

International Rock Gardener

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Each year the Scottish Rock Garden Club is fortunate to be able to award grant aid for students of horticulture or botany to aid them in their college or university costs and also gives grants for Exploration projects. You can find all details [here](#) on the website. The SRGC [offers](#) what we believe to be a really affordable rate of e-subscription to the Club, which gives online access to the twice yearly journal, The Rock Garden, as well as to the Seed Exchange for only £10 per annum. For young people under 18 years of age, interested in rock garden and alpine plants, there is also the option of a postal membership to the Club for a mere £3 per annum. The SRGC believes in positive action to encourage and assist access to study and membership alike.

Cover photo: Interior of flower spike of *Rheum nobile* by Elspeth Mackintosh.

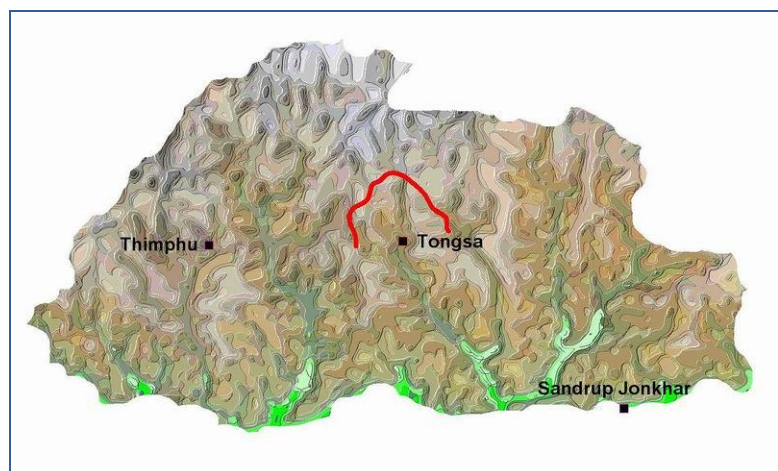
---Learning from the mountains---

An Expedition to Bhutan text and photos Elspeth Mackintosh

This particular account of our 2010 Bhutanese expedition is offered most gratefully to members of the SRGC, whose financial support helped make my own participation possible. This article was first published in "The Rock Garden", journal of SRGC.

The eastern Himalayas have long been considered critically important in terms of global biological diversity and Bhutan, because of its global isolation and the inaccessible nature of much of the country, remains a reserve of an astonishing array of plants. With habitats varying from tropical to alpine, this small country is home to some 5000 plant species including 600 orchids and 46 rhododendrons. Few botanists have visited although the legendary Frank Ludlow & George Sherriff made seven major expeditions into Himalayan Bhutan between 1933 and 1949. They collected large numbers of herbarium specimens and seed collections and later described many new species. More recently, botanists from the Royal Botanic Garden Edinburgh (RBGE) collaborated on the [Flora of Bhutan](#) (2002) and Bhutan has since developed its own Botanic Garden and National Herbarium with its own researchers. Because of its inaccessible nature, many of the country's areas still require botanical investigation.

Iris clarkei and prayer flags at Dochu La



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Bhutan

Bhutan, called Druk Yul (*Land of the Thunder Dragon*) by its people, is a small land-locked country in the eastern Himalayas. It is bounded by Tibet to the North and India to the South with Sikkim and Arunachal Pradesh lying respectively west and east. It is about 300km long and 150km wide, an area similar to Switzerland.

Almost the entire country is mountainous and ranges in height from 100m to the 7570m peak of Gangkhar Puensum on the Tibetan border. It is divided into three major geographical regions: the Himalayan region to the North, the hills and valleys of the inner Himalayas in the central belt, and the foothills and plains to the South opening into India. The southern plains have a tropical climate while the uplands have cool winters and hot summers. The northern mountains have extremely cold winters and cool summers. The summer monsoon, which sweeps up from the Bay of Bengal, affects the whole country between May and August.

The population is small – around seven hundred thousand, of whom 65% are Buddhist of Tibetan origin. The remaining 35% are of Nepali origin and are Hindus, settled in the southern foothills. The country has one of the smallest economies of the whole world and Gross National Happiness takes precedence over Gross National Product. It is still very much rural with 69% of the population involved in agriculture working 8% of the land. Sheer inaccessibility coupled with low population and the Buddhist reverence for Nature have brought Bhutan unspoilt into the 21st century with 72% of its land still under virgin forest. As such it remains a mecca for botanists, virtually unchanged since Ludlow & Sherriff explored the valleys last century.



Across the Warthang basin

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The Chance of a Lifetime

In spring 2010 I was invited to join a group of plant enthusiasts (Julia Corden, Tim Lever, David & Margaret Thorne, Martin Walsh) to trek to the legendary Me La area in Northern Bhutan. It is a restricted area close to China and Arunachal Pradesh and no botanists are thought to have visited since Sherriff was there in 1949. Unfortunately, we were denied permission at the last minute and had to arrange a new itinerary. Our organiser, Sonam Wangchen, came up with a new route in Central Bhutan exploring two river systems and botanizing the unknown area between them to heights of 5000m. Our aim remained unchanged: we were to study high altitude alpines, in particular *Meconopsis* and *Primula*.



