulata* also grew happily here with succulent foliage and tall white flower spikes. A little higher up, looking down at the campsite *Dianthus angulatus* was growing alone and proved difficult to photograph in the failing light.

I felt euphoric as I looked up at the new mountain range before us, reflecting on the day's achievements of the crew, and of the group's achievements from the completed trek.

Meadow. 18th July - Chattru to Chedagaru, 3850m

The Chattru valley lies southeast in a rain shadow and the difference in temperature was noticeable immediately. Horizontal ground allowed a strolling pace as we unpeeled the layers we had just adorned. The rocks we were walking upon began to get larger as we came to our first snowbridge and as the angle was relatively steep we were each guided by hand to cross one at a time. Our guides would simply skip back across the snow to help the next in line, whilst we took tentative baby steps.

We walked across stabilised scree to our next challenge of a long steep vertical path upwards. Any remaining breath we had left at the top was soon taken away by the view of snow peaked summits in the distance. Our new ponies and ponymen went ahead of us and we followed their 'trail' thereafter. Meadow had established in the stabilised ground and as I rounded a bend next to a watercourse I was confronted with the most magnificent display dominated by *Bistorta affinis*, *Pedicularis rhinanthoides* and *P. siphonantha*, with *Potentilla argyrophylla* through to *P. atrosanguinea*, splashed throughout with purple *Geranium wallichianum* and *Phlomis bracteosa*, and all highlighted with a delicate white Apicaceae. It was rich with colour, and a combination only achievable by nature. I was glad I was wearing sunglasses for I was reduced to tears (fig. 83).

The plants of the meadow continued to grace our path but in less abundance as we headed further into the valley. At a high point we found a solitary group of *Anaphalis nepalensis* var. *nepalensis* not far from a north facing bank covered with *Cassiope fastigiata*.

Coming out into an open clearing the ground was boggy with mountain streams streaking through. Islands of *Bistorta affinis* and *Pedicularis bicornuta* sat amongst the streams (fig. 84). Had we been a few days earlier we would have witnessed a spectacular display of *Primula rosea* covering almost the whole boggy basin (fig. 85). As it was we were a little late and it was mostly only the seed heads nodding in the wind. I found the fluffy silver foliage of *Waldheimia tomentosa* (fig. 86) sitting in a dry patch amongst small rocks near a stream but with no flower.

Our campsite was supposed to be here but the ponymen had crossed the river and gone on ahead. It was late in the day and the snowmelt river was high and flowing fast. David was reluctant to take the older members of the group across this or a snowbridge further down so we waited for the camp to get dismantled and brought back. As the wind was picking up, the light fading, and the chance of rock fall a possibility, we were instructed to shelter behind large rocks standing singly in the clearing (fig. 87). With umbrellas as windshields and emergency silver blankets strewn over us we huddled

together and waited for the equipment to arrive before helping to set up camp in the dark. It had been another long eventful day.

Paraquilegia. 19th July - Chedagaru to Balugere, 4268m

Yesterday a couple in our group had reported seeing *Paraquilegia anemonoides* and there was a report of the *Waldheimia* in flower. Going back the way we had come to cross the snowbridge a few of us explored the higher crags. We could not find the *Paraquilegia* but did see the daisy like flowers of the *Waldheimia*. On the path below David was frantically calling us down; we had to cross the snowbridge quickly as there was a hair line crack in it, it was going to go at any moment. It seemed never too early for a spot of panic and adventure on this trip!

