THE ROCK GARDEN 123

July 2009

£3

SUBSCRIPTIONS FROM 1st OCTOBER 2009

Members' subscriptions are payable annually on 15th October and provide membership of the SRGC until 30th September in the following year.

Subscription rates from 1st October 2009

	UK	OVERSEAS
Single annual membership	£16	£22
Junior membership *(Under 18 on1st October 2009)*	£3	£7
Family membership *(Two adults and up to two children under 18 on 1st October 2009)* *Each additional adult or child*	£19 £3	£24.50 £7

All payments to the club must be in GB Pounds Sterling.

Cheques should be made payable to 'The Scottish Rock Garden Club' and must be drawn on a UK bank. Unfortunately, due to the high commission now charged, we are unable to accept cheques or credit card payments in US dollars or euros.

Where subscription payments are made by Visa or Mastercard they can only be accepted if all the following information is given: the number on the card, the name of the cardholder as shown on the card, the card expiry date, the three digit security code and the cardholder's signature.

Visa or Mastercard subscription payments may also be made via the secure order form on the Club's website at **www.srgc.org.uk**

No card details whatsoever are retained by the club after a transaction.

Applications for membership and all subscription payments or authorisations for payment from a Visa or Mastercard account should be sent to:

Graham Bunkall, 145 Stonehill Avenue, Birstall, Leicester, LE4 4JG, UK

Although every effort is made to minimise costs, they continue to rise. These new rates therefore reflect the decision of the club's annual general meeting of November 8th 2008 to increase the annual subscription during the course of 2009. Allowing for inflation, the new subscription is about the same as at the end of the last millennium. The support of members in this matter is both vital and much appreciated by the club's council.

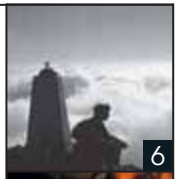
SRGC email - *info@srgc.org.uk*

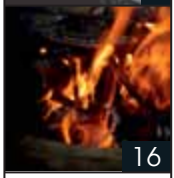
The ROCK GARDEN

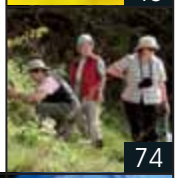
The Journal of the
Scottish Rock Garden Club
July 2009

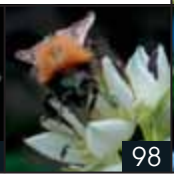
Number 123

Cover: *Primula florindae* in ice









Printed by Wyke Printers, Hull.
www.wyke-printers.co.uk ISSN 0265-5500 www.srgc.org.uk

The ROCK GARDEN
is published twice yearly by The Scottish Rock Garden Club
on 31 January and 30 June

Anton Edwards
Duguid's Wark
Manse Road
Caputh
Perthshire
PH1 4JH
01738 710774
antonedwards@aol.com

The Editor welcomes articles, photographs and illustrations on any aspects of alpine and rock garden plants and their cultivation. Authors are encouraged to submit material electronically but articles may also be submitted in manuscript, preferably double spaced. Digital images are particularly welcome but 35 mm slides, high quality prints or drawings may also be submitted for professional scanning.

The deadlines for contributions are 1 November for the January issue and 1 April for the July issue. These dates also apply for material for the Yearbook & Show Schedules.

Enquiries about advertising should be made to:
Maeve Lewis
The Pheasantry
Brodie
Forres
IV36 2TE
01309 641355
maevec42@hotmail.com

Individual copies are available from:
Glassford Sprunt
17 Claremont Drive
Bridge of Allan
Stirlingshire
FK9 4EE
Tel. 01786 833607 (evenings only)
glassfordsprunt@aol.com

Contact may also be made through the website: www.srgc.org.uk

The Cover

In the winter of 1924, Frank Kingdon-Ward and Lord Cawdor came down the Tsangpo gorge from Tibet, passing the peaks of Namche Barwa on the inside of the Great Bend and the lesser peak of Gyala Peri on its north side. These mountains were said to form the breasts of the sleeping goddess Dorje Phagmo; nearby are the settlements of Gyala and Pemakochung that gave their names to two of Kingdon-Ward's discoveries, *Berberis gyalaica* and *Rhododendron pemokoense*. It was beyond and over the adjacent pass of Nyima La in the valley of the Rong Chu that he discovered and collected one of our best primulas for woodlands and bog gardens - *Primula florindae*. Ignoring the mountainous charms of Dorje Phagmo, he named the plant after his wife Florinda.

Less than a hundred years after Kingdon-Ward's discovery, and helped by the longevity of its seed, *P. florindae* is now widely distributed as one of the most popular primulas. In the North of Europe, the Arctic-Alpine Botanic Garden in Tromsø has a large and ever-increasing collection of primulas and species of related genera. Members of the Sikkimensis section flourish along a stream by a waterfall; after late July the scene is dominated by *Primula florindae*. There are numerous large individuals of several colour forms; plants self-seed; and the whole area is fragrant with sweet scent.

In 2008, the earliest frost came to Tromsø on the first day of October and spray from the waterfall formed ice on the nearby still-flowering *Primula florindae* plants. Our cover shows these unusual circumstances, photographed by Martin 'Hajmi' Hajman, who moved from Prague in 2006 to work as a gardener in Tromsø. The image was sent by the curator of the garden, Arve Elvebakk; we are immensely indebted to Hajmi for this beautiful, frosty and slightly unseasonal curiosity.

1 - Namche Barwa (published under the licence terms of Wikimedia Commons)

Stirling Group Discussion Weekend

2nd to 4th October 2009

After the spectacular discussion weekends of the past two years, the 2009 event will be held at the Macdonald Inchyra Grange Hotel, Polmont, just off the M9, Junction 5. With easy access by road, the hotel is close to Polmont railway station and Edinburgh Airport. Edinburgh, Falkirk and Stirling are within twenty minutes drive while Linlithgow Palace, the Falkirk Wheel, the Pineapple and other attractions are nearby.

The hotel is an extended country house on the landward side of Grangemouth. The facilities are modern and spacious and there is a heated pool for delegates to use. The registration area, lecture room, plant areas and restaurant are all on the ground floor. Accommodation is in double, twin or single rooms. A few rooms on the ground floor will be reserved for disabled delegates. There are lifts to the upper floors where there are more rooms for any delegates with disabilities.

A booking form is enclosed with the Secretary's Pages. Please indicate on the back of the booking form if you require special facilities. If you are sharing a room with someone, please indicate the person's name. We will help you to find a sharer if you need one. Extra nights are available on the Thursday and Sunday as per the booking form. Please return the form and booking fee to Liz Mills as soon as possible, but not later than 7th August 2009. After this date bookings will incur an extra charge of £10.

The registration secretary: Liz Mills,
Upper Kinneddar House, Saline, Fife KY12 9TR
Telephone 01383 852321
e-mail liz.saline@hotmail.co.uk

RESIDENT (per person)

Friday dinner – Sunday afternoon tea, double occupancy	£195
Friday dinner – Sunday afternoon tea, single occupancy	£255
Saturday morning – Sunday afternoon, double	£137
Saturday morning – Sunday afternoon, single	£167

NON-RESIDENT

Saturday - morning coffee, lunch, afternoon tea	£40
Saturday - morning coffee, lunch, afternoon tea, dinner	£66
Saturday - dinner	£26
Sunday - morning coffee, lunch, afternoon tea	£40

PROGRAMME

Friday 2nd October

16.00	Registration
16.00 - 17.30	Plant staging
19.45	President's Welcome Address
20.00	The Bulb Group Lecture: Magnus Lidén - *'Corydalis flora of China - a never-ending adventure, including the genus Dactylicapnos'*
21.30	Small Bulb Exchange

Saturday 3rd October

08.00	Registration
08.00 - 09.00	Plant staging
09.00	Optional activities
11.30	Martin Walsh - *'Plant hunting in the Himalayas'*
12.45	Show opens
14.00	The Harold Esslemont Lecture: Harry Jans - *'Alpine plants on the Equator: Ethiopia, Bale Mountains and Kenya, Mount Kenya'*
15.45	Magnus Lidén - *'Dionysia - plants in the wild & cultivation'*
16.15	Harry Jans - *'Highlights of ten times in China: a selection of the best - some ungrowable!'*
19.00	Dinner
21.00	Plant Auction

Sunday 4th October

08.30	Registration
09.30	The William Buchanan Lecture: Graham Nicholls - *'Alpine plants of the Western USA from the Rockies to Alaska'*
11.00	Ian Christie - *'Wild Patagonia'*
14.00	The John Duff Lecture: Jim Jermyn - *'Eastern European Alps: plants in the wild and cultivation'*

The SRGC at Scotland's Garden Show 2009

As usual, the club had a strong presence at Scotland's Garden Show. Your council and members worked hard, displaying many floral gems, selling seed, dispensing advice to enquirers and seducing show visitors to join the club. The sun shone and Edinburgh's Ingliston showground once again gave us chance to show our wares.

Come next year!

Passers-by were enticed into the delights of the club stand by these and other highlights from the SRGC display:
2 - Above: Ian Christie's *Lilium mackliniae* (compact form)
3 - Opposite: The floral display
4 - Below: *Nomocharis saluensis* (Cox)

Inclines, Alpines and Deadlines

Andrew Fraser

Looking back, I suppose it all started at the club AGM in 2006. I had a chat with Anne Chambers and Liz Mills about Scottish hill plants, especially the rare ones and where they could be found. About three months later Anne asked if I would give a talk about plants of the Scottish hills at the discussion weekend in October 2008. As that date was still two summer flowering seasons away, she hoped it would give me enough time to collect photographs and compile my talk.

I had given quite a number of talks in the past so I was not immediately panic-stricken at the prospect but it did not take long before my feet began to chill. It is one thing to speak to a smallish audience at a group meeting but the discussion weekend is altogether more daunting. All those people, all so knowledgeable, all used to a high calibre of speaker; could I possibly cope? Of course I could; after all, I'd done it once before. And anyway ... Anne wants the hills themselves to be part of the talk ... and there can't be many of those listening who have been on as many Scottish hills as I have ... so the thoughts churned in my head.

5 - *Cornus suecica* (Dwarf Cornel), Strathfarrar

As I vacillated between self-doubt and self-confidence I knew there was another snag. I was waiting for a major heart operation; one can never be certain about the outcome. Characteristically, Anne said she would not pressurize me by pursuing her request. However, I was keen to go ahead with the talk so the acceptance was made.

Government rules stipulated that such operations had to take place within 26 weeks

6 - *Diapensia lapponica* and its habitat, near Glenfinnan

of the original decision. Despite an impression that it would be sooner, the summons did not finally arrive until the last day of the 26th week, late in May 2007. The operation was mostly successful and I started my recovery period. The medics encouraged me to walk as much as I felt able to do. They were thinking gentle inclines; I was thinking hills. They were right and a summer season had been lost. All of a sudden that comfortably distant deadline had come an awful lot closer.

I am not in the same league as the Hebridean crofter who, when the word "mañana" was explained to him, gasped at the degree of urgency, but I have been known to procrastinate. Nevertheless, as summer 2008 approached I had made some progress with background reading, a framework for the talk in my mind and a list of plants to be found and photographed. I consulted Margaret and Janet of the Inverness Botany Group, both very knowledgeable about potential locations and flowering times for plants I'd not yet seen. As my wife still did not like me to go out on the hills alone, several hill-walking pals were recruited to accompany me.

Then - disaster. On a sailing trip to the Western Isles on a friend's boat in May, I fell into the water. He was scared I might take a heart attack in the sudden cold. I was mortified because I had my two cameras round

my neck. I was dragged out safely but the cameras were ruined. To my great relief, my insurers replaced them quickly without a qualm but I had to familiarise myself with them PDQ for the imminent flower season.

Two nice days in the last week of May got my programme going. The first excursion, to Strathfarrar, produced Mountain Bearberry (*Arctostaphylos alpinus*) and Dwarf Cornel (*Cornus suecica*) in flower. The second was a return to the Glenfinnan area to see *Diapensia lapponica*. One of my companions, such a plant Philistine that his wife does not even let him cut the grass, reacted to this treasure with the comment *'Did you bring me all the way up here just to see that?'* My previous visit had been in early June when more of the plant colony was looking its best.

Early June 2008 meant a trip to Ben Vrackie above Pitlochry where we found some lovely examples of *Geum rivale* and *Vaccinium vitis-idaea* as well as the plant we had come for, *Oxytropis halleri.* It was also the time to visit Balblair Wood near Golspie to find *Linnaea borealis* and *Moneses uniflora*, collecting digital photos to supplement my existing slide collection. The following week, my wife and I went to Barra and the Uists hoping for a splendid display of machair flowers. We caught the end of a six week spell of sunny weather which - in one respect - was great for us, but the drought brought a disappointing year on the machair. Such are

7 - *Geum rivale* on Ben Vrackie

8 - *Linnaea borealis*, Balblair Wood

the frustrations of being restricted to just one season. However, there was some consolation in the display of *Dactylorhiza orchids.*

9 - *Moneses uniflora*, Balblair Wood

10 - *Goodyera repens*, Culbin Forest

11 - *Dactylorhiza incarnata,* Loch Droma

I had earmarked late June for a visit to Assynt to explore the limestone areas near Inchnadamph. On the way to Ullapool we stopped at Loch Droma and on its north slope found *Dactylorhiza incarnata* at the grid reference Janet had given us. Her tips for Assynt were unfortunately not quite so successful, with *Gentiana verna* and *Epipactis atrorubens* eluding us. On the plus side there were some fine examples of *Trollius europaeus* and *Dryas octopetala,* and the area of limestone pavement was interesting.

12 - *Gentiana nivalis,* Ben Lawers

July was expected to be the key month but it proved one of the most frustrating. A trip in the first week to Glen Doll in Angus was abandoned in dreadful weather that left me depending on converted slides for pictures of *Oxytropis campestris, Homogyne alpina* and *Lychnis alpina.* The weather also did for my planned trip to Mull where I'd discovered the location of *Koenigia islandica* which flowers in the middle of the month. On the other hand, while visiting a favourite orchid location between Coylum Bridge and Nethy Bridge in Strathspey I was tipped off about *Pyrola minor* and *P. media* both in flower in a field close by. Another tip-off about *Orthilia secunda* came just too late for the best flowers but I shall return next year to these sites at the western end of Loch Morlich and in the Culbin Forest. However, Culbin did give me *Goodyera repens.*

Unexpected visitors and last minute commitments added to July's frustrations but one trip remained sacrosanct: a return to Ben Lawers. We left Inverness in lovely sunshine so could not believe our bad luck in finding the Perthshire hills under low cloud and strong winds. Fortunately, even in the mist I knew where to find the places I most wanted, the *'hanging garden'* crag near the col between Beinn Ghlas & Ben Lawers, and the rocky area south-east of Lawers summit. Of course

13 - *Lynchnis alpina*

14 - *Pyrola media*

the mist made things difficult but the gusty wind was what really made photography very tricky. I found nearly all the sought-after plants though the *Gentiana nivalis* flowers remained closed for lack of sun.

15 - *Saxifraga cernua,* Ben Lawers

16 - *Dryas octopetala*, double form

That evening, the capricious wind died and the midges had to be endured at our camp near the Lochan na Lairige dam. It was still windless in the morning, the cloud base was now lower than our tent but we nevertheless went to the crags of Meall nan Tarmachan to find some good things, of which *Woodsia alpina* was the only new one for me. There were several good examples of *Parnassia palustris* which, like most white flowers, is easier to photograph in sunless conditions.

July ended on a high note with a beautiful day in Cairngorm's Coire an t-Sneachda. The main objective was *Saxifraga rivularis* which took most of the day to find but on the way we came across other new plants including *Cerastium arcticum* and *Saussurea alpina*.

The biggest task for August was to find the two remaining rarities on my list. The first, *Saxifraga hirculus,* grows on the north-eastern slopes of The Buck, a hill straddling the Moray-Aberdeenshire border. Despite having a ten figure grid reference - but no GPS - Derek and I could not

find it. Some consolation came later in the day on other Aberdeenshire hills from good examples of berry-bearing plants and heathers. The second rarity was *Artemisia norvegica*. All I knew about it was the kind of habitat it liked and that it grew on Cul Mor in Wester Ross. Nicol, who is not a plant person, came with me and I was thrilled to find it on the north-west ridge, although slightly past its best. When Nicol told his workmates he had been out looking for Norwegian Mugwort, they imagined it was something out of Harry Potter.

17 - *Cerastium arcticum*

From the outset I determined that this would be my first digital talk but I had never used PowerPoint and now faced a fairly steep learning curve. After being shown the basics I could start to practise compiling a picture. Then the script had to written - not to be read, but as the substance of what I wanted to say. Finally, the PowerPoint presentation was made up. I thought that was the end but friends now warned me of the need for compatible equipment and of other technical hitches that could still occur. With fingers crossed that all was in order, I set off for Clydebank.

The big day arrived. I was not on till the afternoon so in the morning I tested the recording on my memory stick; many pictures would not show; the equipment was not compatible. So it had to be plan B with the presentation on my laptop. It worked. A quarter of an hour before I was due to talk Ian Young helped me get ready. The pictures came up pink! As the auditorium filled, frantic last ditch efforts, including an alternative projector, were made. With a minute or two to spare, the fault was found, a button was pressed, and we were all spared pink faces as well as pink pictures.

After the introduction I was off. The opening joke got a laugh. Everybody could relax a bit. All I needed to worry about was not fluffing too much and keeping to time. Then it was all over. Kind people approached and said complimentary things. As I sipped a much-needed cup of tea, a hand on my shoulder; more compliments, then the sucker punch; it was Anton: *'Would I like to write for the Journal?' 'Oh no'*, I thought, *'... more deadlines.'*

Cistus - Out of the Fire ...

Ian Bainbridge

Growers are always seeking ways to improve seed germination. Different combinations of cold, compost, light, gibberellic acid and even Fairy Liquid have been used; and here's good evidence of another one – the oven!

It has long been realised that Mediterranean and Chaparral shrubs germinate better after fire, and *Cistus* species often become dominant in the shrub layer after mass germinations following fires. It has been suggested that carbonic acid leaching from burnt vegetation acts to denature the seed coats and break dormancy in *Cistus* and other shrubs. Horticulturalists' means of doing this have included setting fire to sheets of newspaper or straw laid over the top of seed pots, adding ground charcoal to pots, and more. However, French and Spanish researchers have done experiments that involved putting seed of *Cistus albidus, C.*

19 - Seeds and seed heads of *Cistus albidus* (Paul Busselen)

20 - *Cistus albidus* (Paul Busselen)

monspeliensis and *C. ladanifer* in the oven over a range of temperatures, and then germinating the seed under test conditions.

At 30˚C (normal temperatures in Mediterranean France and Spain!) the French workers (Roy and Sonie) got 25% and 5% germination rates for *Cistus albidus* and *C. monspeliensis* on seeds which were about 18 months old. At 60˚C the rates were no better; at 90˚C, rates increased to 35% and 65%; at 120˚C and above, the seeds were killed. Their treatment was to place the seed *'between two layers of soil preheated to the test temperature'* and leave it in the oven for ten minutes.