For me, this was the chance of a lifetime. Having grown and tended Himalayan plants in the RBGE for the last 20 years, the opportunity to study them in their native habitats and to tread the same unspoilt valleys as the legendary plant hunters Ludlow & Sherriff would realize a dream. In practical terms I hoped the experience would strengthen my plant knowledge of high altitude alpines and aid me in their cultivation.

Left: Elspeth plunging plants in sand in the alpine house, photo from RBGE.

Our journey took place in the last half of June 2010 in a country dominated by rivers (Bhutanese “Chu”) and passes (Bhutanese “La”), both very important features in Bhutan’s geography. There are four major river systems, three of which flow from Tibet. Flowing south, they have carved deep valleys, making east-west travel a tedious process of sharp and winding ascents and descents. Our route lay along tributaries of the Mangechu (Mange River) which drains Central Bhutan. Starting at Nikkachu on the west-east main road, we headed northwards up the Nikkachu to Marootherang and the Om Tscho, heading to Padima Tscho and over the Chukarpo river.

Right: Elspeth with a Gold Medal winning display, including a *Lewisia cotyledon* which won an SRGC Professional Medal, at the Aberdeen show in 2010.

Then eastwards to cross the Sasachu and down to the basin of Warthang (photo previous page).

East again, and down to the Mangechu before our last climb over the Jule La (Jule Pass). The Gorsum Chu led to our finishing point at Dur.



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The altitude ranged from 2603m at our start to a maximum of 4983m at the Demso La before finally dropping to 2727m at Dur. The first and final legs of our expedition trod the same ground as [Ludlow and Sherriff](#); Ludlow and Sherriff had explored the Nikkachu area, and Ludlow botanised around Dur in 1949.

Yak trails lead through silver fir forest, rhododendron woodland, juniper and rhododendron scrub to high alpine pastures crossing high passes before dropping back down to cross rivers. Ascents and descents are steep and it is not unusual to climb 400m to drop 700m in a day. Our last four days would be spent driving across and out of the country at Sangdrup Jongkhar in the south. This would be a bonus, offering the full range of warmer vegetation zones, blue pine and evergreen oak, Chir pine (*Pinus roxburghii*) and broadleaf forest, culminating in sub-tropical on the descent towards India.

The High Botanical Trek

Flying in from Delhi over the Himalayas with the high peaks rearing through the clouds, and diving down to Bhutan's only airport in the beautiful Paro valley leaves a lasting impression. Few pilots are qualified to fly this route which suddenly sweeps down past steeply forested ridges. The wing tips almost graze the rooftops as the plane makes its rapid descent to what must be the most scenic airport to be found. Welcoming Bhutanese in their striking national costume placed Buddhist scarves round our necks in their traditional welcome and we were whisked off to the capital, Thimpu. The air was clean and clear and we drove through alpine scenes of little white houses scattered over the green valley flanks.



'Buttoned Ghost Orchid' *Ponerorchis puberula* syn. *Amitostigma puberulum*.

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Iris clarkei

The next day we met our trek staff and drove eastwards to the Phobjika valley through forest-clad twisty roads, crossing mist-shrouded passes with their chortens (Buddhistic religious monuments) and prayer flags. Familiar plants abounded: pines, oaks, hemlocks, primulas, anemones and arisaemas. We stopped at Dochu La to walk through a glade of magnificent moss-clad hemlocks festooned with prayer flags.

Magnolia globosa was in full flower with *Iris clarkei* and *Arisaema griffithii* close by. We had our first sighting of *Pleione hookeriana* bedded in a mossy tree trunk.

Descending to the valley floor we came across spindly pines, paddy fields and *Opuntia* hedges. We visited the impressive 16th Century dzong (palace) at Punakha built at the confluence of two rivers. To this day dzongs remain the seats of administration and monastic teaching. We then climbed from Punakha (1300m) up twisting wooded roads over the Lowa La (3200m) shrouded in cloud, to the Phobjikha valley. The valley is beautiful, wide and green with wooded slopes.

The rare black-necked crane (*Grus nigricollis*) arrives here every autumn from Tibet when the farming families migrate from the valley to warmer climes. Sadly, there were no stragglers to be seen.

We drove past stands of prayer flags, twisting up valleys with traditional homesteads scattered along their flanks, cattle and horses in fields and crops of potatoes behind ranch-style fencing. We drove through woods of rhododendron, fir and birch with pink *moyesii*-type roses and *Buddleja colvillei*. Clumps of *Arisaema* and *Euphorbia griffithii* grew at the roadside.

Crossing the Phele La with its chorten (stupas) and prayer flags, we saw on the other side of the valley the Black Mountain National Park which stretches south to the border with India. On the approach to Nikkachu, we saw our first lily, *Lilium nepalense*, in bud on the roadside banking. Seventeen yaks waited to carry our baggage and food but I was distressed to see blood trails running down their coats from tiger leech (*Haemadipsa ornata*) attacks. The leeches drop off after they have had their fill but the wound keeps bleeding. Seemingly, yak herders would gather up 'full' leeches and cook them – Bhutan black pudding!