Once safely over *Primula macrophylla* var. *moorcroftiana* was again spotted, sitting alongside *Ranunculus tricuspis* in the damp ground. *Primula minutissima* carpeted the floor, with large flowers above tiny leaves it looked very *Androsace* like. Steps were shoveled out of the next snowbridge for our safe passage and we headed upwards with the line of snow on our right to the Hampta Pass. We saw combinations of *Gentiana carinata*, *Androsace sempervivoides* and *Salix calyculata*. *Caltha palustris* var. *himalensis* found its usual spot on rocky streams and the purple form of *Anemone obtusiloba* graced us with its presence once again. The Hampta Pass was a drop on one side and a wall of rock on the other, scattered throughout were *Cremanthodium ellisii* and *Meconopsis aculeata* (fig. 88). Henry Taylor had wondered on seeing *M. aculeata* growing on dry stony mica-schist why we think of all *Meconopsis* as peat bed plants⁷. This was a good point as all the specimens we had seen had been in the cracks of mica-schist. The pass had offerings on its rocky ledges; traveler's names were inscribed on smaller rocks, and David and Tenzin erected a prayer flag, it was a poignant moment. We crossed down the other side to face a large snowfield, sloping acutely downhill (fig. 89), prompting more shoveling of steps to make traversing easier. Resting on a ridge down the centre of the valley David scanned a spectacular rock face opposite (fig. 90 & 91) through his binoculars and found the elusive *Paraquilegia anemonoides*. Having come so far I was not going to let this opportunity pass, although the rock face ahead did fill me with fear. The usual threesome, plus Nawang to hold my hand, set off back across the snow to make the treacherous route up the steep rock face that was probably not far off a 90° angle. Making it to the first ridge we were able to take photographs of the clumps of *Paraquilegia* closest to us, although they were displaying only a few purple, yellow centered flowers. This high ridge was also home to the inflated flowers of *Silene setisperma* and *Swertia petiolata*. We ventured further up, leaving a good distance behind each of us to make way for the falling loose shards of rock. A profusely flowering *Paraquilegia* was our goal, but still we were only able to reach it properly from below (fig. 92). When the Taylor's found *Paraquilegia* in fertile soil in this region they took back with them a sample of rock to be studied. It was sandstone with no lime⁸, so I assumed this cliff face was the same. Descending with the utmost cautious, pleased with our success, we discovered that the others too had found the *Paraquilegia* growing in an easy to access crack along the cliff face, not as grand as our specimen however (fig. 94).

⁷ Taylor, M & Taylor, H (1989). "The Blue Corydalis" *The Rock Garden* 83: p143

⁸ Taylor, M & Taylor, H (1998). "New Flowers in the N W Himalaya", *The Rock Garden* 101: p378

By now I'd still not found my snow feet, and once I lost my footing, the slide down was somewhat quicker than my painstakingly slow steps. With one last wide river crossing to negotiate we headed down to camp. Two members of the crew brought juice out to us; I think they must have been getting tired of waiting for our arrival.

Last Camp. 20th July - Balugere to Panderopa 2800m

With a relaxed start to the morning we continued gently downhill on a route popular with shepherds and western trekkers. We found an *Epilobium latifolium* with its large pink flowers in moist ground and had a pleasant picturesque walk through all forms of *Potentilla*, *Phlomis* and *Anaphalis*. I saw a larger clump of *Leontopodium himalayanum* (fig. 95) than I had seen all trip, sitting upon a rock at waist height basking in the sunlight. A field of Himalayan Balsam, *Impatiens glandulifera*, looked pretty in its natural habitat amongst *Potentilla* and *Phlomis* (fig 96). Bir Singh, our guide, constructed a stone bridge for us to cross a waterfall, never ceasing to make our lives easier. Before stopping for lunch we found a thin damp dark ledge containing more *Primula reidii* (fig. 97). Returning to this higher ground after eating we scrambled upon the rocks to take a look in the cracks and crevices of a shallow cave above but found nothing new. The tried and tested technique of using my backside came in useful again on the way back down.

With a drop down to a waterfall on our left we meandered along the cliff ridge taking in a small white *Campanula pallid*, what we took to be a clump of *Silene gonosperma* var. *himalayensis* and the unopened flower spikes of *Morina longifolia*. Across the other side of the valley we could see the density of trees thicken up as we descended. Another quick scramble up into higher rocks resulted in finding more *Primula reidii* and *Roscoea alpina*, and a further struggle to get down again!

We reached the camp at around 3:30pm to enjoy biscuits and cake, and reflect on all we had seen. This was to be our last camp meal of curried vegetables, curried tofu, curried paneer, dhal and rice, all finished off with a cake of course!

Goodbye to the Crew. 21st July - Walk out of Panderopa, drive to Manali

It was with a heavy heart that I had my last bed tea and washing water. We said an emotional farewell to the amazing crew who had done so much for us. Before leaving the campsite we ventured onto the crags above camp and onto a ridge to find the yellow green flowers of *Malaxis muscifera* (fig. 98) and *Herminium monorchis*, both difficult to find amongst *Morina longifolia*, *Cotoneaster microphylla*, *Potentilla* and bracken.

We had one last precarious river crossing, balancing on felled trees to reach the other side. The scenery became forest, with *Quercus* and *Abies* species, and *Arisaema propinquum* re-emerged. We came out of the forest and onto the road where our drivers and taxis were waiting to take us back to Manali.

It was the end of the second trek. Later that evening, before dinner at the hotel we were all invited, and taken to Tenzin's house where we met some of his family, drank Yak butter tea and given gifts of t-shirts and socks.