The Spanish study (Pérez-García) looked at *C. ladanifer* and found best germination results from leaving seed in a pre-heated oven at 100˚C for 30 minutes! He also found that seed age and storage had no effect on

21 - *Cistus albidus* (Júlio Reis)

germination rates; seed kept at room temperatures for 18 months germinated just as well as seed kept cool.

So, next time you're sowing seed of *Cistus*, set the oven to 90˚C or 100˚C and bake them for ten to thirty minutes before putting the pots out to germinate. Why not try the same with other Mediterranean, Californian, Cape or Australian shrubs and see if that improves germination rates too? Maybe they also just need heat treatment rather than carbonic acid?

22 - *Cistus ladanifer,* Sierra de Andujar

Further Reading

Roy, J and L Sonie, 1992, Germination and population dynamics of *Cistus* species in relation to fire, *Journal of Applied Ecology* 29: 647-655

Pérez-García, F, 1997, Germination of *Cistus ladanifer* seeds in relation to parent material, *Vegetatio* 133: 57-62

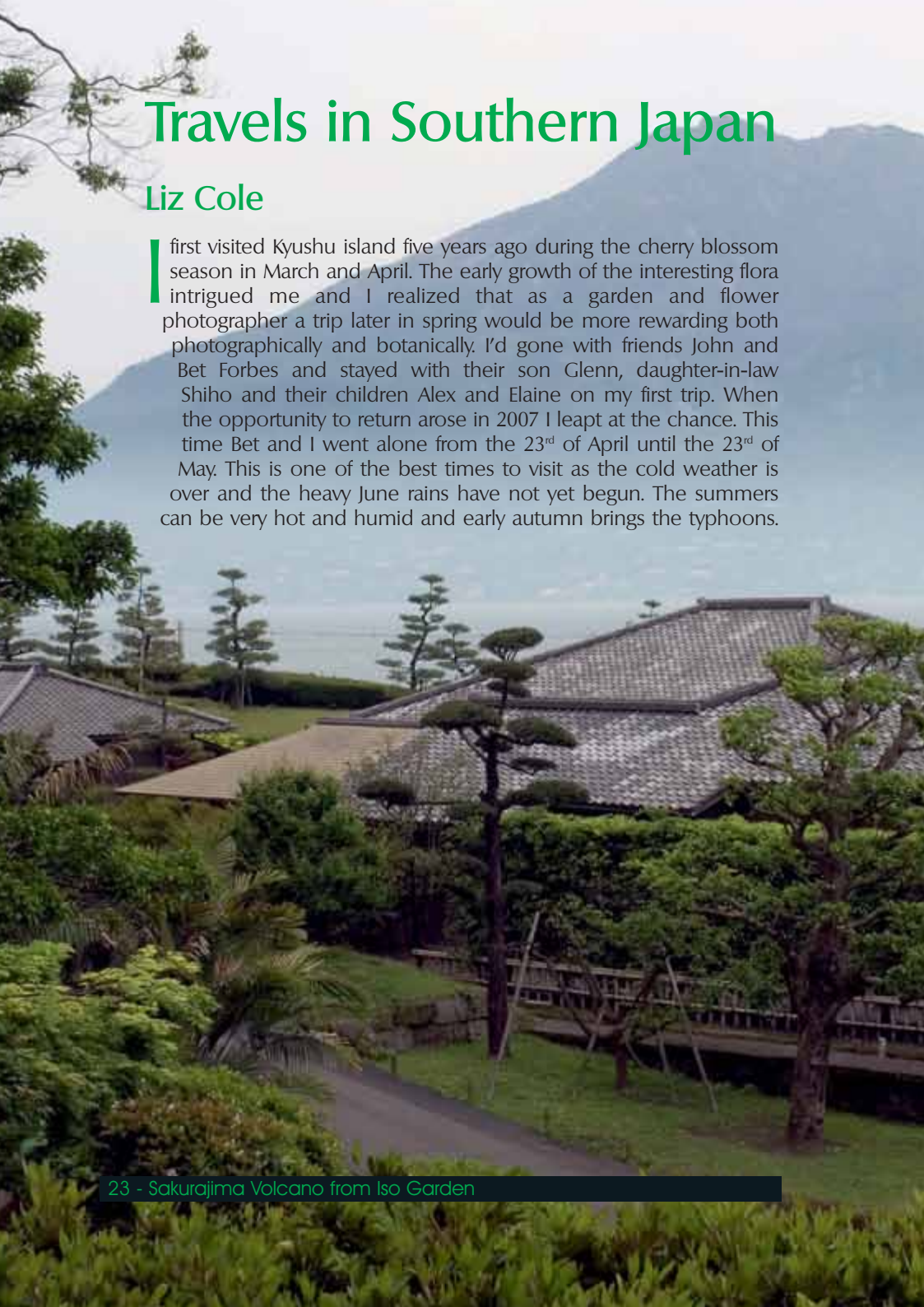
Postscript

Are *Cistus* hardy? I collected seed of *Cistus albidus* in 1988 in Extremadura in Spain, and germinated it (without an oven bake!) and it has been with us ever since, growing happily at 250 metres above Edinburgh. It flowers wonderfully every year and is now over two metres high; we send seed to the SRGC Exchange and every so often a self-sown seedling appears, so Scottish summer temperatures don't inhibit germination completely!

Travels in Southern Japan

Liz Cole

I first visited Kyushu island five years ago during the cherry blossom season in March and April. The early growth of the interesting flora intrigued me and I realized that as a garden and flower photographer a trip later in spring would be more rewarding both photographically and botanically. I'd gone with friends John and Bet Forbes and stayed with their son Glenn, daughter-in-law Shiho and their children Alex and Elaine on my first trip. When the opportunity to return arose in 2007 I leapt at the chance. This time Bet and I went alone from the 23rd of April until the 23rd of May. This is one of the best times to visit as the cold weather is over and the heavy June rains have not yet begun. The summers can be very hot and humid and early autumn brings the typhoons.



23 - Sakurajima Volcano from Iso Garden

南日本への旅

We flew from Edinburgh to Paris then on to Osaka, from there flew to Kagoshima city and finally drove to Glenn's address about 10 km south west of Kagoshima in an ex tin mining area called Suzuyama. The family lives here in a small rustic building that was to be our home for most of the trip. During the month, I visited three main areas: Suzuyama and Kagoshima; Kirishima National Park; and the island of Yakushima. I describe here each area and the plants I found.

24 - *Arisaema serratum*

25 - *Phyllostachys pubescens*

26 - *Arisaema ringens*

13 species recorded from Kyushu in the monograph *'The Genus Arisaema'* by Guy and Liliane Gusman, I saw five and one subspecies. Three of these were in the Suzuyama area. *Arisaema serratum*, which I had seen on my previous trip, was just going over when I arrived so I photographed the best specimens I could find. Both the green- and purple-spathed forms were present, mostly growing along the edges of the roads and pathways.

The most abundant species of *Arisaema* at this time of year was *Arisaema ringens*. Both the purple and green spathe-limb forms were present. They used to have different names but it is now recognised that there is only one polymorphic taxon. The green types are rarely seen for sale in the UK but here were growing side by side with the purple type; I estimate at least 30% of the population were of the green form. The plants were growing along side roads and paths and also beside a pond and in clearings in the *Cryptomeria* forest. Some were in

Suzuyama and the surrounding region are very hilly, about 300 to 600 metres above sea level. The area around the house was dominated by *Cryptomeria japonica* and *Phyllostachys pubescens*. There were many ferns including *Gleichenia japonica*. I am particularly interested in *Arisaema* species and, of the

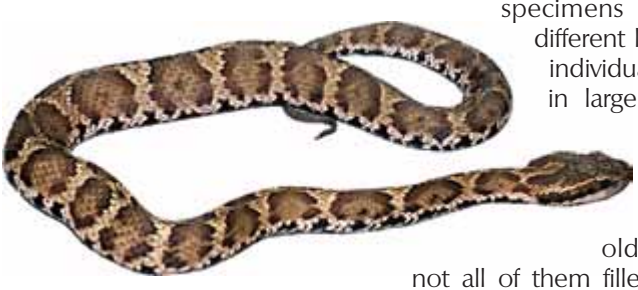
27 - *Gleichenia japonica*

28 - *Arisaema ringens,* green form

29 - *Arisaema sazensoo*

quite deep shade with huge leaves.

I only found one specimen of *Arisaema sazensoo* on a footpath in this area but I also saw this species in Kirishima and Yakushima. Unlike the two previously mentioned, which have a wide distribution, *A. sazensoo* is restricted to Kyushu. The Gusmans' book describes a form with a green inflorescence as being reported from Yakushima; however, the only specimen I saw there had the normal dark purple spathe. The three specimens I saw at the different locations were all individual plants and not in large clumps as was often the case with *A. ringens*.



The ground is riddled with old mine shafts - not all of them filled with concrete; most of the time I kept near the paths. Other things to watch out for were the local pit viper, the Mamushi (*Gloydius blomhoffii*), and the even more feared Mukade, a giant centipede with a very venomous bite. Both of these beasties I met and photographed near the house.

Other plants around this area were *Viola verecunda*, *Calanthe discolor*, *Bletilla striata*, *Pinellia ternata*, *Ajuga decumbens* and *Rhododendron* species I have not been able to identify. Many of these plants were by the road side on the mile walk to meet Alex as he came out of school. As a keen young naturalist himself, he was eager to point out where frogs, newts and lizards could be seen. A local plant expert, Susumu, heard of my interests and went with me and Shiho to an area around the Senganbira nature park west of Suzuyama. Here, in very misty conditions, we saw *Drosera spathulata* and many rhododendrons thriving in the acid soil. He knew where to find the beautiful orchids

30 - *Viola verecunda* (below) 31 - *Calanthe* hybrid (right)

32 - *Bletilla striata*

33 - *Cephalanthera falcata*

Cephalanthera falcata and *Goodyera schlechtendaliana* growing in woodland with the saprophytic plant *Monotropastrum humile*, commonly known as the ghost plant. He kindly showed me the only known clump of white *Bletilla striata* in Kagoshima.

Apart from the wild plants I photographed in this area I also visited parks and gardens to photograph indigenous and non-native species. The parks included Yoshino Park with its many fine examples of *Cycas revoluta*, Kagoshima Flower Park, and Iso Garden - which features a shrine to cats and has a splendid view of Sakurajima, the huge and very active volcano that rises 1117 metres above sea level to dominate Kagoshima bay. In 1914 there was a massive eruption which was the most powerful one in Japan in the 20th Century. Ash fall is today between three and thirty million tons a year. The volcanic soil accounts for the record-breaking vegetables grown here. Alex once grew a 14 kg daikon radish which must have lasted for many a meal.

Kirishima

On the 3rd of May we drove up to Kirishima National Park, approximately 50 km north of Kagoshima city, to stay a couple of nights in apartments with several expatriate British and Australian families. Like Glenn, they originally came to Japan to teach English. We arrived in

34 - *Ajuga decumbens*

wonderful light of a late afternoon so I set out to photograph the flora around the accommodation. This included *Calanthe* and my favourite plant here, the small orchid *Cymbidium goeringii*. The night's sleep was disturbed by heavy rain and the incredibly loud sound of calling tree frogs of the species *Rhacophorus schlegelii*; it sounded like there were hundreds but the children had only caught two specimens in the afternoon. We woke to find the rain had become even heavier than in the night. I was determined to get some pictures, so Glenn dropped me up at the national park while everyone else wisely played table tennis or relaxed in the large onsen.

Kirishima means *'Fog Island'* so expect plenty of rain. The national park

35 - *Pinella ternata*

36 - *Goodyera schlechtendaliana*

37 - *Monotropastrum humile*

includes fifteen volcanic craters, ten crater lakes and more than a dozen hot springs. The highest peak is Karakuni-dake at 1700m. Shinmoe-dake erupted in 1993; it was also made famous in the James Bond film *'You only live twice'*, as the secret base of the bad guys. Steaming vents show this to be an area of very active volcanoes.

The mountain Takachiho-dake is considered to be the birthplace of Japan, where the gods pulled the islands up from the sea. Because of the appallingly relentless rain and mist there was no way I could climb as high

38 - *Cycas revoluta,* Yoshino Park

as on my last visit in 2003 when I enjoyed sun and blue skies. Visibility was very poor and light levels were low, so I was restricted to photographing plants in the coniferous forest around the interpretation centre. With my camera in a plastic bag and my glasses steaming up I managed to photograph *Goodyera schlechtendaliana*, *Potentilla stolonifera*, *Disporum sessile*, *Arisaema sazensoo*, *Arisaema tashiroi* and a beautiful *Viola* whose name I am not sure of. Because of the altitude and colder weather here the *Arisaema* were only just opening up.

39 - *Cymbidium goeringii*, in the mountains at Kirishima

By the time Glenn picked me up I was cold and soaked. Luckily, with my small amount of Japanese I had been able to order some onigiri (rice balls) from the visitor centre café and get a can of hot coffee to warm me up from one of their wonderful vending machines. These are found all over the countryside, not just in towns, and supply you with isotonic drinks, green tea and more ... either in hot or cold cans. Some even have beer and never seem to be vandalised.

Yakushima

On the 8th of May Bet and I went on the hydrofoil from Kagoshima to Yakushima, staying for three nights. The island is reached by plane, ferry or the hydrofoil. The boat takes about four hours, the hydrofoil two hours, and as the cost of the two is similar we took the hydrofoil there and the ferry back so as to have good views of the island.

This magical island, declared a UNESCO world heritage site in 1993, was the inspiration for the film *'Princess Mononoke'* by the great director Hayao Miyazaki. Yakushima has a surface area of about 500 km^2; over 90% of the island is mountainous, the highest peak being Miyanoura-dake at 1935m. The high mountains are snow-covered in winter while the coast is sub-tropical. The rainfall is up to 4.6 metres per year. The remarkable *Cryptomeria* forest here includes the Jomonsugi tree, thought to be around seven thousand years old. Yakusugi (giant cedars) have to be over a thousand years old to earn their title.

We hired a car to go round the island. Bet had been a couple of times before so knew the best bits to see on a short trip. We stayed in a cheap but clean room above a fish bait shop and next to a pachinko parlour (games arcade) in the main town of Miyanoura.

40 - Opposite: *Viola* at Kirishima 41 - Below: Kirishima National Park

Around the coastal area we visited the tropical fruit garden and the banyan garden. However, our main aim was to get up into the forests. Our first trip was up to Yakusugi cedar land. This trail is 1000 to 1300 metres above sea level. We walked past the 1800 year old Buddhasugi and saw stumps that date back to the era of Japan's feudal clans. Surprisingly, there was no rain during our visit so the amazing moss-covered stumps were not as green as I had previously seen in photographs. Nonetheless, the tree roots can be very slippery and visitors are asked to keep to the trail paths as it is easy to get lost.

Our main trip up to the forest was to the Shiratani Unsuikyo trail. A drive up some very steep and scary roads reaches the trail at 800 metres above sea level. The area was designated a natural recreation forest in 1974 and is about 12 km from Miyanoura. The forest floor is covered in many rare ferns and mosses. It is here that the Jomonsugi lives and that Wilson's stump may be seen. Wilson's stump is named after the botanist

E H Wilson who reported the existence of Yakusugi cedar to the world. It is Yakushima's greatest stump, with a diameter of 4.39 m. A spring gushes from its hollow interior.

We spent about six hours hiking in the forest and saw viola species, the shrub *Damnacanthus indicus* var. *microphyllus*, *Arisaema sazensoo* and the very common endemic *Arisaema serratum* var. *yakushimense*, a splendidly striped sub-species of the mainland form. The range of spathe colour was extensive and the size of the plants varied from no more than 30 cm to huge specimens almost as tall as me. These larger plants were by the road side where light levels were much higher than in the forest. On the trail we encountered Sika deer that slipped silently among the trees. Most of the time, the only sound was the rushing river and bird song. We met some Japanese hikers but saw hardly any westerners; English is not widely spoken here. The most amazing encounter was with a group of Japanese macaques deep in the forest. These are a sub-species of the famous mainland snow monkeys, the most northerly monkeys in the world. They passed by us quite closely calling amongst themselves and were hard to photograph in the gloom of the forest. Alas, we then had to come down the mountain to return to Kagoshima. There are huts in the forest where you may stay overnight and then climb up above the tree line to see the special Yakushima Gentian and Rhododendron, but this will have to wait for a further trip.

Conclusion

During my month's stay I was able to see and photograph many interesting plants and see how they grew in their natural habitats. My plant list covers forty species that I was able to photograph and name and I have other pictures still awaiting identification. I hope that the information I obtained will inspire people to grow more Japanese plants in their gardens and perhaps some day to visit Kyushu.

Acknowledgements

I thank many people: the SRGC Exploration Committee gave me funds towards this trip; the Forbes family gave me friendship, hospitality, driving and interpretation; generous and helpful people I met made me want to return to see more Japanese flora and to eat more of the wonderful food.

42 - Forest in Yakushima

43 - Rodrigues (red), 1000 miles east of Madagascar

Ramosmania rodriguesii – the world's rarest plant?

Lynn & Frazer Henderson

After more than 6000 miles of travel involving three aeroplanes, a bus and a rain-sodden trudge up a slippery hillside through dense tropical vegetation, we finally faced a nondescript green bush no more than 150 cm high. Could this undistinguished plant really be *Ramosmania rodriguesii* - supposedly the world's rarest wild plant? A small wooden sign confirmed the fact.

Though the plant may be uninteresting, its tale is certainly worth telling. *Ramosmania rodriguesii* is an endemic wild coffee found on the island of Rodrigues, a dependency of Mauritius in the southern Indian Ocean. The plant produces small white perfumed flowers. The common name 'Café Marron' refers not to its colour but to black slaves who were known as 'Marron' and whose descendants now constitute the majority of the island's population.

A passing European visitor first recorded the plant, unnamed, in an 1877 drawing. By the mid 20th century it was presumed that it was extinct, having succumbed – along with most of the indigenous flora - to the twin perils of goats and pigs.

In 1979 a local teacher distributed images of extinct plants including the 1877 picture. One pupil knew of the existence of the plant! A cutting was taken, scientists confirmed the plant to be Café Marron and at their suggestion a fence was erected for protection. In the early 1980s the plant was infested by spider-mite. Fortunately, it recovered and cuttings were sent in 1986 to Kew Gardens in an attempt to propagate the species and ensure its survival.

Kew's horticulturists were successful and at the end of 2001 flew eleven rooted cuttings to the islands to repatriate the species. A few plants survived and are now growing in the Mauritius Wildlife Foundation's species nursery on Rodrigues. In 2004, Carlos Magdalena, a tropical horticulturalist, managed - after much trial and effort - to produce viable seed at Kew and a dozen seeds were sent to the island, where three have since germinated.