With back packs, and trekking poles at the ready, we set off up the valley. Local children saw us off. We followed yak herders' tracks that lead to the upper pastures and passes. Flowers studded the pasture, **small orchids like buttoned ghosts (*Ponerorchis puberula*)**, potentillas, bugle and the small yellow *Hypoxis aurea*. *Roscoea alpina* and pink *Pedicularis* were colourful.

After lunch we met three girls walking homeward down from the Lunana district on the Tibetan border. They had been collecting Cordyceps, *Ophiocordyceps sinensis*, the fungus-invaded caterpillar that is literally worth its weight in gold. This [caterpillar phenomenon](#) is common in Tibet and I had wondered if we would meet collectors in Bhutan. One family member is allowed to collect for the month of June and we met many collectors of all ages, some with tiny babies. They travel light and walk like the wind in their blue wellies.



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We continued through woodland, the trees moss-clad with an understorey of rhododendrons. *Pleione hookeriana* poked out of a mossy trunk and a pretty little *Oxalis* caught the eye. Following the river we got into camp late, picking our way over boulders in the dark, the river ominously close.

Next day we left our buttercup camp in its woodland clearing and saw by daylight the boiling river. A yak was to fall in later with its load of rice. We went upwards through untouched woodland heading for Maroothang.



Lilium sherriffiae

Our first *Meconopsis*, the yellow flowered *M. villosa*, grew by the path alongside green-hooded arisaemas. A strange horse lichen (*Alectoria* sp.) grew beside a petiolarid *Primula* (no longer in flower) and *Primula geraniifolia* grew on the pathside banking. *Polygonatum* and a red-flowered *Maianthemum oleraceum* arched towards the path over a carpeting of ferns, *Viola biflora* and yellow potentillas. We discovered *Meconopsis paniculata* as the woodland thinned. Its smaller relative, the blue flowered *Meconopsis primulina*, grew in the shelter at the foot of a tree.

We were now in leech country and were wary of walking through the small scrubby bamboo. However, a leech dropped onto my neck from an overhanging branch. As the woodland thinned into rocky pasture by the river, we saw our first *Androsace* cushion, white-flowered *Androsace globifera*, clothing the ground under a *Berberis*. Exploring a side ravine we came upon a treasure chest of plants – cushions of pink and white androsaces clothed the rocky banks together with *Meconopsis bella* and *Anemone rupicola*. A small crucifer, [*Pycnoplithopsis bhutanica*](#), with its rosette of jagged leaves and white flowers grew at the waterside with the sweetly scented white *Primula munroi* and the larger *Primula sikkimensis* var. *hopeana*. This *P. sikkimensis* was much shorter and finer than any specimen I had seen before and had a creamy white colouration. We were to become quite familiar with these plants as our trek progressed.

Climbing higher, a lovely pink lily was found, looking very much like a pink form of *Lilium sherriffiae* - but neither had been recorded in this area. Next day, Martin, Sonam and Tim returned to the ravine; they found a darker form that indicated the 'new' lily was indeed a pink form of *L. sherriffiae*.

We ascended through the yak pastures by the Nikkachu. At the last 'shop' in the valley we found a lady cleaning Cordyceps. It is valuable, and she was nervous at letting us borrow it to photograph. Prayer flags lined our way through rhododendron woods, the pretty *Clematis montana tongluensis* scrambling throughout. White and blue-flowered *Meconopsis simplicifolia* grew under shrubs.

Out in open pasture were attractive clumps of *Arisaema* and abundant *Primula munroi* in wetter areas.

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Primula primulina

My first clump of the little ***Primula primulina*** was seen here with its pompom of white hairs in its throat, growing close to the creeping stoloniferous *Saxifraga brunonis*. *Cassiope fastigiata* and a pale yellow *Rhododendron lepidotum* grew on the top of a large rock with cushions of *Androsace* at its base. A tiny rush with white 'flowers', *Juncus* aff. *thomsonii*, looking like a small allium, was widespread with the yellow-bracted *Chrysosplenium*.

Carrying on up to the top of the valley the slopes were clothed with *Rhododendron campanulatum*. *Meconopsis paniculata* scattered over the rocky slopes with *Meconopsis horridula*; a white flowered *Lloydia* drooped in the shelter of a rock. Towards the top, altitude sickness powered in and the yak man had to push me up hill past beautiful plants which I did not have the energy to stop at. Our camp was set out on a grassy pasture between snow-clad rocky slopes. The toilet tent was a beacon. On the fourth day I enjoyed the Bhutanese cure for altitude sickness - garlic and ginger soup and ginger tea by the bucketful! I had soup for breakfast, lunch and dinner. Thankfully this became a rest day that entailed only a gentle stroll and plenty of fluids. We walked through drifts of *Primula sikkimensis* var. *hopeana* down to the 'Lake with no Tail', so-called by the Bhutanese because it has a number of waterfalls entering but no visible exit point. Yellow *Lloydia flavonutans* and white *Leontopodium* dotted the alpine turf with occasional clumps of *Primula calderiana* and *P. macrophylla*.