Taj Mahal and Goodbye to India. 22nd - 24rd July - Manali to Delhi, Delhi to London

We had to be up at 3:30am for the long drive out through Manali and back to Delhi, a distance of just under 600km. The twists and turns of the initial journey did not particularly agree with me so after a 15 hour journey on the coach I was glad to get to bed in the Ashok Hotel.

After breakfast the next day it was back on the coach for our six hour journey to the Taj Mahal (fig. 100), back on the Delhi roads the beeping and traffic dodging soon became the norm again. As we approached, the monumental structure could be seen on the skyline. Inside the Taj Mahal the small interior chamber housing two tombs was packed with tourist and people lay in corridors for shade from the heat. As gardeners Adam and I stopped to watch the lawns being mown with a push pull mower (fig. 101).

We left for the airport on Sunday morning, saying our goodbyes on the other side at Heathrow. The worries I had set out with had long been left behind, and I returned instead with inspiration, admiration and amazing memories of plants, people and places.

Comments

I feel I have gained an understanding of alpine habitats by seeing firsthand the effects of altitude, temperature, moisture availability, and aspect on plant communities and colonies. I saw the importance of boulders on open mountainsides and cracks in rock faces, as plant niches for shade loving species, and when walking by snowwalls, metres high, I saw just how thick the insulation of snow needs to be for the plants to survive. I now have an appreciation for the difficulties of botanising in the field, with so much natural variation in size and colour, and also the effects of crossbreeding, identification can be problematic. My plant knowledge increased as I became familiar with new plants and species, and my botanising skills improved along the way.

I still have a lot to learn about geology, so as to be able to better describe the rock formations we saw, and understand their effects on the plants that grew within them, and I still have a lot to learn about photography, both things that can be worked upon on another trip!

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In At the Deep End

Three Weeks in the Indian Himalayas

Photographs



Figure 1 *Potentilla argyrophylla*.

Figure 2 Colour variation in *Potentilla argyrophylla*.



Figure 3 *Potentilla* in orange.



Figure 4 *Potentilla argyrophylla* var. *atrosanguinea*.





Figure 5 *Arisaema propinquum*, on route to Sarahan Camp.



Figure 6 *Arisaema tortuosum*.



Figure 7 *Roscoea alpina* on route to Sarahan camp.



Figure 8 *Anemone rivularis*, with purple underside.



Figure 9 *Epipactis helleborine*, on route to Sarahan.



Figure 10 Our first campsite at Sangla.

Figure 11 Mountain view from camp.



Figure 12 *Delphinium roylei* at Sangla camp.





Figure 13 *Arisaema jacquemontii* at Sangla camp.

Figure 14 A large beautiful bug on my tent, covered in morning dew.





Figure 15 *Morina longifolia* adorning the route to Sangla Khunda.



Figure 16 *Morina longifolia* detail.



Figure 17 *Oxyria digyna* growing out of a dry stone wall.



Figure 18 Botanising at the damp meadow.



Figure 19 *Phlomis bracteosa* with *Anemone rivularis*.



Figure 20 *Herminium monorchis* in the damp meadow.



Figure 21 *Aquilegia pubiflora* in the damp meadow.



Figure 22 *Geranium wallichianum*, on way to Sangla Khunda.

Figure 23 The view from camp.
(Photograph taken by Adam Bowley).



Figure 24 *Iris kemaonensis* on way to Ranglati.



Figure 25 Botanising 'Jack Vettriano' style.



Figure 26 Blue *Gentiana carinata*.



Figure 27 The pink form of *Gentiana carinata*.



Figure 28 *Androsace sarmentosa*, on way to Ranglati camp.

Figure 29 *Geranium donianum*.



Figure 30 *Cyananthus lobatus*.

Figure 31 *Gentianella pendunculata*.



Figure 32 *Aquilegia fragans* above the campsite at Ranglati.



Figure 33 The intense colour of *Thermopsis barbata*.

Figure 34 Pink heads of *Allium carolinianum*.





Figure 35
Meconopsis
aculeata,
above
Ranglati
camp.



Figure 36 *Pedicularis bicornuta* with *Cassiope fastigiata* in the background.



Figure 37 Habitat above the area *Cassiope fastigiata* and *Rhododendron anthopogon* var. *hypananthum*.



Figure 38 The long stamens of *Picrorhiza kurroa*.



Figure 39 The Gaddi bridge before it needed to be rebuilt.



Figure 40 Across safely, thanks to Bir Singh. (Photograph taken by Sheena Hesketh).



Figure 41 *Primula macrophylla* var. *moorcroftiana* at 4466m.



Figure 42 Waiting for camp to be erected after returning early due to the weather conditions .