44 - *Ramosmania rodriguesii* habitat on Rodrigues

We were fortunate to see the rooted cuttings and young plants and remarked their heterophyllous characteristics (juvenile and lower leaves differing from others on the plant). We understood from local scientists that many of the indigenous plants share this characteristic; it is believed to be an adaptive feature to overcome predation by the now extinct Rodrigues Giant Tortoise. Tortoises, with poor eyesight, have difficulty in seeing linear, ensiform or lanceolate leaves; plants thus retain such leaves in their juvenile stages and up to about 120 cm, the maximum extension of a tortoise's neck.

Six thousand miles seems a long way to travel to see one plant but, in truth, we saw many other species including pandanas and dombeyas as well as indigenous fauna such as the endemic Rodrigues warbler (*Acrocephalus rodericanus*), the Rodrigues fody (*Foudia flavicans*) - a yellow sparrow-like bird, and the world-famous Rodrigues Flying Fox (*Pteropus rodricensis*).

45 - The sign, the plant and the rock-climbing tortoise

Charles Darwin and His Primulas

In recognition of the 200th anniversary of this great botanist's birth

Roy Sexton

I am sure that most SRGC members will be surprised to find that Charles Darwin stated that nothing in his scientific life gave him greater pleasure than working out why many species of primula had two forms of flowers. Sadly, most commentaries on Darwin do not recognise that he was a very accomplished botanist who wrote five books about plants. Indeed, had he never written *'The Origin of Species'* he would still be remembered by today's plant scientists. As a young boy Darwin was steeped in botany. His great grandfather Erasmus Darwin was an expert on the Linnaean system of plant classification as was his great uncle, the author of *'Principia Botanica'*. Charles' father was also a keen gardener and their house in Shrewsbury had five glasshouses, a hot house for tropical plants and a walled garden. Charles and his sister both tended their own plots and at the age of eleven Charles was given Berkenhout's lexicon of botanical terms (Allan 1977).

Charles started medical training at Edinburgh but - unable to stand the sight of surgery - transferred to Cambridge to study divinity where he was introduced to the Reverend John Stevens Henslow, the recent appointee to the Chair of Botany. Darwin described this meeting as the luckiest day of his life and as a result he enrolled on Henslow's innovative course, attending every lecture and excursion. He became a great admirer of his tutor, describing him as *'quite the most perfect man I ever met'* and towards the end of his stay in Cambridge the two of them had become good friends.

In August 1831 Darwin received a letter from Henslow which encouraged him to apply for the post of naturalist on board HMS Beagle whose mission under Captain Robert Fitzroy was to survey the coastline of South America. Initially Charles' father would not let him go but on the intervention of his Uncle Josiah Wedgwood II (the son of the great potter) he relented. Beagle set sail on 27th Dec 1831 on the voyage that was to last nearly five years. Darwin found his first new plant species (*Pisonia darwinii*) on his way to Brazil when they visited the isolated islands of Fernando de Noronha. As FitzRoy surveyed the coastlines of Brazil, Uruguay and

Argentina, Darwin made expeditions inland collecting rocks, fossils, plants, animals and fungi. He found the array of tropical plants bewildering and wrote to Henslow *'It is positively distressing to walk in the forest amidst such treasures and feel they are thrown away on one'*. Henslow's reply reassured him that his plant collections and seeds were eagerly awaited.

46 - One of Darwin's first finds: *Calceolaria darwinii* (syn. *C. uniflora* var. *Darwinii.* Photo: Ian Christie)

After Beagle had been away for almost a year they reached the stormy shores of Tierra del Fuego. Near Port Desire, Charles discovered four new species of plant which are all named for him, including the cactus *Opuntia darwinii* and the beautiful *Calceolaria darwinii* (syn. *C. uniflora* var. *darwinii*. Not all plants were new or rare and he was surprised to find some familiar British species like the field mouse-ear (*Cerastium arvense*) and the sea pea (*Lathyrus maritimus*). On the island of Chiloe off the west coast of Chile he discovered the popular yellow-flowered evergreen hedging plant *Berberis darwinii*.

In Sept 1835 Beagle sailed to the remote Galapagos islands 1100 km west of the South American mainland. Although these volcanic islands were largely barren, Darwin found many species of plants and animals which he had not encountered in similar habitats on the mainland. An astonishing feature of the flora and fauna was that although the islands of

the archipelago were quite close together they often had their own endemic species. For instance, thirty species of the James Island plants were confined to this one island. The famous tortoises were not the only giants on the islands, since eight new species of the daisy family (Asteraceae) were trees - a completely atypical growth form for this group.

Upon the Beagle's return in October 1836 Darwin found that Henslow had not been able to classify many of the unusual Galapagos plants and they had to wait seven years until the young Joseph Hooker undertook the formidable task. Joseph was the son of William Hooker, Kew's first director, whom he was eventually to succeed. He was familiar with the flora of South America, having accompanied Ross on his Antarctic expedition of 1839 which visited some of the same locations as the Beagle. Darwin prided himself on collecting 199 of the 239 Galapagos species, of which 123 were not found anywhere else in the world. Some of the new species were named for him including the wild cotton tree *Gossypium darwinii*, a tree composite *Scalesia darwinnii* and *Darwiniothamnus* - a new genus of Erigeron-like plants.

A long lasting friendship developed between Joseph Hooker and Darwin. In January 1844 Charles started confiding his theory of natural selection to him, starting with the notion that species formed by the Creator could change with time: '*I am almost convinced (quite contrary to the opinion I started with) that species are not (it is like confessing to murder) immutable*', adding that '*I think I have found out (here's presumption!) the simple way by which species have become exquisitely adapted to various ends*'. The *'simple way'* was of course *'Natural Selection'*.

An important element in formulating the theory of evolution was the observation that although members of a species had many common characteristics there was also a lot of individual variation. Darwin realised that, when there where too many offspring competing for limited resources, those variations that increased an organism's chances of survival would be preserved and multiplied in subsequent generations at the expense of less advantageous variations which would be eliminated. Darwin referred to this process as *'Natural Selection'* and offered it as a mechanism that would explain the Origin of New Species (Darwin 1859).

While gathering information about plant variation, Darwin noticed that there appeared to be more than one form of golden flax (*Linum flavum*) flower. He must have followed up this observation because the next spring he wrote to Hooker '*I have this morning been looking at my experimental cowslips and I have found some plants have all flowers with long stamens and short styles and others with short stamens and long styles, this I have somewhere seen noticed, I think by Henslow*' .

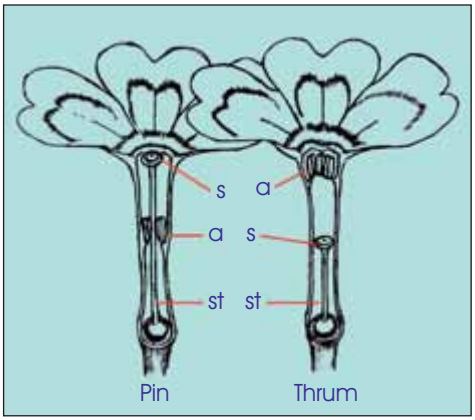
The Primulas

Indeed, Darwin's recollections of his botany course were almost certainly,

47 - Thrum-eyed (left) and Pin-eyed primulas

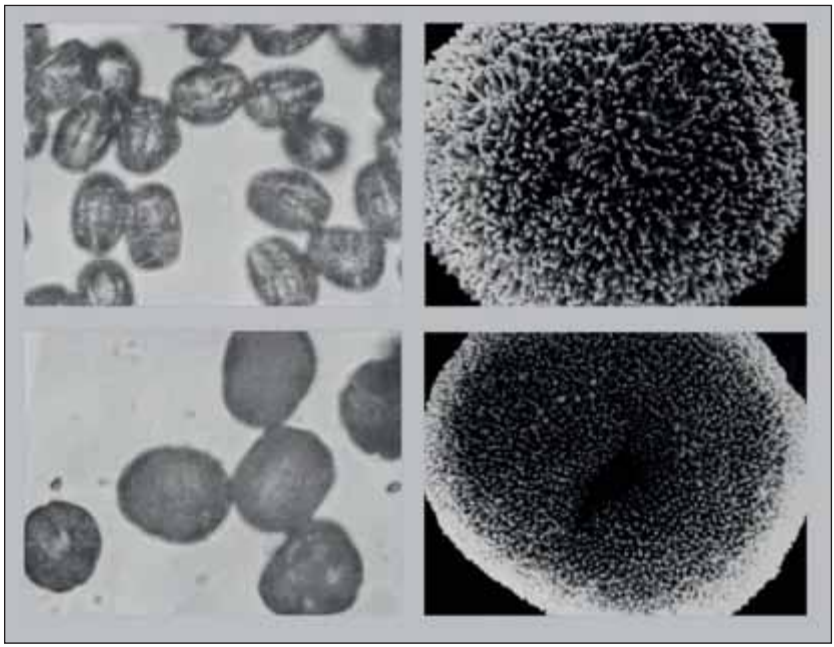
correct as Henslow's drawings of what we now call the *'Pin'* and *'Thrum'* forms of *Primula* have been discovered at Cambridge (Kohn et al 2005). Initially, Darwin thought the two forms might just be '*unmeaning variation*'; however, the following facts suggested otherwise: intermediate forms were very rare; only one form of flower was found on any plant; marked plants retained the pin or thrum character from season to season; when propagated by division, all plants retained the parent plant's characters; thrum and pin were found in the wild state in approximately equal numbers; and this dimorphic (two forms) condition occurred in a number of other *Primula* species. He went on to examine both forms carefully, finding that the pollen of the thrum form was bigger than that of the pin in the ratio 3:2. The stigma in the pin form was globular and covered with longer hairs or papillae while that of the thrum was smoother with a central depression (Darwin, 1862a).

48 - Pin-eyed (left) and Thrum-eyed primulas



Longitudinal sections of the two forms of primrose flower (From Darwin 1861): '*In the 'pin' or long styled form the stigma (s) projects just above corolla tube and is externally visible; it stands high above the anthers (a) which are situated halfway down the tube and can not be easily seen. In the 'thrum' or short styled form the anthers (a) are attached high above the stigma; for the style (st) is short not rising halfway up the tubular corolla'.*

Darwin's first explanation for this 'dimorphic' condition was that these species were '*on the high road to having separate male and female plants*'. He thought the short stamens with their smaller pollen grains would eventually abort in the pin plant to leave a female flower with only a functional stigma, style and ovary. In contrast, in the thrum plant the stigma, style and ovary would abort to leave a male flower with only functional anthers. He tested the hypothesis that the pin anthers and thrum style might be partially defunct by comparing seed set when pin pollen fertilised thrum with that produced when thrum pollen fertilised pin. Much to his surprise, the union between the partially defunct anthers and styles set the most seed - which '*knocked the abortion theory on the head*'.



49 - Micrographs of pollen and the stigma from primrose flowers:
Upper - pin; lower: thrum

Although it was possible to self-pollinate both forms of plant artificially, this rarely happened in Nature. Primulas netted to exclude insects rarely produced seed, unlike adjacent un-netted plants which were visited - and presumably pollinated - by bees. Darwin suddenly realised a significance in the fact '*that the stigma in one form stands at exactly the same height as the anthers in the other*'. He went on '*If the*

proboscis of a dead humble bee be pushed down the corolla ... ' as it would be if extracting nectar from the base of the flower '*... it will be found that the pollen from the thrum form will adhere round the base of the proboscis and will be left with certainty on the stigma of the long styled form'* should the insect go on to visit one. Likewise '*pollen from the short stamens will adhere a little above the tip of the proboscis and will generally be left on the stigma of the thrum form'.* So 'dimorphy' appeared to be a mechanism to encourage cross pollination between the pin and thrum forms. Later, Darwin went on to show that 'dimorphy' or 'heterostyly' (different style lengths) - as it became known - was found in a number of plant families; in some species like purple loosestrife (*Lythrum salicaria*) there were even three style lengths (Darwin 1877).

However, heterostyly was not a perfect mechanism, as it allowed some self pollination to occur. Darwin noted '*in withdrawing the proboscis from the pin flower, pollen adhering to the tip can be left on the pin stigma'* and '*when inserting the proboscis between the anthers at the mouth of the thrum form, pollen is invariably carried down and left on the flower's own stigma'.* These observations led him investigate if pollen from the thrum form would produce the same amount of seed when placed on the thrum stigma as it would if placed on the pin stigma and *vice versa*. He found that one third more seeds were produced if pin pollen was placed on a thrum stigma compared with the same amount of pollen placed on pin. Similar results were obtained using thrum pollen suggesting that the plants could distinguish between pin and thrum pollen types. In a further experiment he first placed pin pollen on a pin stigma and then a day later followed it with thrum pollen from a red cultivar. All the thirty offspring he raised from this union were red, suggesting that the pin stigma discriminated in favour of the growth of thrum pollen. Conversely a pin stigma would favour pollen from a thrum plant. What Darwin had discovered is now termed *'self incompatibility'* and represents yet another mechanism to avoid self fertilisation. Primulas are only partially self incompatible but he went on to show that '*ovules of other plants absolutely refuse to be fertilised by pollen from the same plant but can be fertilised by pollen from any other individual of the same species'*; they were completely self incompatible.

The Orchids

Because the anthers and stigma are so close together in most flowers it was widely assumed that the majority of plants were self pollinated. Darwin began to suspect that, like the primulas, many plants had mechanisms to favour cross pollination. Encouraged by Robert Brown, the great Scottish botanist, he embarked on an investigation of '*The Contrivances by which Orchids are Fertilised by Insects*' (Darwin, 1862b). These beautiful flowers, like peacock tails, were one of the strongholds of the '*Creationists'* who opposed his theory of Natural Selection. Both were

considered as prime examples of *'Celestial Art'* created purely for the pleasure of mankind with no evidence of utility. Darwin worked from the premise that the orchids had evolved from an ancestral monocot that - like a modern lily - would have had two whorls of three equal petals (tepals), two whorls of three stamens and a stigma with three lobes. Orchids do not look even remotely like lilies but by tracing the vascular system of the flowers Darwin was able to work out how the original fifteen flower parts had been modified to form a modern orchid flower.

The Lady's Slipper orchid (*Cypripedium calceolus*) serves as an illustration. It has only four twisted brown tepals, one of which represents two of the original tepals fused together. The large gold slipper-like labellum represents the sixth tepal which is in-rolled round the upper opening to form a funnel trap for small bees. Bees are attracted by the fruity smell and enter the labellum, the inside walls of which are very slippery. Once the bees are inside, their only escape is up a tract of hairs at the rear of the flower. They are attracted in this direction by translucent panels in the labellum at the back of the trap. The ancestral six stamens and three stigmas are united in the orchids to form a structure called the column. In the Lady's Slipper orchid there are two short stumpy stamens on either side of the column with a third which has evolved into a 'staminode'. This stamen has lost its function of producing pollen, the anther sack having become flattened and covered with purple-pink dots. This modified structure serves to block escape from the labellum, the pink

50 - Cross section of a *Cypripedium* (Photo: Evelyn Stevens)

dots acting as nectar guides to direct bees that have just landed on it into the trap. Darwin thought the other three non-functional stamens had been assimilated into the structure of the column and the edges of the labellum.

After a period of frantic buzzing, trapped bees calm down and climb up the tract of hairs, squeezing under the stigma and anthers to escape via two small apertures at the back of the flower. Sticky pollen is deposited on the bee's back as it pushes past the anther. It then flies away, probably vowing never to visit another *Cypripedium* but, having a short memory, it eventually falls into the trap on another plant. This time as it squeezes out of the labellum it deposits the pollen from its back on the new plant's stigma before picking up another load of pollen on its way out. This one-way mechanism is quite effective at promoting cross pollination. The Lady's Slipper orchids are the simplest and most primitive members of this huge family. Darwin found that the more advanced forms had unbelievably elaborate '*contrivances*' to promote cross pollination. Our own fly orchid (*Ophrys insectifera*) has evolved modified petals to resemble an insect and also produces a scent containing female pheromones; the combination attracts male *Gorytes* wasps to mate with the flower, pollinating it in the process.

It became apparent that there is a wide range of mechanisms favouring cross fertilisation and Darwin '*inferred from this fact alone that they must derive some great advantage from the process*'. An accidental observation made while studying inheritance was to provide an explanation. Seeds of toadflax, *Linaria vulgaris*, produced by cross pollination (pollen from one plant placed on the stigma of another plant of the same species) were grown in a border next to seeds produced by self pollination (pollen placed on the stigma of the same plant). The first were obviously much stronger and vigorous than the latter.

51 - The Fly Orchid, *Ophrys insectifera* (Photo: Tom Turner)

To investigate if the phenomenon was widespread a range of plant species was shielded from insect visits by nets. Some flowers were then artificially pollinated by their own pollen and others by

pollen from a separate plant of the same species. Two seedlings from self fertilised seed and two from cross fertilised seed were grown on opposite sides of the same pot, ensuring identical growth conditions. The height, weight and seed production of the resulting plants were compared. The first generation of self pollinated plants was then also self- and cross-fertilised and the second generation seed was grown and examined. This careful painstaking work was carried on for up to 10 generations on 57 species, the whole study involving 1101 different crosses. The most important conclusion drawn from all this work was '*that cross-fertilisation is generally beneficial and self-fertilisation injurious*' (Darwin, 1876). Results from the cowslip *Primula veris* provide an example. Plants were initially self pollinated for three generations before being divided into two groups, one self- and the other cross- pollinated. Cross pollinated seed produced much more vigorous plants; they were more than twice the height; they bore more than three times the number of flower spikes; and they produced twenty times more seed than their self pollinated counterparts.

Darwin's experimental design of raising cross pollinated and self pollinated seedlings on either side of a single pot sometimes resulted in severe competition. This provided an illustration of the principle of *'Natural Selection'* since '*In all such cases the crossed seedlings exhibited a great superiority in their power of growth over the self-fertilised'*. Müller later expressed the doctrine in a more dogmatic form than Darwin: '*Whenever offspring resulting from crossing come into serious conflict with offspring which are the result of self fertilisation the former is victorious, only when there is no struggle for existence (... protected by man in farms and gardens) does self fertilisation prove satisfactory'*. So, if a self pollinated species produced mutants in which cross pollination was favoured, they would be *'naturally selected'*. The existence of plants which are routinely self pollinated by no means contradicts Darwin's view. For example, self fertilisation is more important in annuals than perennials as without it the lack of pollinators during a single season could be disastrous.