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Primula sapphirina

The dwarf *P. sapphirina*, its violet flowers like tiny parasols, was abundant on damper ground and in the lakeside water flush *Corydalis calliantha* and *Sedum oreades* formed yellow clumps throughout. On rockier slopes white and yellow saxifrages grew with *Meconopsis horridula*, and yellow and pink forms of *Pedicularis* (including *P. oederi*, left) looked attractive amongst clumps of small prostrate willow.

We found clumps of creamy-yellow *Primula elongata* in amongst small rhododendrons with *Cassiope* while *Rheum nobile* stood out high on the steep slopes on the valley behind.



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Rheum nobile



Refreshed, the next day we headed over the Om Tscho La (4574m) to Padima Tscho, passing the Om Tscho lake. Following a dry start we walked up and past the 'lake with no tail', its surface like a mirror in the still morning air. It was a pleasure to photograph *Meconopsis horridula* and some rather attractive clumps of *Primula megalocarpa*. The damp slope was a carpet of yellow *Caltha palustris himalaicus*. On a ridge overlooking the lake we found lovely ***Diapensia himalaica*** growing on a north-facing slope with pink *Rhododendron anthopogon*.

Above and below: *Diapensia himalaica*



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A flat damp area of pasture was carpeted with *Primula calderiana*, *Caltha* and a small white anemone. The skeletal-flowered *Primula tenuiloba* was widespread on a damp bank and *Primula megalocarpa* thrived. Once over the pass we descended to the lakeside where broad drifts of *Primula sikkimensis* var. *hopeana* ran down to its shore. Many of the creamy-white flowers had a very attractive rose-tinted corolla tube. Fluffy *Eriophyton wallichianum* and *Corydalis meifolia* ran around in the rockier scree areas, and in the steep lakeside pasture *Pedicularis* and the pink *Ponerorchis chusua* orchid made a pretty display with white *Anemone rupicola* amongst *Cotoneaster*. Dainty *Primula atrodentata* made a shy appearance. Further on, *Meconopsis bella* and a pink crucifer grew on the rocky slopes alongside showy yellow-flowered ***Saxifraga thiantha* var. *citrina***. The steep slope on the other side of the valley was densely clothed with larger rhododendrons.



Saxifraga thiantha var. *citrina*

Our camp at the far end of the lake was probably where Ludlow had camped in 1949. By chance, a passing Cordyceps hunter had actually met him. This man, **Tenzin Norbu**, was a young child when he met his first westerner (Ludlow) and had been intrigued by the man 'putting flowers into a book'.

Day six brought a fine start. We dropped 400m to cross a river and then climbed 900m towards our camp below the Khema La. It was wet and slippery underfoot as we cut down a landslip through the juniper scrub to mixed woodland; I fell several times.



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In the woodland we came across our first *Meconopsis sinuata* with nodding lilac-blue flowers in a group of four in the shelter of a rhododendron. A mauve-flowered *Polygonatum kasuense* caught our attention as the diminutive *Parnassia delavayi* grew amongst rhododendron leaf litter.



Primula umbratilis

On the climb out of the woodland a fine colony of exquisite ***Primula umbratilis*** inhabited a rocky slope and a very large cushion of *Androsace lehmannii* reared out of the juniper scrub like a white boulder. As we gained height all the small primulas made an appearance whenever conditions suited, and we spied a newcomer on a damp slope, *Primula rebecca*.

Day seven – we came out of the tent to the snow-tipped peaks with waterfalls tumbling down steep green slopes and the morning mist snaking up the valley below. Breakfasting in the mess tent, we looked onto a damp scree slope with *Primula sikkimensis* var. *hopeana* and the small ice-blue crucifer, [*Pegaeophyton scapiflorum* ssp. *robustum*](#) amongst the stones. After a short climb to our first pass, we found *Lilium nanum* growing under a boulder, then found tightly cushioned *Potentilla tapetodes* abundant at the top within a pink-studded carpet of the tiny bistort, *Polygonum macrophyllum*. Nestled amongst rocks were cushions of *Arenaria* alongside *Eriophyton* and a tight-cushioned *Saussurea* that looked more like a *Celmisia* in foliage. The little white-flowered *Draba bhutanica* was scattered around. A new plant, a densely woolly white cut-leaved cushion turned out to be another *Saussurea*, *S. tridactyla*. Tiny electric-blue *Corydalis ecristata* dotted about and, over the pass, *Lilium nanum* was plentiful in the alpine turf with the hairy *Anemone polycarpa*, and small rhododendrons clothed the slopes in a tapestry of colours - pink, yellow and white.

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The banksides were dotted with yellow *Lloydia flavonutans*.