Figure 43 *Podophyllum hexandrum* displaying brown markings and its pink flower.





Figure 44 *Primula obtusifolia*, taller than we had previously seen.

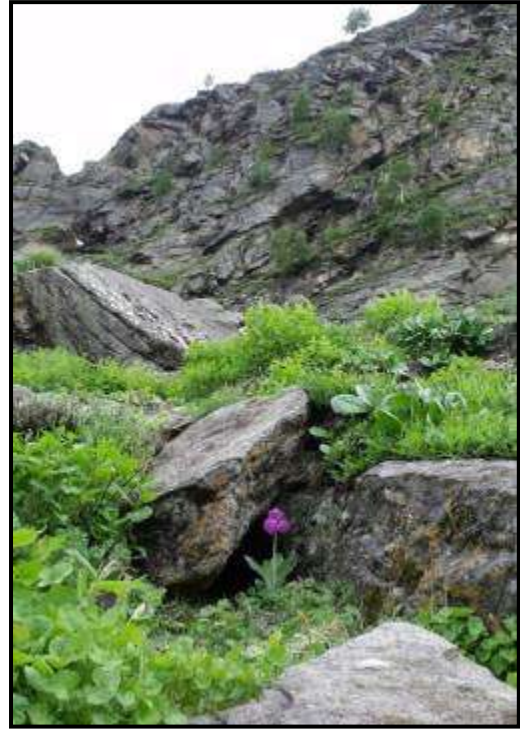


Figure 45 Habitat of *Primula obtusifolia*.



Figure 47 The pink carpet of *Androsace muscoidea*.



Figure 46 *Primula minutissima* on way to Garwa camp.



Figure 48 The 'woolly candle' *Arnebia benthamii*.



Figure 49 *Arnebia benthamii* detail.



Figure 50 *Arnebia* habitat with *Pedicularis bicornuta*, demonstrating the gradient.



Figure 51 Area of recent snow melt with *Oxygraphis polypetala* and *Trollius acaulis*.

Figure 52 The Fast Group.



Figure 53 The distinct bracts of *Saussurea obvallata*.



Figure 54 *Fritillaria roylei* 'Nalgan Dwarf'.



Figure 55 *Primula reptans* on 'Primula Ledge'.

Figure 56 *Primula elliptica* on 'Primula Ledge'.

Figure 57 A section of 'Primula Ledge'.





Figure 58 View towards Nalgan Pass with *Saussurea obvallata* in the foreground.

Figure 59 The wall of snow at the Nalgan Pass.



Figure 60 Looking back at the evil boulder field we had just crossed.



Figure 61 Emerging *Oxygraphis polypetala* from the melting snow.



Figure 62 The rest of the group making their way over.



Figure 63 *Pedicularis cheilanthifolia* and *Androsace delavayi*.

Figure 64 *Androsace delavayi* and *Saussurea gossypiphora*.



Figure 65 *Codonopsis rotundifolia* seen on the way back down.



Figure 66 Fungus of the cloud forest.

Figure 67 Fungus with *Arisaema* sp. foliage.



Figure 68 The delicate flower of *Iris milesii*.



Figure 69
A tree shaggy with epiphytes along the Jalhori Pass.



Figure 70
The ethereal light of the Jalhori Pass.



Figure 71 The roadside cliff containing many plants at the bottom of the Jalhori Pass road.

Figure 72 *Zingiber officinale*.





Figure 73 *Rhododendron lepidotum*.



Figure 74 *Cortusa brotheri* near the Rohtang Pass.

Figure 75 *Primula denticulata*.



Figure 76 Vehicles on the Rohtang.





Figure 77 The group stoically trudging through the mud.



Figure 78 *Lagotis cashmeriana* on the Rohtang.

Figure 79 The wall of unmelted snow and me. (Photograph taken by Adam Bowley).





Figure 80 *Primula macrophylla* var. *moorcroftiana* in the silt above the landslide road.



Figure 81 *Pedicularis oederi* at the Rohtang Pass.



Figure 82 Prayer flags at the Rohtang Pass.



Figure 83 The meadow of *Bistorta affinis* and orange *Potentilla argyrophylla*.



Figure 84 *Bistorta affinis* with *Pedicularis bicornuta*.



Figure 85 The boggy clearing where we saw *Primula rosea* seed heads.



Figure 86 The unopened flower buds of *Waldheimia tomentosa*.



Figure 87 The large rocks acted as shelter whilst we waited for camp to return.



Figure 88 Natural colour variation in *Meconopsis aculeata* at the Hampta Pass.