Darwin, the Gardeners' Friend

From 1841 till the end of his days Darwin used the '*Gardeners Chronicle*' as a sounding board. The 57 letters and articles he submitted ranged from a request for observations on whether seeds could survive long enough in sea water to reach remote islands like the Galapagos, to the origin of double flowers. As a result, Darwin's books on plants are full of acknowledgements to gardeners who sent him plants, ideas and observations. The following extract is from a letter in the '*Gardeners Chronicle*' just after his death in April 1882 (Allan, 1977). It reflects the sincere sense of loss felt by the gardening fraternity: '*You can not so well estimate what mental quickening and pleasure Darwin brought to*

hundreds – probably thousands – of practical horticulturalists. His facts, so powerfully marshalled, brought new light, fresh inspirations and a higher intellectual life to myriads of plodding workers in the field of horticulture ... No practical man no matter how humble his station that had a fact to record was considered unworthy of his notice or a note of thanks ... In losing Darwin few amongst us but feel we have lost a friend as well as a great teacher ... His friends may be assured that he lives in the hearts of many of us and being dead he will yet speak to us through his marvellous works, which have done so much and will do yet more to raise the science and practice of horticulture as well as botany to a higher, nobler level than either of them has ever reached heretofore.'

References

Allan, M (1977) Darwin and His Flowers. Faber and Faber. London
Darwin, C (1859) On the Origin of Species by Natural Selection. John Murray. London
Darwin, C (1862a) On the Two Forms, or Dimorphic Condition in the Species of Primula, and their Remarkable Sexual Relations. Journal of the Linnean Society (Botany) 6, 77-96
Darwin, C (1862b) The Various Contrivances by which Orchids are Fertilised by Insects. John Murray. London
Darwin, C (1876) The Effects of Cross and Self-Fertilisation in the Vegetable Kingdom. John Murray. London
Darwin, C (1877) The Different Forms of Flowers on Plants of the Same Species. John Murray. London
Kohn, D et al. (2005) What Henslow taught Darwin. Nature 436, 643-645

Write for the Journal

Do you have a favourite plant? An alpine travelogue? A gem of growing advice? Glowing images of plantly perfection? A horticultural enthusiasm you want to share?

If you thought 'Yes!' to any of these questions, read on …

We are fortunate to have members who write fascinating material so often and so generously. Why not join them? From my experience so far, I believe that even the most reticent of us have something well worth sharing with fellow members. We stand particularly in need of short articles to leaven the mix. It is easy: string a few thoughts together, select a few pictures, send whole thing to your editor in almost any form and he will help you achieve your desired result. No-one marks your efforts out of ten; fellow members will buy you drinks; all the praise will be yours; all the blame will be the editor's. What could be easier?

Anton Edwards

Growing *Bellendena montana*

Jeff Irons

It has been estimated that there are 5000 cubic kilometres of dolerite below Tasmania. It was put there in Jurassic times and in places the molten rock welled up through fissures almost to the surface of the overlying rocks. Today those strata have worn away and the upwellings form and dominate Tasmania's landscape. This was brought home to me one Easter; three of us had decided to visit Hartz Mountain, about sixty miles south of Hobart. Around an hour after leaving the hut in which we had spent the night we reached a dolerite outcrop. On its top, in a crack, was a line of *Bellendena* plants, each displaying its little red flag of seed heads. Nearly fifty years later the sight is still vivid in my memory.

Bellendena montana, Mountain Rocket, is the only member of the genus *Bellendena* in the family Proteaceae. The genus is one of the oldest in this very old family, estimated to be eighty million years old. The species has a complex dormancy and because there is no commercial incentive it has not been studied. Various suggestions have been made as to what amateurs can do to overcome the germination difficulties. One is that because the seed is so colourful it is often collected before it is really ripe; I have tried leaving seeds on my own plants until they were black, then collecting and sowing. It has also been suggested that seeds should be collected while they are green and before the germination inhibitors have formed. I have tried collecting and sowing green seed; like sowing black seeds, it did not work. What follows is my own unscientific method.

Firstly, do not bother with the small samples given in society packets. They do not contain enough seeds for reasonable success. Buy one gram of seed (or several people could club together and buy more) and sow all of it on the surface of an open mixture, in a six inch pot. Place outside, off the ground in the shade, and leave. Keep the surface free from liverworts. After a few years, germination will take place over about three weeks in spring. There may be as many as fifteen seedlings. This will continue for

52 - Habitat of *Bellendena montana* (photo: Greg Jordan)

four or five years. Always, germination will be in the short spring period. Seedlings should be removed as soon as they germinate and transferred to a pot.

Here it is necessary to digress a little. *Bellendena* is the only plant in its genus, which is in the Proteaceae family. The family is mostly found on very poor soils and has developed a way of coping with lack of nutrients that affects the way we grow them. All except three genera have special very fine seasonal roots called proteoid roots. When present they make up half of the root mass and are in the upper layer of soil, even rooting into leaf litter. When growing *Bellendena* we have to provide suitable conditions for these roots which, providing conditions are right, form even in the first season. Without them, growth is slowed down.

Tasmanian mountain soils have an average pH of 3.9. Experience has taught me that some species need an acidic growing medium. So, very acid compost is desirable. It also needs to be well aerated and should be low in nutrients. Many Proteaceae have sufficient food in their large seeds to sustain the seedling for a year or more. Because of this I use a mixture of equal parts of peat and Perlite and do not add any nutrients. Seedlings are put in a one to six inch pot and placed in a cool, light, airy position. On no account must sun be allowed to play on the sides of the pot; it raises the compost temperature and effectively steam-cooks the plant roots. After the first year I give a little feed every now and then. Many Proteaceae are sensitive to phosphorus so I use a proprietary zero-phosphorus mix with a little seaweed fertiliser added. I have tried using

53 - *Bellendena montana* (photo: Greg Jordan)

nothing except rain and wind blown dust; that seems to be quite effective! Phosphorus poisoning shows up by the leaves' turning brown or black. In the former case all compost should be washed off and the plants repotted in a low nutrient mix. If the leaves turn black, it is impossible to save the plant. Another factor is water. Plants of some species can be healthy and grow well - then when additional water is given, phosphorus becomes available and the plant dies. Because it 'locks up' phosphorus and so helps eliminate water induced stress, some growers add 5 to 10% of clay to their potting mix. Properly grown plants will bloom after five or six years. Once you have your own plants they can be propagated from cuttings; early spring and late autumn seem to be equally effective. Leaf size is quite variable and some seedlings will have larger leaves than others. This does not affect the time needed to produce flowers.

54 - On Ben Lomond, Tasmania

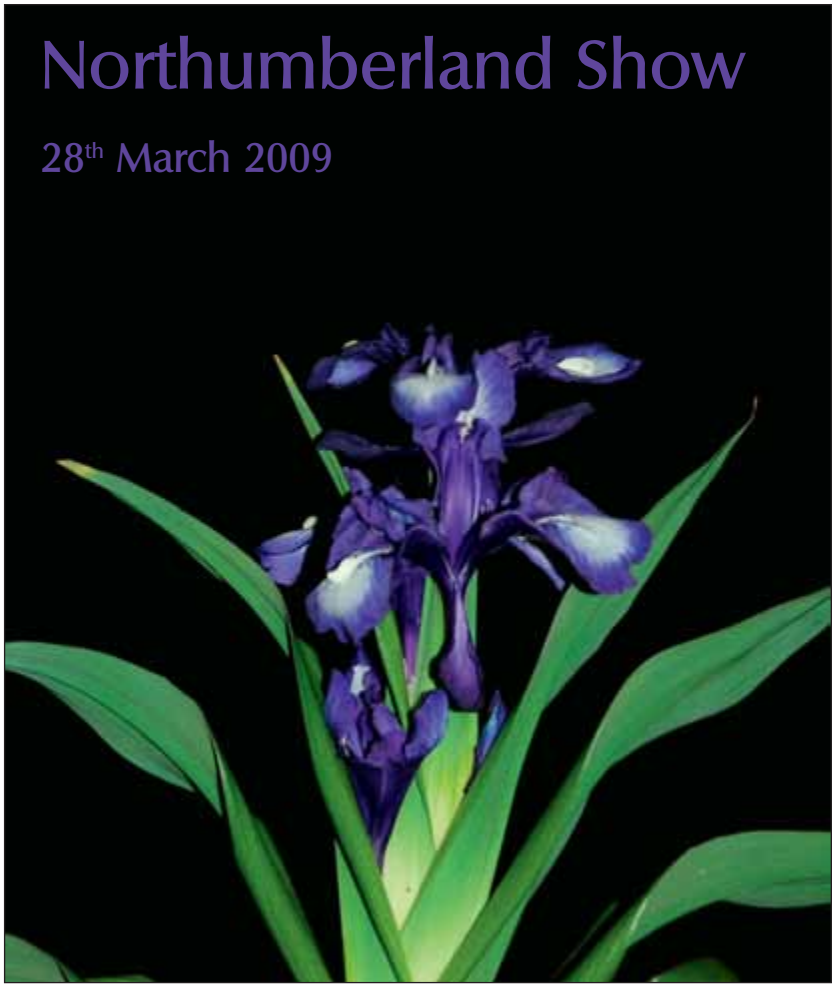
Many Proteaceae resent transplanting and open-ground plants die when moved. Proteaceae in general are very sensitive to root rotting fungi, especially *Phytophthora cinnamomi*. That is why plants in the ground nearly always die when moved. The disturbance breaks roots and exposes them to attack. Repotting is rarely necessary but, because of the danger from death due to disturbance, plants in pots are best transplanted just as the proteoid roots begin to form. This can be determined *only* by experiment, removing a plant from its pot and observing whether any cobwebby white roots are present. If they are, the plant may be repotted.

55 - Cultivated in Heswall, Cheshire

A suggested seed supplier:
Wildseed Tasmania
www.wildseedtasmania.com.au

Northumberland Show

28th March 2009



56 - *Iris aucheri* 'Indigo' (Vera Buck)

The Northumberland show has always been favoured with a large entry of plants and this year was no exception thanks to the effects of an old-fashioned winter that held back many plants. A good number of plants were in the peak of condition, with *Primula allionii* strongly represented by 17 entries in the single pan (less than 19 cm) class alone. The floral display was especially enhanced by a wonderful display of early bulbs and cushion plants from the Royal Botanic Gardens, Edinburgh, who returned to the show after an absence of several years. Their highly regarded display received a gold award from the judges.

57 - *Shortia uniflora* (Brian Davidson)

Amongst the abundance of flower power, the Farrer Medal winner for Geoff Mawson was an example of subtle excellence. His *Trillium rivale* (reticulated leaf form) with its patterned leaves has been coming to shows for some time, having been selected as an unusual seedling some time

58 - *Ranunculus alpestris* (Ian Kidman)

59 - *Tulipa schrenkii* (Barbara Hoyle)

ago. But this year its time had come, and the beautifully presented foliage, topped with delicate white flowers, was a worthy winner.

This year is the 80th anniversary of our sister society, the Alpine Garden Society (AGS), under whose rules the show was held this year; the 80th Anniversary Award, along with the local group's Sandhoe trophy for the best plant in pot up to 19 cm, went to a fine *Shortia uniflora kantoense* from Brian Davidson. The closely bunched groups of delicate fringed flowers suffused with light pink were held above the foliage - unlike many shortias that hold their flowers down amongst the shiny dark green leaves. A close contender for these awards was Ian Kidman's neat little *Ranunculus alpestris* – a difficult plant to grow and even harder to keep compact like this specimen when under glass. It was awarded a certificate of merit as a consolation prize - not that Ian needed consolation, winning two AGS medals in the small and large pan classes for six distinct plants in each class, and the R B Cooke plate for the most first prize points in the open section, for the tenth year in succession.

There was also strong representation in the B and C classes for those less experienced in showing and some fine plants were on display here. A beautifully coloured *Iris aucheri* 'Indigo' grown by Vera Buck, with the classic deep blue indigo colour of the flowers set off by a white splash in the centre of the falls, caused quite a stir. Nearby was a well grown *Tulipa schrenkii* from Barbara Hoyle, with its neat red and yellow flowers nestling amongst the short glaucous-green foliage; it showed how beautiful tulips can look on the show bench when well grown.

Two other plants particularly caught my eye: local group member Derek Lockey had a fine hybrid *Primula* in the large pan classes. *Primula*

60 - *Primula* 'Phillip' (Derek Lockey)

'Phillip' has mealy, toothed leaves reminiscent of *Primula* 'Linda Pope', but the pompoms of flowers hovering over the foliage were purplish-blue (almost indigo, in fact) with a white central area and fine white margin, giving a very dainty look to the display. Evidently other people were also impressed by the plant, as Derek said he had promised cuttings to two

61 - *Pulsatilla* 'Budapest Seedling' (Brian Davidson)

other exhibitors by the end of the show. To change the colour scheme, Darren Sleep was exhibiting two forms of *Ranunculus asiaticus*, both flowering at about 30-40 cm high. The red form was good but I especially liked the deep yellow form, whose brick red colouration just bled into the margins of the petals; a stunning combination and, as it was just opposite the results table, we had ample time to study it.

It would be easy to continue listing many fabulous plants, but I should perhaps finish with one plant which is not often seen these days. Brian Davidson showed a potful of *Pulsatilla* 'Budapest Seedling' which was a beautiful clear light blue with the merest hint of mauve in the petals and looked something like the original *Pulsatilla* 'Budapest Blue' was reputed to look. Other seedlings of the original which I have seen (and grown) were either a faded blue, or otherwise showed too much purple in the petals. Altogether, another fabulous show - and one which would not be possible without the willing support of so many members, both from the local group and some regulars from further afield, all making my task as show secretary so much easier.

Peter Maguire (and Glassford Sprunt)

Kathleen Dryden, VMH

23rd May 1925 - 18th May 2009.

Members will be sad to know that Kath Dryden, an honorary vice-president of the SRGC, died in May. Many people have already paid tributes to Kath as one of the best respected plants-women we have ever known. A unique lady whose knowledge and love of her plants spread world-wide, she stood no nonsense from anyone and I, for one, feared her in my early days - but she had a heart of gold. Kath loved her garden, we kept in touch every week, she was very proud to be an honorary member of the SRGC, and we intend a tribute to her work in the next issue of this journal.

Ian Christie

Stirling Show

21st March 2009

The show was well supported by exhibitors and visitors and was a dazzling success. Although not as big a show as Blackpool, the benches in Dunblane's Victoria Hall were filled with pans of good alpines and bulbs. Cyril Lafong triumphed by taking most of the trophies in Section 1 (except the Carnegie Dunfermline Trust Trophy for most points in section I, which Watt Russell kept from him). Cyril's *Tecophilaea cyanocrocus leichtlinii* took the Forrest Medal and the Institute of Quarrying Quaich for 'Best non-European Plant'. His *Primula* 'Broadwell Milkmaid' was awarded the Ben Ledi Trophy for 'Best European Plant' and the Spiller Trophy for 'Best Primula'. Four top prizes - 2 plants! *Trillium rivale* 'Purple Heart', winner of two previous Forrest medals, sulked in the corner.

64 - Watt Russell & trophy

Watt showed a wide selection. His miniature garden won a well deserved first prize; it was carefully planted with 19 different alpines including saxifrages, sempervivums, androsaces and primulas. His three pans of sempervivums came first and he had strong entries in the *Primula* and *Saxifraga* classes.

Certificates of Merit were awarded to Cyril's *Corydalis aitchisonii* hybrid & his *Saxifraga* 'Coolock Gem', to Scott Cook's *Iris* 'Shocking Blue', Jim Sutherland's *Ranunculus crithmifolius* and Peter Semple's *Ranunculus calandrinioides*. Ian Steele again won the Fife County Trophy for most points in Section II.

Ian & Carole Bainbridge showed two rarely seen Chinese saxifrages - *S. clivorum* and *S. georgei*. Their green-centred white flowers made a cool contrast to the many very bright hybrids. Jean Wyllie's pan of *Narcissus* 'Bette Mae' gets bigger every year and we now expect it on the bench, but Jean cultivates other plants skilfully. This time, her fabulous *Shortia uniflora* grabbed attention with its pristine shiny green-red leaves surrounded by a crown of palest pink flowers.

We often fail to recognize the great contribution conifers and shrubs make. They are the backbone of many shows south of the border. Here in Scotland we need more people to grow and show in the shrub, conifer and foliage classes. These plants provide extra interest and give our eyes respite from the exuberant flower colours. Combined, the wee trees and shrubs create an 'enchanted forest'. *Coronilla emerus*, looking like a delicate pale yellow broom, was an eye catcher from Bob Meaden. What a pity it was up against the *Shortia* in its class. My favourite (but not

65 - *Shortia uniflora*

66 - *Pulsatilla vulgaris*

67 - Trough (Watt Hunter)

everyone's) small shrub of the moment is *Leucothoe* 'Curly Red', a plant whose leaves go dark red in winter. David and Carol Shaw combined *Leucothoe* with *Santolina* 'Lemon Fizz' to enhance each plant's features.

The glory of a show is that it brings special plants to your attention - and not always the big pans. Margaret & Henry Taylor have hybridised narcissi for many years. This time they brought a stunner, a hybrid between *N. provincialis* and *N. cyclamineus*. It reminded me of a refined

68 - *Saxifraga clivorum* & *S. georgei*

69 - *Townsendia spathulata*

70 - *Tulipa berkariense*

N. pseudonarcissus with swept back petals but much shorter in habit.

Muscarima moschata is an example of the refined relation with star qualities in family of common - some might say weedy - garden plants, namely *Muscari*. The flowers generally form a more open, taller and sturdier spike, often in muted colours. I like the muscarimas a lot, although my spell checker wants to change the name to *Mascara* or *Macarena*! *Muscari chalusicum* is neither shrinking violet nor thug in the garden. It is another refined cousin ... and some *Muscari* are *Bellevalia*. *Bellevalia pycnantha*, from North Africa and South-West Asia via the Royal Botanic Garden, Edinburgh (RBGE), according to the label, was collected by Eric Pasche!

Tulipa berkariense, with huge flowers, seems to be a Janis Ruksans' introduction as I cannot find out much about it. *Tulipa sogdiana* from central Asia must be one of the smallest tulips in the world. Typing its name I imagined a wet and soggy Princess Diana. A delightful little princess among garish giants, I commend it to you all. *Tulipa humilis* is a stronger growing plant we should all try to grow. There are various colour forms and a collection would make a fine present for a rock gardener with a birthday in October planting time. Tony Derby doesn't show often but here he had a small pan of the later flowering *Galanthus platyphyllus* with wide shiny green leaves and simply marked flowers.

The six pan class commemorates the SRGC Silver Jubilee in 1993 and attracts a diverse entry. Peter Maguire won with a classy entry - *Draba rosularis*, *Primula* 'Broadwell Milkmaid' & *P.* 'Mary Berry', *Hepatica japonica* 'Unabara' & *H. americana*, and *Dionysia* 'Ewesley Omicron'. 'Ewesley' was the address of past SRGC president Eric Watson, who lived in the same neck of the woods (Tyneside) as Peter. Other fine plants among the sixes were a fine *Erythronium hendersonii* and *Narcissus atlanticus*, the latter looking like a taller and creamier version of *N. watieri* from Morocco, both of which would have appealed to past-president bulb log guru Ian Young (www.srgc.org.uk/bulblog/bulblog.html) who was gallivanting, sorry, lecturing in western USA.