Lake Conch (in the shape of the revered conch shell used in religious ceremonies) was glass-like with a wash of *Primula sikkimensis* var. *hopeana* running down from the cliffs. A steep slope was once more home to *P. umbratilis* and saxifrages were common amongst the rocks. From the second pass we made a difficult and muddy descent down to the bridge to cross over and climb to the night's camp. An impressive clump of *Saussurea obvallata* grew amongst the rocks at the crossing.

Day eight started in heavy rain which didn't let up. On the river plain were no ibis, but the sweet scents of *Primula munroi* and aromatic pink rhododendrons were very strong. Pink *P. sapphirina* rather than the violet form and herbaceous *Potentilla* carpeted the damp ground. We crossed boulder fields and old scree where well-flowered *Meconopsis horridula* were flattened by the rain. *Eriophyton*, *Corydalis*, and yellow saxifrages all defied photography while groups of *Rheum nobile* stood proudly on the other side of the valley. Where there is no path the plants remain undisturbed and are not collected as a Bhutanese vegetable.



Rain turned to driving sleet and we had to stop to defrost at a yak herder's shelter, being wet through and frozen. The Bhutanese are such a hardy race – **the yak lady** was out knocking snow off their blue tarpaulin roof in bare feet! We shared lunch with them and she put on her traditional hat to have her photograph taken. She and her husband had never seen westerners in this area and said we would be the first to cross over the pass.

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On the ninth day we set off watched by a group of blue sheep cavorting on the snowy crags. We made our way up the valley wondering if we were being watched by snow leopards. Elusive creatures, the elderly yak herder had only seen them four times in his whole life. We followed the stream upwards to cross extensive boulder fields with their tenacious rhodiolas, and consolidated screes with their rich populations of high alpine – *Eriophyton*, *Meconopsis horridula*, saxifrages and primulas. Very impressive specimens of the woolly snowball-headed ***Saussurea gossypiphora*** sheltered between rocks. An intriguing light-grey cushion with toothed incurved leaves grew between rocks nearby. This was ***Saxifraga hemisphaerica*** (female form); we never saw this plant again.



Saxifraga hemisphaerica (female form)

We erected a flag to celebrate our crossing the snowy Demso La and as we made our way downwards we came across a large population of the cushioned potentillas, and very nice specimens of *Primula tenuiloba* and *P. caveana* were tucked in between rocks. Very striking pink-flowered *Saxifraga bergenioides* made an appearance while a similar yellow-flowered and red-calyxed *S. lychnitis* made a good showing on a damp grassy slope.

Continuing downwards we followed a fresh landslip, leaving behind the small alpine flora to be replaced with the larger *Rhododendron campanulatum* and rat-tailed bistort. Underfoot was treacherous, being a descent over slippery boulders down to our woodland camp.





Saussurea gossypiphora

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Down the valley from the Jule La

That night the yaks chomped all night around our tent, the sound like a waterlogged wellie. We made our way down to the river to cross the bridge. On an open slope amongst dwarf rhododendrons and cotoneaster we found a good specimen of *Cypripedium tibeticum* alongside a collection of small green orchids and the deep pink *Ponerorchis chusua*. A further group of *Cypripedium tibeticum* looked tired as did an example of *C. himalaicum*. However, a small group of *Primula bellidifolia* looked charming amongst the rocks.

Over the bridge on a path through large leaved rhododendrons we came across a very attractive thistle, *Cirsium eriophoroides*, white and woolly in bud. Later we were to see it in flower, stunning with a dark red centre and mauve filaments.



Climbing past red-thorned roses we were on our way to look for *Meconopsis sherriffii* (left) which was reputed to be in a clearing in the woodland where the *Abies densa* had been destroyed by fire. We found only one flowering plant, after crossing an area of loose scree and a steep ravine, the flower was damp with all the rain but a lovely clear pink.

Climbing up and out of the ravine afforded us a close inspection of the flora - a tight tapestry of cotoneaster, *Ephedra*, Rose, *Spiraea* and Juniper with *Androsace strigillosa*. Re-joining the path to the campsite we came across some very nice *Androsace* cushions, all of which were eclipsed by thousands of golden *Meconopsis paniculata* in the mist at Shachu Na.



Meconopsis paniculata in profusion in the mist

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In the clear morning light of the following day we could see the path of the previous day snaking down the valley opposite. It looked very steep. Today we were to climb out of this valley and down to



Warthang. There were thousands of golden *Meconopsis* but very few rosettes of flowering size for the next season. Walking up the valley we found a reasonable population of *M. sherriffii* growing through prostrate juniper and *Lonicera*. Further up, some very nice *Androsace* cushions dotted the rocky landscape, all overlooked by stands of at least two hundred *Rheum nobile* on the upper rocky slopes. We met up with them later and took the opportunity **to look inside the spike**. The leafy bracts protect the reproductive parts and temperatures inside may be 5°C more than the outside temperature. The spikes were almost 2 metres tall.

