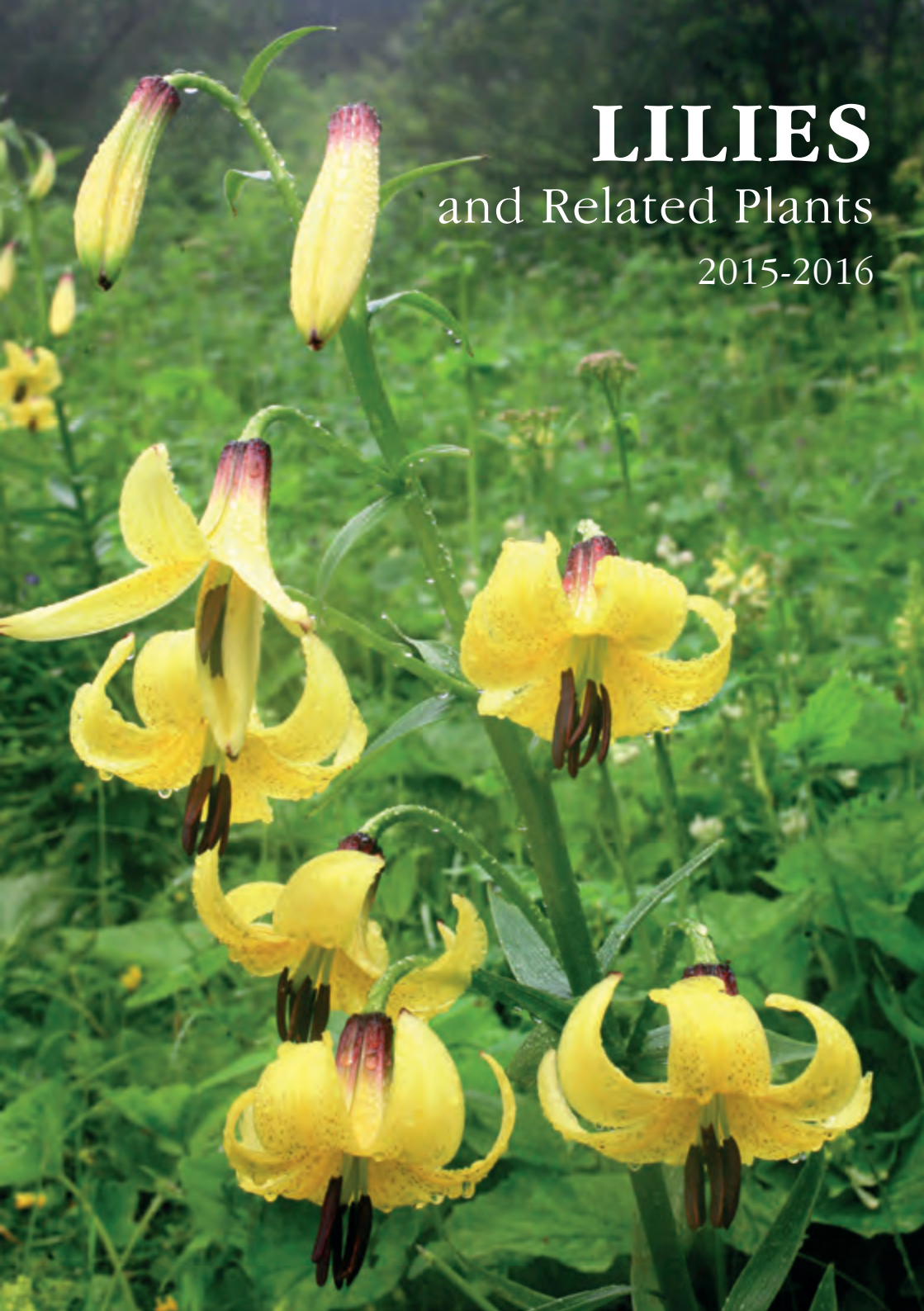

LILIES

and Related Plants

2015-2016

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Lilies and Related Plants
Published by the RHS Lily Group
80 Vincent Square, London SW1P 2PE, UK
www.rhslilygroup.org

ISBN 978-0992791810

Editor: Alan Mitchell

Subscriptions and membership:
Rose Voelcker

Typeset in Garamond and Frutiger by Rob Kirkham and printed at Four Way Print Limited, Launceston, Cornwall

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Front cover: *Lilium monadelphum* var. *armenum* growing in lush meadow-land, Trabzon in NE Turkey (see pp. 7–16)

Back cover: *Lilium bakerianum* var. *delavayi*, near Lijiang, Yunnan (see pp. 97–101)

Half title: The Yulong Xue Shan (see pp. 97–101)

Royal Horticultural Society Lily Group page:
Lilium martagon var. *cattaniae* (see pp. 88–96)

Contents page: Buddhist Monastery, Shangri-la (see pp. 97–101)

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Editor
Alan Mitchell

The Royal Horticultural Society
LILY GROUP

Royal Horticultural Society Lily Group

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NOTES ON AUTHORS

Dr Nuala Sterling a niece of the market gardener and author Ethelind Fearon, almost chose Horticulture in place of Medicine. A short spell at Rothamsted was followed by a lifetime in medicine. Nuala enjoys growing plants from seed (bulbs to trees) and found joining the RHS Lily Group, in 2004, a revelation, inspiration and education.

Duncan Coombs has been interested in *Lilium* species, and cultivars, since the age of four. He has been involved in pharmaceutical and agrochemical research and lectured for 30 years. He has visited China a number of times, where he focused on studying the Flora of Yunnan. Recently retired, Duncan has more time for gardening and visiting China.

Amanda Banfield FdSc Hort. MCI Hort. has worked within the horticulture industry for over fifteen years, of which, ten years was spent as head gardener managing the garden of a private manor house in Northamptonshire. It was here that an interest and love for the group *Lilium martagon* was borne, after a small cluster appeared under a beech tree one summer. A research project conducted during horticulture studies, on the gardens of nearby Maidwell Hall, led to further research into the Lily hybridising work of Oliver Wyatt.

Kate Kearns attended the Annual Show of the New Zealand Lily Society for the first time in 1991 and was overwhelmed by the beauty and scent of massed lilies. She bought seed and started raising lilies from seed. Upon retiring in 2012 she joined the NZ Lily Society and started growing lilies more seriously, but still feels like a beginner. She is Secretary, Seed Supervisor, and *Bulletin* Editor for the NZ Lily Society, and involved in the Society's project to establish a wide-ranging collection of *Lilium* species in the Christchurch Botanic Gardens.

Peter Zale is curator and plant breeder at Longwood Gardens in Kennett Square, Pennsylvania. He planted his first lily (*Lilium regale*) at the age of 14 and his interest in the genus *Lilium* has grown exponentially since that time. His main interests are studying the variation in lily species and cultivating them successfully. This interest has taken him throughout the U.S. and to Vietnam and Myanmar for in-depth study of lily species in the wild. Having recently moved into a new house and half-acre garden, his new goal will be to establish a large collection of seed grown lily species to showcase and help conserve the fascinating variation in the genus.

Harris Howland a past chairman of the Lily Group, has been interested in lilies for over 40 years and now maintains a relatively good collection of lilies and fritillaries. He also collaborated with Michael Jefferson-Brown, on the authorship of the book entitled *The Gardeners Guide to Growing Lilies*.

Alisdair Aird has been growing lily species from seed for several decades, and gardens mainly in Sussex, England. He is vice chairman of the RHS Lily Group and president of the Mediterranean Garden Society, and has been chairman of the Cyclamen Society and editor of its journal.

Martyn Rix VMH, is an authority on the genus *Fritillaria*. At Cambridge he did a doctoral thesis on Turkish fritillaries. He was for many years a Botanist at RHS Wisley, and contributed significantly to *The European Garden Flora*, *Flora Europaea*, *The Flora of Turkey* and many other scientific publications. With Roger Phillips, he is also the co-author of the very popular *Pan Garden Plants* series of books. His monograph on Fritillaria is eagerly anticipated.

Richard Wilford is Head of Garden Design and Collection Support at The Royal Botanic Gardens, Kew, where he has worked for nearly 27 years. He is particularly interested in bulbs and is a member of the RHS Bulb Committee. He is the author of two books on tulips, both

published by Timber Press: *Tulips, Species and Hybrids for the Gardener* (2006) and *The Plant Lover's Guide to Tulips* (2015).

Walter Erhardt is a teacher and horticultural author. He lives in Bavaria, Germany, and has for many years been interested in lilies and daylilies. He has written books about the genera *Hemerocallis* and *Narcissus*, but his most important works are *The European Plant Finder* and *ZANDER–Dictionary of Plant Names*, also published by Timber Press.

Christopher Brickell CBE, VMH, former Director of Wisley and Director General of the RHS is a botanist, horticultural taxonomist and keen gardener with a long term interest in bulbous plants. He has contributed accounts of bulbous genera to the Flora of Turkey, Flora Europaea and the European Garden Flora and is also Chairman of the International Commission for the Nomenclature of Cultivated Plants as well as a current member of the RHS Lily Group Committee.

Aaron J. Floden My interest as a PhD student in the Lilies in, a broad sense, focuses on the Ruscaceae, particularly Polygonatum and its two sister genera, Disporopsis and Heteropolygonatum. I am studying the evolution and diversification of these genera, their cytology, and biogeography. As a gardener, my interests are much broader and include many of the Lilioid monocots including Lilium, Fritillaria, Galanthus, Crocus, Aspidistra, Ophiopogon, Disporum, Uvularia, and many others. Cultivation interests of other plants has a focus on the Asian-American disjuncton, but is not limited to these.

Susan Band started Pitcairn Alpines nursery in 1984, growing alpines to begin with and then gradually moving into bulb growing, including many Himalayan, and other Asian, species lilies. Over the past few years, species lilies have become an ever growing part of the nursery. Susan's quest is to develop standardised systems, to germinate and grow different groups of lilies, and release the rarer species into more general cultivation.

Pontus Wallstén with a BA degree, in film and TV production, from the University of Westminster, as well as a Masters degree in Journalism from the University of Neuchatel, Pontus now lives in Switzerland, where he runs Pontus Wallstén Plants, which is a nursery for rare plants: (http://pontuswallstenplants.smugmug.com). Pontus is the editor of the *RHS Lily Group Newsletter*.

Alan Mitchell is an optimistic amateur gardener with a passion for growing lilies. He finds their difficulty a challenge and their diversity and beauty engaging and therapeutic.

Michael and Mary Jane Delgado live near Santa Barbara, California. They are active members of three local naturalist groups, which facilitates Mary Jane's interest in photography. They have been interested in Fritillaria, but especially *Fritillaria ojainensis*, for several years.

Alain Jean Denis I have been growing Alpines for 30 years, including some bulbous plants like tulips, frits and erythroniums. Then, an article in the SRGC journal, on growing lilies from seed, convinced me to cultivate them. My encounter with species lilies in China did the rest. *Lilium* are extraordinary and beautiful plants that bring me much happiness.

Vijay Chandhok has an interest in flowers that he inherited from his father. However, his specific interest in species lilies started after he joined the *Lilium* Species Preservation Group, with whom he has searched for American species lilies in Washington State and California. Vijay has trekked in Kashmir and Uttarakhand State, where he has encountered species lilies, including *Lilium polyphyllum*.

Vladimir Trifonov is a botanist, whose job is 'Chief Expert, Biodiversity and Protected Areas', for Bulgaria's Ministry of Environment and Waters, based at the Ministry's regional inspectorate in Haskovo, southern Bulgaria. Among his many responsibilities, is the conservation of rare plants, such as *Lilium rhodopaeum*.

From the Chairman

Nuala Sterling

The 1932 objectives of the Lily Group 'to encourage the cultivation of Lilies, Fritillaries, and Nomocharis by holding meetings for lectures and discussions, by visiting gardens where these plants are well-grown and to promote research and to publish a Lily Yearbook to share that knowledge' remain over 80 years later. The creation of the seed distribution came later in 1976 led by James Platt, then Molly Pottinger and expanded by her successor Alan Hooker to a worldwide exchange and was a major factor in encouraging the growing of lilies. This became increasingly important for the enthusiastic amateurs keen to grow the unobtainable as species disappeared from the catalogues in favour of hybrids[1].

Pat Huff and George Battle now create and distribute the seed list composing over 600 seeds, *Lilium* species, hybrids, Liliaceae, and other bulbous species and hybrids. The 1994 letter from Göte Svanholm praising the LG seed list as a mechanism for contributing to the group is as true today as then: Rare and interesting lily seed, reliably named, good germination and interesting non-liliaceous seed difficult to find.

George has spread the net for distribution of any spare seed to Botanical and Horticultural Institutions. David Leung is involved in a tissue culture project for earthquake replacement of lily species at NZLS Botanic Garden by the School of Biological Sciences University of Christchurch.

Valuable too for members are the varied and interesting papers on growing advice. The 2015 award of the Lyttel Cup is made to Gene Mirro in Washington State USA. Just read his careful, precise instructions, for preserving seed[2] and the techniques for growing Lily Species[3] and know also of his generous donation of seed to our lists. Without ready access to the RHS Lily Group Publications DVD 1932–2014 of our Journal I would not be able to bring these so readily to your attention. Every time I open a Yearbook I find insights into the previous era of the

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1 Elliott, B. (1992). A brief history of the lily Committee. *Lilies and Related Plants* 1992–93. pp. 10–18.

2 Mirro, G. (1992). The Long-term storage of Lily Seed. *Lilies and Related Plants* 1992–93. pp. 90–91.

3 Mirro, G. (2013). Growing Lily species in the Pacific North West. *Lilies and Related Plants* 2013–2014. pp. 103–110.

The Bulb Committee visit to Fullers Mill, Suffolk.
From left to right, (back row) M. Pitcher, R. Nicholl, J. Amand, A. Street, R. Hyde, A. Shipp, G. Davies, J. Walker, S. Gibson, J. Pennings, Jenny Horne and Perennial team; and (front row) Nuala Sterling, Lady Skelmersdale, Teresa Clements, Annie Dellbridge.

Lily Group, such as Richard Dadd's personal reflections on the botanist Professor William T. Stearn[4], April 1911 to May 2001.

Although an alert transatlantic member was the first person in 18 months to notice that the DVD 1988-89 issue was a duplicate of the 1986-87 issue it can be found on page 70/213 on the second listing of that Yearbook. Yet although I prefer to read a book I have only achieved approximately half the publications so acknowledge and am grateful for electronic communication. The 2014 award of the Lyttel Cup was made at Wisley to Richard, Elizabeth and Sarah Hyde by Tim Upson RHS Director of Horticulture.

Digital transmission of the Newsletter and Seed List to reduce costs and speed delivery was first trialled to our overseas members in Autumn 2013 and subsequently to all those with current email addresses, but the option of a printed copy remains. Initially distributed using email strings, that rather laborious method has been replaced by using the fast, efficient and secure method via MailChimp. The membership list is kept up to date by our Treasurer, Colin Pope and Membership Secretary, Rose Voelcker. An additional advantage is that we are notified if there is a rejected email and whether or not the Newsletter has been opened. The reasons for an unsuccessful delivery inlcude: incorrect email address, address rejected by the server or more simply, an 'unopened' email. At the AGM

[4] Dadd, R (2001). Professor William T. Stearn (April 1911 to May 2001). *Lilies and Related Plants* 2001–2002. pp. 46–48.

Lilium 'Golden Splendor Group' with Helenium, and *Lilium* 'Eileen North'.

in November there was wide approval for the system and the majority of members preferred to read the contents online. We should welcome other feedback.

The programmes have reflected our wish to travel around the UK and abroad. The AGM and Bulb Auctions were held at Wisley in 2014 and Pershore College in Worcestershire in 2015. We plan to hold the 2016 Bulb auction at the RHS Lawrence Hall, Vincent Square. Our visits to Bernard Tickner's, Fullers Mill Garden, Suffolk in July 2014 and 2015 are reported in the Autumn Newsletters. Our two-day visit to Perth, Scotland is reported on pages 48–52 which reminds us how valuable it is to meet up and discuss the variable approaches to growing lilies. Distance and cost make it less easy to travel the world but I appreciated my opportunity to visit gardens and meet members in New Zealand in 2008, 2009 and 2013 notwithstanding the earthquake and to see William Doreen still growing lilies even having retired to a Masonic Village at 90. This year the Lily Group had a wonderful tour in June to seek lilies in North East Turkey under the guidance of Chris Gardener and Nursel Ikinci which is reported on pages 7–16 by Duncan Coombs. Pontus Wallstén showed a short film of the visit at the AGM specially nice for those unable to go. We were delighted that Alisdair Aird was able to be our ambassador to Japan when we were invited by Hiroko Saito to propose a speaker on lilies at the RHSJ International Horticultural Forum in August 2014 (see pp. 39–42).

The RHS Bulb Committee Chairman, Jan Pennings, invited the two Lily Group members Richard Hyde and me to coordinate an 'outward facing' visit to a lily garden, Fullers Mill Garden, Suffolk on 15 July 2015. 12 members of the Bulb

Committee who grow/produce/sell summer or autumn flowering bulbs came and assisted with the setup, benefitted from a tour of the garden prior to welcoming approximately 170 visitors to the Garden thereby contributing to Perennial, the Gardeners Benevolent Society. The Lily Group stand backed up the garden show. Theresa and Jason Clements gave a demonstration of English Florist Tulips for the Wakefield and N.W. England Tulip Society, and Christine Skelmersdale displayed Alliums and Dierama. Rob at Pheasant Acre delivered a splendid display of gladioli, whilst Richard Hyde identified many of the historic Lilies. Members gave horticultural advice to visitors. Anne Dellbridge, Head Gardener and her team gave us all the support we needed, and a picnic lunch with delicious cake at tea. www.fullersmillgarden.org.uk

The entrance poster produced by Chris Tank, Interpretation Team Leader at Wisley, ensured visitors understood the involvement of the RHS and Jan Pennings did an excellent job of welcoming visitors and explaining how they might question BC members identified by their name badges.

The following day Annie, Heather and Nuala hosted an interactive Plant Heritage Study Day wiith enjoyable participation from the Suffolk Branch — now adept at scaling and seeding Lilies. The Lily Group stand was replicated on 19 July at the Suffolk Nurseries Plant Fair.

Lily Group Committee Encouraged by the example set by the RHS Council we have made some modifications to the Committee structure. I am delighted to welcome three new committee members whose appointment was confirmed at the Annual Meeting and Bulb Auction at Pershore College on 7 November; Nataliya Cuttel whose financial experience will be invaluable, Tony Dixon who will coordinate the Pollen Project and Pontus Wallstén our new Newsletter Editor. Cynthia Young becomes a friend, welcoming at meetings, as will the Corless family when they have more discretionary time. Tim Whitley is elevated to Honorary Membership.

From all my comments you will know that we are indebted to each and every contribution made by committee members and the wider world interest and support from overseas members with articles, seed , knowledge and friendship.

RHS Lily Group visit to North Eastern Turkey 2015

*In this article, **Duncan Coombs**, recounts the wealth of plant species, especially species lilies, which were encountered during the Lily Group's visit to NE Turkey last summer.*

On 20 June 2015, eight intrepid members of the Lily Group set off for NE Turkey.

Sunday 21 June was an excellent first day. We spent the morning wandering around fascinating ancient graves, which were about 5,000 years old, above the town of Amasya. Crossing the river Yesil, we went into the main mosque and were allowed to take pictures. In an adjacent building there was an interesting three dimensional model of the city and the surrounding mountains. There was also a local museum, but this part of Turkey has a very complex history and contained too much information to take in quickly.

The afternoon saw us, at about 800 m, looking at wildflowers outside Amasya. The largely unimproved land was very good for wildflowers. A lack of use of herbicides allowed many weeds to flourish which looked very attractive. I saw many plants that were completely new to me. Our guides Chris Gardener and Nursel Ikinci soon demonstrated that they had an excellent knowledge of the local flora.

The undulating countryside was very scenic. Most of the land is still held by local families, and over the generations this has led to a system of very small fields, very diverse cropping and unusual crops. On uncultivated steeply sloping land the very rich local flora was largely untouched. The presence of plants such as *Paris quadrifolia* demonstrated a lack of disturbance from time immemorial. A thin soil on top of limestone had developed, thus allowing a very species-rich flora to

develop, including many terrestrial orchid species. Orchids—very rare or absent in UK—were commonplace!

Unfortunately, there was much evidence of apparently uncontrolled quarrying and much new road building. The road traffic was, however very light. Our guide said the need for the roads was questionable and may be due to local politics.

Our female local guide was worried that the farmers were not adopting modern farming methods and production was very inefficient. However, from our point of view, this lead to an attractive diverse countryside. We were informed that local small farmers were selling up to larger more efficient concerns and production methods were changing.

We had an excellent evening meal in a very old building formerly used for camel trains, traders and their attendants. The building had been completely renovated and we were shown the best rooms. The people were exceptionally friendly and clearly wanted tourists such as us to come and spend money. The meal was very good with local dishes, many containing yogurt, but with no alcohol, as it was Ramadan.

The following day we travelled by mini bus from Amasya to the town of Erbaa. Here I took photos of the old dusty town and the climber, Campsis, flowering in gardens. The area looked rather poor and not very flourishing. From here we went first up into the Canik Mountains and later to the Akkus Valley. On the mountains there existed an open forest mainly of *Fagus orientalis,* which is being managed for sustainable timber production. Here the beeches were smaller than *Fagus sylvatica,* (common beech), in UK with a shorter trunk leading to a comparatively narrow head. The shortness of trunk may have been due to the open, rather thin nature of the wooded areas. *Mespilus germanica*, (the Medlar), was common and its characteristic fruits were beginning to develop. The saprophytic *Neottia nidus-avis*, (Bird's Nest Orchid), occurred in heavy shade beneath the dense beech canopy.