In the 'grown from seed' three pan class, Margaret & Henry Taylor showed *Sarcocapnos enneaphylla* from the Pyrenees, *S. crassifolia* from Andalucia and - showing how far they travel - they completed their entry with *Primula obtusiloba* from the northwestern Himalayas. All were sown in 1997. Just as beautiful but much easier to grow and find in gardens is *Primula denticulata alba*. Several forms of *P. marginata, allionii* and *pubescens* revealed the variation to be found within a genus. *Primula* 'Pink Aire' is an example of Tom Green's fabulous plants. Seeing them I think I will have to reduce my numbers of bulbs and grow *Primula* hybrids. I just love them - especially when they are grown like Tom's!

The corydalis classes were perhaps the most colourful in the show. Cyril's superb yellow *Corydalis aitchisonii* hybrid dominated the class. Its daddy is unknown as it is a plunge bed foundling. My money would be on *C. popovii*. Blue *Corydalis turtschaninovii* was shown by Scott Cook. A wonderful cool colour, it could be renamed Cook's Cool Corydalis. If they did not have to spell '*turtschaninovii* ', who would object? There is a hybrid *Meconopsis* x *cookei* but it is pink. How apt that a family which gives its name to a pink meconopsis should have a Scottish member who shows blue corydalis at a time of year when most are purple, red or pink.

Townsendia spathulata was a wee star which everyone wanted to take home. Each year we seem to get one *Townsendia*, never enough for a class but always surprising by their early start to flowering. I think of them as summer plants.

The judges awarded two gold medals for bulb displays. The first went to the RBGE; we thank and congratulate the Regius Keeper and John Mitchell & Elspeth Mackintosh who brought and set up the plants. Everyone wanted the dark blue iris in the centre - *Iris aucheri* 'Shooting Star'. I might have tried to get 'Ink' into the name, in keeping with the inky dark flowers but I agree it is a star. I would settle for their *Fritillaria assyriaca* ssp. *assyriaca*. I admired their plant of *Scoliopus hallii* with its tiny orange brown flowers. I have grown it for years and it is only a quarter of the size. The second gold medal went to the show secretary, me, for hardy bulbs including several pans of *Fritillaria sewerzowii*, *Narcissus* 'Mitzi', *Narcissus* 'Snipe' and *Tecophilaea cyanocrocus*, all raised in Dunblane to show visitors just what can be grown in the town.

A plant to watch for future Forrest medals is Cyril's pink *Pulsatilla vulgaris*; it gets better and better each year. It has large, beautiful pale pink, silken flowers with crowns of golden stamens and regal purple stigmas in the centre. This is a plant that screams 'Quality' - a queen in its genus.

Looking round the hall you could see what a show is about. Colour, Sunshine, Interest, Scottish Rockers, Chat, Variety, Quality. Marvellous well grown plants from all over the world.

March 21st ... and it looked like summer.

Sandy Leven

71 - *Leucothoe* 'Curly Red' & *Santolina* 'Lemon Fizz'

Edinburgh Show

4th April 2009

72 - *Arum creticum*
(Ian and Carole Bainbridge)

73 - The Edinburgh Show

With four seasons of weather in one week and squally showers on Friday and Saturday mornings, growers did not have an easy run up to the Edinburgh show but by 9.30 the benches were full and festooned with every colour of the rainbow. At 9.45 the rigorous job of judging took place and we extend big thanks to Sandy Leven, Julia Corden, Harley Milne, Ian Christie, Barry Caudwell, John Lee and the stewards who worked so very hard behind the scenes. By 11.45 all the medals and points had been tallied, at noon the doors opened and the expected mad rush of the public and exhibitors started - to be the first to see the show. They were not to be disappointed.

This year, because of the very high standard, four Certificates of Merit were awarded to outstanding plants. Cyril Lafong received three for *Pleione* 'Shantung', *Lewisia tweedyi* 'Lemon' and *Androsace vandellii*. Local members Sue and Hector Riddell were also awarded a Certificate of Merit for a stunning pan of *Draba bertolonii*.

74 - The RBGE exhibit

75 - *Erythronium multiscopoideum* and generous advice (Cyril Lafong)

Other local members also received awards; the Alf Evans Quaich was awarded to Stan da Prato for a pan of *Erica carnea* 'Winter Sun'. The Midlothian vase for the best rhododendron in the show went to Stan for his pan of *Rhododendron* 'Snipe' and he was also deservedly awarded the Reid rose bowl for most points in section I. The award for the best plant in section II went to Mike Hicks who received the Midlothian bowl for a superb pan of *Primula elatior*. A large pan of *Saxifraga georgei*, covered in flower and dug up from the garden for this show, gave Hector & Sue Riddell the 'Best Saxifrage in Show' and the Bill Mackie Quaich.

There were lots of European and American primulas to light up the benches but the K C Corsar Challenge Trophy for the 'Best Primula in Show' was awarded to Tom Green for *Primula* 'Pink Aire' with its pinky-white flowers covering the whole plant. The 'Best Asiatic Primula', *P. henricii* - with its distinct yellow eye and pinky-white flowers poking through the dark green leaves – was shown by Cyril Lafong and was awarded the R E Cooper Bhutan drinking cup. A large pan of *Scoliopus bigelovii*, native to North America, was exhibited by Ian Christie; it won the Henry Tod Carnethy Quaich for the best bulbous plant in the show.

76 - Opposite from top - Seven beauties:

1 - *Primula Pink Aire;*
2 - *Lewisia tweedyi* 'Lemon';
3 - *Androsace muscoidea* var. *breviscapa*
4 - *Benthamiella patagonica;*
5 - *Androsace vandelli;*
6 - *Primula henricii;*
7 - *Saxifraga georgei*

77 - *Benthamiella patagonica* (Richard Barr)

Class 5 was closely contested and top honours went to three pans of *Androsace vandellii*, *Primula henricii* and *Jeffersonia dubia alba* from Cyril Lafong while Henry & Margaret Taylor came a close second with three pans of *Paraquilegia anemonoides*, *Primula bhutanica* and *Primula obtusifolia*.

Class 3 also was won by Cyril Lafong for three pans of *Benthamiella nordenskioldii*, *Benthamiella patagonica* and *Fritillaria maximowiczii* - all new, rare or difficult in cultivation. Benthamiellas are not very common plants, coming from Argentina and Chile; you will see no better examples than in these pots.

The top honour, the Forrest medal, was closely contended but a large pan of *Androsace muscoidea* var. *breviscapa* received the prize and once again Cyril Lafong was the grower.

The Royal Botanic Garden Edinburgh put on a superb display of alpine plants which drew many comments from other growers and the public. The display gained the garden a gold medal.

78 - Judging (Ian Christie, John Lee, Barry Caudwell)

We have to mention all the people involved in setting up the show. Without their support and hard work none of this would be possible. We are especially grateful to the ladies who worked tirelessly producing home cooking and serving the public, all adding to the whole experience and fun of SRGC shows. Finally, our congratulations go to all the growers for making this an excellent show and to the local members who won so many of the prizes.

John Mitchell

79 - *Papaver orientalis* (Eileen Goodall)

80 - *Jeffersonia dubia alba* (Cyril Lafong)

Perth Show

18th April 2009

The long cold spring season this year seemed to suit many plants and there were good flowerings. Cyril Lafong (Glenrothes) was the grower who took home the largest number of trophies. His *Iris suaveolens* was an unusual winner of the Forrest Medal, the best bulbous plant and the winner of the Major-General Murray-Lyon trophy. In the wild, this iris is found in eastern Bulgaria, north-western Turkey & south-eastern Rumania. Cyril grows it in gritty bulb compost and gives it fortnightly feeds of half-strength Phostrogen. Unfortunately, the flowering period is one week at the most and the subtle yellow flowers don't last long, so luck is needed to show it in peak condition. Other colour forms can be found in purple and yellow-brown.

Cyril was also the exhibitor with the most first prize points in section 1, the winner of the Dundas Quaich and the winner of Class A. His three pans entry consisted of *Androsace vandellii, Trillium grandiflorum* 'Roseum' and *Lewisia tweedyi* 'Lemon'. The six pan display was a good combination of *Lewisia, Sebaea, Daphne, Androsace* and *Dionysia.*

81 - *Lewisia tweedyi* 'Lemon'
(Cyril Lafong, Glenrothes)

82 - *Muscari macbeathianum*
(Andrew Radley, Auchterarder)

83 - *Fritillaria pyrenaica*
(Dave Milward, East Fortune)

The winning plant for the Joyce Halley award came from Carole and Ian Bainbridge (Edinburgh) - an *Erythronium helenae* grown from seed collected in the wild. It originated from the 1998 seed exchange, labelled as *Erythronium multiscapoideum*. Carole & Ian grew it in their alpine house in JI grit-peat compost and re-potted it every two years.

Margaret & Henry Taylor (Invergowrie) exhibited a hybrid between the yellow *Primula szechuanica* and the bright red *Primula maximowiczii.* A pale orange colour, this plant was the best Asiatic primula and winner of the R S Masterton trophy. In the wild, *P. maximowiczii* and *P. szechuanica* are both found in alpine meadows of south-western China although, according to Josef Halda, in different areas.

84 - *Primula maximowiczii*
(Margaret & Henry Taylor, Invergowrie)

The Cox Trophy for the best rhododendron was given to the pink-flowered *Rhododendron* 'Snipe' shown by Stan da Prato (Edinburgh). This year has generally been good for flowering of rhododendrons, particularly those in Scottish gardens.

Barry & Cathy Caudwell (Abernyte) were winners of the Perth Trophy for the second year running; let this be a warning to other members of the Perth group - most of them hadn't entered. Many members were dismayed to find that the number of plants exhibited in Section 2 amounted to one! This does not detract from the excellence of the plant, *Cypripedium* 'Holger' exhibited by Alan Gardiner, who was a worthy recipient of both the Perth Salver and the John Duff prize. If you're

85 - A bench at Perth

86 - *Iris sprengeri* (John Lee, Glasgow)

thinking of exhibiting next year and are not sure whether to ... please do! The idea behind having two sections in the show is that new exhibitors need not compete against the experts or 'big boys' in Section 1. You can win 25 first prizes in section 2 before being elevated to the ranks of the experienced growers in Section 1.

The Royal Botanic Garden Edinburgh (RBGE) kindly brought a large display of plants from the glasshouses. It included such rare gems as *Cyrtanthus flanaganii* with its bright yellow spectacular tubular flowers, the small yellow *Delphinium luteum* and *Bellevalia longistyla* from eastern Turkey and Iran. A gold medal was awarded for this display.

87 - 'Raised from seed in 2003, *Primula ellisae* shows a range of growth forms and flowering heights. Richards now places this under *P. Rusbyi* but our plants of that show further variation of height, leaf shape and colour. Grown in alpine house conditions in JI and grit and repotted every few years, they grow into progressively larger clumps.'

(Ian and Carole Bainbridge)

88 - *Ranunculus parnassifolius*
(Alan Gardiner, Falkirk)

89 - *Primula chionantha* ssp. *chionantha*
(Anne and Viv Chambers, Killearn)

90 - Rock plant native to Scotland
(Stan da Prato, Edinburgh)

91 - Henry Taylor and the one that got away

Michael Almond (Errol) brought an exhibition of photographs *'Seen in the Engadine'*. They included a very nice marmot surrounded by alpines which it had so far not grazed. This was more than could be said for the effect of his - presumably genetically manipulated - ladybirds *'Giant Coccinellidae grazing in the Swiss Alps'* and his similar *Pseudopteron nephelococcygiensis* (bird from cloud cuckoo land) which had made its nest in the rare *Eritrichium giganteum.* These destructive members of the cryptozoological fauna of Pontresina and the Upper Engadine have, to date, only been recorded from this area by Lynn and Mike.

Cathy Caudwell

Dancing Bees & Lilac Jewels

Ann Sinclair

I have been to a land where plants climb trees; where dauds of Africa appear, plunked by arable land; where tiny jewels are found at the feet of gnarled ancients and Mother Nature does rock gardening so much better than I do.

With February and March 2008 turning bleak and snowy, a holiday in Cyprus seemed like a good idea, but threatened to turn sour as flu' struck. A walking holiday with a large group of Scottish Rockers now looked like bad news for some, so - to limit damage to others - a few walks would have to be solitary.

The Akamas Peninsula, one of the natural jewels in Cyprus's crown, was one of the first walks we took and it introduced us to the photographic capabilities of our local guide – a man obsessed by squinny local flora and outstandingly gorgeous orchids *at the same time*. One minute a weeny weed, the next - breathtaking bees. These were to be enjoyed at eye level and I, for once, was the right height, for here was *Ophrys lapethica* growing on a tiny meadow at the roadside, the bees dancing in front of my eyes; and here another that looked like the laughing policeman (*Ophrys flavomarginata*). *Clematis cirrhosa* was nearly over and there were seeds to be had. I spotted *Lupinus micranthus* growing in the grit at exactly the size a lupin has any right to be – and not an aphid in sight. Instead, the tiny plant - flower and leaf - was covered in tiny hairs.

I had never seen *Serapias* before but was captivated. Here they seemed to favour moistish situations and to have an interesting construction. Rather cheekily, tongues stuck out from the sepal and petal helmet. Their name comes from the Egyptian god (Serapis) of fertility and joy ... and they can be purchased at your Discussion Weekend! There were almond & *Cistus* blossoms, *Allium neapolitanum* & *Gladiolus italicus* to be enjoyed, and lunch under an olive tree with the peace broken

92 - Above: *Clematis cirrhosa*
93 - Left: A daud of Africa

only by the scuttle of the lizards, while away in front a blue sea stretched calmly over to Turkey in the haze.

– Bliss.

94 - *Gladiolus italicus*

95 - *Ophrys flavomarginata*

We are homeward bound from the mountain foothills; from *Arabis purpurea*, a beautiful pink form; from *Orchis anatolica* ssp. *troodii* and *Gagea julia*; from *Romulea ramiflora* and a dangerous snake in a litter bin. But over by a lonely old building - just a small detour - is a most exciting Cypriot rarity.

Not by the abandoned road; not by the abandoned agricultural building; not even by the abandoned household rubbish which lined the farm track on both sides.

– Thankfully.

96 - *Ophrys lapethica*

97 - *Ophrys levantina*

But on a beautiful natural banking overlooked by ancient trees was a sprinkling of *Scilla morrisii*. This was a jewel of

98 - *Serapias laxiflora*

99 - *Arabis purpurea*

And the daud of Africa? Unlike Ailsa Craig in the Firth of Clyde, this bit wasn't tossed by a giant, Greek or Turk, but was left behind when Africa split from Europe.

Round its base we scrambled enthusiastically looking for plants of interest mainly to our guide - squinny weeds not on an SRGC 'wanted'

100 - *Gagea julia*

a plant, white flushed by pale lilac, with lilac stamens, growing in a secret location closely guarded by our guide, and we were fortunate to have him check it over. On the IUCN Red List of threatened species, it was living in a tiny area in scattered populations. How much longer will it escape the abandoned rubbish and general neglect?

101 - *Scilla morrisii*

list. Some of them looked familiar - could we have these growing wild back home? I suppose so - the vetches and buttercups and so forth, but certainly not the Dutchman's Pipe.

102 - *Barlia robertiana*

Isn't the digital age wonderful? At home with the wind howling and the trees at 45 degrees, I can slip a DVD in the laptop and am instantly transported to Cyprus, March 2008, to find the sun shining through the Dutchman's back once again.

Some photographs are passable; some just snapshots; others a record of a time, a place, an occurrence; but one or two bear second and closer scrutiny. Tiny specks of pollen on the bee orchids, minute spiders' webs on the *Barlia*, small flies that were not apparent in the haste and enthusiasm of capturing a plant portrait. Some can be enjoyed all over again for their depth of colour and others for their sculptural outlines. The most interesting outcome for me, however, has been the appreciation of some of those squinny plants: the gorgeous blue of *Convolvulus siculus*,

103 - Wine, women & wondering

the intense contrasts of *Tetragonolobus purpureus*, and *Scrophularia peregrina* dressed in that so-appealing crushed raspberry with a hint of blackcurrant. What is it about *that* colour that makes most rock garden audiences sigh? *Tetragonolobus purpureus*, the Asparagus Pea, can be grown and eaten, although the fruits are smaller than the name. *Scrophularia peregrina*, the Mediterranean Figwort, which we searched for so diligently on behalf of our guide, was very easily overlooked; it bears a resemblance to our own Common Figwort - regarded by some as Queen of the Herbs for its medicinal and magical properties. And 'magic' was indeed the reaction of our guide when it was discovered.

Looking back (now so easy with the flick of a switch), what can be learned? Inspection – individual flowers are interesting but what grows with them and how is even more so. Grouping – white cyclamen with pink tips growing under a pink-flushed *Cistus* showing a golden shaving-brush of anthers. Contrasts – *Barlia* can look pretty gross compared to delicate orchids like a Naked Man but, seen up close and personal, individual flowers repay a second look (now that's not a group of words I ever thought I might put together).

104 - *Ranunculus* with *Tetragonolobus purpureus*

Mother Nature does rock gardening so much better but she gives out hints too. Dig out those old slides, persuade your group to invest in digital equipment and investigate the hidden clues in your photographs.

Ann Sinclair's Cyprus pictures won the 2008 Discussion Weekend holiday photographic competition.

Back To Basics - Pontresina and the Upper Engadine

Michael J B Almond

If you want to see lots of magnificent alpine flowers in their natural habitat but don't want too much adventure or superfluous excitement, why not try Pontresina? It lies at about 1800m at the lower end of the Val Bernina in the Upper Engadine (the 'upper valley' – literally the *garden* – of the river En, German *Inn*) in southeast Switzerland. Surrounded by glorious scenery and unlimited flowers, these delights are easily reached by public transport, including cable cars, and a modicum of Shanks's Pony. All paths are clearly way-marked and a single sheet of the Swiss 1:50,000 map series will suffice. If you opt for 1:25,000, you need several very expensive sheets. This article takes a tour around the Val Bernina and the headwaters of the En, visiting places Lynn and I have been and proceeding clockwise in an orderly Swiss fashion. The plants are named according to the third (German) edition of *Flora Helvetica* (2001).

The area is part of the Canton of Grisons (German *Graubünden*, Romansch *Grischuns* & Italian *Grigioni)*. The language of the area is Romansch, supplanted to a certain extent by German although all three languages are spoken. Original Romansch names exist side by side with, or are virtually supplanted by, German names – as in Puntraschigna (Pontresina) and San Murezzan (St Moritz). However, names of natural features often retain their original Romansch form and the use of words such as *fuorcla* (col), *lej* (lake), *munt* (French *mont), piz* (French *pic), vadret* (glacier) and *val* (valley) is widespread.