Drifts of *Primula sikkimensis* var. *hopeana* and *Cremanthodium* brightened the landscape and again the beautiful *Primulas umbratilis*, *tenella* and *sapphirina* accompanied us up and over the pass. In this area there are white forms as well as the blue shades of *P. umbratilis*. Descending into the Warthang amphitheatre we came across creamy yellow *Primula elongata* growing down a rock cleft and through a

shrubby juniper. *Rheum nobile* advanced over the hillside while *Cassiope* and dwarf rhododendron clothed rocky outcrops. The alpine turf was studded with flowers of *Lilium nanum* and the tiny bistort with an even tinier blue gentian. Water rivulets and the surrounding wet ground were home to a population of *Cremanthodium*, *Meconopsis horridula*, *Primula sikkimensis* var. *hopeana* and saxifrages. On the twelfth day we left the Warthang basin behind, climbed up the pass and then dropped down 1000m to the hot springs at Dur Tsachu. On the opposite side of the valley the yak sheilings raised a smoke in the early morning. This was to be our last yak day – ponies were waiting to take over at our next camp. As we climbed to the pass, *Saussurea* rosettes scattered over the rocky turf with *Lloydia flavonutans* and *Meconopsis bella* (below).



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Once over the pass, *Rhododendron campanulatum* swathed the valley sides together with *Swertia* and rat-tail bistort. A tall *Lilium nanum* flowered in the protection of a berberis. We continued, dropping into *Picea densa* forest and then fell into a landscape of large rhododendrons with cherries and rowans. *Clematis* climbed through pink and yellow roses while *Bergenia purpurascens* spread over a mossy rock. As we often noticed, petiolarid primulas preferred to be on the down side of the rocks whereas pink *Primula geraniifolia* inhabited a more open banking. The force of last year's monsoon was evident by the number of landslips and shattered trees in the valley bottom. We crossed a dilapidated bridge over the Mange Chu and climbed to our woodland camp, there making haste to the hot springs where the promise of a long soak in a very hot open-air tub was long overdue!



Androsace ludlowiana

A long thirteenth day offered the promise of a following rest day at the Jule Tscho. It had rained all night and promised to rain all day. A six-hour long hard slog took us up through the woodland on a muddy rocky path. A new find, the tall purple *Corydalis flaccida*, proved impossible to photograph. *Astilbe rivularis* was another new find. Towards the upper reaches of the woodland a large rock outcrop again provided the ideal habitat for the cliff-dwellers *Primula umbratilis*, *Meconopsis bella* and *Anemone rupicola*. Lunch was held at a yak sheiling sitting amongst a sea of yellow rather than white *Primula sikkimensis* var. *hopeana*. The rose staining on the corolla tubes was also clear in this population. Elegant *Geranium refractum* appeared in small numbers. Towards the Jule La, *Anemone rupicola* and cushions of pink ***Androsace ludlowiana*** appeared on a rocky bank with *Meconopsis bella* and a charming pink-flowered, red-stemmed saxifrage.

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Drifts of *Anemone rupicola* grew through the short turf. Down from the pass the slopes were clothed in large patches of *Rhododendron campanulatum* with areas of short turf and scree. *Swertia hookeri* were abundant. The valley slopes down to the lake were clothed with *Meconopsis paniculata* and *Primula sikkimensis* var. *hopeana* whilst the sheltered slopes on the other side of the lake were a solid mass of *Rhododendron campanulatum*. Our camp was set up at the far end of the lake, a pleasant walk after the exertions of earlier in the day.

Our promised rest day was at the Jule Tscho. It rained very heavily all night with water running down the slopes and flooding the mess tent. By mid-morning the sun came out and there was a flurry of activity to dry and air everything including the cook's cheese! Horse mats covered the ground, a colourful array of Tibetan and Bhutanese textiles. There was a holiday atmosphere – with Cordyceps hunting and a special lunch; our horses and the now ten-day-old foal lay at peace among the primulas at the waterside.



Sleeping foal

Exploring our surroundings we again found the crucifer *Pegaeophyton scapiflorum* ssp. *robustum*; this plant differs from *Pycnoplithopsis bhutanica* in having smooth rather than jagged leaf edges. *Cremanthodium thomsonii* was widespread in the stream delta with *Primula sikkimensis* var. *hopeana* and *P. munroi*. In contrast, abundant *Cremanthodium reniforme* with its dark purple leaves preferred unstable shale but was too early to show us any flowers. Yellow *Corydalis meifolia* was plentiful and an attractive starry *Leontopodium* was common in the alpine turf with *Potentilla* and *Sibbaldia purpurea*. Once more we came across the larger *Primula elongata*, *P. macrophylla* and *P. calderiana* and also the diminutive mauve *P. glabra* as a solitary clump on a mossy rock. A rocky grassy bank provided some of the best *Meconopsis bella* that we have seen. Spikes of *Rheum nobile* stood erect amongst the small rhododendrons and large numbers of immature specimens were scattered up the watercourse. We were woken in the depth of night by turmoil. Julia had woken to a rumbling crashing sound and the rushing of water. There had been a landslide and water was pouring around our tent. In the pitch dark we could not see where the landslide was. A hurried camp evacuation - and we spent a wet and cold night huddled under a survival blanket.