An acidic soil containing much organic matter had developed above a reddish limestone. The recently discovered *Lilium akkusianum* was found growing amongst bracken, (*Pteridium aquilinum*), the lily apparently competing well with the bracken. Patches of *Rhododendron luteum* were also present. The ground had never been cultivated, with the beech cropped and then left to regenerate naturally. Chris felt that originally when the forest was denser the lily must have grown in considerable shade, but now it appeared to be doing well in open sunny situations. I felt it was worth noting that the lily was in flower before the fern fronds had fully developed. This meant that the lily would have the early opportunity to grow strongly and flower in virtually full sun before developing seed as the bracken canopy closed over it. This yellow-flowered Turks cap lily was very sweetly scented, with the leaves and pattern of growth being very similar to *Lilium*

Lilium akkusianum on Canik Mountains at 1,300 metres, near the Akkus Valley.

monadelphum. The pollen was a beautiful orange/red colour. Unfortunately, many of the stems had been broken, by some agent, before our arrival and many of the flowers had been partly eaten, but nothing responsible for this damage to the flowers was seen. As far as I am aware this new species is not yet in cultivation, but providing it does not prove too difficult to please, it will make an excellent addition to any garden.

We were at an altitude of approximately 1,300 m. The presence of plants such as *Helleborus orientalis*, *Neottia nidus-avis*, (Bird's Nest Orchid), *Cyclamen coum, Colchicum* sp. *and Sorbus torminalis,* (Wild Service Tree), indicated that the ground had probably never been disturbed.

As we moved inland *Pinus sylvestris*, (Scots pine), became the dominant tree species. Good views were obtained from the mountains down towards the Akkus Valley. Lower, at an altitude of 700 m, in a rain shadow area, there was a remarkable Mediterranean enclave of flora, with *Arbutus andrachne* and *Cedrus libani* (cedar of Lebanon). All the strawberry trees had been coppiced, presumably for timber, but their stems with peeling bark and red colouration beneath looked very attractive.

Once down in the Akkus Valley much of the ground was covered by an *Eryngium* sp., plus numerous rushes. In one spot *Iris zanthospuria* was producing its beautiful yellow flowers. This is an unusual flora, which has presumably developed

due to the dry summer season followed by a very wet winter with possibly some salinity in the soil.

On 23 June we travelled from Ordu to south of Giresun where the road climbed along the Aksu Valley. In the valley, at 560 m, we found *Campanula sibirica* and *Campanula persicifolia*, (peach-leaved bellflower), in flower. Further up, at 1,075 m, we found *Lilium monadelphum* var. *armenum* in flower in lush grassland together with *Heracleum* sp., *Securigera varia*, (syn. *Coronilla varia*), and *Echium vulgare* (viper's bugloss).

At 1,070 m we found a north east sloping meadow, at the base of a taller mountain, that was a picture, and full of wild flowers. At the base, by the road, a magnificent verbascum was in full flower together with cows complete with bells! In the meadow, amongst the turf, we found *Pedicularis condensata*, *Gymnadenia conopsea*,(fragrant orchid), *Anacampsis pyramidalis*, (pyramidal orchid), *Dactylorhiza saccifera*,(wedge-lipped orchid), Polygala, (milkworts), and several other Verbascum spp.

In part shade, but still on the slope, there were *Aceras anthropophorum*, (man orchid), *Petasites* sp.,(butterbur), the parasitic *Orobanche lutea,*(broomrape), *Paris quadrifolia*,(herb paris), and *Lilium monadelphum*. A plant community I will not forget!

Higher still, at 1,605 m, we saw our first *Lilium ciliatum* growing on a very steeply sloping site. There were hundreds of stems arising from lush vegetation. The plants looked almost threatening, the dark centres of the otherwise yellow flowers appearing to stare out at us. The shade of the yellow was variable, some having a much darker colouration. With close inspection, the ciliate margin of the leaves was clearly visible to the eye. Growing around and at the base of the lilies was

Opposite

Lilium ciliatum in Aksu valley at 1,605 metres.

Left

Lilium monadelphum var. *armenum* growing in lush meadow-land near our hotel in Trabzon.

Aster calcausica. This purple-flowered daisy was shorter than the lily and the two associated well. Also growing in large clumps, separate from the lily, was *Anemone narcissiflorum*,whose large white flowers were just past their peak, together with the tall yellow composite *Calcalia pontica*. The would-be cultivator of this lily species might do well to note they were growing in a clearly fertile soil, with good drainage, due to such a steep slope and high rainfall at the time of flowering.

At yet another site we found *Lilium ciliatum*, again on a steeply sloping site, together with *Dactylorhiza saccifera*, *Orchis tridentata*, (toothed orchid), and a very beautiful Dactylorhiza hybrid with variegated flowers whose parentage one can only wonder at. At the edge of the road, where we left it to find the lily, there were *Saxifraga rotundifolia* and the beautiful pea *Vicia aurea,* both in flower.

On 24 June we drove from Ordu to Trabzon, the largest city in the north-east of Turkey. On route we took lunch at a café in the Altinere Valley, the road leading us into a steep limestone gorge. The weather was wet with lots of low cloud and mist which greatly reduced visibility. Despite the weather one could discern that this was a scenic area. Where we stopped for food a stream rushed along its course crossed by a dilapidated bridge. On the rock walls of the gorge the outstanding plant was *Campanula betulifolia*, growing in small crevices in the rock. All the plants we found had large white flowers and birch-like foliage.

We drove and then walked up a long stepped path to the famous Sumela Monastery. This is perched on a massive rock cliff, the buildings hewn out of the

Lilium ciliatum flowering on a steeply sloping site in the Aksu valley, at 1,605 metres.

rock. The ancient buildings were impressive and the murals on many of the walls, both inside and out, very beautiful and interesting. We were assured the view from the monastery was breath-taking, but because of the weather we had to take our guide's word on this!

From the monastery it was short drive to our hotel just outside Trabzon. Our hotel was situated in wild flower meadows—ideal for plant seekers! Around the wooden, very comfortable chalets in which we stayed was very lush, florally diverse grassland. The rainfall in this area is high and indeed we experienced some of it, but it clearly encouraged the growth of the local vegetation. In the grounds of the hotel we found in flower *Lilium ciliatum*, *Geranium psilostemon*, *Geranium pyrenaicum* and *Silene alba*.

On 25 June our initial botanising took the form of walking out of the hotel and along the local country lanes. We were not disappointed. Along a track leading from the hotel there were present, in a wide grassy verge between the road and spruce forests, several plants that were new to us on this tour—including *Symphytum aspera*, *Stachyus macrantha*, the comparatively large round headed terrestrial orchid *Traunsteinera sphaerica* (Globe Orchid) and familiar to us from our gardens in the UK, the blue-flowered *Geranium ibericum*. In slight shade two shrubs, the white-flowered, but unfortunately unscented *Lonicera caucasica* and yellow-flowered and beautifully scented *Rhododendron luteum* were present.

Wandering further from the hotel a larger grassed area, leading up to a gentle bank, revealed an interesting range of plants including *Lilium ciliatum* growing with *Lilium monadelphum* var. *armenum*. This was a mixed population of both species, but no obvious hybrids between were found. Also growing with the lilies was the tall herbaceous perennial *Carophyllum auranticum* with masses of tiny fine white flowers. In areas where the vegetation was a little shorter *Geranium*

Lilium monadelphum var. *armenum*

ibericum was found again. To my eye one of the most beautiful plants also present was *Aquilegia olympica*. The flowers of this species were large, deep blue, short-spurred when compared to garden hybrids, but very conspicuous.

Later in the day we moved on to the Zigana Pass. The south facing versant was clearly very hot and dry at this time of year. The vegetation was fairly sparse with much coarse broken rock exposed, but young trees were beginning to colonise the slopes, these including *Quercus* sp. and *Crataegus orientalis.* At around 1,205 m we found *Pranges ferulacea, Scabiosa columina, Eryngium campestre, Echium vulgare, Linum tenuifolium, Dianthus commelina* and *Onosma erina.* In the very driest areas *Digitalis lamarckii* was easily seen with its spires of distinctive brown and white foxglove flowers. In a steeply sloping area, where the rock was perhaps a little more finely broken, there was a large colony of *Epipactis helleborine* (broad-leaved helleborine). This population was very interesting, because of the wide variation in vigour and flower colour between different individuals. On a flatter slightly cooler spot tall plants of *Morina persica* were flowering, tiers of pink, fading to white trumpet-shaped flowers emerging from vertical stems arising from basal whorls of spiny leaves. This was a treat for me, as previously I had only seen this species in hot dry gardens of the UK.

At the top of the pass we noted a large pale pink area on a west facing slope. Upon closer inspection this proved to be a very wet flush with the expected rushes. Amongst the rushes in large numbers was *Dactylorhiza iberica*, (Crimean orchid), in full flower. The mass of pink flowers from this orchid caused the

Lilium ponticum

localised pink area seen from a distance. I learnt later that this particular species is known to favour this specific habitat.

Looking down the pass, from the point where we spied this orchid, it was clear to see the very different climates experienced on the south and north facing slopes of the valley. The south facing versant was extremely hot and dry, as described, but by contrast the north facing versant was green and lush with tall trees, all within what I would estimate to be less than a mile as the crow flies. What an object lesson for teaching the importance of topography in affecting rainfall and temperature!

Friday 26 June saw us going up, again, into the mountains. Whilst still fairly low in altitude, we found *Phlomis russeliana,* beloved by modern garden designers for its whorls of yellow flowers in summer and distinctive strong winter outline, *Campanula aliarifolia* and *Dianthus* sp. In common with our previous findings we found *Lilium ponticum* growing on a steep slope. The population was notable for the various colour forms of this species, some having the typical light yellow background perianth colour whilst others were very much darker. Amongst the lilies *Geranium psilostemon* was in flower. In a damp position, at the base of the slope, an Equisetum, probably *Equisetum arvense*, (common horsetail), was rampant. However, in this context it looked attractive with its upright stems and fine foliage-like branches contrasting against other vegetation.

Higher, at 1,875 m, the bright yellow flowers of *Anthemis tinctoria* announced its presence together with more *Lilium ponticum* and *Dactylorhiza saccifera*.

At just below 2,000 m we encountered small Turkish villages. These looked unloved and our guides explained that life for these farmers was extremely tough, most barely able to make a living. Depopulation was happening, with people being forced to seek work at lower altitudes, the villages dying had led to scrub beginning to develop in what were previously grazed meadows. At this altitude *Rhododendron luteum* was still in full flower and very prominent on the valley sides. One of the tour members, Lady Christine Skelmersdale, had visited this region before and remembered the Rhododendron being confined to only the upper parts and crest of the valley, but this species now extended much further down—almost to the valley floor in places. Was this change due to a reduction in grazing pressure, she wondered? Down on the floor of the valley we saw *Rhododendron ponticum* whose purple flowers contrasted against the yellow of *R. luteum*.

Up to 2,000 m *Pinus sylvestris* was the dominant tree with dark patches of woodland and patches of open coniferous woodland—with *Rhododendron luteum* forming a colourful shrub layer—and yet other places where the Rhododendron formed a mono-culture on its own. This vivid mosaic, spreading out around and below us, reminded me of a course I went on many years ago, called appropriately, "Patterns in nature". In the very thin turf, below the canopy of the pines, we found the small, but delightful wintergreen *Moneses uniflorum*

Fagus orientalis and *Rhododendron luteum* on the Canik Mountains, near Akkus, at 1,300 metres. These plants have been able to take advantage of depopulation in certain areas.


Lilium akkusianum

whose white flowers looked too delicate for such a severe climate, plus a solitary flowering stem of an early purple orchid, its lateness in flowering a testament to the lateness of the season at this elevation.

At almost exactly 2,000 m there was a clear tree line, running along the sides of the valleys, marking the point above which the growing season was just too short for successful tree growth. Here a very short turf developed that contained a dense population of *Ceologlossum viride*, (frog orchid). On north facing slopes snow patches remained and now, in June, the day temperature was low. Chilled by both the low temperature and then rain we retreated to the warmth of our hotel.

Unfortunately I had to leave the tour at this point, since work beckoned me back to the UK, but the tour continued for a further two days with the same extensive range of plants being seen.

I left with a strong memory of a rich and varied experience. The people were open and friendly with a cuisine that was new and attractive. The flora had been found to be diverse exciting and in many places unique. Nowhere else will one find *Lilium akkusianum*. I also realised, perhaps rather late in life, that the British Isles does indeed have what botanists call a depleted flora, thanks to the ravages of the Ice Ages and subsequent development of the English Channel. One, however, only needs to cross the sea, to the continent of Europe and Asia Minor, to find many plants, which are very rare in Britain, plus many others, which are absent in these fair isles — including of course lilies!

Dr Ian Boyd 1933–2015

an appreciation by ***Nuala Sterling***

I first met Ian at the Lily Group international Conference in London in 2004. He was extremely kind and welcoming to a relatively new member of the Lily Group and spent some time advising me to become more involved. Little did he know what he was doing! Yet that was typical of all the responses I have had in creating a picture of him from members, colleagues and family.

Born in Moston, Manchester he was educated at Manchester Grammar school. His interest in gardening began when he helped his father and grandfather 'Dig for Victory' during the Second World War, not just growing and eating the radishes he had sown but also tending a clump of 30–40 *Lilium speciosum* in the front garden. At 16 a friend of his father's taught him to scale bulbs and he was hooked for a life of appreciating lilies.

He took his degree in Pharmacy at Manchester University. After national service in the Brecon Beacons, he joined the Sunderland Polytechnic, now University, as a lecturer where he remained a member of staff for 30 years. Then employed by MHRA (Medicine Healthcare products Regulatory Agency) and afterwards as a Pharmaceutical Consultant to the Industry, he moved to Hertfordshire continuing to grow lilies and hybridise. Some of the crosses were super but often didn't survive past their first year of flowering. Much space was given to pots in the garden containing seeds or bulbils maturing through their five year or so growing period. Late summer was spent sorting out which pots might produce a lily in the future and which had had more than their allotted six years. He and partner Ailsa soon learnt what stealth was required to find and kill the red Lily Beetle in Wheathampstead, not a problem in Keswick to where they retired in 2001.

Ian was remembered at Sunderland & London with great fondness for his ready smile, sharp wit and helpful nature and his kindness and patience as a lecturer and colleague. His interest in lilies inspiring an MHRA colleague to grow orchids.

Ian joined the Lily Group in 1989 and the Committee in 1990 on which he served until 2006. He was secretary in 1992 for six years and subsequently ran the website.

On retiring to Keswick he joined the North Lakes Horticultural Society and became a member of the committee—including a few years as programme secretary. Some of his garden lilies even surviving the tougher conditions there. His *Cardiocrinum gigantum* were a particular source of pride.

Oliver Wyatt (1898 – 1973)

Oliver Wyatt was a Chairman of the Lily Group and the producer of many beautiful hybrid lilies, as ***Amanda Banfield*** *recounts in the following article.*

Portrait of Oliver E. P. Wyatt,
(by kind permission of Mr Robert Lankester)

Oliver Evelyn Penfold Wyatt a Northamptonshire amateur horticulturist, specialised in the hybridisation of *Lilium* species and the selecting of many *Galanthus* species. In 1935 Lady Beatrix Stanley of Sibbertoft Manor, also Northamptonshire and a friend of Wyatt's, introduced him to the renowned horticulturist, plantsman and writer E. A. Bowles. Following this introduction a friendship developed and a regular correspondence began, Bowles beginning his letters to him as 'Dear galanthophile', a designation first used by Bowles for Wyatt, according to Bishop et. al (2001). Wyatt in turn, considered Bowles and Sir Frederick Stern of Highdown, Sussex to be his 'horticultural godfathers', (Synge, 1973). A large part of Wyatt's working life was spent at Maidwell Hall School, as Headmaster from 1933 until his retirement. It was during this time he also worked as an 'amateur' horticulturist developing the breeding and hybridisation of lilies, making significant plant selections. Not only were selections made of lilies and snowdrops, but also a sport of *Clematis macropetala,* 'Maidwell Hall'.

Wyatt moved from Shardlow Hall, a Preparatory School, to Maidwell Hall, Northamptonshire in 1932 after purchasing the small estate to establish his own preparatory school for boys. The purchase was made from Reginald Loder, a member of the renowned gardening family, who had previously laid out the grounds

at the hall with grand plantings of interesting, and at that time unusual, trees and shrubs. Some of which are still standing today. The collection included seedlings directly from some of Ernest 'China' Wilson's Far Eastern expeditions. Now no longer present in the grounds, but examples included shrubs such as *Berberis polyantha and Philadelphus purpurascens*. Wyatt further developed the grounds,

Maidwell Hall (2013)

adding fine specimens to the gardens, focusing on the growing of small bulbs and lilies amongst the trees and shrubs. *Iris histrioides* were grown at Maidwell in great profusion beginning with eight and, eight years later multiplied to around 1,200, until as Wyatt (1966) mentions in an RHS lecture 'ink disease appeared and killed them all.' In the same lecture he mentioned that he was given one bulb of *Crocus sieberi* 'Bowles White' by Bowles and managed to increase, along with *C. tommasinianus*. Wyatt grew *Fritallaria recurva* at Maidwell from seed then grew from scales in one bed. When planted in a bed 10 yards away the same bulbs always died and also elsewhere in the garden.

A surprising number of his collection of shrubs and perennials would not normally have been associated with growing conditions of Northamptonshire at that time, only made possible by the protection of large laurels, yew and box.

During his time at Maidwell, Wyatt developed and honed his skills in hybridising lilies. In the *Journal of the Royal Horticultural Society 1956,* Wyatt describes the

large plantings of representative species and many of the hybrids, some of which were originally raised in the gardens. A man not keen on self-congratulation, declared at an RHS lecture in 1950 'in comparison with the experiments of others, not only in this country but in America, Canada and New Zealand, my own have been made on a very small scale.' His importance in the world of horticulture is highlighted by Bishop et al. (2001), who list Wyatt along with Bertram Anderson and Chris Brickell as one of the influences of not only lilies but that of snowdrop promotion too in the latter half of the twentieth century. Numerous selections of *Galanthus* were made whilst at Maidwell, with bulbs given to Wyatt, which he recorded as having, 'come direct from Mr. Bowles, or from Lady Beatrix Stanley, who received hers from him, or from her daughter Lady Barbara Buchanan'.

Speaking at the aforementioned RHS Lecture, Wyatt stated "We are at the beginning of Lily hybridisation and it will take many generations of hybridising to produce superior strains, but unless it is done Lilies can never become popular plants for the ordinary garden. Yet, that is the vision: to every garden its own Lily bed." Having seen the losses of lilies through the neglect in wartime, he felt that these had been too pampered previously. He set out to create and select lilies which would be beautiful in colour and shape, lush foliage, strong constitution, resistant to disease, self-supporting, heavenly scented, easy to reproduce from vegetative cuttings with the ultimate aim of producing true from seed.

Lilium × *burbankii* 'Yellow Maid'

Lilium 'Oliver Wyatt'
(Award of Merit 1965)

In his 1966 lecture Wyatt said "I could not refrain from putting in a few things about lilies, as they've always been one of my special loves." He mentions growing easily from seed the *Lilium szovitsianum*, from Russia, which, he found naturalised easily. For the young grower he suggested "sowing *L. martagon* in an old patch of ivy or out of the way place and they will grow happily."

Wyatt admitted that sometimes it was often difficult to ascertain which lilies would grow in which types of conditions, so a fair amount of trial and error was necessary. Living in Northamptonshire he was keen to treat his lilies mean! All hybrids were raised in an open frame under a north facing wall. He firmly believed that growing in the cold conditions would produce hardier stock. His early experimenting was to cross those which were in flower together. Firstly, trying *Lilium roezlii* with *L. parryi.* Whilst each of these parents was beautiful the progeny were bearing the least interesting features from them. He moved on, after some thought, to crossing *L. fresnense* with *L. parryi* and *L.* × 'Shuksan' with *L. parryi.* With much preparation of the heavy clay soil, digging deep beds with gravel drainage, success was to follow with *L.* × *burbankii* 'Yellow Maid' a hybrid of *pardalinum* × *parryi.* The first of many in the Maidwell series, it also became his first hybrid to receive an Award of Merit, A. M., granted in 1948. Derek Fox wrote in 1987 further of a seed parent *L. nevadense* rather than *parryi* it was worthwhile,

Lilium 'Ares'

as 'Yellow Maid' proved to be a good parent in later breeding. Described in the *International Lily Register* as Aurelion yellow growing four feet in height.

Others, in the series that were equally well-received were 'Bridesmaid' (Award of Merit, 1949), brilliant yellow with maroon spots. 'Dairymaid', pale orange-yellow in colour, slightly spotted, another in the series.

At the time of writing, the only known hybrid of Wyatt's thought to be still growing is *Lilium* 'Oliver Wyatt' an example of which can be found growing in a garden in Kent. Described in the *International Lily Register* as of *parryi* parentage × with an unknown vivid orange yellow lightly spotted with maroon.