When we first visited Pontresina in July 2001 the profusion of flowers in the meadows and on the mountainsides overwhelmed us. It may be that heavy winter snows and a late spring that year had compressed the flowering season. Be that as it may, we were not disappointed when we returned in late June and early July of 2003, 2005 and 2008, even though the season was slightly different each time. We have seen such a super-abundance of flowers that I can only mention the most striking or interesting – otherwise this will become a sequence of extremely long lists! Although the majority of the rock in the Upper Engadine is non-calcareous, a substantial limestone band passes through the area. In our experience, the region is drier in late June and early July than one might expect for such a mountainous area and we have rarely had our plans seriously disrupted by weather.

Whether arriving by road or by rail, the first view of Pontresina may be a shock. Perched precariously on an alpine hillside is a confection of the Grand Hotel at Scarborough topped by a Teutonic-Disneyesque tower of monstrous proportions. Adding to the awful suspicion that this is not the sort of place you want to be associated with, this edifice used to function as a colony of the *Club Méditerranée* and now swarms with Italian teenagers. But do not fear! Although tourists have come to this area for well over a century, there are no big airports or motorways nearby and they still come in sufficiently small numbers to be swallowed up by the surrounding grandeur.

We start our tour up the funicular railway from the Punt Muragl, a couple of kilometres below Pontresina. Being Switzerland, the bus service is both regular and coordinated with that of the funicular. It takes us up to Muottas Muragl, a 2453m knoll above the confluence of the Val Bernina and the En valley with a superb view of St Moritz and the lakes leading up to the Maloja pass. This is an excellent introduction to the geography and the flora of the Upper Engadine. From here you can walk up the Val Muragl to the Lej Muragl and the screes and rocky ridge above it, along the mountainside above Pontresina to the Alp Languard, or back down to Pontresina.

We found the slope above Muottas Muragl punctuated with *Gentiana punctata* while vivid patches of *Viola calcarata*; *Loiseleuria*

105 - *Gentiana punctata,* Val Rosegg

106 - *Viola calcarata,* Piz Nair

essentially a walk along the contour. In the meadows below Muottas Muragl we saw *Aconitum napellus*, *Aster alpinus*, *Campanula barbata*, *C. scheuchzeri*, *Gentiana verna*, *Nigritella nigra*, *Phyteuma nigrum*, *Pseudorchis albida*, *Pyrola rotundifolia* and *Veratrum album*. As we passed by woodland margins we saw *procumbens* and *Silene acaulis* carpeted the rocks. There were *Gagea fistulosa*, *Gentiana acaulis*, *Geum montanum*, *Potentilla aurea* and even the last few flowers of *Crocus albiflorus* beside the path. Further up the Val Muragl, the hillside was first speckled with white dots of *Ranunculus kuepferi*, then with the lemon-yellow blooms of *Pulsatilla alpina* ssp. *apiifolia*. Higher up, the mountainside glowed pink with thousands, if not millions, of *Soldanella pusilla* and, further on, the brighter pink of *Primula integrifolia*. There were other primulas too: clumps of *Primula latifolia* huddled in the shade of boulders and *P. hirsuta* dotted along the rocks near the top of the ridge where the last few *Pulsatilla vernalis* were still in flower and a few *Geum reptans* scrambled over the scree.

Rather than going up the valley and ridge above Muottas Muragl, you could walk along the hillside above Pontresina to the top of the chair lift at the Alp Languard. Although with some ups and downs, this is

107 - *Silene acaulis,* Fuorcla Surlej

108 - *Gentiana acaulis* below Piz Nair

Lilium martagon & *Phyteuma betonicifolium* while on rocky sections were *Erigeron alpinus* & *Phyteuma hedraianthifolium*.

The chair lift from the centre of Pontresina goes to Alp Languard at 2326m, on the other side of the Piz Muragl from Val Muragl. You can walk onwards up Val Languard, across the screes to Piz Languard and to the

109 - *Ranunculus kuepferi*, Ils Lejins

110 - *Pulsatilla alpina* ssp. *apiifolia,* Val da Fain

cliffs below its summit. You may continue across the Crasta Languard and down into Val da Fain, further south-east on the other side of Piz Albris. This is a high level walk only to be attempted if the weather is set fair. We have sometimes returned to the top of the chair lift on the path down from the Piz Languard to the Lej Languard and thence back along the valley floor. As at Muottas Muragl, the valley floor and the hillside above the chair lift are dotted with many flowers, including *Aster alpinus*, *Erigeron alpinus*, *Primula farinosa*, great numbers of *Viola calcarata*, and *Pinguicula leptoceras* in wet flushes. Further up are swathes of *Primula integrifolia* and *Soldanella pusilla*, mainly in damper areas near watercourses. The screes below Piz Languard and above Lej Languard are covered with *Geum reptans* & *Ranunculus glacialis*, the cliffs with *Androsace alpina*, *Eritrichium nanum* & *Silene acaulis* (although, not in such profusion as elsewhere, in particular on Piz Nair). We also found *Androsace obtusifolia*, *Linaria alpina*, *Minuartia sedoides*, *Potentilla frigida*, *Saxifraga exarata* and *S. oppositifolia*. The valley floor below Lej Languard is an excellent place to observe and photograph marmots. They ignore the tramp of walkers and stand their ground until within about twenty metres.

It is a fairly easy walk up Val da Fain to the Italian Border. Cows grazing the lower reaches are friendly enough, if a little too inquisitive and overbearing at times. The valley is composed mainly of non-calcareous rock but a band of limestone crosses it part of the way up. Here we found edelweiss (*Leontopodium alpinum*) beside the track, *Globularia cordifolia*, and a fine compact clump of *Helianthemum alpestre* on the rocks above. The sides of the lower valley glowed with the bright red of *Rhododendron ferrugineum* and the meadows abounded in orchids (*Coeloglossum viride*, *Dactylorhiza maculata*, *D. majalis*, *Gymnadenia conopsea*, *Nigritella nigra*, *Pseudorchis albida*) and clumps of *Daphne striata*, *Gentiana punctata*, potentillas, *Silene acaulis* & *Trollius europaeus*. There were *Pulsatilla* and *Geum* seed heads glinting in

111 - *Primula latifolia*, Ils Lejins

112 - Marmot, Languard

the sun; *Arnica montana*, *Aster alpinus*, *Campanula barbata*, *Erigeron uniflorus*, *Pinguicula leptoceras*, *Saxifraga exarata*, *Trifolium badium*, *Lilium martagon* (which was mostly not yet in flower) and *Thalictrum aquilegiifolium* poked up through juniper scrub. Higher up, the *Pulsatilla alpina* ssp. *apiifolia* was still in flower in great drifts down the slopes, together with *Gentiana verna* and large numbers of *Gentiana acaulis*. While the marmots kept beady eyes on us, we photographed *Viola calcarata*, a beautiful sky-blue *Gentiana acaulis* and large clumps of deep-pink *Daphne striata*. In the higher reaches of the valley above the shieling we again found hillsides below the melting snow painted pink with *Primula integrifolia* and *Soldanella pusilla*, and screes with almost as many flowers of *Ranunculus glacialis* as they had stones.

113 - *Primula farinosa,* Languard

114 - *Ranunculus glacialis,* Val da Fain

In places, *Geum reptans* scrambled over the screes. There were also clumps of *Primula latifolia* beside and on boulders by the torrent while its hybrids with *P. integrifolia* could easily be found.

Around the west and south of Piz Alv ('white peak', so-called from its light-coloured limestone) and at the lower end of Val da Fain and Val Minor is an area of limestone boulders fallen from the screes above, with its own distinctive flora. Many of the boulders are covered in *Dryas octopetala* and stands of *Gentiana lutea* march across the hillside. There are *Aconitum napellus*, *A. vulparia*, *Aquilegia alpina*, *Atragene alpina*, *Lilium martagon*, *Polemonium caeruleum* and *Rhododendron hirsutum* as well as *Daphne striata*, *Gentiana acaulis*, *G. verna*, *Globularia cordifolia*, *Pinguicula alpina*, *Primula farinosa*, *Salix breviserrata*, *S. reticulata*, *S. retusa*, *Saxifraga bryoides* and *S. paniculata*. In the area between the boulders and the main road below (opposite the car park for the cable car to Diavolezza) we found *Campanula barbata*, *C. cochlearifolia*, a *Gentianella* (possibly *Gentiana engadinensis*), *Gymnadenia conopsea*, *Nigritella nigra* varying from almost black to bright red, a mass of *Pedicularis verticillata* and some *Pseudorchis albida*. At the edge of the road itself and in the ballast beside the railway was a mass of *Campanula scheuchzeri* and *Gentiana nivalis*. On the limestone at the bottom of the Val Minor we found a wealth of flowers: *Coeloglossum viride*, *Daphne striata*, *Globularia cordifolia*, *Horminum pyrenaicum*, *Polemonium caeruleum*, *Primula farinosa* and, in at one particular site, a superabundance of *Aster alpinus* and *Leontopodium alpinum* – more of this elusive alpine emblem than we have ever seen in one place.

Further up, Val Minor reverts to non-calcareous rock. The walk up from Curtinatsch station skirts round Piz Lagalb and down Val Bügliet to the station by the *Ospizio* below the Bernina Pass, making a very pleasant day's excursion. We found a mass of *Gentiana acaulis* and *G. verna* together with *Pulsatilla alpina* ssp. *apiifolia* and *P. vernalis* in flower close to each other. Higher up there were drifts of *Pulsatilla vernalis*, *Primula integrifolia* and *Soldanella alpina*, accompanied by the usual occasional *Primula latifolia* and hybrids. This was in the middle of July 2001 - a very late season - and the opposite north-facing screes were still covered in snow. When we returned at the end of June 2005, the snow had melted and the screes were covered with *Ranunculus glacialis*, *Androsace alpina* and bright yellow *Papaver rhaeticum*: You have to come to remote locations like this to find the genuine thing; although Pontresina is certainly in Rhaetia and offers plenty of yellow and orange poppies there and in other villages, they

115 - *Soldanella pusilla,* Val da Fain

are nearly all garden hybrids bidding for freedom!

Near the top of the valley beside Lej Minor were cushions of *Androsace alpina* - still in bud - and drifts of *Soldanella pusilla*. As we came up to the col above Lej Minor we found patches of *Saxifraga oppositifolia* in the turf and the odd clump of *Primula hirsuta* on the rocks. Beside the path along the eastern flank of Lagalb, above Val Laguné, the hillside was again covered with *Primula integrifolia*, with clumps of *Primula hirsuta* and *P. latifolia* on the rocks. In places were groups of *Pulsatilla vernalis* and occasional flowers of *P. alpina* ssp. *apiifolia*.

A whole day may easily be spent on the hillsides within sight of the main road up to the Bernina Pass, alongside Lago Bianco. The acres of pink flowers we saw here were *Primula farinosa*, although we also saw a good number of *P. hirsuta, P. integrifolia, P. latifolia* and, of course, hybrids. We encountered abundant *Daphne striata*, *Gentiana acaulis*, *G. verna*, *Loiseleuria procumbens*, *Pulsatilla alpina* ssp. *apiifolia*, *Silene acaulis* and *Soldanella alpina* together with *Campanula barbata*, *Coeloglossum viride*, *Lloydia serotina* and *Viola biflora*.

The southwestern side of the upper Val Bernina is not quite as accessible as the other, which is served by the main road. There are bridges over the torrent and it is possible to explore areas such as Val d'Arlas. The band of limestone that crosses Val da Fain and makes up much of Piz Alv forms a ridge at the bottom of this valley. Here we found *Aster alpinus*, *Chamorchis alpina*, *Dianthus superbus*, *Gentiana ramosa* (a *Gentianella*), *Gypsophila repens* and *Leontopodium alpinum*. A little further up the valley, the banks of the torrent were covered with *Dryas octopetala* and the shingle was bright with red *Epilobium fleischeri* and a yellow sedum.

From Curtinatsch the cable car goes up to Diavolezza at 2973m. The views of the Morteratsch and Pers glaciers are spectacular but botanising is limited. A descent of 900m to Curtinatsch looks very interesting if rather precipitous – or you can take the short walk to the summit of Munt Pers and back again; unless equipped for rock climbing or glacier walking there is nothing to do but descend in the cable car. There is some *Eritrichium nanum* on the rocks at the top of the ridge near the cable car station and we have also seen *Androsace alpina*, *Gentiana bavarica*, *Ranunculus glacialis* and *Saxifraga aspera*. The Morteratsch glacier flows down the deep valley below and to the west of Munt Pers. It is an easy stroll from the hotel by the railway station at the bottom of the valley up to the snout of the glacier. Every so often a notice tells your distance from the glacier and how many years it is since the glacier extended to this point; it is clear that the

116 - Aspects of *Eritrichium nanum:* above - *Ils Lejins;* below left - *Ils Lejins;* below right - Piz Nair; right - on limestone above Lej Suvretta

whole valley floor has only quite recently been colonized by vegetation.

Opposite Pontresina, the long Val Rosegg comes down into Val Bernina from the glaciers of the Bernina massif on the Italian border. Rather than walking up from Pontresina railway station, it is possible to start at a higher level by approaching the valley from a different direction. From Surlej, above the lake of Silvaplauna, 5 km south-east of St Moritz, a cable car goes up to Murtel and on to Piz Corvatsch at 3451m, where you are confined to the snow and there are no plants to be seen. The Murtel mid-station is at about 2700m and, alighting here, you have an easy walk up to Fuorcla Surlej at 2755m past rocky slopes covered with *Gentiana verna*, *Primula integrifolia*, *P. latifolia* and *Soldanella pusilla,* with screes enlivened by patches of *Geum reptans* and *Saxifraga oppositifolia*. As you approach the Fuorcla, near patches of *Gentiana punctata*, *Lloydia serotina* and large clumps of *Ranunculus alpestris*, the cliffs are dotted with *Androsace alpina*, *Eritrichium nanum* and *Silene acaulis*. On the ridge to the north we found *Aster alpinus*, *Campanula barbata* and a

117 - *Ranunculus alpestris,* Fuorcla Surlej

superabundance of *Gentiana verna*. Enjoying a cup of coffee at the refuge on the Fuorcla gives a fine vista of Val Rosegg and the several glaciers at its head. From here a good path leads more or less along the contours towards the head of the valley. The views are outstanding and *Androsace*

118 - *Dryas octopetala* & view to Maloja Pass from Furtschellas

119 - *Globularia cordifolia,* Val da Fain

alpina, *Eritrichium nanum*, *Primula integrifolia*, *Ranunculus glacialis* and *Soldanella pusilla* all grow beside the path. Leaving this path at the signpost a little below the col and turning left, a path descends to the Rosegg Glacier Hotel in the valley bottom. On our way down we passed

120 - *Daphne striata,* Val da Fain

121 - *Ranunculus glacialis,* below Piz Nair

Androsace obtusifolia, Bupleurum stellatum, Campanula barbata, Crepis aurea, Nigritella nigra, Daphne striata, Gentiana lutea, G. punctata, Phyteuma nigrum, Polemonium caeruleum, Pulsatilla alpina ssp. *apiifolia* and *Trollius europaeus*. From the hotel there is an 8 km walk back to Pontresina - or an hourly horse omnibus.

East of the cable car from Surlej to Murtel is another from Sils to Furtschellas at 2313m; it sets you off on a delightful walk around Ils Lejins ('*the lochans*') now billed as the *Engadiner Wasserweg*. The path passes six small lakes newly named after various minerals and involves a steep climb to the highest lake at 2646m; it is then downhill (almost) all the way back. The scenery is superb, with flowers to match. Just above Furtschellas, enhancing the stunning views across Lej da Segl to the Maloja pass and the source of the En, are large boulders draped with *Dryas octopetala*. The first part of the steep slope to Lejin Cristal - the first lake - was covered in dwarf willow including *Salix breviserrata, S. herbacea* and *S. reticulata*, giving way to *Primula integrifolia* interspersed with *Gentiana verna* and *Soldanella alpina*. As it became rockier there were clumps of *Primula latifolia* and *Saxifraga aizoides* with fine cushions of *Eritrichium nanum*. Clumps of *Gentiana brachyphylla, Geum reptans* and *Saxifraga oppositifolia* dotted the scree by this lake while on the ascent to the next we found *Pulsatilla vernalis* with more *Primula integrifolia* and *Saxifraga aizoides*. This second lake, Lejin Magnetit, is the highest and sits in a deep hollow below dark brooding cliffs. The grassy banks were covered with lemon-yellow *Pulsatilla alpina* ssp. *apiifolia*. The water rushing down to Lejin Malachit and Lejin Rhodonit was bordered with *Primula integrifolia* and *P. latifolia* with patches of *Gentiana verna, Geum reptans, Linaria alpina* and *Soldanella pusilla;* the hillsides above were dotted with

122 - *Geum reptans* & Piz Corvatsch, above Murtel

Pulsatilla alpina ssp. *apiifolia*. Growing right in the torrent were clumps of *Ranunculus glacialis* and in the water of Lejin Rhodonit was a striking patch of *Caltha palustris*. The path up to the low col between Lejin Rhodonit and Lejin s-Chaglia (*s-Chaglia* is a type of rock structure known as *Schuppen*) was bordered with *Primula integrifolia* but it was the rocks at the top, looking over Lej da Silvaplauna to St Moritz, that really caught our attention. They were plastered with *Eritrichium nanum*, together with *Saxifraga exarata* and *Sempervivum montanum*. The rocks above the last lake, Lejin Epidot, had more *Eritrichium nanum*, clumps of *Primula latifolia* and *Silene acaulis*, and an attractive cushion of what appeared to be either arenaria or minuartia. *Loiseleuria procumbens* crept over some boulders and in the turf we found *Gentiana acaulis*, *Ranunculus kuepferi* and an extensive collection of *Pulsatilla vernalis*. Beside the path back down to Furtschellas we passed a large patch of *Primula farinosa* in a boggy patch and a knoll festooned with *Dryas octopetala*, together with some *Daphne striata* and *Primula latifolia*.

The floor of the En valley westwards from St Moritz to the Maloja Pass contains several lakes and the pass, at just over 1800m, is only a few metres above their level. The source of the En is the small Lej dal Lunghin, nestling in the folds of the ridge to the north-west of Maloja. The path towards it held little interest when we walked up it in early July 2005 apart from impressive banks of *Rhododendron ferrugineum*, some *Phyteuma hemisphaericum* on the rocks, and clumps of *Dianthus superbus*.

Above the Suvrettahaus, on the western outskirts of St Moritz, a chairlift ascends to the meadows on the southern flanks of Piz Nair. Below, and to the west of Piz Nair, lies the valley called Suvretta da San Murezzan. As we walked across the hill meadows, we passed impressive spikes of

123 - *Helianthemum alpestre,* Val da Fain
124 - *Androsace alpina,* Languard

Campanula thyrsoides while in the valley itself was a mass of *Pinguicula leptoceras* below hillsides red with *Rhododendron ferrugineum*.