A late start after our 'rest', and we climbed for three hours to the Jule La. Again, *Lilium nanum* was common in the short turf with *Androsace* cushions plentiful on damp pathside slopes. An altogether bigger yellow *Corydalis* with coarser foliage appeared and the small primulas, common now at these altitudes, *P. sapphirina*, *P. primulina* and *P. tenella* were a joy to behold. *P. glabra* was present too but in no great numbers.

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As we gained height towards the pass the ground became rockier and *Diapensia himalaica* appeared in the shelter of rocks with a gentian bearing white flowers sessile. Yellow saxifrage and blue *Primula tenuiloba* were constants in the landscape with ***Lloydia flavonutans***. A new *Chrysosplenium* with shiny leathery leaves and chestnut brown bracts grew on and around the stony path.



Once over the pass the sky cleared for us to see the wonderful mountain panorama ahead. The last of *Rheum nobile* could be seen on upper slopes as we followed the watercourse down, leaving the high alpiners. Small rhododendrons and *Cassiope* were replaced by juniper, *Lonicera* and *Rhododendron campanulatum*. *Fritillaria cirrhosa* was spotted growing through a juniper as were *Primula elongata*, *Meconopsis simplicifolia* and *M. sinuata*. *Cyananthus lobatus* grew in the shelter of berberis. This area was heavily grazed by yaks and

coarser flora like dockens and ferns appeared, with the more herbaceous *Hackelia uncinata* and *Salvia wardii*. Looking up the valley we noticed a dew-like glistening on all the very high pastures. Binoculars confirmed it to be *Primula sikkimensis* var. *hopeana* in vast drifts. Our camp was set up at the end of the valley and we made an easy descent through fields of *Iris clarkei* and *Primula sikkimensis* which at this altitude was yellow-flowered. The other side of the valley was clothed with *Abies densa*.

On our penultimate day we left this lovely section of the valley with its winding river and green pastures, to walk downriver towards our end point. *Abies densa* clothed the opposite slopes as pink-flowered *Spiraea* and willows replaced the rhododendron and junipers. We saw our last *Meconopsis paniculata* and *Podophyllum*, while *Arisaema* and *Anemone rivularis* reappeared. *Cypripedium elegans* was spotted growing in the shelter of a shrub, as did a new meconopsis, small and pale, possibly *M. lyrata*. Following the path downriver through woodland we watched our footing; it was raining heavily and the ponies had churned the new sections of path into deep mud.



Rounding a bend we found an open bank where I was pleased to see a group of *Cypripedium himalaicum*. However, steps away, was ***Lilium sherriffiae*** named in honour of Betty Sherriff who found it in Eastern Bhutan. This elegant lily, wine outer with chequered inner, was scattered over this bank, whose lower sections had sadly already fallen into the river following the heavy 2009 monsoon. A fine clump of *Cypripedium tibeticum* lay further along but this find was eclipsed by the lily. The

rain was impossibly heavy as we made our way to camp, ploughing and slipping through the mud.

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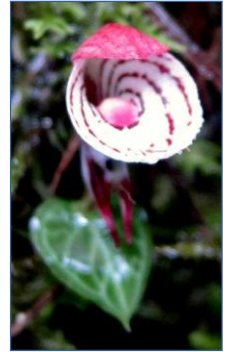
On seeing grubbed-up soil at the base of a tree we talked of Himalayan bears, only to find out later that not only were bears behind us on the trail but were also in front of us!

Day seventeen - a leech climbed into my washing bowl in the morning, a fine start to a long horribly muddy day walking downriver. The paths, rocky at best, were churned into boot-sucking sinkholes by the horses. The woodland was beautiful with moss-clad trees and elegant ferns.



A fine patch of *Roscoea purpurea* (left) appeared in an open clearing but I missed two good plants of *Cardiocrinum giganteum* because of watching my footing. I saw a specimen later on but it was far too far up a bank amongst bamboo to get a decent image. We climbed muddily at last to open pastures with asters and *Pedicularis* before dropping down to our camp at Chad Khang.

A strenuous descent down deep earth-banked paths brought us to a bank with the highlight of the day, a tiny orchid, a spiral of wine-red on white, *Corybas elegans*. There were about twenty plants of this rarity on this bank and no more were ever seen.



Corybas elegans – the tiny size of this can be seen by the scale of the moss

The seventh of July was our last trek day and it was dry. There was a relaxed atmosphere in camp and we walked at a leisurely pace downriver through mixed woodland to our finishing point at Dur. The horsemen had come across a large wild boar on this path the previous night but we just saw *Arisaema*

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and *Podophyllum* in fruit, clumps of *Calanthe tricarinata* in the shade and a *Pyrola* with nicely marbled foliage. On a cliff face above the river we saw *Notholirion macrophyllum* and an attractive large-flowered purple *Thalictrum chelidonii* over the water.