Wyatt further describes his attempts at hybridizing with *Lilium* × *testaceum* and *L. chalcedonicum maculatum,* both of which flourished at Maidwell. The results were not quite so successful. One progeny, 'Zeus' (A. M. 1949) was described as with a good salmon colour, but with a weak constitution. Others in the series were 'Apollo', 'Ares', 'Artemis' and 'Hephaestus'.

Whilst Wyatt also had success with martagon lilies, he began to realise work needed to be limited to one or two selected strains, "otherwise the breeder is completely overwhelmed." Success was had with the first hybrid between a European and an American lily, crossing white *L. martagon* with *L. kelloggii.* The progeny was named after the neighbouring village of Kelmarsh. Further experiments crossing *L. grayi* and *L. parvum, L. parryi* and *L. parvum,* proved less successful.

Not only did he write about his successes and failures, Wyatt recorded his preferred planting partners to grow his successes with. Suggestions were made to place *Imperiale* hybrids grown in a border, with the unusual combination of *Thalictrum sulphureum, Geranium armenum* and *G. sylvestris* in the background. Foreground plants were *Prunella grandiflora, Gazania* and *Verbena* 'Laurence Johnston'.

After much experimentation Wyatt concluded, "that achievement can be made

with three main factors: Spend 5s on a Lily and £1 worth of labour in making a home of deep cultivated beds. Secondly, do not pamper the seeds and seedlings. If weaklings are produced, the sooner something kills them off the better." Thirdly, he felt the removal of the seedlings to their final resting/growing space as soon as can be handled is of a benefit. While young the whole root can be moved unbroken and they will grow away very happily without further assistance.

Wyatt was a busy man, not only was he a much admired headmaster and horticulturist he also sat on numerous committees whilst at Maidwell and was a J. P. for Northampton from 1946–63 (*The Times*, 1973).

Synge (1973) recalls him as a most friendly and lovable man. As well as his role as headmaster, he was a magistrate, an authority on old glass and the Chairman of Preparatory schools committee. He retired from Maidwell Hall in 1963, moving to the Old Manor, Naughton, Suffolk. Here, he continued his gardening on very heavy clay. In 1953 he was awarded the Lyttel Lily Cup. Then an issue of *The Lily Year Book* was dedicated to him, in recognition of his work as an amateur horticulturist, especially with regard to the hybridising of lilies Wyatt became a member of RHS Council in 1964 and was awarded the V. M. H. in 1965. From 1967–1971 Wyatt was Treasurer of Royal Horticultural Society, and President of the Alpine Garden Society. Wyatt also chaired the RHS Lily committee and Floral Committee 'B', and during this Chairmanship, he presided over the fourth International Lily Conference in London and Edinburgh in 1969 (*The Times*, 1973). He was involved in the writing of *The Wisley Handbook*, *Lilies* in 1972.

Born in 1898, Wyatt spent many years at Maidwell Hall where he was respected by his pupils as a fine headmaster. He was also respected as an amateur horticulturist and esteemed for his experimentation in lily breeding and hybridising, during the mid-twentieth century, by the Horticultural community.

Continuing his work into retirement at the Old Manor, Naughton, Suffolk, Wyatt died suddenly in 1973.

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Do you have lilies that won't set seed?

In the following article ***Kate Kearns*** *discusses "Lilies that won't set seed", a problem that perhaps all lily growers have encountered.*

Some lilies don't readily set seed, such as *Lilium tigrinum* (now known as *Lilium lancifolium*), which normally propagates itself by forming stem bulbils. Sometimes, as in the cool damp summer of 2013–14, most lilies have a poorer seed set than usual: many of us had no seed last year from lilies that usually set seed quite well. There may be a handy way to encourage lilies in these circumstances to set seed.

In the New Zealand Lily Society *Bulletin* for March, 1983, a contributor called 'Lily Fan' wrote a short article about making reluctant lilies set seed. 'Lily Fan' reported that a publication of the Royal Horticultural Society Lily Group recommended spraying lily foliage with a weak solution of 85% phosphoric acid ('syrupy' phosphoric acid)–one teaspoon in one gallon of water (5 ml in 4.5 litres). This solution is sprayed all over the plants when flower buds are beginning to form. NZLS members who had tried the treatment reported success in setting seed on *Lilium candidum* and *Cyclamen coum* that had not previously seeded. The Society had phosphoric acid for sale at the Annual Show in 1984.

The March 1988 Bulletin reported that Vice-President Henry Harrington had found the treatment successful on *L. tigrinum*.

"Vice-President Henry Harrington used the mixture of one teaspoonful of phosphoric acid to one gallon of water sprayed on *L. tigrinum* at weekly intervals over a period of four weeks. The first application was made when the incipient flower buds could be clearly seen. Flowers on the treated plant were pollinated with yellow Asiatic and pink auratum pollen, and a few seeds of each of these crosses were planted on 14 April. A check with Henry Harrington indicated that there was some germination in June.

One observation by Henry was that the treated plant did not produce leaf-axil bulbils. Hopefully we will be updated on the progress of this interesting project."

The NZLS December *Bulletin* reported that some of the seeds from Henry Harrington's *L. tigrinum* had germinated and were doing well. It was especially intriguing that the treatment had been effective enough to alter the normal bulbil-forming behaviour of *L. tigrinum*.

Presumably the effect is due to the action of phosphorus. A Kansas State University web page gives this summary: "Phosphorus influences flowering and fruiting habits of plants; hastens maturity; increases grain production; encourages

Lilium lancifolium

root development; increases disease resistance; improves resistance to drought and cold temperature; encourages early spring growth; improves seedling vigor, strengthens stalk and straw; improves crop quality, increases yield; and balances other plant nutrients."

Phosphoric acid has many uses, but the commonest is in the production of phosphates for fertiliser. But the form in which phosphorus is given makes quite a difference to the plants. Compared to phosphates in the soil, phosphorus is more readily absorbed in soluble form as in phosphoric acid, especially as a foliar feed. (Phosphoric acid, a fertiliser, is not the same as phosphorous acid, which is not a fertiliser but is used as a fungicide.) Phosphoric acid is a component of a spray used on commercial crops to promote fruiting and seed set.

Having decided to try this treatment on a lily which has never set seed, I managed to buy a small quantity of 85% phosphoric acid from an agricultural supplier. When the season came I sprayed the lily according to the instructions but had no luck with seed set. I suspect my pollination technique was at fault, and I shall try again next season. Fellow Society member Des Paulson also tried the spray and decided it was effective, having had a better seed set than usual.

Footnote

This article first appeared in the NZLS *Bulletin*, December 2014, and is reprinted here by kind permission of the Society.

The search for epiphytic *Lilium* species in Vietnam and Myanmar

***Peter J. Zale**, PhD, Breeder and Curator of Plants at Longwood Gardens, Kennett Square, PA, USA.* *In this article the author describes his momentous discovery of both* Lilium arboricola *and* Lilium eupetes *in their challenging natural habitats..*

Two species of epiphytic *Lilium* have been described from Indochina and rank among the rarest lilies in the world; few westerners have seen them, and even fewer have grown them. The first, *Lilium arboricola*, was discovered by Frank Kingdon-Ward and his associates in 1953 at "Hkinlum, North Triangle, Upper Burma (present day Myanmar)", although it was also found in other areas near Hkinlum, and all were east of the Irrawaddy River near the border with Yunnan Province, China. Kingdon-Ward observed flowering plants in the wild and described the flower color as "delicious Nile green in startling contrast to the orange-vermillion anthers" and the shape of the flowers as "enchanting Martagon type", in reference to the reflexed tepals. It was formally described by W. T. Stearn when the plant flowered at RBG Edinburgh in 1954. Despite the excitement it created, it proved

Opposite, A view into the mountains from the habitat of Lilium arboricola.

Right, *Lilium arboricola*, the rare epiphytic lily discovered by Frank Kingdon-Ward in 1953.

difficult to cultivate and the plant died after flowering and was lost to cultivation. Since that time it has not been seen in the wild, recollected, or reintroduced to cultivation. Efforts to relocate it were hampered by the inaccessibility of Myanmar from 1962–2010 due to political control by a military junta that restricted visitation from the outside world, let alone it's habitat in the remote and inaccessible, ruggedly mountainous northern part of the country that is of slow and difficult navigation. These factors contributed to the nearly mythical presence of this species in the minds of lily enthusiasts. In 2009, an epiphytic *Lilium* was found by B. Wynn-Jones in Lao Cai Province in northern Vietnam and was thought to be a rediscovery of the long lost *L. arboricola*, some 500 miles from the type locality. When it flowered for the first time, it was immediately obvious as a new species due to the striking difference in flower color and the subcampanulate flower shape, and a less obvious difference in the shape of the bulb scales. It was named *Lilium eupetes*, which means "flying well", in reference to the presence of stem bulbils that remain attached to the senescing leaf to facilitate aerial dispersal. The flowers are a subdued "maroon- purple" (liver colored!) color, and were featured as the back cover of the 2013 edition of *Lilies and Related Plants*. Various collection parties working in northern Vietnam have reported finding the species, but the seeds were not ripe during those times (October–November), and it maintains a tenuous hold in cultivation due to limited introduction of bulbs and bulbils. The provocative and rarefied air surrounding these species led me to plan two trips in 2013 and 2014 to search for these elusive lilies.

In December 2013, I traveled to Lao Cai Province in Northern Vietnam to search for *Lilium eupetes*. The type location for the species is on the lower slopes of Fansipan, Vietnam's highest mountain, but the species was also previously located on the ascent to a north-south ridge near the village of Y Ty in extreme northern Lao Cai Province near the border with Yunnan Province. Since previous plant

Lilium eupetes, a new epiphytic species from Vietnam, which was discovered by B. Wynn-Jones in 2009.

hunters noted that seed was not mature in October–November, I purposely scheduled the visit in December with the hope that seed would be mature at the later date. The first leg of the expedition was five days in the Y Ty region; *Lilium eupetes*, in addition to a variety of other rare plants, had been reported in the area. Y Ty lies approximately 80 km from Sa Pa and is accessible by a single road

gouged into the side of steep, soaring mountains rising dramatically from deep, narrow valleys. Despite the relatively short distance, the journey took four hours and resulted in a broken drivetrain on our transport truck. The journey terminated at what my guide described as a "restaurant", a traditional H'mong mud-walled structure in which we prepared our own food and served as a community hub for local tribespeople. As we hiked away from the restaurant, interesting plants became immediately apparent including a new species comprising a new genus in the Hamamelidaceae, and a mixture of familiar temperate and tropical genera. The first phase of the trek was a gradual ascent and we eventually entered mature broadleaf forest consisting of widely spaced large trees covered in a rich tapestry of mosses and epiphytes. The elevation teetered around 1,800 m. When searching for plants, I would typically be staring at the ground searching for prized lilies or other herbaceous plants, but in this instance my eyes glared towards the sky, fixated on the tree canopies, and hoping to discern the familiar form of the lily amongst the tangle of orchids, gesneriads, and bryophytes. As we slowly meandered the trail, we chanced upon a particularly large oak missing most of its canopy. This provided extra light that resulted in a particular proliferation of epiphytes beyond their normal exuberance. As I stood and stared in awe, I recognized a familiar form and quickly realized I was standing beneath a veritable mother lode of *Lilium eupetes*! Because the plants were growing at 5–8 m high on the trunk, it was difficult to count the exact number of plants, but there were 20 or more and many of them bearing numerous dried brown capsules filled with mature seed. Quite surprisingly, the largest plant had seven capsules, ranking it as the most floriferous individual found. The majority of plants had a single capsule. At this point, the trip could have been called a success, but it was only day two, and still much to see! As we hiked further into the forest and neared the ascent to the ridge summit, I was able to find a few other individuals of *L. eupetes* growing on fallen trees, but nothing like the first population found. The next day we summited the ridge and found *Lilium primulinum* growing in dense grasses and *Rhododendron* thickets. The plants were very large, over 2 m tall, each with multiple capsules with mature seed. After Y Ty, we visited areas around Sa Pa and found *Lilium poilanei* (syn. *Lilium primulinum* var. *poilanei*) growing on the Dragon's Jaw, a unique and spectacular limestone formation at the edge of city. The remainder of the trip was spent climbing Fansipan, and another population of *L. primulinum* growing along the road at the Tram Tron Pass on the way to Fansipan. On the lower slopes of the mountain we again encountered *L. eupetes* growing very high up on the trunk of a single tree. This population was the first discovery of the species and used as the type location for Shaw's description of the species. All told, I spent two weeks in northern Vietnam and found five lily populations comprising three taxa. Most importantly, I was able to

The habitat of *Lilium arboricola* on the ascent to Phongun Razi, a 3,665 m peak on the border with Arunachal Pradesh, India.

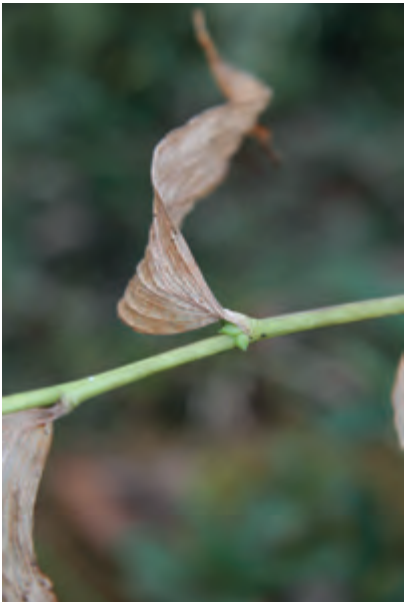
A single plant of *Lilium arboricola* on the ascent to Phongun Razi at 2,300 m in elevation. Photograph Nick Macer.

relocate *L. eupetes* in several regions and make a substantial seed collection that was distributed to growers around the world.

After the thrill of traveling to Vietnam and finding *Lilium eupetes*, I was inspired to search for *Lilium arboricola*, a decidedly more difficult proposition. It just so happened that a group of British plant hunters were traveling to Myanmar in fall of 2014, and I was invited to join them. Based on my success finding Vietnamese lilies, I was urged to apply for a North American Lily Society Research grant, and submitted a successful application that allowed me to travel to Myanmar in November 2014.

In early November 2014, I met the British contingent of plant explorers in Bangkok. From there, we traveled to Mandalay, Myanmar for a short respite and then on to the remote northern village of Putao. We traveled via motorcycle north of Putao to where the road ended and prepared to hike north into the southern flank of the Himalaya range and ultimately summit Phongun (also spelled Phonekan) Razi, a 3,665 m peak on the border with Arunachal Pradesh, India. The search for *Lilium arboricola* was hampered from the beginning as this region is on the opposite side of the Irrawaddy River from where Kingdon-Ward originally found it, and not previously reported from the region. However, the flora of northern Myanmar is hardly well-known and the potential for new discoveries vast.

Because the road ends long before the foothills of the mountains, we began



Detail of the stem bulbil of *Lilium arboricola*.

our trek at relatively low elevation (1,000 m) in subtropical forest rich in Begonias, bananas, gingers, palms, and other major plant groups representative of subtropical southeast Asia, and as we hiked further gradually gained elevation, and after two days rapidly began to gain elevation as we entered the mountains. By the time we reached 2,000 m, the flora was decidedly temperate and rich in recognizable genera that have contributed to western horticulture: *Rhododendron*, *Disporum*, *Polygonatum*, *Sorbus*, *Illicium*, *Gaultheria*, *Dichroa*, *Rubus*, *Magnolia*, and *Acer*. As we climbed to around 2,300 m in elevation, we found ourselves on a steep 'razorback ridge' that fell away steeply on both sides of the trail. The forest canopy was exceptionally dense and the forest rich in epiphytes and understory herbaceous plants. I paused to take in the complexity of the flora around me, and while scanning the surrounding forest, my eyes rested on a familiar form growing gracefully from the side of a rhododendron trunk. It was a lily, an epiphytic lily! When the immensity of the discovery finally sank in, it caused me to bellow with joy at the potential rediscovery of *Lilium arboricola*, and from a completely new location from the type locality. My inability to contain my excitement must have startled my British compatriots, who came rushing down the trail to make sure I was all right. Once I regained my composure, I began scanning for more lilies, but only one was to be found, and unfortunately the seed was not yet mature. However, the lone plant was studded with bulbils that provided some hope that this lily could be brought into cultivation, flowered, and a properly identified. The trek continued deeper into the mountains we continued to chance upon several unique plant species, including *Acer wardii* and *Sorbus harrowiana* and many others. As we neared the summit, the weather was decidedly colder, and most of the herbaceous plants were straw-colored and dormant, but again, in a clearing among the bamboos and roses at around 3,200 m, a familiar form showed itself, and a second lily was discovered amongst the tangle. Again, only single plant was found, but fortunately this one had a mature seed capsule still full of seed. The

identity of this lily is something of a mystery. Originally, it was thought to be *Lilium mackliniae*, but we were significantly north of the range of that species and the elevation too high. Further discussion after returning to the U.S. revealed that it may be a new species in the *Lilium souliei/saccatum* complex that was also found in various areas of Arunachal Pradesh. After summiting, we gradually made our way back to Putao. All told, only two lilies were found on the expedition, but both have the potential to refine and contribute to our understanding of the genus.

Detail of the unidentified *Lilium*, possibly in the *souliei-saccatum* complex, near the summit of Phongun Razi.

Cultivation of Epiphytic Lilies

The epiphytic lilies have not proven easy to maintain in cultivation. *Lilium eupetes* has been successfully flowered at Crug Farm nursery in northern Wales, but that is the only report of the species flowering in cultivation. My own efforts with seed of *L. eupetes* collected near Y Ty indicated that fresh seed exhibited immediate epigeal germination and grow rapidly at first, but then rapidly damp-off and die. Stem bulbils seem more resilient, but many ultimately succumbed in similar fashion. My original plants were watered with the standard chlorinated, fluorinated, calcium-rich tap-water found in the Midwestern U.S. However, using other epiphytes from this region as an example, such as *Pleione*, it seems likely that these epiphytic lilies may be sensitive to water quality and require "pure" water with low dissolved minerals and electrical conductivity and absence of chlorine and fluorine. A new batch of seedlings are being raised with this in mind and the initial results are promising. In the end, these lilies will always be in the realm of skilled specialty growers, but stand as aristocrats of conservation in a genus of prominent, charismatic plants.

Lilium arboricola

The following reports, from the Lily Group DVD, by ***P. W. H. Conn*** *and* ***F. E. W. Hanger****, VMH, provide an historical insight into the discovery, in 1953, and cultivation of* Lilium arboricola*, which may be read as a companion piece with Peter Zale's article about this epiphytic lily and the other epiphytic lily,* Lilium eupetes*, which was dicovered in 2009.*

P. W. H. Conn (Superintendent, Liverpool Parks and Gardens Dept.)
Four small bulbs, with a packet of seeds, were received by the Liverpool Parks Department on the 27th January 1954.

The bulbs were placed in a small pan with a mixture of silver sand, peat and fine sphagnum moss and left in an intermediate temperature until they commenced to show signs of rooting.

The seeds were sown in a mixture of peat, sand and loam, and started to germinate very well, but a mishap occurred when the regular gardener was on holiday. An assistant knocked the pan over and, not realizing their importance, was not careful enough in sorting out the seedlings with the consequence that they were lost.

No.1 Bulb was potted on the 29th March 1954, in a tree fern, in a mixture of decaying fibre, leaves and dry cow manure. This bulb was approximately ½ in. in diameter, and the shoot attained the height of 24 in., but died down without flowering. This plant was wintered in an intermediate temperature, but rotted off.

No. 2 Bulb, approximately ¾ in. in diameter, was placed in a pot on the 8th May 1954, in a mixture similar to the above. It grew to a height of approximately 24 in. and the first flower opened on the 25th August, the flower being 5 in. across from petal point to petal point.

This was wintered in a cool greenhouse and it came through the winter satisfactorily. It was re-potted in the early part of this year, and owing to the increased size the bulb had made during 1954, it came away very strongly and there were great hopes of much better flowers, but suddenly at the end of April it began to wilt and it was found that the bulb had completely rotted. As the roots were showing well at the bottom of the stem, some more soil was put round, and although the plant was checked in growth, it is still alive but rather weak and shows signs of flowering.

No. 3 Bulb, approximately ¾ in. in diameter, was potted on 26th April 1954, in a mixture similar to No. 1 above, and was placed in an orchid basket and hung in the roof. The stem reached a height of 21 in. and flowered on the 1st September, the flower being about 4 in. across. This ultimately died down.

It was wintered in a cool greenhouse, and as I had come to the conclusion that

they grew better in pots than hung in the roof, this bulb was re-potted in the early part of this year and continued to grow away strongly. Eventually it was noticed that the growth was wilting, and it was found that the bulb had rotted at the base. As there were no roots showing, it was cut off and placed in a propagating frame, but here again the stem showed signs of rot, and it was then reduced another 2 in. to a joint, and dipped in Seradix "B" and placed in a cold propagating frame. At the time of writing (mid-July), four weeks after this was done, the growth has stiffened up and the plant looks very healthy. It is hoped that there will be some roots or a bulb forming at the base.

No. 4 Bulb was potted on 8th May 1954. It was very small, and grew to approximately 1 ft. in height. It did not flower last season, but was wintered successfully in the cool. This year it was re-potted, and it has grown away strongly, but at the moment it does not show any sign of flowering.

From the foregoing experience it would appear that, as with so many fresh plants introduced from warmer climates, horticulturists (like nurses) tend to "coddle" their patients too much, and it would seem that these lilies might grow much better under cooler conditions.