Piz Nair (3056m) towers above St Moritz, to the north-east. It faces the Val Bernina across its confluence with the En; Pontresina is clearly visible in the valley below. A funicular railway runs from the middle of St Moritz up to Corviglia at 2486m, whence a cable car goes to the summit of Piz Nair. We recommend a return ticket from St Moritz to Corviglia and a single onwards to the top, whence the view is superb – and the choice of alpine plants incomparably better than at Diavolezza. Three ways lead back to Corviglia. One very steep and hair-raising path plummets south-easterly, downwards to the slopes west of Corviglia. It is unlikely that its flowers surpass those found on the other two descents and we have not attempted it. The other two routes start along a broad track over screes north-west of the summit. Within a hundred metres of the cable-car station the steep screes are covered in *Ranunculus glacialis* and, a few metres further, more level patches of scree are patchworks of blue *Eritrichium nanum* and abundant cushions of pink *Androsace alpina*. The flatter areas contain many saxifrages with a generous scattering of *Gentiana verna* and *Linaria alpina*. After about 500m the track doubles back to the left, to negotiate the slope down the ridge. One path goes westwards, rejoining the track lower down, while the other turns to the right, heading for the col north of Piz Nair.

The westward path leads down to Lej Suvretta. Until at the level of the ski installations about half way down we continued to pass quantities of *Androsace alpina*, *Eritrichium nanum* and *Ranunculus glacialis* together

with occasional clumps of *Gentiana verna*. We found a limestone outcrop approximately level with the ski installation to be well covered with *Eritrichium nanum* - also growing on adjoining non-calcareous rock - and in the turf below were *Gentiana verna* and *Primula integrifolia*. Down towards the lake, the scree on the left of the path was covered with *Ranunculus glacialis* and on the right, below the limestone outcrop, with *Viola calcarata*. Lower down, the *Ranunculus* was joined by *Geum reptans* and occasional clumps of *Primula latifolia*. The path divides just above the lake, one way going down the Suvretta valley and the other leading south-easterly across the southern flanks of Piz Nair to Corviglia. This walk commands fine views across the lakes between St Moritz and the Maloja Pass to Fuorcla Surlej and Furtschellas. The first half follows the contour across very steep but stable scree and along this section we saw - among other things - *Androsace obtusifolia, Gentiana acaulis, G. verna, Linaria alpina, Primula farinosa, P. hirsuta, Pritzelago (Hutchinsia) alpina, Saxifraga exarata, S. oppositifolia, Silene acaulis* and *Viola calcarata* in some very attractive colour forms, ranging from pure white to deep carmine. Beneath the southern cliffs of Piz Nair is a less precipitous area and much of the scree is composed of large boulders with turf or grit between them. Here were *Geum reptans* and a mass of *Gentiana acaulis*, with *Loiseleuria procumbens* creeping over rocks and large wet flushes pink with *Soldanella pusilla*. Once in sight of Corviglia we passed *Saxifraga aizoides* and a large area of *Pulsatilla vernalis* flowers covering the hillside. On the last few hundred metres to the funicular station the ground was purple with *Viola calcarata*, together with *Gentiana*

125 - *Gentiana verna,* Ils Lejins
126 - *Aster alpinus,* Languard

acaulis and *G. verna*. The limestone immediately below Corviglia is festooned with *Dryas octopetala* and we found *Androsace chamaejasme*, *Leontopodium alpinum* and *Saxifraga androsacea*.

The northern branch of the path from high on the Piz Nair ridge leads past more *Androsace alpina* to the col called Fuorcla Schlattain, at the head of the westward-leading Schlattain valley north of the eastern ridge of Piz Nair. The Sass Corviglia, on the north side of this valley, is largely composed of limestone which outcrops just beside the Fuorcla. Here we have found *Eritrichium nanum*, *Gentiana verna*, *Saxifraga oppositifolia, Silene acaulis* and *Viola calcarata*. *En route* from the Fuorcla into the Schlattain valley is scree that from a distance seems barren. However, we have found it one of the most floriferous patches of scree we have ever seen. Although there is some bare ground, everything grows in abundance and usually in massive clumps: *Androsace alpina*, *Campanula cenisia, Doronicum clusii, Gentiana verna, Geum reptans, Linaria alpina, Ranunculus glacialis* and *Viola calcarata*. Lower, in the jumble of boulders and patches of turf and scree, we found a great quantity of *Gentiana verna* (including a white one) together with *Androsace alpina, Geum reptans, Ranunculus glacialis* and *Saxifraga oppositifolia*. Lower down were *Doronicum clusii* and *Gentiana acaulis* and the path was lined with *Gentiana punctata*. In the bottom of the valley below Sass Corviglia is Lej Alv; this area was covered in acres of *Soldanella pusilla* below the melting snow, together with large numbers of *Primula integrifolia, P. latifolia* and their hybrids.

On Sass Corviglia itself and associated with its limestone boulders that have tumbled down into the valley below, we have found many interesting flowers. In particular, *Androsace helvetica* grows on the boulders with *Eritrichium nanum*; in the turf and scree round about we found *Dianthus deltoides*, *Leontopodium alpinum*, *Salix reticulata*, *Saxifraga oppositifolia* and *Viola tricolor*. The slopes below the boulders were dotted with *Pulsatilla alpina* ssp. *apiifolia*. There is more *Androsace Helvetica* up on the cliffs at the top of Sass Corviglia, which may be reached by scrambling up the steep screes from the Val Schlattain (which I have not done) or by approaching from the valley to the north, below the Piz Grisch. Instead of descending from Fuorcla Schlattain into Val Schlattain, I continued above the limestone outcrop to the col between the Piz Schlattain and the Piz Grisch. The scree on the way up is again covered with *Androsace alpina* and *Ranunculus glacialis* while the col is decorated with *Eritrichium nanum*. It is rough going to follow the line of the ski-tow down into the valley behind Sass Corviglia and to cut across south-easterly to the col between Piz Schlattain and Sass Corviglia but it is manageable. Along this route I saw lots of *Gentiana verna, Geum reptans, Saxifraga aizoides, S. oppositifolia* and *Viola calcarata*. At the col I was above steep screes and cliffs and directly above the boulders on which

we had found *Androsace helvetica*; and ... there it was - in much greater quantity - together with the odd clump of *Eritrichium nanum* and *Leontopodium alpinum*.

From Lej Alv a broad path follows the end of the eastern ridge of Piz Nair to Corviglia. The torrent down the Schlattain valley, however, continues to Val Saluver and on to Marguns (2279m), reachable by chair-lift from Celerina (Schlarigna), between Pontresina and St Moritz. The slopes above Marguns were thick with *Gentiana acaulis*, *G. verna*, *Pulsatilla alpina* ssp. *apiifolia* and *Viola calcarata*. The stream banks were pink with *Primula farinosa* and there was a little of *P. integrifolia*. Further up the valley was a mass of *Soldanella alpina* and *S. pusilla*, and a hillside covered in *Pulsatilla vernalis*. We also found *Aster alpinus*, *Crepis aurea*, *Daphne striata*, *Erigeron alpinus*, *Leontopodium alpinum*, *Pinguicula alpina* and *Salix reticulata*.

Standing at Corviglia or riding back down to Celerina, you may look across to Muottas Muragl and Pontresina in the distance and marvel that such a wealth and concentration of mountain flowers is to be contained in such a small area – particularly one that has been subject to the depredations of skiers and tourists for so many years. May it long be so!

127 - *Androsace helvetica* on Sass Corviglia

Glimpses of the New Tromsø Gentianaceae Collection

Arve Elvebakk

A new rock landscape was constructed last year to improve conditions in the Gentianaceae collection at Tromsø Arctic-Alpine Botanic Garden. It was designed and completed by David Holubec, son of the plantsman Vojtěch Holubec, known to many readers of this magazine. It profits from the opportunity at Tromsø to bring in large boulders with good moss and lichen cover - making them look natural. It is in the same style as our much larger new Arctic and Caucasus landscape, also nearing completion. All surface structures are not yet finished but it has been very inspiring to give our gentians and their relatives a new and better home. I will introduce a few plants grown here which are rarely seen in cultivation.

Gentiana hexaphylla has been produced in numbers by Bjørn Thon's nursery at Tromsø. Needless to say, it is a precious and very attractive rock garden plant. We grow several specimens in a scree slope. It is very characteristic with many whorls of stem leaves, six in each. The species grows in northern and western parts of Sichuan and in adjoining parts of neighbouring provinces.

Swertia is a Gentianaceae genus not much represented in gardens. However, we find many of them very charming.

128 - *Swertia gyacaensis*

129 - The gentian garden from the West

So do the wasps and bumble-bees that visit them in huge numbers on clear autumn days; our swertias then appear to be more attractive than any of the other plants in our garden! The nectar-producing nectaries are obviously the explanation. They are fringed saucer-shaped organs located

130 - *Swertia lactea*

near the base of the very robust stamens found in this genus. The plant illustrated here was received as *Swertia multicaulis* (sourced by Josef Jurašek from Tibet at 5100 m) but when in flower it keys out as *Swertia gyacaensis* when following the *'Flora of China'*. It has five violet corolla lobes contrasting with the blue colour of the robust stamens. This is a Tibetan endemic, described in 1980, named after and restricted to Gyaca Xian, about 200 km east of Lhasa. It flowered for more than two months with us and was left unaffected by the first snow on October 30th, when this photograph was taken. With us this is normally a period when only *Gentiana sino-ornata* and some related species are in flower.

Swertia lactea is another very different species, with four milky white corolla lobes contrasting with yellowish green nectaries and almost black

131 - *Gentiana hexaphylla*

132 - *Halenia corniculata*

anthers. It is a Central Asian species, chiefly found within Tadzhikistan and Kyrgyzstan.

Halenia corniculata is a new addition to our Gentianaceae collection. It is a striking species with yellow flowers. Typical of the genus *Halenia* are the spurs at the lower end of the four corolla lobes, almost like a Gentianaceae counterpart of *Aquilegia.* The genus was named after the Swede Jonas Halenius, a contemporary of Linnaeus, author in 1750 of *'Plantae rariores camschatcenses'. Halenia corniculata* is listed as an annual by *'Flora of the USSR'* but behaves as a biennial with us; we do not grow many annuals or biennials. However, we find this species so interesting that we would like to maintain a population in our garden. It produced seeds during the extra cold growing season in 2008, so we hope we will succeed in propagating it. The species has a wide distribution in Asia from the Urals eastwards to Kamtchatka and Japan, and southwards through Mongolia to north central & north-eastern China and on to Korea.

A Gardener's Guide to *Crocus*

Tony Goode

As a child I was first drawn to crocuses by the jewel-like flowers that appear so suddenly at winter's end. Now, as a collection holder for the National Council for the Conservation of Plants and Gardens (now Plant Heritage) I appreciate the abundant variation in the flowers of a genus that provides flowers for almost nine months in cultivation and year-round in the wild. It is impossible to condense a genus of so many species into a short essay or even into a one hour lecture. Indeed, contrary to popular opinion, it is possible to have too much of a good thing and single genus lectures are not to everyone's liking. In this article I introduce the genus *Crocus* and discuss some of its variation. For the gardener I also give some information on cultivation. To cover every species (or even the selection included in the 2008 Discussion Weekend lecture) could easily fill an entire edition of this journal. Perhaps the editor will consider a couple of 'Photo Essays' for future editions to cover the spring and autumn flowering species available to gardeners?

The Botanical Bit

The Genus *Crocus* is a member of the Iridaceae with 70 species divided into 126 taxa. It is entirely an old world genus with its distribution centred on Turkey and Greece, west to Portugal, south-west to Morocco, south-east to the Levant, north to Poland, east to Central Asia and towards the fringes of China.

The plants grow from a corm that is a solid mass of starchy material. The corm is entirely renewed each year which is why it is essential to keep the plants growing as long as possible in spring and not to remove the leaves until they have yellowed. The corm

133 - *Crocus abantensis - cataphylls & bracts*

Tony Goode

134 - Leaves of *Crocus goulimyi*

has a 'tunic' formed from the base of the previous year's cataphylls (sheathing leaves enclosing the entire growing shoot.) This is an important feature in defining the different species. The tunic can be thick or thin, papery or eggshell-like, or made up of parallel or interwoven fibres.

Mention should be made of the distinctive white stripe in the leaves. This is a band of cells without chlorophyll which may act as a 'window' allowing light to reach the inner surface of the leaves, thus increasing their energy capture. The leaves may be few or many, wide or narrow; the cross-sectional profile is a useful taxonomic feature.

135 - *Crocus cartwrightianus* - 3 branched style

136 - Yellow anthers on *Crocus baytopiorum*

The developing flower buds are enclosed by papery bracts (prophyll, bract and sometimes a smaller bracteole.) The flowers do many things in threes, with two whorls of three petals, the inner ones often slightly smaller. There are three pollen-bearing anthers and a central style that divides into three in various ways. The anthers can appear yellow (yellow pollen), white (white pollen) or occasionally black. Blackish anthers

137 - White anthers on *Crocus pulchellus*

138 - Black anthers on *Crocus biflorus melantherus*

dehisce (open) to reveal golden yellow pollen, a striking feature.

The flowers can be yellow, white or various shades of blue. White forms appear in most species while many flowers have attractive markings on the outer petals. These can take the form of stripes, feathering, stippling or a blotch. The flower colour and markings are very variable

139 - Yellow flower of *Crocus chrysanthus*

140 - The blue of *Crocus biflorus pulchricolor*

141 - *Crocus pulchellus* - white form

142 - Feathered petals of *Crocus laevigatus*

143 - Stippled outer petals of *Crocus chrysanthus*

144 - Feathered petals of *Crocus minimus*

145 - Feathered outer petals of *Crocus biflorus rubigena*

within species so are not always useful in determining the different taxa. On the other hand, variation in the anthers and style can be quite useful. The style may branch into anything from three short expanded lobes to

146 - Divided style of *Crocus laevigatus*

147 - Black anthers on *Crocus biflorus*

three long slender branches. In extreme cases the style branches many times giving a showy mass of coloured filaments. The tips of these have a sticky stigmatic surface to which the pollen must attach for successful pollination. The 'message' then passes down the floral tube - which we see as the flower stem. This can take 24 hours and seems to be helped by mild conditions. The ovary remains below ground until the end of the growing season when, as temperatures rise and the leaves begin to yellow, the true stem quickly lengthens, pushing the seed pod above ground where it quickly dries, opens and sheds seed. The seeds display some useful taxonomic features and also have a fleshy appendage which is attractive to ants who often 'plant' the seeds for the inattentive gardener!

148 - Autumnal frames

149 - Variation in *Crocus* corms

Cultivation

Successful cultivation of crocuses depends on several variables. The climate which the plants experience in their native habitat can be related to garden conditions; we should consider the native habitat and climate of the plant in relation to the issue of where to grow it, both geographically and within the garden.

The grouping I offer here is a personal one, based on my experiences in the dry south-east of England. When considering the siting of these plants in your garden, local factors should certainly be considered. Crocuses are plants that enjoy a sunny exposure. Even those that require year-round moisture also need sun. Most are frost hardy but lengthy exposure to extreme cold can damage the foliage and weaken the plants. Prolonged freezing at the corm or root level is best avoided.

150 - Ripe *Crocus* seeds

Given a sunny site and well drained soil, most of the group A crocuses will succeed outside. In warmer and sunnier locations most of the group B crocuses should also grow well although some are more difficult to please than those in Group A. However, Group B will usually do better with some protection; in ideal conditions under cold glass, they and the Group C plants are very successful. The Group D plants may be grown under cold glass in south-east England but are not as vigorous as those in Group C. Group E is generally recognised as more difficult while I have little or no experience of those in Group F!

A: ***Crocus* tolerant of summer moisture** – suited to areas with maritime climate:
angustifolius, banaticus, corsicus, cvijicii*, dalmaticus, etruscus, flavus, gargaricus*, gilanicus, imperati, kosaninii, kotschyanus, laevigatus, malyi, minimus, ochroleucus, pulchellus, rujanensis, speciosus, tommasinianus, tournefortii, vallicola*, vernus, versicolor.*

B: ***Crocus* tolerant of some summer moisture** – may need a drier rest to thrive:
adanensis, aerius, alatavicus, ancyrensis, antalyensis, biflorus, boryi, cambessedesii, cancellatus, candidus, caspius, chrysanthus, cyprius, danfordiae, fleischeri, goulimyi, hadriaticus, korolkowii, longiflorus, medius, michelsonii, niveus, olivieri, paschei, pestalozzae, reticulatus, robertianus, serotinus, sieberi.

C: ***Crocus* that need a warm dry rest** – much more likely to grow well with protection:
asumaniae, carpetanus, cartwrightianus, graveolens, hermoneus, mathewii, nevadensis, oreocreticus, pallasii, thomasii.

D: **Difficult *Crocus*** (Semi-desert, questionable hardiness):
aleppicus, hyemalis, veneris.

E: **Difficult *Crocus*** (High mountain plant):
abantensis, baytopiorum, pelistericus, scardicus*, scharojanii*.*

F: **Little grown *Crocus:***
almehensis, autranii, boulosii, hartmannianus, karduchorum, kerndorffiorum, leichtlinii, moabiticus, sieheanus, vitellinus, wattiorum.

*These crocuses prefer not to be dried out completely at any time.

These artificial categories do not take account of taxa with a very wide distribution or which grow in areas with differing climatic influences. In some cases, such as *Crocus laevigatus* and *Crocus serotinus*, some forms are significantly better garden plants than others.

Much has been written about the ingredients of compost mixes and the relative merits of plastic and clay pots. However, as important as the mix and the pots is the management of watering and feeding. There is no substitute for personal experience; each grower should develop a watering strategy to suit their own compost and conditions. The compost should be moisture retentive but free-draining and contain enough nutrients for the long growing season. I use a mix of roughly 50% John Innes No 3, 45% sharp grit or gritty sand, and 5% Perlite. I have also had good results with a mix of 40% John Innes No 3, 40% grit, 15% soil-less compost and 5% Perlite. Some growers recommend leaf mould to replace some of the loam-based element and this certainly gives good results. I also add bone meal as a slow release feed during the growing season, supplemented by a high potash feed in late winter. Following Ian Young's approach I add a small quantity of Sulphate of Potash to each pot and water it in. This high potash feed boosts the plant as the new corm develops containing next season's flower buds. Corms should be planted quite deep, at least half-way down the pot.

I grow most of my crocuses in open-sided cold frames that are covered during flowering, extreme weather and summer dormancy. Square plastic pots are currently in favour, being more space-efficient than round clays. The pots stand on a bed of sand around 10 cm deep. Given time to manage ventilation and watering, the plants make excellent subjects for the alpine house. Take care that rising temperatures in early spring do not trigger premature dormancy, as this will weaken the plants. Crocuses can also be grown in a range of garden sites. Raised beds and troughs are often suitable; the good drainage is appreciated and the plants do not compete with larger neighbours. Many crocuses (especially readily available commercial clones) can be grown successfully in grass. Indeed, it is massed plantings in grass that provide the greatest spectacle.