Figure 89 The snowfield just over the Hampta Pass.



Figure 90 The rock face home to *Paraquilegia anemonoides*.



Figure 91 Detail of the rock face.



Figure 92 *Paraquilegia anemonoides* with *Cremanthodium ellisii*.



Figure 93 *Cremanthodium ellisii* clinging to the cliff face.



Figure 94 An easier to access *Paraquilegia anemonoides*.



Figure 95 *Leontopodium himalayanum* seen towards Panderopa.



Figure 96 *Impatiens glandulifera* in its natural habitat.

Figure 97 The crack through the middle of this rock face housed *Primula reidii*.

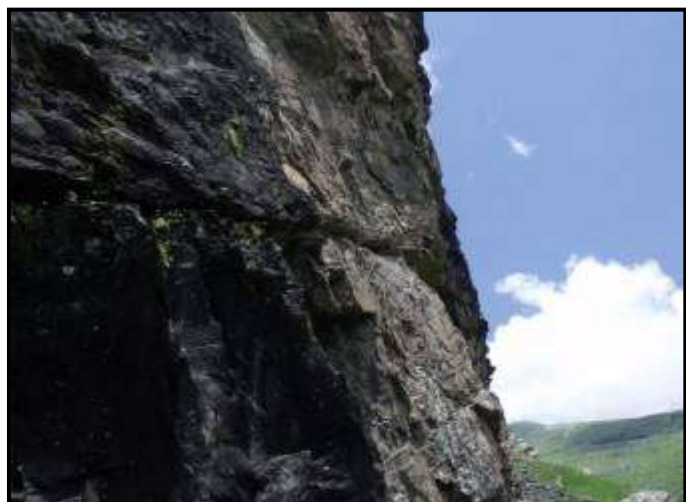




Figure 98 *Malaxis muscifera* above the last camp site.



Figure 99 David, Tenzin and Margaret.

Figure 100 The Taj Mahal.





Figure 101 Mowing the lawns.

Figure 102 Detail of the Taj Mahal.

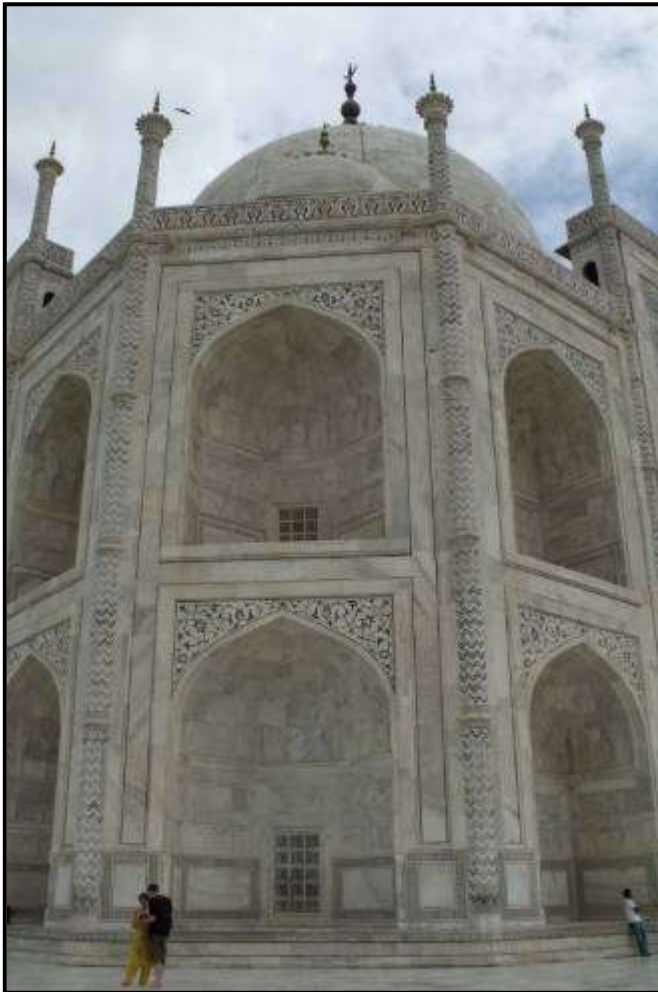




Figure 103 The route of the first trek, taken from Wikimapia
<http://wikimapia.org/#lat=31.3996562&lon=78.2278061&z=12&l=0&m=b> (accessed 22 October)

Figure 104 The route of the second trek, taken from Wikimapia
<http://wikimapia.org/#lat=32.3062864&lon=77.2548294&z=11&l=0&m=b> (accessed 22 October)