I wished to carry out one or two experiments with electricity to see what reactions the plant would make to increased intensity of light and warmth, if necessary to resemble that of its habitat, and I ascertained the following particulars from Mr. KINGDON-WARD which might be of benefit.

It is grown in a latitude of approximately 27° which, of course, should be considerably brighter for light than this country. However, the lily was chiefly found in shade, but it appeared that Mr. KINGDON-WARD grew this in full sunshine in Burma, and it flourished but did not flower whilst he was abroad.

Humidity is very high from June to October, and he said it probably averages over 80 per cent and at times possibly over 90 per cent, but it is decidedly cooler during the few winter months, and occasionally frost does occur. The length of daylight is—summer maximum 14–15 hours, spring and autumn 12 hours, and in the winter 10 hours.

A point noticed was that when the bulbs were originally received they consisted of scales similar to those of a typical *Lilium*, and after growth and during the winter, they resembled hard subjects, more like green onions. Possibly this is the reason why they have rotted away, as I am of the opinion that as our bulbs were only partially buried, they received too much daylight, as I understand from Mr. KINGDON-WARD that they were found just underneath the soil. Another cause of our trouble might have been the use of too much peat which was possibly too sour or acid. Bulbils were obtained from all the plants grown last year, and now in early July most of them are starting away fairly well and, in many cases, they have a pair of nice leaves and are ranging from ¾ in. to 2 in. in height.

F. E. W. Hanger, VMH (Curator, R.H.S. Gardens, Wisley)

Nothing to the true plantsman is more exciting and fascinating than to receive a collection of plants and seeds direct from an experienced plant collector who has recently searched unexplored new regions risking danger and ill-health to obtain them. How grateful we should be to those who find pleasure in risking all, so that we at home may enjoy a much wider range of plant life in our gardens. No trouble should be considered too great to perpetuate the fruits of their labour for posterity.

Imagine the excitement in January 1954 at Wisley when unpacking a consignment of bulbs and seeds from Northern Burma, sent home by that world famous explorer Captain KINGDON-WARD, to find bulbs of a new lily labelled "Tree Lily, an epiphyte". To discover a new *Lilium* species during recent years is a most rare and noteworthy feat, but to procure for cultivation an epiphytic one is unique in the history of botany. It was not surprising that a remark such as "What? Lilies growing up trees; Some-one has been dreaming" should be expressed by one of the students helping with the unpacking. Naturally it was quite understandable that a little doubt should be expressed as to whether this new plant was a true tree-lover. Often in this country plants which are not strictly epiphytes can be found growing in the lichen and accumulated debris on old half-decayed trees. KINGDON-WARD has written, "It is feared that this beautiful Burmese lily will not be hardy in Britain, and may prove difficult to grow until its requirements are well understood". It is regretted that the following report on the behaviour of this plant at Wisley bears out this statement.

The Wisley Gardens received 7 bulbs, one approximately 1½ in. in diameter and the remaining 6 about an inch or a little less.

The largest bulb was treated as a tree epiphyte and planted on a small log using a compost of 1 part osmunda fibre, 2 parts flaky leaf, and 1 part sphagnum moss thoroughly mixed together and then hung from the roof of the shady stove house, with a night temperature of 60-65° F. rising on hot sunny days to 80° F. or more. This particular plant grew away beautifully and by Chelsea Show time of 1954 had made a growth 20 in. in length. Wisley staged an exhibit at the show of outstanding plants introduced into this country during the previous forty years and this particular lily was included growing on the log hanging from a tree of *Acer griseum*. There it remained for almost a week subjected to all the buffeting which is given to plants during showtime. However, the same plant was returned to Wisley and later, again had a trip to London to be the subject of a lecture given by the discoverer, KINGDON-WARD. Not withstanding all these vicissitudes the plant continued to grow, producing two flowers, pale green in colour with orange anthers. The flowers, being similar in shape to the martagon type lilies, were approximately 5 in. in diameter when the flower was pressed flat. The remaining six bulbs were planted, three each into two pans, using the same compost as was

used for the larger bulbs. These were grown on in the intermediate orchid house with a night temperature of 50°–55° F. rising considerably during sunny days. All six bulbs threw one or two blooms each on slender 18 in. stalks. No noticeable difference in the appearance of the plants grown in the varied temperature could be observed, only the plant in the warmer house flowered much earher on 17th July 1954.

One pan of three bulbs was badly disturbed when in flower as a plant complete with bulbs and roots was needed to provide necessary material for a description for the *Botanical Magazine*. All the plants received the necessary attention and conditions to keep them growing after blooming, until such time as they showed signs of dying back, when watering was reduced, but not entirely withheld during the whole of the winter. KINGDON-WARD had stated that the compost was always wet (both summer and winter) in the positions where *Lilium arboricola* was first discovered.

It was considered wise to follow such worthwhile advice and after much consideration to winter the dormant bulbs in a temperature of 45°–50° F. Towards the end of April 1955 new roots began to protrude through the compost from the plant growing on the log and a top dressing of the original compost was applied. It is most disappointing to state that the bulb has since rotted away. No growth was forthcoming from the bulbs still in the two pans and on examination it was discovered that these also had become rotten from the base upwards.

This is a sad report to make concerning the precious new plant, yet at Wisley it is hoped to perpetuate it, with bulbils obtained from the plants grown last year, and also by the seed sent home with the bulbs under KINGDON-WARD No. 21212, which has germinated well.

★ ★ ★

Richard Dadd 1933–2015

an appreciation by ***Harris Howland*** *and* ***Nuala Sterling***

The Lily Group, and particularly those of us who served on committee with Richard Dadd, were extremely saddened to hear of his passing. Richard served on the Lily Group committee for many years along with his wife Ann, who was the Lily Group's secretary.

Richard was born in London and was a computer expert working with the National Westminster Bank on their first computer in the 1950s before transferring to Ferranti (later ICL). He was always keen on growing plants, Dahlias, Fritillaries Alliums and Lilies. He was closely involved with Rear Admiral Furse, who was

an authority on lilies and fritillaries. Unfortunately, Richard could not maintain the fritillaries, in his heavy garden soil. His house was near Reading, where he and his wife Ann lived and brought up their family. Lilies were mainly grown in pots and the Alliums took pride of place in the garden.

Allium rosenbachianum

Richard was a leading authority on the genus *Allium* and in 1982 his knowledge of the subject was evident in the Lily Group's annual publication. Unusually, this publication was entitled *The RHS Lily Group Bulletin, 1982*. Previous publications, and those since 1982, were known as the The Lily Yearbook, or *Lilies and Related Plants*. Richard's article 'The genus *Allium* in British gardens'[1] in the 1982 Bulletin, gives advice on growing and is also an assessment of the plants then in cultivation in British Gardens with the index running from page 22 to 31! No photographs were included, but Richard would have approved of Christine Skelmersdale's photograph of *Allium rosenbachianum.*

Richard's article was to form part of a book, on Alliums, that he was preparing for publication. Ann has indicated that his book remains in draft form in his computer—a challenge to a Lily Group volunteer perhaps? Another insight into his horticultural involvement is evident in his appreciation of Professor W. T. Stearn.

During his time, on committee, Richard was a good friend and supporter of the then Lily Group Chairman Dee Martyn Simmons. He took a major role in helping with numerous garden visits, which the Group arranged, and was also active in assisting with the lily displays in the Royal Horticultural Shows at the Westminster Halls. This involvement was particularly notable with regard to the shows that featured displays of Alliums in 1980 and 1986. The 1988/9 Yearbook features an article by Richard on that year's Allium display. From this article, one can get the measure of Richard's extensive knowledge of the genus *Allium*. Richard served on the Lily Group Committee until the mid-1990s, those of us who served with him on committee will remember him with fondness and admiration.

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[1] Dadd, R. (1982). 'The genus *Allium* in British Gardens.' *RHS Lily Group Bulletin 1982* pp. 21–31.

Coals to Newcastle: talking about Japanese lilies to a Japanese audience

Although there was a certain irony, in talking to Japanese lily growers about their native species, everyone, including ***Alisdair Aird****, enjoyed the shared experience.*

In 2014 I was invited to Tokyo by RHS Japan (an independent society at that time affiliated to the RHS but since dissolved) to give a talk on the lilies of Japan. Hiroko Saito of the Executive Board and her staff, particularly the Secretary General Takashi Higurashi, treated me extremely kindly, welcoming me on my arrival at the hotel where they put me up, and taking me out to a delicious informal sushi and sashimi banquet in a tiny family-run restaurant. Surprisingly for its central Tokyo location, the hotel, the New Otani, is well worth knowing for its large and beautifully landscaped garden with winding shady paths, massive waterfalls, ponds glittering with several hundred large koi carp, immaculate stretches of traditional raked gravel around handsome boulders, and even a little woodland including a historic *Podocarpus macrophyllus* and *Torreya nucifera* there since at least the early nineteenth century.

Takashi Higurashi, with Masaya Tatebayashi who was to translate the talk, also showed me around the beautiful nine-hectare (22-acre) Rikugi-en Garden. This is a seventeenth-century lakeside strolling garden, restored in the late nineteenth century, and illustrating the six principles of poetry—a very peaceful and

The seventeenth century Rikugi-en Garden in Tokyo.

The audience in the hall of the Myonichikan Jiyu Gakuen (a 1920's girls' school).

contemplative place, just right for soothing my pre-talk nerves. It was also the only place I saw any lilies growing, probably *Lilium speciosum*, but the flowers were already over; I was told that an unusually hot August had ended the lily season two or three weeks earlier than usual.

The talk took place in the hall of Myonichikan Jiyu Gakuen, a 1920's girls' school designed by Frank Lloyd Wright, now specially protected and beautifully restored and maintained as an Important Cultural Property. The hall still has its unusual original hexagonal-backed chairs also designed by Wright; I felt very privileged to be giving a talk in such a handsome and historic building. The most special treat for me though was to find that the capacity audience was to include Katsuro Arakawa, the legendary lily grower whose generous donations to the Lily Group seed distribution have been so important to the distribution's success over the years, and who had been awarded the Lyttel Cup in 1998. Before the meeting I had a good

Lilium auratum rubrovittatum

Lilium japonicum angustifolium

long talk with Mr. Arakawa and his wife, in which he brought me up to date with his recent activities, including growing lilies for distribution to members of the Japan Lily Society which he has founded. He also showed me spectacular pictures of the unusually deep winter snow which had blanketed his propagation grounds.

The hall was filled to capacity for the talk itself. I had about 80 slides to show, and Masaya Tatebayashi had worked out with me a system where for each slide I would say my piece, then he would translate. I couldn't have had a better translator, as he had studied both at Kew and at Cambridge Botanic Garden, and our double-act worked very smoothly as a result. What's more, I discovered that Mr. Arakawa had labelled each of my lily slides with the Japanese names, which made things much easier for the audience.

I started by showing how I grow lilies mainly in raised beds in southern England, and then outlining the sequence in which Japanese lily species had reached the West, illustrating this with both early botanical drawings and real-life photographs. Though it's traditionally thought that the first to be grown in England, in the early 18th century, was *Lilium dauricum* (or as the rules of botanical nomenclature would perversely have it *L. pensylvanicum*), it now seems more likely that this was a case of mistaken identity, and that the actual plants were probably forms of *L. maculatum*, or perhaps the natural hybrid later identified as *L.* × *elegans*.

Then came the great late eighteenth- and early nineteenth-century flood of species either endemic to Japan or including it in their range: *Lilium japonicum*,

Above, *Lilium alexandrae*

Left, *Lilium leichtlinii*

L. concolor, L. lancifolium, *L. longiflorum* and *L. callosum*, followed later in the nineteenth century by *L. auratum*, *L. leichtlinii*, *L. medeoloides* and *L. rubellum*, and around the turn of that century and into the twentieth by *L. nobilissimum* and *L. alexandrae*, those two species still so misunderstood by many Western botanists and taxonomists.

The final part of my talk was a brief outline of the parts played by the various Japanese lilies in the development of Asiatic then Oriental hybrids, and later of the more complex often sterile or nearly sterile intersectional hybrids such as the longiflorum/Asiatics (LAs) and Oriental/Trumpets (Orienpets or OTs).

I had to point out the irony that while in the first half of the twentieth century Japan exported many millions of lily bulbs to Europe, it's now the other way round. One single Dutch nursery now produces five million bulbs a year of the *longiflorum* cultivar 'White Heaven', and in total Holland exports about 120 million lily bulbs to Japan.

After the talk everyone adjourned to a "Convivial Gathering", with a magnificent spread of Japanese delicacies and a constant flow of the Japanese equivalent of pink champagne—convivial was certainly the right word. I met many lily enthusiasts among the audience, and particularly remember two. Tomokatsu Udagawa has written a book about ukiyo-e (the classic woodblock prints) which feature potted plants, among them many lilies, and very kindly presented me with a copy. Toshio Tsukada came from the Yokohama Nursery Co., and brought to show me copies of the company's sumptuously produced and illustrated chromolithograph lily catalogues of 1899 and of 1930, when the company exported all over the world—fascinating to leaf through.

Frits in the Open Garden

by ***Martyn Rix***

This is a précis of a talk on *Fritillaria* for the open garden and a survey of the northern European species given at the Fritillaria Group's 2015 Spring Meeting on 22 March 2015. The species which are known to grow well in the open, or might be expected to thrive in areas with summer rain, are described here geographically, starting in Siberia, and moving through China and the Himalayas to the Alps and Pyrenees.

Siberia There are three very interesting species found in Siberia: *Fritillaria dagana*, a dwarf alpine plant, grows in meadows in the mountains along the shores of Lake Baikal. Further east is *F. maximowiczii*, which also grows well in Janis Ruksans' nursery in Latvia. The third member of this particular group is *F. sonnikoviae,* a newly described species from Krasnoyarsk, in Siberia, NW of Lake Baikal; it is similar to *F. maximowiczii*, but has greenish flowers. DNA evidence suggests that these are the most primitive species, the link between the American fritillaries and those in the rest of Asia; it was one of this group that crossed into western North America, and diversified in the Mediterranean climate of California.

Fritillaries grow all across Asia, with a concentration of species on the borders between Kazakhstan and Xinjiang, China. *F. meleagroides* is one that should grow easily in English gardens, but I have never seen it grown in such conditions. The flower smells of dung and attracts blowflies, so it might be better outside! From the same areas, that is from the borders of China to Russia and Ukraine, *F. ruthenica* is often found in association with *Paeonia anomala,* also growing in damp, grassy places.

Fritillaria pallidiflora, one of the best species for growing in the open garden, also hails from the Sino-Russian borders, where it grows in damp, alpine meadows. Paul Furse grew it very successfully in Kent, in raised beds under apple trees. It also performed well, producing big, tall specimens over a foot tall—in E. B. Anderson's garden at Lower Slaughter in the Cotswolds on the other side of the country, growing in a moist bed at the foot of a wall. *F. walujewii* comes from the same area, and has large flowers which are pale greyish-pink on the outside and tessellated with deep crimson within; it would be a striking addition to the garden, and is one species frequently available from specialist bulb dealers. It can have up to three flowers.

China and the Himalayas *Fritillaria pallidiflora* and several other species are grown in China for medicine; they are called Bei Mu, and recommended for

Fritillaria thunbergii at RHS Rosemoor in Devon, under a shrub.

chest infections and coughs. In 1989 James Compton and I visited the Duans' fritillary farm in Xinjiang, where *F. pallidiflora, F. yuminensis* and *F. albidiflora*, *F. tortifolia* and *F. meleagroides* were being grown grown in quantity, to supply seed to other growers who cultivate them commercially for pharmaceutical use. Duan and his wife named *F. yuminensis, F. albidiflora* and *F. tortifolia,* which they had discovered in the hills around their farm. Despite living quite simply in an adobe house, Duan has a copy of Stearn's *Botanical Latin* on the shelf.

Since 1989 I have grown these western Chinese species in a bulb frame, where they have flowered well, despite setbacks from the children's pet rabbits and a falling gutter. The key to their management can, of course, be guessed from the conditions prevailing in their natural habitat. *F. yuminensis*, for example, grows in very dry peaty soil, under deciduous shrubs, and gets little rain except in spring when there's snow melt and in August, when they may get summer showers. The bulbs should be kept on the dry side with drenches in spring and then again in late summer when the roots begin to grow.

Fritillaria thunbergii, which has been collected in the wild on the Kazakhstan/Xinjiang border, grows very happily outside in Britain. It has been widely cultivated in eastern China and Japan, and was probably brought to eastern China along the Silk Road. Although it thrives in some gardens, I have never managed to grow it successfully. There was a fine clump growing under a bush in Rosemoor in Devon, and the secret to growing them outdoors is to keep them on the dry side, but also quite cool, after flowering.

It's hard to find any wild frits in China because they've all been dug up for medicine. It's common to see people by the roadside selling dried bulbs of *F. cirrhosa*, for example. Frank Kingdon-Ward saw Chinese collectors who had come over the mountains into northern Burma to collect bulbs there, and there are areas near Kanding which have been designated reserves for *Fritillaria* in the wild. *F. roylei* from Kashmir is closely allied to some of the Chinese species. It grew outside in the Knox-Findlay garden, and at one time could be found quite happily established on the limestone rock garden at Cambridge Botanic.

Named after the priest-explorer Père David, *F. davidii* is one of the most unusual of this geographical group. Martyn saw it near Ya-an, the rainy city, so called because of the huge amount of rain all year round. The leaves appear in the autumn, and last all winter until it flowers in the spring. It needs ***lots*** of water, and even then, though easy to grow, it is difficult to flower successfully. A splendid pot with 12 flowers was shown by Bob and Rannveig Wallis, grown from bulbs originally collected by Mikinori Ogisu near Moupine (now Baoxing).

Moving on from the Himalayas to Iran, there are wonderful populations of *Fritillaria imperialis*, the Crown Imperial, growing in the wild in the Zagros Mountains. There is considerable variation in this species, and some particularly beautiful forms with lovely purple staining on the back of the petals, come from Hakkari in southeastern Turkey. The Crown Imperial flowers well outdoors in Kent and eastern England, but has proved a failure in Devon; it probably needs more heat to flower in the open garden. Also found in Iran is the pale yellow *Fritillaria raddeana* which Paul Furse grew it happily outside in Kent. In Devon, it flowers well in the greenhouse, growing in partial shade. *F. eduardii* hails from Tadzhikistan in central Asia. It's a paler, smaller version of the Crown Imperial, and without the smell. DNA sequences show that *F. sewerzowii* is closely related to *F. imperialis,* in spite of being put in a separate genus, *Korolkowia*. It grows in rocky places in the mountains of central Asia from Tashkent to Ferghana, and is quite variable in colour, from chocolate and chestnut brown to plain green. Being a robust plant it should survive outdoors, though its early flowering may make it liable to rain and frost damage. *F. olivieri* is another Iranian species which should grow outside in Britain, as it has been found growing in wet clay close to streams, and so should be okay if kept wet in the spring and dry in the summer. *F. uva-vulpis* has a similar habitat as well as growing as a weed in corn fields.

The Caucasus mountains and the Pontic mountains along the Black Sea have a climate very similar to Britain, and are the home of many familiar and easy garden plants such as *Rhododendron luteum*, *Helleborus orientalis*, *Lilium monadelphum* and *Campanula lactiflora*, so it is not surprising that some of the fritillaries from there are easy to grow. *Fritillaria orientalis* is one worth trying outside; in the wild it normally grows on rocky outcrops in beech woods, and

in deep gorges, so the inflorescence sticks out at an angle, with the dark flowers hanging over the abyss. This unusual habit is retained in cultivation. Also found in the Caucasus, the delicate yellow-flowered *F. collina* favours the less challenging habitats of meadows and birch woods, and *F. latifolia* grows with snowdrops, cowslips and docks in alpine meadows; there are old photographs of long beds of it growing at the John Innes Institute in East Anglia. The green-flowered *F. pontica* thrives in many gardens; it is one of the widely-distributed species, found from the southern shore of the Black Sea to northern Greece; there is an interesting subspecies on the island of Lesbos. In the wild it grows in both oak scrub and on the edges of beechwoods.

Most of the Mediterranean species of *Fritillaria* don't grow happily outside in Britain, but there are a few worth trying, especially if the garden is well-drained and on chalk or limestone. *F. acmopetala* is one that will succeed outside and is one of the most beautiful of all species, and if it were rare, people would be very excited by it. Though it usually grows on limestone in the wild, it thrived even on the peat beds in Chris Brickell's garden at Wisley. The dwarf species such as the yellow *F. carica* and even the pink *F. alburyana* succeed outside in some gardens, but few of us have enough bulbs to risk outside. *F. messanensis* can be seen growing on Thessalian Mount Olympus in enormous quantities, since it became a national park and grazing was stopped. Its subspecies, *F. gracilis,* has browner flowers than *F. messanensis* itself, and is one of the easiest to grow outdoors; Valerie Finnis grew it in grass under apple trees at Boughton, and Beth Chatto had a row in her nursery; it was here that it hybridized with the black-flowered *F. tuntasia*.

Alps and Pyrenees Several species of *Fritillaria* are found in meadows in the Alps and Pyrenees as well as in Spain and Portugal. The easiest of all is the black-flowered *F. pyrenaica*, which can sometimes be found under the name *F. nervosa*. It grows in Devon on a steep grassy bank, cleared and kept short after the end of July, but it was equally happy under beech trees with hellebores. It regularly sets seed, and the young bulbs are grown on for two or three years before being planted out. The selected form 'Bernard Tickner', with yellow instead of black flowers, is still around and well worth growing.