Outside Dur we came across fields of wheat and buckwheat, each with their guard-hut. All members of farming families watch at night to save their crops from the wild boar which, either singly or in groups, forage nocturnally. At our stop, beer and crisps were waiting for us and the boys played Dago while waiting for the horses to appear. Dago is a game similar to bowls but uses flat stones instead of bowls. Each player has two stones and throws in turn towards a marker. There are five sets, the person whose stone gets nearest the marker winning the set. Gambling makes the game more interesting! At the end, the horses romped down the last strait – they knew they were going home.

Sadly, we crossed the bridge to our bus; the trek was over but it was still to take us four days drive to cross the country to our exit point.

The Lower Ground

Our last few days were spent driving to our exit point at Sandrup Jongkar. We said goodbye to Kaka, Pelden and Dhoji and drove eastwards, the road twisting along the sides of the valleys and over passes. We drove through woodland and a patchwork of fields of potatoes and buckwheat in the Bumthang valley, stopping every so often to look at plants. At the Sheylang La we found a white slipper orchid, *Cypripedium cordigerum*, on top of a bank by the roadside. Winding down to the valley bottom past spectacular rockfalls we left behind the *Abies densa* woodland and entered a subtropical environment with paddy fields, maize fields and monkeys, the vegetation becoming progressively more tropical the further south we went, with palms and bananas, towering bamboos and tropical orchids. Black eagles soared over the valley. As we drove south the silver fir gave way to bottle brush pine and we again came across *Lilium nepalense* on banking. The white-flowered, yellow-centred *Lilium wallichianum* was a lovely find growing on a slope amongst lemon grass. The lemon grass scented the air. It is harvested in this area, the oil extracted and sent to Germany.

At Trashigang we headed south hoping to find the location of *Primula sherriffae* which, according to Sherriff's diary, was found on a 'large cliff on the east side of the road'. Sadly, we did not find it but, scattered up a slope, we found a very showy **Roscoea** – a large-flowered white with purple markings on the labellum. It was locally common and later we saw it with *Lilium nepalense* var. *concolor* at the top of a regraded bank. No one had seen this before and it is thought that it might possibly be a new species.



The "showy new" *Roscoea*

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Heading south we wound up and down valley sides amongst tropical vegetation. The slopes were very steep and the lush plants jostled for space. Plants I have only seen in heated glasshouses thrived – orchids, *Hedychium* and *Costa*. A charming little ***Corallodiscus*** was discovered running down a wet rock bank. Waterfalls gushed onto the roads and we were delayed by landslips.



Corallodiscus species on the wet bank

For what seemed like days we slowly wended our way southwards. Every kilometre or so road signs reminded drivers to take care – we started noting them for their humour: '*Be Mr Late, not late Mr*'; '*Be gentle on my curves*'; '*Reach home in peace, not in pieces*' ... rain had made the road treacherous with mud and there were very steep drops down the other side. Finally, the slopes flattened out to farmland and beyond the last mountains we saw the flat plains of India. Descending towards Sandrup Jongkhar we caught sight of a pair of great hornbills, huge flashy birds swooping through the trees, every bit as tropical as the land they inhabit – a fitting farewell and end to our adventure.

Problems en route

Our main problems owed to the terrain and the weather – neither of which we could change. The trek itself was physically demanding simply because of the steepness of the terrain. Trek days were long because of shortage of suitable camp sites (grazing land was also required for the animals) and at times we had to walk much further than anticipated. Many of the climbs and descents were on steep and rocky trails that were often a challenge, particularly when muddy. New sections of trail rapidly became mud-pits with the constant rain and animal traffic. Always at the back of the mind was the thought of jeopardising the expedition by having an accident – on one day alone I had seven falls! Thankfully three months of gym training prior to the trek strengthened my body and no real harm befell me.

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Altitude made exertion difficult, particularly on steep climbs. Even though I was taking Diamox to lessen the effects of altitude I suffered badly from headaches that worsened as the day wore on. As expected, it rained, and heavily. Quite often we started our day in rain which made walking more treacherous but also made us physically cold as well as wet. Photography under these conditions was tricky, with erratic light levels and cold hands. I took a new camera with me as backup. This, in hindsight, was not a good idea as operating a new camera under difficult conditions is not advisable.

However, despite these adversities we saw and managed to photograph a fantastic range of plants and their landscapes. And the restorative powers of a cup of tea and a biscuit at the end of a hard day cannot be overestimated!

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I thank the SRGC (Exploration Fund) and the Royal Horticultural Society (Blaxall Valentine Awards) for their generous financial support, the Royal Botanic Garden Edinburgh for their support and for giving me the time off from my normal duties. My thanks go to my travelling companions for their invitation to join the expedition and for their unfailing support and companionship.

It was a great privilege to visit such an unspoilt country and to see such a wonderful range of alpinines. It surpassed all expectations. I would like to return to Bhutan someday to study the alpine flora further.

The Me La, of course, would be the ultimate destination, as no overseas botanist has visited 'The Pass of the Flowers' since Ludlow and Sherriff in 1949.

E. M.

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