Pests are few but can prove fatal! Rodents can lay plantings waste because the starch-rich corms are much to their taste. There are no easy solutions and, although cats (and some dogs) deter them, trapping may be a necessary evil. Viral disease spread by aphids and probably by slugs and snails is also a problem, especially in large collections. Although insecticides will help contain problems, complete elimination relies on vigilance and excellent husbandry. Good ventilation and physical removal as soon as seen is the best prevention. Virus-infected plants often lose vigour and may have distorted flowers or streaky leaves. Any suspect plant should be removed or the problem soon spreads.

In conclusion, I recommend crocus for their ease of cultivation and great variety of flowers over a long season. The first flowers can appear in late summer and the season then extends into spring of the following year. As the first pulsatillas in the garden raise their heads to the sun, the crocus season is just about done! All that remains for the gardener is the challenge of collecting the seed before it is shed and the prospect of a midsummer break in the mountains where crocuses can be found in flower even on midsummer's day.

A Classification of the Genus *Crocus*

The classification of the genus *Crocus* has been revised several times over the last two hundred years. The division of the many taxa has challenged botanists and taxonomists owing to the range of characteristics that are available for scrutiny. In 1809 Adrian Hardy Haworth used the presence or absence of hairs in the throat of the flower to group the species. This feature is now known to vary within species, making this early classification unreliable. The next major revision by Joseph Sabine in 1829 revolved around the absence or presence of a prophyll (basal spathe) and corm tunic characteristics. This classification was developed significantly by William Herbert (1847) and George Maw (1886), allowing new species to be fitted in. Today's classification is a development of that produced by Maw. Brian Mathew, who developed the classification below, has retained the division into two sections based on the presence or absence of the prophyll and using the nature of the style and corm tunic features to describe the different series. This classification shows the relationships between the taxa. Closely related taxa often have very similar requirements in cultivation.

1. Subgenus Crocus

A. Section Crocus

Series Crocus - *(asumaniae, cartwrightianus, hadriaticus, mathewii, moabiticus, oreocreticus, pallasii, thomasii)*
Series Kotschyani *(autranii, karduchorum, kotschyanus, gilanicus, ochroleucus, scharojanii, vallicola)*
Series Longiflori *(goulimyi, longiflorus, medius, niveus, serotinus)*
Series Scardici *(pelistericus, scardicus)*
Series Verni *(baytopiorum, etruscus, kosaninii, tommasinianus, vernus)*
Series Versicolores *(cambessedesii, corsicus, imperati, malyi, minimus, versicolor)*

B. Section Nudiscapus

Series Aleppici *(aleppicus, boulosii, veneris)*
Series Biflori *(adanensis, aerius, almehensis, biflorus, caspius, chrysanthus, cyprius, danfordiae, hartmannianus, kerndorffiorum, leichtlinii, paschei, pestalozzae, wattiorum)*
Series Flavi *(antalyensis, candidus, flavus, graveolens, hyemalis, olivieri, vitellinus)*
Series Intertexti *(fleischeri)*
Series Laevigatae *(boryi, laevigatus, tournefortii)*
Series Carpetani *(carpetanus, nevadensis)*
Series Orientales *(alatavicus, korolkowii, michelsonii)*
Series Reticulati *(abantensis, ancyrensis, angustifolius, cancellatus, cvijicii, dalmaticus, gargaricus, hermoneus, reticulatus, robertianus, rujanensis, sieberi, sieheanus)*
Series Speciosi *(pulchellus, speciosus)*

2. Subgenus Crociris *(banaticus)*

The Iris Family - Natural History and Classification

Peter Goldblatt & John C Manning
290 pages
200 colour photos & 65 line drawings
ISBN-13: 978-0-88192-897-6
Timber Press £40, 2008

Peter Goldblatt is an expert on the Iris family and its relatives, and John Manning is a scientist who has focused on the Iridaceae. Both authors are exceptionally well qualified to write this book. Iridaceae is a huge, almost worldwide, family of plants. The plants are recognised by their soft–textured and colourful corolla with only three stamens and their characteristic sword-like leaves. The Iris family is one of the most significant in horticulture. For example, the craze for *Gladiolus* approached tulipomania, with more than 30,000 cultivars. Galanthomania pales by comparison - only 1,000. There is now interest in improved *Sparaxis* hybrids with larger and longer-lasting cut flowers.

The first few chapters deal with plant form, natural history and evolution but the bulk of the book is about the systematics of the Iris family and outlines the complex classification, followed by a detailed treatment of the genera. A one-page table on classification at the beginning is a useful feature for seeing at a glance where a genus fits within the tribe and subfamily. The diversity of the flowers and the different pollination strategies of particular flower types are described in some detail.

This large and diverse family is made up of 66 genera and about 2025 species, the majority centred in Africa. The authors recognise these genera whereas other authorities recognise more than 75 genera by a subdivision based on minute differences. For example, DNA data has shown that *Iris tuberosa* (better known as *Hermodactylus*) belongs to the *reticulata* section of the genus *Iris* (*Hermodactyloides*). *Freesia laxa* has in the past been treated as a species of *Anomatheca* or *Lapeirousia*. A new genus, *Afrocrocus*, with only one species, *A. unifolius*, is described - a plant in Africa with violet crocus-like flowers. The authors outline the history of classification with new DNA sequences leading to this most recent classification.

Keys to subfamilies of Iridaceae and the genera help identification. Some genera such as *Iris* and *Crocus* will be very familiar to alpine gardeners. Several other genera from the southern hemisphere are also grown in the UK, sometimes outdoors where they have proved surprisingly hardy; for example *Gladiolus flanaganii, Romulea* sp., *Freesia* (previously *Anomatheca*) *laxa, Dierama* sp., and *Olsynium* (previously *Sisyrinchium*) *douglasii*. Many others in the book have stunningly beautiful

flowers but may not be hardy in Britain. For example, many members of *Hesperantha* have most attractive crocus-like flowers and *Watsonia* species are widely cultivated in the southern hemisphere.

Over 200 superb photographs showing plants in flower in their native habitats are supplemented by John Manning's expert line drawings. Most readers will use this book as a reference, so it does not detract too much that photographs are gathered together in the middle. The book has been made as user-friendly as possible by avoiding jargon and technical terms; however, I still had to refer frequently to the glossary.

This book is an authoritative, botanical and technical account of the Iris family and its natural history. Botanists, ecologists, naturalists and gardeners will find it essential reference. However, taxonomy is forever changing and this volume is not going to be the final account of the Iridaceae...

Cyril Lafong

The Endemic Plants of Greece

Kit Tan with Gregoris Iatrou, colour plates by Bent Johnsen
479 pages
Gads Publishers
ISBN-10: 8712038571

This work is a little daunting at first sight. It is a large tome, 30 cm x 22 cm x 4 cm and quite weighty. Opening it at random reveals a wealth of information. If you want to know about the flora of the Peloponnese this is the book for you although, it has to be said, it is no field guide. However, that was plainly not intended; this is a book for study prior to a trip, for the inquest after the trip, for research, for browsing and for the keen plants person.

The work is organised into family groups, genus and specifics, easily located through the detailed index; I quickly found all my favourites with no trouble at all. Each specific form and variation is fully described in botanical detail but is quite readable to the non-botanist, including season, habit, aspect, soil & rock types and all those other details of interest to the grower. For researchers, there is an extensive bibliography.

Particular plants of interest to the rock gardener are well represented including spring and autumn crocus, colchicums, cyclamen, alliums, narcissus and a tulip. I merely quote my own interests; there are of course numerous others and if it is known in the Peloponnese I am sure that it is in this book.

An aspect of each page that strikes me is the maps showing where each plant can be located, although their scale is such that experience,

skill and local knowledge (and probably a local guide) are still required to pin-point the exact spots. Plant hunters anxious to keep their locations secret need have no qualms but these maps will put you in the right area.

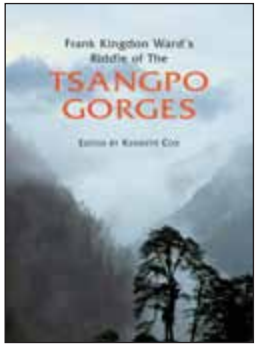
Introductory descriptions of the countryside, archaeology, towns & villages, geography, geology and climate are interspersed with superb vignettes of places of interest - instantly recognisable to those familiar with the area. These aspects are closely connected with the plants and their habitats.

I have left the best 'til last - the colour plates by Bent Johnsen. '*A picture paints a thousand words*' is never truer than in botanical illustration. To me, hand painted colour plates make a work of botanical reference, and these are no exception. Such hand paintings reveal detail that never seems to come from photographs. These particular 111 plates are exquisite, covering a range of plants and including all the detail vital for identification.

Here is a book of great value to a whole range of people and interests but, as the first part of the complete work covering the whole of Greece, I look forward to the next and subsequent parts.

Mike Hopkins

Frank Kingdon Ward's The Riddle of the Tsangpo Gorges



2nd edition, editor Kenneth Cox
335 pages, 270 colour photos,
51 black & white illustrations
ISBN: 978-1-85149-516-0
Garden Art Press £35, 2008

'The Riddle of the Tsangpo Gorges', Kingdon Ward's account of his 1924-25 expedition to south east Tibet with Lord Cawdor, was published in 1926 and has long been out of print. His skilled and very readable portrayal of plants, peoples and terrain has never lost its fascination for us; copies of the book are still highly sought after but rarely available. This then, coupled with results from a decade of recent exploration in the area, was the stimulus for the 2001 publication of 'Frank Kingdon Ward's 'The Riddle of the Tsangpo Gorges" edited by Kenneth Cox, a truly magnificent work (reviewed in 'The Rock Garden' XXVII, part 3 – 108).

New chapters, written by three people who know this remote area best, precede and complement the original text. The first, by rhododendron expert Kenneth Cox, is a biography of Kingdon Ward with an insight into his relationship with Lord Cawdor who found the older

man a taciturn and frustrating companion, perhaps partly because of his own inexperience in the field; but KW was there to do a job and we gardeners are indebted to his single-mindedness of purpose even if it came at the expense of social chit-chat! The second chapter, by explorer Kenneth Storm Jr., is a comprehensive review of the exploration of the Tsangpo Gorges up to 1924 when Kingdon Ward went into the area, and the third - by Ian Baker - an account of the region's very considerable religious significance.

A wealth of colour photographs taken by the three authors and other expedition members is spread throughout the book, to its great enhancement. How fortunate we are to have these modern images to illustrate this little-known region. We read KW's description of the boggy meadows at the foot of the Doshong La - where he refused to accede to the ponymen's demand to camp - and can see them today, still less than inviting. 'A perpetual drizzle assailed the Doshong La', he tells us, and indeed it still does. But best of all, KW's plants are there in glorious colour for us to enjoy; his 'Scarlet Runner', *Rhododendron repens*, creeps over rocks towards the summit and when we complete our armchair crossing of the Doshong La and descend the south side we can see exactly what 'Orange Bill', a form of *R. cinnabarinum* ssp. *xanthocodon*, looks like. And primulas ... rarities like *falcifolia, baileyana, cawdoriana,* all are there for us to marvel at. A small point, uncorrected in the 2nd edition, the *Cremanthodium* species on page 168 is *rhodocephalum*, not *palmatum*.

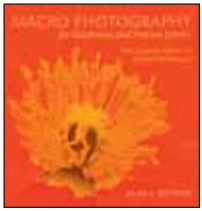
Chapters on exploration of the area since 1925 follow on after the original text; Kenneth Storm's photographs taken on his expedition to the Gorge in 1998 are particularly impressive. For the first time we can see what Kingdon Ward and the earlier explorers missed, a fall estimated to be about 20 metres hidden in a bend in the river, the definitive conclusion to the riddle of the Tsangpo. The 2nd edition concludes with a new and important chapter to bring the story of the river up to date. In 2000 a large amount of water held behind a landslip dam in Tibet was released by the Chinese authorities apparently without prior warning to the Arunachal Pradesh government, causing devastation and loss of life in the province and documented here by comparative photographs and eye-witness accounts. The subsequent protests may - and we can only hope for this - result in closer cooperation between the two governments to safeguard the future of all aspects of this unique region that straddles their borders.

Another change to good effect in this edition – most illustrations have been enlarged by eliminating the page margins. The photographs on the back of the dust jacket are new but the one on the front has been retained. I found this slightly disconcerting because, at first glance, there is nothing to differentiate the two editions - certainly not a stimulus to purchase. But perhaps the publisher's main target is new readers; anyone

interested in the eastern Himalaya but as yet unfamiliar with this superb book should not hesitate to buy it, at a price unchanged from the 1st edition.

Anne Chambers

Macro Photography for Gardeners and Nature Lovers



Alan L Detrick
176 pages
160 photos
ISBN-13: 978-0-88192-890-7
Timber Press £18, 2008

Digital cameras have for several years been the standard method of photographing flowers and plants. However, until 2008 there were no books specifically covering the new equipment and techniques required to produce digital images of floral subjects. At the end of that year two books came out in quick succession. The first, Sue Bishop's 'Digital Flower Photography', is aimed at beginners. This second, Alan Detrick's book, is aimed at the more advanced photographer with a digital SLR camera.

The book is well laid out; it explains what macro photography is and then moves on through equipment - camera, lenses, tripods and accessories - to aesthetic considerations of composition, lighting and focus. It includes post-production of images and the development of a smooth digital workflow, with sections on file format and editing.

Throughout the book there are very useful illustrative photographs for comparison of various techniques. As well as being instructive, many of these are beautiful images in their own right.

The book concentrates on macro photography in the garden, to the exclusion of information on photographing plants in their wild habitats or of wide angle views of plants in the landscape. Both these topics are covered by other photographic books, although not specifically for digital photographers. In view of the frequent and sometimes welcome presence of small wildlife in macro-photographic images of flowers, the book also includes a useful section on photographing insects.

Apart from a couple of photographs which are not quite in focus, I feel there is little to criticise in this excellent book. It is well illustrated, has sound advice and good explanations of a complex subject. Its price will be covered many times over by the saving of time and the better use of your expensive equipment!

Liz Cole

Flowers and Plants of Tasmania

Launceston Field Naturalists Club
120 pages, more than 300 photographs
Paperback ISBN: 978-1-87706-947-5
New Holland AU$27.95 (about £13), 2008

The mountainous island of Tasmania is always high on the *'must go there'* list for northern gardeners visiting the antipodes. Only a quarter the size of New Zealand, it has as many plants. Its maritime climate results in a weather pattern similar to that of Britain and many of its flowering plants fare better in the cooler moister parts of the country than in the dry south-east.

Tasmania's capital city of Hobart lies at the foot of a mountain twice the height of South Africa's Table Mountain and there is a road to the top of the summit plateau. Even wheelchair users can park there and see a good selection of its 400 or so flowering plants. Elsewhere, good roads take the visitor to excellent plant sites and beauty spots.

The problem for visitors is that the flora is so different from their own that even the knowledgeable start at a loss. That is where this book comes in; it has been in print since 1981 and now in its fourth edition has been extensively revised, with many new pictures. It continues to be an invaluable companion for everyone interested in the Tasmanian countryside. In a waterproof cover, it is of a size to fit easily into a car glove-box or a knapsack. Beginning with a chapter about the state's vegetation it then has chapters devoted to the various climatic regions - montane, rainforest, wet sclerophyll (often dominated by *Eucalyptus*), widespread riverbanks, wet places, dry sclerophyll and coastal heath. A selection of about 300 of the most commonly seen plants is illustrated and described. Each section is divided into classifications such as trees, shrubs, herbs, grasses and orchids.

Plant names are always a problem and changes occur between a book's being planned and its publication. There are very few here. *Melaleuca pallida* is called by its alternative *Callistemon pallidus*, and *Simpliglottis grammata* by *Chiloglottis grammata*. Otherwise - as far as I can tell - the book is right up to date. Even such small changes as that from *Orites revoluta* to *Orites revolutus* have been included. This book can be cordially recommended to all visitors to Tasmania.

Jeff Irons

SPECIAL PLANT & BULB SALES

Saturday and Sunday
19 & 20 September

Ron McBeath at Lamberton Nursery

No.3 Lamberton, Berwickshire TD15 1XB (01289 308515)
rare & unusual plants for rockery or woodland garden.
Close to the A1 between Burnmouth & Berwick on Tweed with

Rob Potterton of Pottertons Nursery

who will bring along a superb range of some 250 varieties of Dwarf Bulbs and other plants
Orders can be collected
Extensive gardens to enjoy with free refreshments
OPEN: 9.00am to 4.00pm

The Saxifrage Society

Benefits include an annual magazine, meetings, newsletters and a seed exchange.
Membership: Home and Overseas membership is £10 or €15 or $20 US (non sterling cheques cannot be accepted). Details from Mark Childerhouse, The Gardens, 12 Vicarage Lane, Grasby, Barnetby, North Lincs, DN38 6AU, UK (membership@saxifraga.org)

www.saxifraga.org

www.pitcairnalpines.co.uk

Bulbs to order on the web

Wide Selection of Erythronium, Trillium, Frits and Others
Pitcairn Alpines, Pitcairngreen, Perth PH1 3LT
Tel: 01738 583213 email: info@pitcairnalpines.co.uk

JACQUES AMAND
International

Below are photos of just a few of the plants and bulbs available from our two full colour catalogues published in January and July each year. See us in Edinburgh in June at Ingliston Showground. Visitors welcome to the Nursery. Many treasures not listed also available. To obtain our catalogues write to:

The Nurseries, Clamp Hill, Stanmore, Middlesex, HA7 3JS
or phone 020 8420 7110 or fax 020 8954 6784
or e-mail bulbs@jaquesamand.co.uk or www.jacquesamand.com

Arisaema asperatum

Cypripedium formosanum

Arisaema elephas

Asarum splendens

Nomocharis meleagrina

Trillium stamineum

Trillium pusillum

EXPLORERS

The Scottish Plant Hunters Garden

WORKSHOP

with Ian Young & Sandy Leven

Rock Garden Building

Saturday 22 August 10am-4pm

Learn how to create crevice and boulder style rock gardens. From selecting and placing the rocks to planting, get your hands dirty or just watch!

Tickets: £10 for SRGC members, £30 for non members

WORKSHOP

with Ian Young, Sandy Leven & Susan Band

Making More Of Digital Images

Sunday 23 August 10am-4pm

Bring your digital camera and get some top tips on photographing plants and manipulating your images. You will also learn how to make a powerpoint presentation.

Tickets: £10 for SRGC members, £30 for non members

Theatre Offer

We'd like to invite you to the evening performance of ***The Prime Of Miss Jean Brodie*** on Saturday 22 August, at Pitlochry Festival Theatre. Tickets will be available to all workshop participants at preview prices (£12.00 - £17.50).

EXHIBITION

Bhutan

In The Footsteps Of George Sherriff

Showing until 1 November

In 2008, 60 years after George Sherriff collected plants in Bhutan, **Explorers Garden** Manager, Julia Corden, was invited to retrace his footsteps. Come and see stunning photographs from her journey through this fascinating and rarely accessed kingdom.

FREE with entry to the Garden.

We sell seeds and unusual plants!

CALL: 01796 484626 CLICK: www.explorersgarden.com