There are three species in the Alps which are similar in flower to *F. meleagris*: *F. burnatii,* which grows both France and Italy, has shorter stems and broader leaves. Unlike our snakeshead lily, it only produces dark flowers, no pale or white ones. *F. tubiformis* is closely allied to it, but has a larger flower, greyish outside and *F. moggridggei* is similar but has yellow flowers. These three have the typical, broad-bell-shaped flowers, and are usually pollinated by large bumblebees. A study of the nectar of fritillaries has demonstrated that those with these *F. meleagris*-type flowers are particularly rich in both sucrose and fructose in order to meet the high-

Fritillaria pontica grown by Ronald Mackenzie in Oxfordshire with paeonies and *Lathyrus vernus*.

energy requirements of the queen bumblebee as she emerges from hibernation.

The Alpes Maritimes in both France and Italy is the habitat of another species, *F. involucrata.* It grows happily in many gardens, and is not as coarse as it can be when cosseted in a pot. The flower colour varies between plain green with few tessellations in France around Grasse and Frejus to heavily tessellated and almost all purplish-brown in the gorges above Menton and on Monte Carno di Luano near Savona. Here it grows in rough grass on the edges of beechwoods.

Once stocks of precious bulbs permit, there many other species are worth trying in the open garden. In the British climate the early-flowering ones can be damaged by a sudden return to winter weather, but most will tolerate our climate well. However all are particularly susceptible to being eaten by slugs, snails or mice, and I think that these are their main enemies in the open. In the wild fritillaries are commonly attacked by lily beetle, but this is not normally on the wing early enough to damage them here. Most of the larger species will thrive when growing among the roots of deciduous trees or shrubs, and will have done most of their growing before the trees come into leaf.

Footnote

This article was first published in Journal 37 of the Fritillaria Group of the Alpine Garden Society and is reprinted here by kind permission of the Society.

RHS Lily Group visit to Scotland

*The following report, by **Nuala Sterling**, describes the gardens visited and plants enjoyed by members of the RHS Lily Group in July 2015.*

Scotland is a beautiful country with many enchanting gardens and a staggering horticultural history, relating to the great plant hunters of the nineteenth and twentieth centuries, so it is always an interesting place for people who love plants to visit.

Our weekend visit to Perth, 21 of us visiting five gardens of different significance with enthusiastic Scottish members of the Lily Group in July 2015, fulfilled all expectations. Enjoying each other's company, it gave us an opportunity for exchanging experiences, about growing lilies, and to discuss how the Lily Group Committee can maintain contact with our members throughout the world.

Steve McNamara, head gardener and estate manager guided us round **Branklyn Garden** (the first garden we visited), which is owned by the National Trust for Scotland, but was created by Dorothy (VMH) and John Renton, in the 1920s, on a hillside overlooking the River Tay and the city of Perth. The small overgrown orchard they purchased was cleared and after building an Arts & Craft house, in which they were to live all their lives, they began to create a garden providing shelter and imaginative tree associations. From their experience, including successes as

Opposite

Members of the Lily Group at The Branklyn rock garden, with (*left to right*) Steve McNamara, Susan Band, Alan Mitchell, Liz Mills, Isabel Ritchie, Margaret & Vince Graham, Rev. Fr. Philip Jones.

Right

Lilium lijiangense at Branklyn.

well as mistakes, they learnt to provide ideal plant conditions for the varieties they loved. Their clear interest in specific seed from Sino-Himalayan flora, collected by Ludlow and Sheriff, and enthusiasm, which later extended to rock gardens and peat-wall constructions, nurtured a garden of historic interest and beauty. Together they planned and developed this enduring garden, always making modifications, he the designer and she the gardener, all their lives. Generous with their time and expertise, sharing their plants throughout the world, they bequeathed the house and garden to the National Trust for Scotland in 1968.

Set in approximately two acres, on a steep west-facing slope in the valley above the river Tay, with acidic soil of a medium light loam, Branklyn is perfect for Rhododendrons. The development of scree beds and rock gardens also made it ideal for alpine plants and Himalayan species such as *Primula*, *Meconopsis*, *Morina*, *Magnolia* and *Lilium*. Scotland is well-known for its rainfall (although on our visit it only rained at night) and Perth receives about 800 mm per year, so it is drier than the west coast.

Then the group headed north to the **Explorers Garden, Pitlochry** PH16 5DR www.explorersgarden.com, where we were welcomed by Julia Corden, garden manager, and taken for lunch in the Festival Theatre restaurant, overlooking the Tay Valley. Thereafter, we proceeded to Julia's photographic exhibition, of a Botanical trip to Patagonia, in the David Douglas pavilion. We then walked around the six acre garden, perched high above, each section representing the flora and plant introductions from the relevant explorer, celebrating, in all, the work of 12 Scottish Plant Hunters over the last 200 years. Splendid architectural wood sculptures, rocky enclosures and pavilions enhance the gardens with views over the valley to the distant hills. In mid-July we were a little late to see many lilies, but *Primula florindae*, *P. pulverulenta*, *P. aurantiaca*, *P. sikkimensis*, *P. vialli* were on display

Hosta fortunei var. *aureomarginata*, *Hosta undulata* and *Primula* species—plants that complement lilies—photographed at the Explorers Garden in Pitlochry.

amidst digitalis and Hosta varieties, including *Hosta fortunei aureomarginata*.

Returning to Perth for tea and cake with Madeleine Tinson at **Parkhead Gardens**, we enjoyed a relaxed tour of her garden. Madeleine holds the National Collection of Mylnefield hybrids created by Chris North[1] at the Scottish Horticultural Research Institute in the 1970s, as a diversion from the production of F_1 cabbages. When the programme was terminated, 10 numbered lines were sold to the Lily Group. They had almost disappeared and Madeleine has made huge efforts to find and multiply them. We were bowled over by her enthusiasm and the magnificent collection in her greenhouse, and the well cultivated plants throughout the delightful garden. The lilies set off by the Roses, Delphiniums, Geraniums , Alchemilla, Lupins, Paeonies, shrubs and trees.

In the evening we gathered for dinner at the Royal George Hotel, overlooking the river Tay, and enjoyed discussion of the day's visits and our different experiences of growing lilies. We also reflected how agreeable it was to mix with our Northern colleagues, many previously known to us by name only. We realised that having a substantial number of members to meet each day added more interest and

[1] Waister, P. (2003). Dr. Christopher North's hybridizing work with lilies. *Lilies and Related Plants* 2003–2004. pp. 33–37.

Above, Madeleine Tinson in the greenhouse with her collection of North Lilies.
Below, *Lilium taliense* var. *kaichen* in Alan Mitchell's garden.

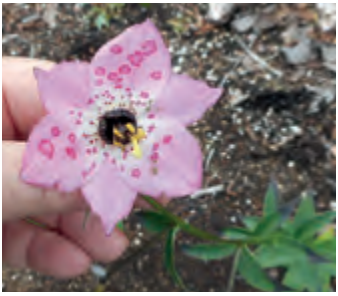
fun. We also discussed the need to consider how best to attract members to next summer's visit to Spetchley Park and Stoulton, Worcestershire. As Nataliya Cuttell comments, in the Autumn 2015 Newsletter report, we benefit from sharing knowledge and making friends in this trying world.

On Sunday we ventured to the kingdom of Fife to visit the **Star of Markinch**, private garden of Alan Mitchell (Editor of *Lilies and Related Plants*) and saw a range of beautiful *Lilium* species. Alan guided us round explaining points of interest and challenges. We admired his practical interpretation of a 'raised bed' and his seedling pots especially of *Lilium iridollae*.

A picnic lunch was enjoyed in the garden—with the background TV coverage of the Wimbledon finals for tennis enthusiasts.

Fife is not the easiest kingdom to navigate, so we were led by Susan Band, safely returning to Perth and Pitcairn Green susan@pitcairnalpines.co.uk where she had offered to show us how she runs her mail order Nursery, of Species Alpine Plants, and grows her seedlings.

Susan informed us that seedlings are pricked out into fish boxes, as soon as they are deemed viable, and then placed in polythene tunnels. Polystyrene fish boxes are, apparently, ideal for lily seedlings as they are deep enough, well insulated, easy to punch drainage holes in and provide a perfect growing environment until the plants are dispatched, in about two years. The advantages of using polystyrene fish boxes for lily seedlings led me to plan to acquire some on my French holiday!



Nomocharis hybrid at Picairn Alpines.

Susan's attractive and informative website contains photographs of a selection of lovely Lilies, Anemonies, Arisaema, Colchicum, Corydalis, Crocus, Cyclamen, Erythronium, Fritillaria, Galanthus, Iris, Narcissi, Nomocharis, Trillium and other unusual exciting bulbs, so it's difficult to resist!

Much discussion, about the different ways of growing lilies from seed, followed our tour of the Nursery, while we enjoyed tea and cookies and admired the Harley Davidson motorbike built by Adrian, Susan's partner.

We greatly appreciated the care and trouble our hosts put into such an interesting and lively weekend and the Scottish weather was also, surprisingly, welcoming.

The full compliment of the party was as follows: Alisdair Aird, Terry and Marjorie Allen, Susan Band, Nataliya Cuttell, Vincent and Margaret Graham, Rev. Fr. Philip Jones, Rosemary and James Lochhead, Steve and Anette McNamara, Liz Mills, Alan Mitchell, Isabel Ritchie, Elma and Ronald Shepherd, Graham and Nuala Sterling, Madeleine and Michael Tinson.

Tulips; full of Eastern promise

*This article, by **Richard Wilford**, covers the distribution, history and cultivation of tulips, the beauty of which is clearly reflected in the photographs that support the text.*

We are all familiar with the spring displays of tulips in parks and gardens up and down the country. Planted to put on one glorious show, they are usually discarded after flowering, to be replaced with new bulbs the following autumn. Of course, in your own garden you can replant the bulbs in a mixed border or reuse them in containers but they rarely achieve the same impact as in their first year. Lifting the bulbs for the summer can help prolong their life, and some cultivars are more amenable to general garden conditions than others, but if left in the ground most will soon fade way. Tulip species however, can survive without lifting and some may even build up a healthy colony over time, if planted in a suitable location. All the myriad colours found in garden tulips today can be seen in the wild species.

A suitable location is the key to keeping tulips species alive in cultivation. This may be just a sunny spot in free draining soil or it might involve growing them in pots kept undercover for the summer, to keep the soil dry during their dormant phase. To grow tulip species successfully you need to consider where they come from. The centre of diversity of the genus is in the hills and mountains of Central Asia, where the summer is long, hot and dry. Here they grow on exposed grassy

Tulipa whittallii at Royal Botanic Gardens, Kew.

slopes and rocky hillsides, in the Pamir Alai and Tien Shan mountain ranges, and the scrub and semi deserts of southern Kazakhstan, Uzbekistan and Turkmenistan.

From Central Asia, the tulip spread west, through Iran to the Middle East, Turkey, the Caucasus and into southern Europe. Along the way they continued to evolve new variations and adaptions to the different conditions, sometimes in a climate with more moisture in the summer. Some of the easier tulips to grow in the open garden come from the western half of the range.

Classifying tulips

Over the centuries botanists have used many characters of tulips to attempt to classify them and organise the species into groups to make sense of the genus. There are around 80 species but many more names have been described. The many variations found within even a single species makes classification difficult and characters such as flower colour, size and shape are unreliable. Some species come in numerous colour forms and others occur over a wide range, covering several countries, resulting in different names being applied to the same plant depending on where it was found.

It is not unusual in tulips to find plants with more than the normal number of chromosome in the cell nucleus. Chromosomes carry the plant's genetic information, mostly in the form of DNA. The normal (diploid) number of chromosomes in a tulip is 24 but in some cases this number is 36, 48 or even 60. This is called polyploidy and the resulting plants are usually larger and more vigorous but they tend to have reduced fertility, relying on vegetative reproduction in the form of stolons that grow out from the bulb to increase their number. These polyploid forms have often been given separate names, based on their differing appearance. Combined with the tulips tendency to hybridise, in the wild and cultivation, and their ability to become naturalised outside their natural range, and you can see why the classification of tulips is difficult. The advent of studies that compare the DNA of different plants has resulted in a clearer view of the genus but there is still a lot of work to do. The most recent classification, based on DNA studies at The Royal Botanic Gardens, Kew, can be found at the beginning of Diana Everett's book, *The Genus* Tulipa, published by Kew in 2013.

Tulips arrive in Europe

The spread of tulips westwards from the heartland of the genus in Central Asia was no doubt helped by trade routes such as the Silk Road. Traders travelling from China to Turkey and south east Europe may well have picked up tulips on their way, either to trade or just as a novelty that was discarded *en route* to the west. These bulbs sometimes became naturalised in their new location or escaped from gardens, as long as the climate suited them. The Mediterranean regions of


Above, left, *Tulipa biflora* and ***right,*** *Tulipa tarda*.

Turkey and Europe were ideal in this respect.

Turkey is commonly mistaken as the home of the tulip even though only a handful of species are truly native to that country but the tulip was cultivated in the Ottoman Empire, especially Istanbul (Constantinople), and breeding was practiced there long before the tulip was cultivated in Europe; these exotic bulbs were little known to Europeans before the sixteenth century. Tulips were planted in palace gardens and depicted on decorative tiles. It was from Turkey that the tulip arrived in European gardens in the mid sixteenth century. From then on a steady trickle of new species arrived in Europe, especially around the late nineteenth and early twentieth centuries. These were used to breed the fantastic range of garden cultivars we know today but the species themselves have been relatively neglected in cultivation. Over 400 years after tulips first arrived in northern Europe, Holland can rightly be called the home of the tulip cultivar but the species still retain an air of mystery; an enigmatic, exotic flower of the East.

Tulips for the garden

In general, tulip species need well-drained soil and a sunny position. If you garden on light, sandy soil then several species can do well in a border but to improve drainage, the construction of a rock garden or raised bed will allow a wider range of species to be cultivated successfully.

Some of the earliest tulips to flower in the garden belong to the group with small, usually white flowers with a yellow centre. The type of this group is *Tulipa biflora*, which has the widest natural range of any tulip. Several species have been described that have similar flowers. One of the most reliable in the garden is *T. turkestanica*. Like many in this group it produces multiple flowers, up to 12 from one bulb. Flowering later in the season, in late April, are bulbs sold as *T. tarda*. The form in general cultivation flowers in late April and produces starry

white flowers, with a large yellow blotch at the centre, near ground level among a cluster of leaves. Although the name *T. tarda* is widely used in the trade it has now been included as a synonym of *T. urumiensis*.

Tulipa sylvestris is a tulip with normal (diploid) forms and polyploid forms. It is a polyploid form that has spread to northern Europe, as far as the UK and southern Scandinavia, where it has naturalised. The large, golden yellow flower, with the outer petals flushed green on their back, is held on a stem 40 to 50 cm tall in April. Naturalised plants in cooler climates often do not flower and they spread by stolons. The diploid form is smaller in all its parts and is found in southern Europe and North Africa, and further east into Iran, the Caucasus and Central Asia. *Tulipa sylvestris* subsp. *australis* grows in southern Europe and North Africa and has a flush of red rather than green on its outer petals. The larger, polyploid form of *T. sylvestris* makes a great garden plant. Eventually forming large colonies that revel in a warm sunny spot.

Found growing wild in the hills around Izmir in western Turkey is a polyploid version of *Tulipa orphanidea* originally called *T. whittallii* but now classified in cultivation as *T. orphanidea* Whittallii Group. Its increased vigour makes it a strong candidate for growing in normal garden conditions. This tulip will flourish in a sunny, well-drained border and display wonderful, dusky orange flowers, with wide, pointed petals.

One of the shortest tulip species is the diminutive *Tulipa humilis*, from Turkey, Iran and the Middle East. This species shows wide variation in flower colour, which

Left

Tulipa sylvestris, a tulip with both normal (diploid) and polyploid forms.

Below

Tulipa humilis, from Turkey, Iran and the Middle East is one of the shortest tulip species, with a stem of only a few centimetres in length.


Above, left, *Tulipa sprengeri* and ***right,*** *Tulipa clusiana*.

ranges from white and pale pink to deep purple, brick red and magenta. There are several cultivars in cultivation, such as 'Persian Pearl' and 'Violet Queen'. The flower stem is only a few centimetres tall and although it can be grown in a well-drained border, a raised bed will make it easier to appreciate this jewel-like species.

Probably the most enigmatic tulip of all is also the last to flower. *Tulipa sprengeri* has a wonderful, bright scarlet, funnel-shaped bloom, with the backs of the outer petals washed with dusky beige. The flowers appear from late May to early June on a stem 30 to 40 cm tall. Also, unlike most other species, it thrives in dappled shade and soil that doesn't dry out completely in summer. First introduced to cultivation from north east Turkey in 1894, this species hasn't been collected since the early twentieth century and was long thought to be extinct in the wild. Seed is produced prolifically and has ensured this species has survived in cultivation. Left to its own devices this tulip will seed around and you will find the thread-like leaves of seedlings appearing around the parent plants that will grow to flowering size in about 4 or 5 years. In fact, sowing seed direct is a good way to introduce this tulip to your garden. Just be sure to avoid the hot, dry, sunny positions that most other tulips enjoy.

Ideally suited to a rock garden or raised bed is the charming *Tulipa clusiana*. The typical form has white flowers with a strip of reddish pink on the back of the outer petals, creating a candy stripe effect. There are also yellow forms, with the same candy stripe. Although its natural range extends from northern India in the east to Iran, it has become naturalised in parts of southern Europe. Other species for a free draining border or rock garden include *T. linifolia* and

T. kaufmanniana, both from Central Asia. The latter has given rise to a huge range of early flowering tulips in the Kaufmanniana Group. *Tulipa linifolia* has numerous cultivars, some with red flowers and others in various shades of yellow, such as 'Apricot Jewel' and 'Bright Gem'.

Tulipa saxatilis is a beautiful pink-flowered species from Crete, where it grows on rocky ledges and along stony field margins. Known as the tulip of Candie, this tulip was in cultivation in the early seventeenth century. Today the most widely available form is the cultivar 'Lilac Wonder'. It can be grown in a sunny border but the bulbs of this species seem to flower better if they are crammed into a rock crevice, where they can become congested, much like in their natural habitat.

Tulipa kaufmanniana

Tulips under glass

By growing tulips in pots under the cover of a glasshouse or cold frame, the amount of water they receive can be controlled. This type of cultivation is necessary for

Tulipa saxatilis

Above, left, *Tulipa montana* is not suitable for outdoor cultivation and ***right,*** the unique *Tulipa regelii* which comes from the Lake Balkhash region of Kazakhstan.

many species that come from the hotter, drier parts of the tulips' range. Use a loam-based soil mix that is free draining, with around one third by volume of sharp grit. This soil will need replacing annually when the bulbs are repotted in late autumn. They are hungry plants in growth and extra liquid feed in spring will be beneficial.

By growing under glass, the whole range of tulip species can be enjoyed. The intriguing *Tulipa lehmanniana* for example, which has a bulb tunic that extends up to the soil surface to protect the young shoot from the searing heat of the sand in the semi desert of north east Iran and Afghanistan. More widely available is bright red *T. montana*, possibly the most beautiful species but unfortunately not suited to outdoor cultivation. Then there is the unique *T. regelii*, from the Lake Balkhash region of Kazakhstan, which has small white flowers and one or two grey-green leaves that have wavy crests along their length. It is probably the hardest of all tulips to grow. If you just want to grow a few tulips in your garden, there is plenty of choice among the more tolerant species and they will reward you with their wonderful blooms for years to come.

★ ★ ★

Lilium longiflorum 'Illusive'

Lilium longiflorum, the other Trumpet lilies and their hybrids

In the following article ***Walter Erhardt*** *focuses on Trumpet lilies, their characteristics and their use in producing many lovely hybrids.*

Easter lilies (*Lilium longiflorum*) are not hardy and are, therefore, rarely cultivated by growers in Germany. However, they are durable pot plants and have been used, more recently, for breeding new hybrids of great importance.

I love my Easter lilies and have cultivated them for a very long time, but as a container plant. Even though the growth is smaller, in containers, they have proven to be robust. They bloom every year, and so far I have lost not a single bulb. However, perhaps my storage in the basement, in the winter, is a little too warm, because the plants in the containers start to grow again, often in February. Then it's time to put them in a bright, but cool, place. Not infrequently, they then show that they really deserve to be called Easter lilies, because their flowers may well bloom in the Easter season. Fresh bulbs, bought in March or April, although usually showing some growth, bloom only in the summer.

Lilium longiflorum is a member of the section Leucolirion and is a trumpet lily. The division, of *Lilium*, into six sections reflects the classification developed

by H. F. Comber, who was born in 1897. He was the son of a notable gardener, which must have helped him to learn his craft. However, he made a significant mark as a plant hunter and lily grower, in his own right, but initially found work in a lily nursery in Buckinghamshire.

In 1952 he was offered a job with Jan de Graff at the Oregon Bulb Farms, where he was employed for ten years. His work "*A New Classification of the Genus Lilium*" was published in 1949. In his classification he placed the white trumpet lilies, i.e. *Lilium longiflorum*, *Lilium formosanum*, *Lilium neilgherrense*, *Lilium philippinense* and *Lilium wallichianum* in the same group. Today, *L. brownii* is considered to be a member of this group, although not all white.

In Japan, where *Lilium longiflorum* comes from, the plants grow on the coasts of the islands of Okinawa, Oshima, Takushima and Kawanabe in humus nests among the rocks. The 30–90 cm tall stem bears one to several pure white, horizontally protruding, funnel-shaped flowers. They are up to 19 cm long, with the leaves reaching a length of up to 15 cm. The species was described, in 1794, by Thunberg and came to England in 1819. Far more importantly, this species was a great success in the US, where they were grown, to a large extent in Bermuda, (hence the common name "Bermuda Lily") for the sale during the Easter holidays. However, the total production, of this lily, was destroyed by virus around the year 1900.

Until the 2nd World War interrupted Japan's pioneering role, in this bulb's production, every year up to 26 million bulbs were sold. Today there are two major regions producing *Lilium longiflorum* commercially: Oregon in America and Holland in Europe. Important breeders, such as Noar, Vletter and Den Haan Beheer, have also adopted the production of this lily. Now, although Japan's role in the commercial production and trade — in relation the Bermuda Lily — is not so significant, there is still a very important breeder, Dr. Heroshi Myodo, who has posted many interesting articles, in English, about lily cultivation on the Internet.

An interesting form, of *Lilium longiflorum*, for commercial production is *Lilium longiflorum* Schnellkeimern. With suitable climatic conditions, or under glass, the seedlings can be brought to flowering size in six months. The wild species often has abundant stem bulbils, a characteristic I was not able to observe in the hybrids. For use as a hybridizing partner, I will deal with this lily later, but now I would like to consider the other species belonging to the section Leucolirion.

Lilium formosanum, as the name suggests, is native to Taiwan (formerly Formosa) and grows from sea level to 3,000 metres above sea level. The interesting thing is that the offshore plants can be 200 cm tall. In mountainous areas, however, they are more typically 30 to 60 cm tall. It is the shorter and hardier variety, referred to as var. *pricei*, that is, generally, offered and grown by gardeners in Europe. *Lilium formosanum* var. *pricei* has small bulbs that barely survive a

Lilium longiflorum 'White American' (left) and 'Lorina' (right)

winter in the open field, so they require more protection if they are to survive for longer. However, it should be noted that this species lily is naturally short-lived, but produces seed in abundance, which can be brought to flowering-size very quickly, thus ensuring a supply of flowering-sized plants. With the taller form, of this lily, the one or two white flowers consist of hanging, narrow funnels that are wide open at the end, the midrib is usually pink. With var. *pricei* the entire back is usually brownish-red. However, some flowers have pure white blooms.

Lilium neilgherrense comes from the southern mountains of India and grows at altitudes from 1,800 to 2,600 metres. This very rare lily is threatened by ongoing removal of bulbs, to the extent that it is questionable whether it still exists in natural habitat. Unlike *Lilium formosanum* var. *pricei*, the bulbs of *Lilium neilgherrense* are very large, growing to a diameter of up to 10 cm. The flowers, with a length of up to 25 to 30 cm, are huge. One or two flowers, with bright yellow throats, grow on stems that are up to 90 cm tall. Abundant stem bulbils are produced by this species.

Lilium philippinense comes from the island of Luzon, which is in the Philippines. It also has one or two long tube-like white trumpet-shaped flowers on stems that are up to 90 cm tall. It is mainly grown in greenhouses, where sowings of seed can be brought to flowering-size in 18 months. Reports from England, which has a maritime climate, indicate, however, that the species can survive in the garden and may even tolerate winter temperatures, if the bulbs are planted in a sheltered location.

Lilium wallichianum has very large flowers, but as with *Lilium formosanum* it has very small, but purple, bulbs. The leaves are longer than any of the other lilies in this section. The species originates from the south side of the Himalayas, the distribution area extending from Nepal to Sikkim, Bhutan and Assam where it grows at altitudes of 1,000 to 1,500 metres, often on very steep slopes. The flower colour is not quite pure white, more of a cream with a green tinge, which originates from the highly-coloured throat of the lily. This lily, which has to be grown in pots because it is not hardy, produces underground stolons, a habit that soon reaches the limits of the planting pots.

Lilium longiflorum 'White Present' (left) and 'White Elegance' (right)

Lilium brownii is one of the two non-white trumpet lilies in this section, the other lily being *L. formosanum* var. *pricei*. The original description of *Lilium brownii* (in 1841) was based on a plant of uncertain origin, which could have been a self-sterile hybrid between *Lilium brownii* var. *viridulum* and *Lilium formosanum*. However, there are two varieties, of *Lilium brownii*, var. *australe* and var. *viridulum*, which occur in many of China's provinces. *Lilium brownii* is white inside, outside, however, it is purple pink to chocolate in colour, so that it is reminiscent of *Lilium regale*. However, it usually produces a single 15 cm long trumpet, horizontally, on a stem between 90 and 120 cm tall.

Breeding with *L. longiflorum*, or crosses with the species mentioned above, led to a number of hybrids, all in Division 5, including the Longiflorum hybrids. When breeding you look not only to improve the quality of flowers, so perfect shape and durability are required, but also resistance to viral diseases. There are varieties that are only 15 to 20 cm tall, such as 'Little Snow White', or very large, tetraploid varieties like 'Welwyn Tetraploid'. The great thing about the two varieties is that they can be true to the variety when grown from seed. In the following paragraphs, I will confine myself to discussing the varieties that I have been cultivating for a few years now.

'Illusive' (hybridiser, Mak Breeding, 2012). When the bulbs have become large enough they produce, on stems that are 130–140 cm tall, up to five silver-white wide-open flowers, which are slightly upward facing and slim. In the mouth of the flowers can be seen a vibrant green star. Flowering time takes about 110–120 days.

'Lorina' (hybridised by De Jong Lilies, 1989). This cultivar is the intersection of several different Longiflorum hybrids and has up to four slightly creamy-white, slender, open flowers held horizontally on stems that are 130 to 140 cm tall. The variety is somewhat susceptible to leaf scorch, which although turning the leaves brown does no harm to the bulbs. Flowering time takes about 90–100 days.

'White American' (hybridised by J. M. van Tuyl, 1981). This very hardy species is not susceptible to disease. The 15 cm long, greenish-white flowers open funnel-shaped with a diameter of 11 cm. The strong stems, which can carry between four and eight flowers, are only 60–70 cm tall. Flowering time takes about 100–110 days.

'Cyrano'

'White Elegance' (hybridised by World Flower BV). This variety is also resistant to leaf scorch. The pure white, very large flowers are wide open, which enables appreciation of the green throat. They sit horizontally on 120–130 cm tall stems. It is one of the few Longiflorum hybrids, which is available in the mail-order catalogues, in Germany. Flowering time takes about 100–110 days.

'White Heaven' (hybridised by J. W. A. van der Wereld, 2001). At the top of 140 cm tall stems three, sometimes six flowers grow, but only when the bulbs are grown to a size of 18 cm, which is unlikely in pot culture. The flowers are pure white and open trumpet-shaped with recurved tepals. The tetraploid variety is not susceptible to leaf scorch. Flowering time takes about 120–130 days.

'White Present' (hybridiser ?, 2013). This new variety has very large, sideways placed flowers with a green shimmer. The somewhat bulbous shape of the elongated trumpet flowers is very nice. Since I have only cultivated this variety for a year, I can provide no more information.

Wolfgang Mathys has reported that he has his Longiflorum hybrids in — "Siberian East Germany" — without any winter protection in the garden and that they had so far survived two very harsh winters without damage.

Intersectional CROSSROADS

The aforementioned Japanese botanist, Dr. Hiroshi Myodo, produced a whole series of intersectional hybrids using embryo culture. This encouraged other

'Lankon'

breeders to experiment with *L. longiflorum*, so that there is now a whole range of "dissimilar" Longiflorum hybrids. However, these are not as described above, i.e. in Division 5, but are in Division 8, the hybrids of different origins, belonging to none of the other seven groups.

LA Hybrids (*L. longiflorum* × Asiatic hybrids). These lily hybrids were discussed in Garden Praxis, 02/2005. It is mainly Dutch nurseries, like Bischoff-Tulleken or Vletter / denHaan, that produce the cultivars for this new group of hybrids. Unlike *L. longiflorum*, these hybrids are amazingly hardy, even late frosts to -6° C do not harm the young shoots. They are also very resistant to Botrytis. Overall, these hybrids have the longevity, or more, of the Asiatic hybrids. However, Asiatic hybrids still have their place in my garden, for example: 'Algarve', 'Ercolano' and 'Mrs Dani Arifin'. However, again, new varieties have been added such as 'Longwood' and 'Royal Sunset'. The large number of LA-hybrids also provides the opportunity to breed new lilies, as Wolfgang Mathys has shown.

LO hybrids (*L. longiflorum* × Oriental hybrids) Anyone who wants to learn more about these lilies is referred to Garden Praxis 07/2009. LO hybrids are quite tender, so whether they flower depends on the presence or absence of late frosts. The influence of *L. longiflorum* shows in the funnel-shaped flowers, by comparison with the, typically, flat flowers of the Oriental hybrids. Mathys offered, in his recent list of 15 hybrids the very lovely 'Cyrano' and the dark-pink 'Kunming'.

LL hybrids (*L. longiflorum* × *L. lankongense*) In the hybrid 'Lankon',

L. longiflorum was crossed with the Chinese species *L. lankongense*. In 2011 this hybrid was shown at the Chelsea Flower Show and attracted a lot of attention. It is hard to adequately describe the beauty of 'Lankon', with its wide open white, flushed with pink, downward facing loosely funnel-shaped flowers, which are generously spotted with purple on the inside of the tepals. Good plants can have stems up to 150 cm tall, but usually they are shorter. Some winter protection is recommended for this hybrid.

Easterpets (*L. longiflorum* × Trumpet Lilies) I discovered this term at Jeffries Nurseries, which is in Manitoba, Canada. The cultivar 'Damson', a trumpet lily of Division 6, has played an important role with these hybrids. G. Ronald bred this lily with 'Easter Dawn', a 90 cm tall lily, which has ivory white longiflorum-like flowers. The resulting hybrid proved to be hardy. A backcross with another trumpet lily rendered 'Easter Morn', also very tough and disease resistant hybrid, which is reminiscent of *L. regale*. This was backcrossed with *L. longiflorum* and the result was 'Easter Charm', a pink-coloured, 90 cm tall variety.

It is highly likely that *L. longiflorum* will continue to be of great importance for the breeding of hybrids. Therefore, all of those—who deal more or less intensively with the lily cultivation—should focus their attention on the otherwise rather neglected Division 6.

Footnote
This article was published, in German, in the April 2015 issue of the magazine *Garten Praxis*.

★ ★ ★

Michael Upward 1932–2015

an appreciation by ***Chris Brickell***

A man of many parts, Michael Upward, Secretary of the Alpine Garden Society from 1961–1996, who died in April 2015, was a mercurial figure in the world of horticulture.

While his long tenure in this post was concentrated on the AGS and in supporting the Local Groups he still found time both when Secretary of the AGS and in retirement to become involved in, and give time to, many other horticultural societies. One of these was the RHS Lily Group for which he served as Secretary from 1997–2000.

Among other horticultural and horticulturally-linked organisations with which he became involved and served in an honorary capacity were the RHS, the Hardy

Plant Society, The Horticultural Club (which usually met on the first evening of the (then) fortnightly RHS Shows at Vincent Square), the NCCPG, the Gardeners' Royal Benevolent Society and the Worshipful Company of Gardeners of which he was Master from 1993–94. In 1997 he was awarded the Gold Veitch Memorial Medal by the RHS for his services to horticulture having been awarded the Lyttel Trophy, the supreme award of the AGS, the previous year.

Michael first trained as an accountant at Brighton College but after National Service with the Intelligence Corps decided to take up horticulture as a career. After working at Notcutt's nursery, training at Plumpton Agricultural College followed by a spell at Brighton Parks he came to Wisley as a student for two years in 1959. He obtained the Wisley Diploma with Honours in 1961 and was appointed as Secretary of the AGS that same year.

I was, at that time, the Assistant Botanist at Wisley when Michael arrived and since then (in spite of his protestations that he learnt nothing from my botany lectures!) became and remained good friends throughout our "formal" careers and beyond.

Above all it was the management of the Alpine Garden Society and his support for the development of the Local Groups that should perhaps be recognised as his major achievement during his tenure as Secretary. He was very ably supported by his wife, Primrose, who apart from sharing his love of alpines and border perennials largely ran the small nursery at Lye End near Woking where they settled after he left Wisley and from where the AGS was managed in the early days of his tenure as Secretary.

Michael also travelled widely in the UK and many countries abroad giving lectures and promoting the AGS as well as being a leader of AGS tours to the mountains to see and photograph alpine plants. He also helped to organise and travelled with the first AGS seed-collecting expedition to Sikkim of which I was a member. Not, alas, a happy time for Michael—heavy rain, poor accommodation, leaking tents and a damaged knee were among the problems he encountered. As the expedition's medic he was, however, much appreciated by the local yak herders who regarded him as their local doctor—a role he relished.

Much more could be written about Michael—a gifted author of horticultural books, a fine designer of gardens and garden exhibits at Chelsea and elsewhere, his straight-faced, dry humour, his quick wit and kindness and the twinkle in his eye that preceded a candid opinion on a plant or exhibit at a flower show.

★ ★ ★

Disporopsis bakeri and *D. yui* (Asparagaceae: Nolinoideae), new species from Southwestern China

In the following articles ***Aaron J. Floden****, University of Tennessee Herbarium (TENN), Department of Ecology and Evolutionary Biology discusses two of the lesser known members of Liliaceae, which are, deservedly, attracting more attention than henceforth.*

Abstract

Disporopsis is a small genus of about 10 species distributed across Southeast Asia. A novel species long in cultivation in Europe and North America is described and illustrated, *D. bakeri* from China's Yunnan-Guizhou Plateau and it is compared to the morphologically similar *D. pernyi*. A second novel species, *D. yui*, is described from western Yunnan and Kachin State, Myanmar. These two species are delimited by several fundamental morphological features of the inflorescence peduncle to leaf petiole measurements and perianth shape and size. Chromosome counts for both species, $2n = 2x = 40$, are reported from plants originating near Baoshan, Yunnan, China.

Introduction

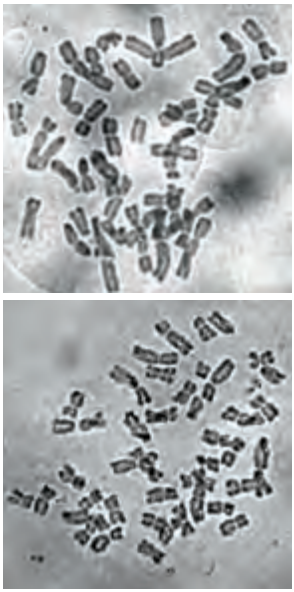
Disporopsis Hance (Asparagaceae) is a small genus of approximately 10 species distributed mostly within China, Indochina, Taiwan, and the Philippines (Floden 2015, Shaw 2011, Saito *et al*. 2009). *Disporopsis* is recognizable by its evergreen habit, fasciculate inflorescences, the lobes of the perigone longer than or equal to the tube length, and the distinctly corona-like structure of the membranous conjoined filaments (Hua 1892). Cytological data shows that all species of *Disporopsis* have a base number of $2n = 2x = 40$ with similar karyotypes shared between species (Sato 1942, Larsen 1963, Chang & Hsu 1974, Kumar & Brandham 1980, Hong & Zhu 1990, Floden 2015).

A long cultivated plant similar in appearance to *Disporopsis pernyi* (Hua) Diels was introduced to cultivation in the UK by the late Bill Baker from a market, presumably in Kunming, Yunnan Province, China. This plant differs from *D. pernyi* in its more lustrous leaves and the smaller fuscous-maculate tepals. Because of its distinctive appearance it received a cultivar name, "*Bill Baker*." I recently received a second living collection of a *Disporopsis* identical in appearance (and confirmed by molecular data), but this one originated from a flower market/nursery near Baoshan, Yunnan in 2010. Like the aforementioned cultivar, these plants have a

Figure 1

***Right* (*top*),** mitotic chromosome squash of *Disporopsis bakeri*, 2n = 40, from plants of the type collection cultivated by the author;

***Right* (*below*),** mitotic count of *D. yui* from a living collection, *B. Olsen 53*, Baoshan, Yunnan. Protocols followed Floden (2014) and plates were photographed with a Zeiss Axioskop microscope and images were taken at 1000x using AxioVision Rel. 4.8 (Carl Zeiss MicroImaging GmbH, Germany).



distinctly different perigone shape and size when compared to *D. pernyi* that is more similar to *D. aspersa* (Hua) Engl., but they have the overall plant habit and appearance of *Disporopsis pernyi*.

A second collection originating also from around Baoshan, Yunnan was sent to me as an unknown species. Initial comparison suggested this was a far western population of *D. aspersa*, but molecular data shows them to be distinct. This plant has small rhizomes with short internodes, nearly cordate, small leaves with long acuminate apices held on long petioles. Comparisons with numerous herbarium specimens show that they also differ in several morphological characters enumerated below.

Comparisons of morphology and molecular data (Floden in prep.) support the recognition of these two novel species both with limited distributions in southwestern China. Mitotic chromosome counts confirm both are diploid with base numbers of $2n = 2x = 40$ (Figure 1).

Taxonomic treatment

Disporopsis bakeri Floden *sp. nov.* (Figures 1–3).
Type:—CHINA. Yunnan. From a market in Baoshan, 2009, *B. Olsen B-19* (holotype, PE; isotypes, CAS, H, KUN, MO, NY, TENN, US).

Similar to D. pernyi*, but leaves abruptly tapered near distal third with an acuminate apex vs. tapered from near the middle; leaf sides convexly tapered vs. concavely tapered to apex; pedicel of perianth usually longer than perianth and not usually exceeding petiole of associated leaf vs pedicel ca. equal to the perianth or longer and is longer than the petioles of the subtending leaf; perianth shorter, ca. 1 cm vs. 1.5–2 cm; tepals obovate to ovate vs. lanceolate, and tepals adaxially fuscous vs. white or yellowish-green.*

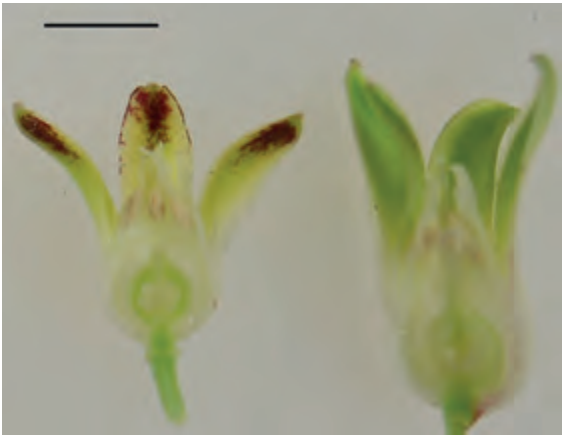


Figure 2a

Disporopsis bakeri, left, and *D. pernyi*, right, dissected lengthwise showing the perigone size difference, corona, and shape. Scale bar 0.5 cm.

Figure 2b

Flowering stem of *Disporopsis bakeri* cultivated by the author, accession B19 from near Baoshan, B. Olsen.

Plant perennial, evergreen. Rhizome cylindric, elongate, greenish near surface, yellowish when buried, internodes 5–10 cm; roots thick. Stem erect, 15–45 cm, reddish maculate below, terete, arching in upper half. Leaves alternate; petiolate, petiole 0.5–1 cm, u-shaped, leaf blades lanceolate, base round, gradually tapered, apex acute, lustrous above and below, 3-veined. Inflorescence axillary in lower axils; fascicles 1–4-flowered, peduncle shorter than attending leaf petiole. Perigone 0.8–1.5 cm, tube 0.3–0.7 cm, lobes 0.5–0.8 cm, tepals obovate,

Figure 3

Vegetative growth of *Disporopsis bakeri* and *D. pernyi* in cultivation. Plants largely on the left half of the image are *D. bakeri* and those on the right are *D. pernyi*. Note the difference in leaf shape (broader towards base), venation (3 vs. 5 equally prominent veins), and the undulation seen in the latter species.

apex rounded with apiculate apex, abaxial surface fuscous-maculate, highly fragrant. Corona lobes opposite the tepals, lobes lanceolate *ca*. 2 mm long, surpassing anthers by 2 mm; anthers *ca*. 1 mm long. Ovary spherical, 2.8–3.2 mm long, style 2–2.3 mm long. Fruit, a berry, purple, but mature size unknown.

chromosome:—$2n = 2x = 40$ (Figure 1).

etymology:—The name was chosen because it both honors the person who first introduced this to cultivation, and also J. G. Baker whose monumental work on the Asparagales (1875), though *Disporopsis* was not yet described, provided a solid foundation for future work on *Polygonatum* and other genera.

phenology:—Flowering April-June, fruiting September–January.

distribution:—CHINA. Guizhou and Yunnan, elevation range unknown. This species is known from as far southwest as the limestone areas around Baoshan, Yunnan and northeast into Guizhou where most of the collections are without a definite locality.

Additional specimens examined (Paratypes):—CHINA. **Guizhou**: sin loc, 15 Jun 1907, *J. Cavalerie* (P00038288); sin loc, May 1913, *J. Esquirol 4301* (P01775140); Tsin-tchan, 5 May 1904, *Cavalerie et Fortunat 2158* (P01814595, PE00136449!);

Figure 4a
Disporopsis yui cultivated by the author, B-53 from Baoshan, Yunnan, China.

Yunnan: environs d' Yunnan-sen, 28 Apr 1897, *Bodinier et Ducloux 234* (P01814555, P01709227, P01814556); sin loc, 1912, *Maire 446* (PE00136344!); Hua-Ting-Hze His-Shan, Kunming, 27 May 1945, *T.K. Liou 13234* (PE00136471!); Xishan, 27 Aug 1953, *Z. Zhang 50203* (PE00136475!);

Disporopsis yui Floden sp. nov. (Figure 4).
Type:—CHINA. Yunnan. Fengqing, Holungtan, 2900 m, 10 June 1938, *T.T. Yu 16212* (holotype, PE barcode 136301!; isotypes HUH!, KUN 220373 image! KUN 220374 image!, PE 136305!, PE136302!).

Similar to D. aspersa *(Hua) Engler in the overall plant size and habit, but the rhizome has shorter internodes 1–2 cm long (vs. 2-8 cm), leaves nearly cordate with abruptly and long acuminate apices and petioles 1–2 cm long (vs. leaves with truncate to rounded bases and shortly acuminate to acute apices), and the peduncle of the inflorescence 1–1.5 cm (vs. 0.5-1).*

Plant perennial, evergreen. Rhizome cylindric, torulose, greenish when exposed to sunlight, yellowish when buried, internodes 1–2 cm long; roots thick. Stem erect, 10–30 cm, reddish maculate below, terete, arching in upper half. Leaves alternate; petiolate, petiole 1–2 cm, leaf blades lanceolate, base cordate or truncate-rounded, gradually tapered, apex acuminate, lustrous above and below,

Figure 4b
A portion of the specimen collected by F. Kingdon-Ward in eastern Myanmar, Kachin State.

3-veined. Inflorescence axillary in lower axils; fascicles, usually one flowered, peduncle as long as or longer than attending leaf petiole, 1–2 cm. Perianth *ca*. 1 cm, tube 0.3–0.5 cm, lobes 0.5–0.7 cm, tepals broadly lance-ovate to elliptic, apex obtuse, abaxial only rarely with fuscous-maculation, fragrance unknown. Corona lobes opposite the tepals, lobe shape lance-ovate, bifid, *ca*. half the length of the tepals. Ovary spherical, 2–3 mm long, style 2–3 mm long. Fruit, a berry, purple, 0.5–1 cm diameter.

chromosome:—$2n = 2x = 40$ (Figure 1).

etymology:—Named for Tse Tsun Yu, a prolific botanist who collected extensively in Yunnan and Sichuan, was a co-founder of the Kunming Institute of Botany, director of the Institute of Botany at the Chinese Academy of Sciences, and an editor of the *Flora Reipublicae Popularis Sinicae*. This species commemorates his extensive contribution to botany in the region, but also to his collections of the types of this species which are the earliest known.

phenology:—Flowering April–June, fruiting September–October.

distribution:—CHINA. Yunnan. MYANMAR. Kachin State. Elevation range from 2,000–3,100 metres.

additional specimens examined:—China. Yunnan. Lijiang Naxi Autonomous Co. (AC), NW Likiang, Tuchi, flowers white, 27 May 1939, *R.C.Ching 20511* (HUH!, PE photo!); Jingdong Yi AC., foot of Ta-tun-tze-shan 2,500 m, 31 Oct 1939, *M.K. Li 1003* (PE); Yangbi Yi AC, 6 June 1963, *Northwest Jinsha River Team 4326* (PE); ibidem,

2 June 1963, *Northwest Jinsha River Team 4228* (PE); Jingdong Yi AC, Wuliangshan, 19 Nov 1956, *B. Qiu 53801* (KUN image!, PE image!); Tengchong, Gongfang, 23 November 1978, *780 Team 577* (HITBC image!); Lushui Xian, Pianma Xiang, along the river in vicinity of Pianma Hydroelectric station, W side of Gaoligong Shan, 1,820 m, 12 May 2005, *Gaoligongshan Biological Survey (GSBS) 22773* (HUH!); Lushui Xian, Pianma Xiang, Gangfang village, N of Pianma, along stream N of village, W side of Gaoligongshan, 1,860 m, 14 May 2005, *GSBS 24178* (CAS!). MYANMAR. Kachin State. North Triangle, Wing Bum above Ahkail, 8,000 ft., flowers cream or yellow, undergrowth in the forest; epiphyte or more commonly on banks, 23 May 1953, *F. Kingdon-Ward 20899* (HUH!).

Discussion

Disporopsis bakeri and *D. yui* are described as new species that have been infrequently collected from areas of the Yunnan-Guizhou Plateau and the Gaoligongshan and adjacent mountains, respectively, of southwestern China. The description of these two species raises the total number in the genus to 11.

Several reliable characters serve to separate *Disporopsis bakeri* from *D. pernyi*: the peduncle is shorter than or equal to the associated leaf petiole vs. longer; the petioles are *ca*. 1 cm vs. <0.5 cm long; the leaf shape lacks the undulation of the surface; the leaf is widest near the middle (narrowly elliptic) whereas *D. pernyi* is widest at the base (lanceolate) the leaf margins are gradually convexly cuneate to the acute apex vs. concavely acuminate; and the lobes of the perianth are nearly equal to the tube vs. distinctly longer than the tube. It has a smaller perigone and the tepals of *D. bakeri* are purple-brown (fuscous) marked whereas *D. pernyi* are white and green (Figures 2–3). Other characters less discernible on specimens, but obvious on living plants, are that the petioles of *D. bakeri* are distinctly u-shaped in cross section whereas *D. pernyi* has flattened petioles. Furthermore, both surfaces of the lamina are distinctly lustrous whereas *D. pernyi* is usually a dark green above.

Disporopsis yui (Figure 4) is known from western Yunnan and eastern Myanmar. Specimens of this at KUN and PE have been annotated as the unpublished name "*D. yunnanensis* Wang & Tang" and also as *D. aspersa*. In contrast to *D. aspersa* this species has longer petioles and the lamina of the leaf has a long acuminate apex. The base of the leaf is often cordate or occasionally truncate-rounded. The peduncle of the flower is usually longer than the subtending leaf petiole; often 2 cm in length. The rhizome is also distinctly nodose, with the nodes often a larger diameter than the internodes. A single clone of this in cultivation has not yet flowered for me, but the vegetative differences are notable. Many of the specimens cited are in fruit, though the types and the Kingdon-Ward collection are in anthesis.

Unpublished molecular data supports the distinctiveness of both novel species

described here. *Disporopsis bakeri* is resolved as sister to *D. pernyi* and *D. yui* as sister to an unidentified species and *D. aspersa*. Pairwise comparison of the nuclear ribosomal ITS and ETS, and several chloroplast markers show multiple nucleotide substitutions unique to each species.

KEY to the species of *Disporopsis*. *Disporopsis luzoniense* is considered by AF to be a synonym of *D. arisanensis*, but is included at specific rank in the key.

1 Flowers in clusters of 5–10, corona lobes not exceeding anthers, fleshy; berries white; plants 60–110 cm tall, perigone 0.8–1cm . . . . . *D. longifolia*
1 Flowers solitary or in clusters of 2–3; corona lobes exceeding anthers, membranous; berries purplish; plants 6–90 cm tall; perigone 0.8–2.2 cm.
  2 Rhizome moniliform; perigone 1–2.2 cm.
    3 Leaf base obtuse to subcuneate, rarely slightly cordate; perigone 1.5–2.2 cm, white; corona lobes alternate to tepals. . . . . *D. fuscopicta*
    3 Leaf bases rounded to truncate, petiolate, margin strongly undulate; perigone 1–1.5 cm, white with fuscous maculation; corona lobes opposite tepals. . . . . *D. bodinieri*
  2 Rhizomes terete; perigone 0.8–2 cm.
    4 Plants small 6–10 cm, 1–3 leaves per flowering stem; purple maculate on petiole and stem; perigone white tinged yellowish green, *ca*. 1 cm, apex of corona lobes often entire. . . . . *D. jinfushanensis*
    4 Plants larger 10–90 cm, 3+ leaves per flowering stem; apex of corona lobes 2-cleft.
      5 Leaves lanceolate to lanceolate elliptic.
        6 Leaves tapered from middle, margins occasionally undulate; pedicel of flower longer than petiole of leaf (0.5–1 cm); perigone with tepals longer than the tube, adaxial surface of tepals white-green . . . . . *D. pernyi*
        6 Leaves tapered from upper 1/3, margins strait; pedicels of flower not longer than petiole of leaf (1–1.5 cm); perigone with tepals *ca*. equal to tube, adaxial surface of tepals brownish purple . . . . . *D. bakeri*
      5 Leaves ovate, ovate-lanceolate, ovate-oblong, base cordate, subcordate to truncate; flowers campanulate, white or yellow.
        7 Leaf margin undulate (or not), base truncate cordate, petiole <1 cm, purple maculate; perigone yellowish-white, purple maculate abaxially, 1–1.2 cm long. . . . . *D. undulata*
        7 Leaf margin entire; base subcordate to truncate or cuneate; petiolate.

8 Rhizomes 2–3 mm in diam.; leaf base truncate rounded, sometimes cordate.
9 Perigone yellowish-green, purple spotted abaxially on apex; leaf usually abruptly tapered to an obtuse apex; peduncle usually less than leaf petiole length 0.5–1 cm . . . . . .*D. aspersa*
9 Perigone whitish; leaf long acuminate to an acute apex; peduncle usually longer than leaf petiole length, 1–2 cm . . . . . *D. yui*
8 Rhizomes 4–10 mm in diam.; leaf base cuneate to rounded.
10 Perigone whitish-green, fuscous maculate adaxially; leaf base rounded; Taiwan. . . . . *D. arisanensis*
10 Perigone whitish-green, fuscous maculate adaxially; leaf base cuneate; Philippines. . . . . .*D. luzoniense*

Acknowledgements
I thank B. Olsen for living material, Tony Avent and the staff at Juniper Level Botanic Garden, NC, USA where numerous cultivated *Disporopsis* were examined and utilized in chromosome analyses, CAS, F, H, MI, MO, NY for specimen loans, PE for accommodating my visit there, and ISBC, E, K, and P for digitization of their type and other specimens, and Kelly and Sue at Far Reaches Farm for several living collections of various *Disporopsis* species.

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Delimiting *Disporum uniflorum* and *Disporum flavens*

Aaron J. Floden

The taxonomy of *Disporum uniflorum* Baker has been a contentious issue with regards to the synonymy of several other names especially that of the Korean plant, *D. flavens* Kitagawa, which dominates the cultivated material under the name of *D. uniflorum*. Baker (1875) described *D. uniflorum* from collections made by Shearer (types at Kew) in Jiangxi. These plants have single-flowered inflorescences borne opposite a leaf at the terminus of each stem. Each stem usually only has a single inflorescence. *Disporum flavens* was described in 1934 from plants from Liaoning Province, China. Kitagawa considered the relationship of his new species closer to *D. sessile*. To further complicate matters, Handel-Mazzetti (1936) described *D. sessile* var. *pachyrrhizum* from plants collected by Henry in western Hubei and this is currently treated as synonymous with *D. uniflorum* (Liang & Tamura 2000) though not enough data is at hand to provide discussion of this here.

Since the descriptions of these no systematic efforts have dealt with these names as distinct species, or provided discussion regarding their placement in synonymy despite differences in morphology and distributions. The most recent generic revision by Hara (1980) treated them as synonyms notwithstanding apparent morphological differences. In cultivation, most plants offered under *D. uniflorum* are in fact *D. flavens*. In addition to morphological differences the type of *D. flavens* is from northeast China and the Korean peninsula. The distribution of *D. uniflorum* is from southeastern China west into eastern Sichuan. I have observed it near Chengkou at 1,900 metres and also on Fanjingshan in Guizhou at 1,600 metres. The geographic disjunction between *D. flavens* and *D. uniflorum* has not been considered when treating them as morphological extremes of variation, without apparent intermediate morphological forms, across a large and discontinuous distribution.

Hara (1988) emphasized characters of the papillose inflorescence branches, tepal shape and margins, and rhizome type ("stolons"). Moreover, Hara also showed a great range of variation within quantitative characters in his circumscription of *D. uniflorum*. Though Hara directly compares *D. uniflorum* with *D. sessile* morphological comparisons suggest that the two are not closely related to one another. He delimits them based on the short and compact rhizome and yellow tepals of the former against the long rhizomes and white and green tepals of the latter. Likewise the characters of the rhizome can be used to delimit *D. flavens* from *D. uniflorum*.

Figure 1

Morphological comparison of the inflorescence and perigone of *Disporum flavens* top row, and *D. uniflorum*, bottom row. **From left to right**: pedicels, inner surface of tepal, proximal portion of the filaments, apical portion of the perigone.

Figure 2

Far left, comparison of the filaments of *Disporum flavens* (right) and *Disporum uniflorum* (left). Note the distinct gibbous nature of those on *D. flavens* and the scabrous surface;

Left, comparison of the stigmas showing the distinctively divided style of *D. flavens* (right) and the nearly fully connate style of *D. uniflorum* (left).

Table 1. Enumeration of morphological and growth characters of *Disporum uniflorum* Baker and *D. flavens* Kitagawa.

	Disporum uniflorum	*Disporum flavens*
rhizome	leptomorphic	pachymorphic
stem	ridged, ridges papillose	terete, leaf petioles decurrent
leaf		
shape	elliptic	ovate
apex	apiculate	acuminate, acute
abaxial veins	smooth	papillose
margin at 20x	papillose	papillose
inflorescence	terminal	terminal and axillary
flower per infl.	1 (–3)	1–5
pedicel	angled, papillose	terete
flower	25 mm	31 mm
tepal	oblanceolate, puberulent within	oblanceolate, puberulent within
colour	deep yellow	pale yellow
spur	1–1.5 mm	2–2.5 mm
margin	ciliate	ciliate
apex	emarginate	acute-apiculate
stamens	included	included
style	included	exserted
filaments	17 mm, papillose, not gibbous	18 mm, papillose, gibbous proximally
ovary	4.75 mm	3 mm
anthers	6 mm	5 mm
style length	22 mm, stigma trifid, connate for 15 mm	21 mm, stigmas divergent, recurved, mostly free

Recent introductions of wild-collected material of *D. uniflorum* and *D. flavens* from central China and from northeast China and South Korea, respectively, have enabled a preliminary comparison of the broad species concept of *D. uniflorum*. I cultivate three accessions of *D. uniflorum*, two of my own collections and one received from Chen Yi, and two clones of *D. flavens*, both presumably from South Korea. Additionally, examination of specimens from CAS, F, HUH, MO, NYBG, PE, and types of both species have aided delimitation of these two species. Here *D. flavens* is treated as distinct from *D. uniflorum*.

The differences between *Disporum uniflorum* and *Disporum flavens* serve to adequately distinguish these two species from one another, especially when observed in a common garden (Table 1, Figures 1–4). The aptly named *D. uniflorum* is a smaller plant often less than 20 cm tall and frequently has only a single flower per stem even when cultivated in optimum conditions. That said, I have observed it on Fanjingshan, Guizhou Province, China (Figure 3) with a few stems in a colony with up to three flowers per stem. In contrast, *Disporum flavens* is a larger plant to nearly 40 cm tall and the terminal third of the stem often has 1–3 branches each terminated by a cluster of 1–5 flowers per branchlet (Figure 4). The rhizomes of *D. flavens* are short with numerous stems in dense colonies and those of *D. uniflorum* can be up to 30 cm long and a colony is composed of widely spaced stems, most of which are non-flowering. Other differences that serve to delimit *D. flavens* from *D. uniflorum* are observed in characters of abaxial leaf veins, flower pedicels, flower size, tepal spur length and shape, filament shape and surface sculpturing, and stigma size and shape (Table 1, Figures 1–4). The preponderance of morphological and growth habit data suggest that *D. uniflorum* is more closely related to *D. shimadae* from Taiwan and to other species with scabrous and sulcate pedicels.

Recent molecular analyses have resolved the relationships of clades of *Disporum* without specific resolution (Tamura et al. 2013). In that phylogeny, *D. viridescens* and *D. smilacinum* are sister to one another and form the basal clade. The next clade, albeit with very limited sampling, contains *D. bodinieri*, *D. cantoniense*,

Figure 3

***Opposite**, Disporum uniflorum* in Guizhou, China, Fanjingshan at about 1,300 metres.

Figure 4

***Right**, Disporum flavens* HC 970431, from South Korea, cultivated by the author.

D. longistylum, and *D. multiflorum*. The last clade contains a single branch with *D. austrosinense*, a second branch with *D. uniflorum* (which is actually *D. flavens*), *D. shimadae*, and *D. kawakamii* though their relationships are unresolved, and then a mostly unresolved polytomy containing *D. sessile* forms, *D. nantouense*, and *D. lutescens*. Part of the lack of resolution is that the molecular data used contains only invariable regions of the maternally inherited chloroplast. In addition to low loci sampling, taxonomic sampling is limited with many of the mainland Asian species either absent or represented by a single sample. Nonetheless, these preliminary data do support a relationship of *D. flavens* to *D. uniflorum* though their morphology and distributions are distinct. Future molecular work and field sampling will undoubtedly confirm their distinctiveness.

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Observations—principally dealing with lily seed germination—in Scotland

*In this article **Susan Band**, of Pitcairn Alpines, describes the propagation methods she uses with some fairly difficult* Lilium *species.*

On the east coast of Scotland the annual rainfall is about 75 cm, which is spread evenly throughout the year, with temperatures rarely dropping below -10° C. The relatively mild and wet climate along with the low light levels in Scotland is particularly good for growing species lilies especially those from the Hengduan mountains of China.

Over the years we, at Pitcairn Alpines, have increased the variety of species *Lilium* and *Nomocharis* we grow, specialising (but not exclusively) in those from China and the west coast of the USA.

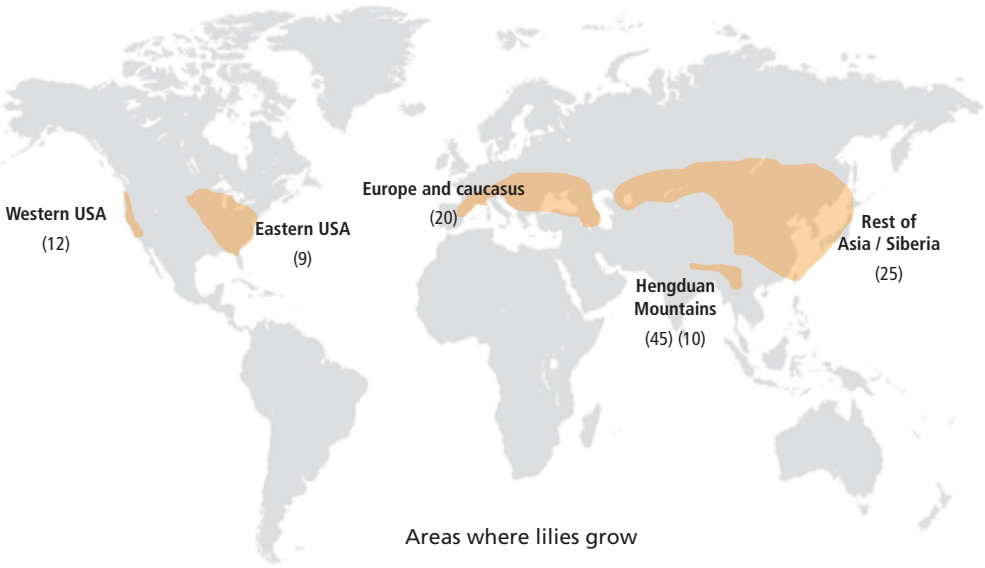
In this article *Nomocharis* will be treated the same as *Lilium*, for the purpose of growing and cultivation. Although we grow on a rather larger scale than the average gardener, many of our methods can be adopted by gardeners. The methods used might not suit everyone, but are those which have worked for us here in the nursery.

Before dealing with the propagation methods, used at Pitcairn Alpines, I would like to describe where the species we grow originate.

Areas where lilies grow

Asia Mostly found in the northern hemisphere, the natural growing areas for lilies are varied, with differing climates, and, in Asia, are to be found in the following geographical areas:

The Hengduan and Gaoligonshan (a sub-range of the southern Hengduan Mountains), Southeast Tibet, Bhutan, Arunachal Pradesh, Myanmar (Burma), Yunnan and Sichuan. These areas have the highest concentration of different species, i.e. at least 45 *Lilium* and 10 *Nomocharis*. Lilies from these areas are the most likely to do well and thrive in Scottish gardens. In their natural habitats, the lilies grow in the mountain pastures, scrub and forests—mostly above the altitude needed to be hardy for zone 7 gardens. The summers are wet and are never very hot. The smaller *Lilium* and *Nomocharis*, from these areas, flower in gardens in June with the taller species flowering from



Areas where lilies grow

July until September. Specific examples from these areas, that grow well in the east of Scotland, are *Lilium macklinae*, *Lilium taliense*, *Lilium nanum*, *Lilium wardii* and all of the *Nomocharis* species. The *Lilium* and *Nomocharis* referred to, if given the right growing conditions, can be surprisingly long-lived in gardens.

After a break of many years, since Forrest and Farrer collected in these areas, seed, plants, and photographs of these lilies are again making their way into the west.

Other areas, of Asia, where species lilies grow are Japan, Vietnam, Eastern China and Russia. Many lilies from these areas are used to produce hybrids for the garden, or cut flower industry. Species, with the exception of *Lilium longiflorum*, which is rarely long-lived in Scottish gardens, as it suffers from our damp summer climate, that can be grown reasonably successfully are *Lilium japonicum*, *Lilium formosanum* and *Lilium lancifolium*.

Western America Species lilies occur in the western USA, mainly in Californina, Oregon and Washington State. Although lilies from these areas are not so well know in cultivation they have been proving surprisingly amenable to our growing conditions, although they flower better when the summer is drier. They often suffer from botrytis, which limits seed production. Western American species lilies are divided into those which grow in the damper coastal parts and those

which occur on the east side of the Sierra Nevada mountains, in the rain shadow. Those in the drier areas are usually found in the mountain regions, where the air is cooler, finding moisture often near ditches. All the eastern lilies are tall and flower in mid summer, but with the seed ripening quickly. Examples of western American species lilies are: *Lilium oregonum* (a.k.a. *L. columbianum*), *L. pardalinum*, *L. washingtonianum, L. humboldtii* and *L. rubescens*.

Lilium rubescens

Eastern America Species lilies also occur in the eastern USA and Canada, extending from Canada, in the north, to Florida in the south. The climate varies between cold winters in the north to mild damp conditions in the south. We, at Pitcairn Alpines, have not had much experience, as yet, of growing these lilies mostly because of the lack of availability of seed. The species from the north, such as *Lilium canadense*, *L. superbum* and *L. michiganense* are known to do reasonably well in cool Scottish gardens. The growing requirements of the lilies, from the south-eastern areas of the USA, have not fully been understood up until now, although we, in Scotland, can provide moisture I suspect that the lack of sunshine might be a problem.

Europe Most of the lily species from, the Pyrenees, the Alps and NE Turkey, are well known in the garden and do especially well in good summers, as they naturally occur where the summers are hot and dry. They are often long lived with *Lilium pyreniacum* sometimes out-lasting the garden they were planted in.

To recap, species lilies that do well in Scotland — in my experience — are species from SW China, America (especially the western states already mentioned) certain areas of Europe (already mentioned), but only when the summer is good.

Cultivation

Seed sowing. Species lilies are often best when grown from seed. By growing from seed, the gardener can prevent virus propagation and the lilies can adapt to the local climate. Understanding where the seed originate from can provide a clue as to how to grow them.

***Above**, *Lilium mackliniae* seedlings, late March and **right**, *Lilium mackliniae* in flower.*

Germination methods

I prefer not to divide the lilies into hypogeal or epigeal germination, but separate them into the different regions in which they grow. I have found that in general lilies from the same areas have similar germination patterns.

How and when seeds ripen can also provide guidance about when to sow them. American seed develops and ripens quickly suggesting Autumn sowing and those from SW China, e.g. the Hengduan and Gaoligonshan Mountains, are late to ripen suggesting they are better kept for spring sowing.

Southwest China Seed of lilies, from SW China, are immediate warm germinators, taking four to six weeks at 5–15° C. At Pitcairn Alpines, we sow these lilies in January—in trays of general seed compost—and keep them in a frost free tunnel, germination occurs when the weather warms up. A heating cable is

Lilium humboldtii seedlings.

not essential, but by bringing them on more quickly it means the seed can be pricked out in April when the weather is still cool. A cool windowsill can also be used. Keeping the seed frost-free, whilst germinating and until the danger of frosts have passed, is most important. The exception—with regard to lilies from this area—is *L. henrici*, which I have found has sporadic germination over the summer.

The seedling lilies are pricked out from their seed trays into large boxes when their first true leaf is forming. Using boxes, or large five-litre pots, means it is easier to keep the soil temperature and moisture consistent. It is important to keep the seedlings cool and shaded for the first summer and protected from severe frosts until after their first winter. These lilies are best planted out—in their final position—after their second winter in a shady position with lots of humus dug into the soil. In Scotland, they are happy in an open position, but further south they will do better if grown in the shade.

Western USA Through trial and experimenting we have found the best time to sow seeds, of lilies from the western USA, is at the beginning of December, in a cold but frost free tunnel. We will continue experimenting with the American lilies, but so far *L. humboldtii*, *L. pardalinium*, *L. rubescens*, *L. washingtonianum*, *L. kellogii* and *L. parryi*—kept at 0-10° C—will begin to germinate in January with minimal hypogeal germination. At these low temperatures, the seed produces a short stalk, often lying on top of the compost. It then produces a bulb, true roots and then when the weather warms up a true leaf. It is important not to sow them at a later date than this, as the seed then goes into dormancy which is difficult to break. This way of germinating could be attributed to the germination starting under the snow, where the temperature and moisture is constant, and then they are ready to grow on during the snow melt, but before the summer heat builds up. As with the immediate germinators they are kept frost-free and then pricked out in April into large pots or boxes when the true leaf appears. For the first summer and winter they are kept under an open shelter. Two year old bulbs are then planted out, into a gritty bed, in full sun. We intend trialling planting in the sun—at the edge of conifers—where there is less summer rainfall.

Other regions of the USA The northern species (in other areas of the USA) tend to have true hypogeal germination. This is when the seed forms bulbs within or close to the seed underground in the first instance only putting up a true leaf later. We find these are best sown in ziplock bags filled with perlite and kept in a warm area such as the house. We sow them in the autumn and keep them warm until Christmas then refrigerate. The bulbs should then form in the spring. They can then be emptied from the bags and sown in trays when bulbs form. The true leaf appears above ground during summer/autumn. They are best left in their seed

trays until the next spring when they can be pricked out.

We, at Pitcairn Alpines, would like to experiment more with these species trying to establish a time of year for sowing, so they might germinate and put up their first leaf more quickly.

Europe The European species we grow, have varying germination patterns. Often within the same species there can be two types of germination, both immediate and delayed.

We are working to try and analyse why this happens. Perhaps the age of the seed and storage conditions before sowing may be the main culprits? For example, *Lilium martagon* seed (from external sources) often germinate in the same year, whereas our own seed can often take two years. Is this because our seed is fresher, or because it is stored in a fridge? There is anecdotal evidence that suggests storing *Fritillaria* seed, a close relative to *Lilium*, in a fridge delays germination. This year, any seed from European species will be kept in bags of damp perlite—both in warm and cool temperatures—to see which best aids germination. Also, old and new seed will be sown to compare results.

Rest of Asia Most of the lilies from the rest of Asia, such as lowland China and Japan, grow readily from seed. On the whole they are immediate warm germinators which can be sown at any time in the first half of the year. They grow quickly once pricked out often flowering in the first or second year from sowing.

These observations have been made over time, at the nursery, to allow us to standardise seed sowing and pricking out. Our aim is to be able to propagate species lilies which are healthy and grow quickly to a saleable size. Our climate always has a high humidity even in the summer and shade is easy to provide. These conditions allow us to handle small plants throughout most of the year and are ideal for propagation. Unfortunately, a lot of summers in Scotland are not the best for flowering all the Lilies we grow—without the help of a shelter. However, we are lucky to be able to grow those which require cool damp conditions, some of which can last in the garden—with minimal attention—for many years.

I hope this article helps and encourages Lily Group members to try growing species Lilies from seed, by adapting some of Pitcairn Alpines methods to their own gardens and climate.

★ ★ ★

The highlights of 15 years of lily growing in Switzerland

In this article ***Pontus Wallstén*** *celebrates his love of lilies and shares the — mostly — high points he has achieved in growing many species, and some hybrids, of a plant that clearly captivates him.*

It was in April 1999, when I was 13, that it all started. I was at my local garden centre looking at the various plants and bulbs on offer, on a nice sunny spring day. Suddenly, in the "bulb section", my young eyes caught sight of a superb picture on a bag of bulbs; it was the very elegant bright yellow Asiatic lily hybrid 'Connecticut King'. The three bulbs, which were packed in sawdust, were, to me, very strange looking white bulbs, with tight overlapping scales, very unlike the more familiar typical tulip bulbs or narcissus I had grown in the past. On the back of the packet were detailed planting instructions, stipulating several layers, grit, humus, deep digging, sand, and how many centimetres each layer had to be. It was all so precise that it made these bulbs seem very difficult to me, and a real challenge to grow. I was a bit put off for a second, thinking I would not manage to grow them well. However, the sense of challenge was huge, and the excitement at trying something new and so different intrigued me. I could not resist trying them, the bulbs quickly returned home with me. I decided simply to plant them in a well-drained humus rich soil in full sun, with a few strawberries at the bottom, to shade the roots, thinking that should suffice. What a joy it was to see them grow, and flower in July 1999. An unforgettable sight! I remember staring at the beautiful flowers for several minutes, photographing and filming them. I was hooked on lilies from that day on.

Later on, I discovered that there were not only hybrid lilies, but very beautiful species as well, some very rare and hard to find. I began increasing my collection with the easy to find species in local Swiss garden centres. But these were not many, and I soon started to order *Lilium* species by mail order from specialist nurseries in France and the UK. Some of these proved a challenge. Later on, in 2004, I became a member of the RHS lily group in the UK, and their yearly bulb auctions became an excellent source for further, very rare, almost unobtainable species, and also very good friendships with other lily growers from around the world, who shared growing advice, and bulbs through many swaps. My *Lilium* species collection steadily grew, and in 2010 I tried selling a few potted plants at my local village's yearly market. It worked well, people showed interest, and the idea of starting a small nursery began, with main sales being displaying at four yearly plant shows. Later on, I created my website for mail order and, in 2013,

acquired a small piece of land, 300 m^2, on which I established a "showgarden" divided into geographical regions, in relation to where the plants come from, as well as production beds. It is here that I grow most of my lily collection today. At the time of writing (November 2015), I grow 47 species and subspecies.

This year marks 16 years of lily growing, here in Switzerland, and over the years I have grown nearly 80 different species; given that there are about 100–110 species, currently known worldwide, that is quite a large number. Sadly enough, of course, not all of them flowered or grew well and a few proved very difficult to keep even for a few months, being very specific in their requirements.

However, in this article, I will focus on the highlights of 15 years of lily growing, delving back into my archives, notes and photographs, in order to recall some of my personal favourites from the years past.


Lilium canadense

Lilium canadense For many years I struggled with growing this Canadian beauty – one of my personal favourites. I either sourced only small seedling bulbs, which did not tolerate the warm dry Swiss summers very well, or I had pest infestations on more — seemingly — vigorous plants. However, in 2014 I was finally able to get some good-sized bulbs which grew very well in a sunny spot in acid and humus rich soil. What a joy to admire, for the first time, a marvellous stem with almost ten flowers! So gracious and elegant with its wide flaring upturned orange-yellow flowers — it was an amazing sight! In 2015 I had almost 10 flowers in half shade of a very beautiful orange-red form. The key to success with *canadense* seems to be acid soil, which stays moist from spring to autumn, thereby making more vigorous growth and larger bulb clumps in time.

Lilium gloriosoides Exquisite, marvellous — in the extreme — and a true wonder of nature. Its pure white flowers are sprinkled with the deepest possible red and look rather like a peppermint stick from a fairground! Long deep purple anthers dangling on gracious extended stamens complete the heavenly picture. Cultivation is definitely not easy. Some trial and error is needed to find the perfect conditions, but as it is sadly rare in cultivation, chances of experimenting with this beauty are few and far between. However, in 2014, after ten years of trying various methods, I finally cracked it!

The key to success seems to be to plant the bulb in a plastic long tom pot,

which is about 20–30 cm tall, and about 10–15cm wide. This pot is filled with a mix made up of 60% ericaceous acid soil mix, and 30% neutral, normal well-drained humus/potting mix. 10% of coarse material is then added, pine needles, very fine composted pine bark or vermiculite/perlite all seem to work equally well. The bulb is placed about 5–10 cm deep in the pot. The pot is then sunk into a raised bed, with the top being about 5 cm below the soil surface so as to allow the stem to grow out of the pot, and if it so wishes, to root into the surrounding soil. The mix in the raised bed should be the same as that in the pot. It is vital that the raised bed is in half shade, and that constant temperature is maintained in the soil. Fluctuations will make the bulb rot, as will overwatering. It is important that the plants never be allowed to dry out during the growing season, but they should not be waterlogged either. The soil needs to be kept constantly moist, and mulched with fine bark. In winter, protection from excessive moisture must be given with a cloche or covering of some sort. This will ensure success for a few seasons, but nonetheless it is sadly not a long-lived species.


Lilium gloriosoides


Lilium humboldtii var. *ocellatum*

Lilium humboldtii* var. *ocellatum
Again a true beauty and a favourite of mine. *Lilium humboldtii* is a typical "dryland lily", meaning that it grows in areas where soils in summer go very dry after mild often wet winters and wet springs. Therefore, if you want to attempt this rare—and almost impossible to find—species, it is vital to understand its specific needs: a dryish soil without too much humus, which will make the bulbs rot, and an almost totally dry period from the end of flowering to about November. Winter


Lilium kelleyanum

rains or even snow cover, keeping the bulbs a bit drier, are fine. Growth in full sun without too much competition from neighbouring plants seems the best conditions, as, when grown in shade, excess moisture in spring may cause fungal disease. I had a short-lived success for about two years with this species in 2010/2011 and then lost it. I was able to acquire a new bulb in 2013, planted in full sun in soil (that I had brought down in bags from the Jura mountains), which mimicked as closely as possible its native "dryland soil". The bulb produced one flower in 2014, and 10 in 2015. I can only cross my fingers that I will see it again in 2016!

Lilium kelleyanum Another true American beauty, which I have experimented with for several years. I was finally successful in growing a nice stem, in 2015, that flowered with over 10 flowers, which were admired by many visitors to my show garden. The subrhizomateous bulb is planted in a humus rich slightly acid soil, with the bulb and roots shaded, while the actual plant gets sun for about 60% of the day, which seems to suit it well.

Lilium majoense Although this gracious lily survived with me for only two seasons, once in 2006 and again briefly, in 2009, it certainly deserves a mention. Once seen in bloom you will never forget this sight (and scent — especially at night, very overpowering indeed!). As I was leaving for a two week trip to Ethiopia, in July 2006, when the unique flower was about to open, I decided to cut the stem half


Lilium majoense

way down and take it with me—in a bag—on the plane. It travelled safely with me and bloomed for over seven days—in Ethiopia!

Lilium grayi Short-lived (only two seasons) but very unique with its dark red hanging bells. I obtained superb specimen-sized bulbs, of this American rarity, at the 2005 Lily Group bulb auction. They grew well and flowered profusely in 2006, some stems had over ten flowers. Sadly, the next year there were only one or two flowers to a stem, before disappearing completely the following season. Now, pretty much impossible to find for sale anywhere, this is a jewel greatly missed!

Lilium martagon cattanniae It has always been a great joy when this dark burgundy beauty has made appearances in my collections over the years, mostly obtained through swaps with Lily Group friends, as it is not common commercially. I have found it, however, more difficult to grow than *Lilium martagon* and *Lilium martagon* var. *album*. Bulbs may flower profusely—and be growing vigorously one year—only to be totally gone the next. It tends to flower in late June, early July, two to three weeks later than other martagons, and can be very prone to fungal disease.

Lilium nepalense Not very rare, but a curiosity, not only for its strange sombre colour combination of greenish yellow and purple, and the fact that it changes scent at night, but also for its incredible stoloniferous capacity! In Swedish garden centres, where this species is very popular, plants often grow out of the plastic pot drainage holes. A few years ago I obtained a shorter form from Gothenburg botanical gardens, with huge flowers, more yellow in colour. Sadly they were not long-lived. In 2005 or 2006, in a large 60 cm wide wooden pot, a stem circled around a few times before trying to plunge downwards in order to grow out of the bottom, at which point I had to help it upwards to get it back on the right track! I have found that this species loves ground cow horn, which I apply at the time of planting, or in the autumn. Bulbs can double or triple in


Lilium 'Kushi Maya'

Above, from left, *Lilium pardalinum* var. *giganteum*, *Lilium primulinum* var. *burmanicum* and *Lilium papilliferum*.

size in one season with this method of feeding! Worth a special mention here is the outstanding *Lilium* hybrid 'Kushi maya', a *Lilium nepalense* × Oriental hybrid cross, which produces massive flowers, very like *Lilium nepalense*, but larger and more robust, with stronger stems. The flowers also change scent at night, and each individual flower usually lasts for a bit more than the usual seven days for other individual lily flowers. It is also with great fascination that I have observed them being pollinated by Hawk moths on warm summer evenings.

Lilium pardalinum* var. *giganteum Again not rare, but a single bulb that I bought at the Wisely botanical garden centre, in 2007, has been flourishing in my garden ever since, increasing steadily, making its large "panther lily" red and yellow spotted brown flowers reliably, every late June/early July. I know it is a colour combination that is not necessarily liked by some people, but I could definitely not be without my yearly dose of *pardalinum giganteum* blooms!

Lilium primulinum* var. *burmanicum After trying to get hold of correctly named plants for almost a decade, (they are often mislabelled as *Lilium sulphureum* as the bulbs look very similar), and then trying to find optimum conditions for this almost tropical lily, (from upper Myanmar, Thailand and western Yunnan in China), I gradually found that the bulbs dislike the temperature variations and uneven moisture levels in pots, be they plastic or clay, and indeed grow best left undisturbed in wooden raised beds in half shade in humus rich soil with added bark chippings and perlite for drainage. As I write, my largest specimen with eight flowers has just finished blooming, lasting from early October to mid-November. Such a late flowering ranks it amongst the top three *Lilium* species—for late flowering—together with *Lilium speciosum* var. *album* and *Lilium wallichianum*—all great season extenders! With such a late flowering period, seed ripening is not always assured, which is a shame, as it is becoming increasingly hard to buy correctly

Lilium rubellum

labelled bulbs. Totally hardy, this species has survived being frozen in the raised beds at -8° C, with minimal cover, in the winter of 2014/2015.

Lilium papilliferum A tiny ruby gem, only about 10–15 cm tall, and extremely stoloniferous. Like *Lilium nepalense* it is extremely late to emerge, in late May, early June or later, so care must be taken not to damage underground stems when digging around them in spring! Growth is usually very fast, with flowers already in bloom by July.

Lilium rubellum One of the most difficult species I have grown and flowered. This one surprised me to say the least. A friend was able to purchase two bulbs for me while in Japan in 2010. She then posted these on to me. When they arrived, in early April, the stems had already grown considerably in transit, but most importantly, they showed the typical characteristic of this species. The small buds were already formed and very visible even at an early stem-growth stage. I carefully potted them in a very well drained mix. The highly fragrant, vivid pink blooms, with orange anthers, bloomed in May. Sadly however, by November the bulbs had more or less already rotted, making it one of my most short-lived beauties!

Lilium fargesii Again a short-lived beauty, with a tiny bulb barely one centimetre across! Here I was struck by the absolutely miniature Turk's cap flower, barely 1–2 cm across.

Lilium regale One of my all-time favourites, I started growing this species I think in 2001 or 2002, and since then, I do not remember a year that this species has not been in bloom with me, either from earlier acquired bulbs, or from a few new bulbs which I plant every other year to enlarge the clumps. The exquisite perfume of this marvellous lily on a warm summer

Lilium speciosum var. *rubrum*

Lilium taliense

evening is pure heaven. A true sun lover, who likes its stem roots shaded and kept moist during the growing season. Planted in too much shade they are at risk from fungal disease and stem wilt during moist springs. A clump planted next to the garden entrance has now survived, since 2005, with very minimal care.

Lilium speciosum* var. *rubrum I will always have a particular affection for this species, one of the first I ever grew. It has always been widely available, as good quality bulbs, from Swiss garden centres in early spring. What I liked about it was the fact that it was a reliable late summer bloomer, which then carried on well into late September most years. This meant that when I got back from my summer holidays in Sweden, around mid-August, (at which point most plants had more or less finished blooming for the season), *Lilium speciosum* var. *rubrum* was still in bud, ready to bloom equally well whether the summer had been dry or wet while I had been away. The last flowers on the stem always opened three to four weeks later than the first flowers, making each individual stem last very long in flower.

This overview could not be complete without a few honourable mentions to the following: An exceptionally large, huge in fact, *Lilium pumilum*. The flower was two to three times as big as a normal flower of the species. The bulb was also much bigger. A superb individual of *Lilium taliense*, which exhibited so much variation that individual flowers on the same stem, blooming at almost the same time, would be coloured differently and finally a few more record breakers: two *Lilium* 'Royal Gold' specimens, which reached 180 and 206 cm tall. The highest

bud count was on *Lilium* × *dalhansonii, Lilium* × 'Black Beauty' and *Lilium regale*, all exhibiting over 35 flowers on very strong specimens. In terms of scent, apart from regale, I would have to say that almost nothing beats one of my all time favourite Lily hybrids, 'Star Gazer', the sweet scent on a warm summers day is exquisite and unforgettable. Curiously elegant is a new creation released only recently from Japan, a "lotus lily", double light pink, named *ploypan,* which is very attractive indeed.

A long time ago, in a past RHS Lily Group Yearbook, I wrote at the end of an article that one of my goals was to have grown almost all of the *Lilium* species—on my then current "unfindables" wish list—by the time I was thirty. Well, with 78 species grown so far (not all of which flowered or grew with success of course), I can say that I almost managed it. I did manage to find "unfindables" such as *Lilium kelleyanum, Lilium canadense, Lilium kelloggii, Lilium rubescens, Lilium washingtonianum, Lilium humboldtii* var. *ocellatum* and *Lilium grayi*, to name but a few. After years of trial and error, I also now have superb well-established specimens of *Lilium kelleyanum, Lilium canadense* and *Lilium humboldtii* var. *ocellatum* growing very well, which I feel is a great achievement. During this autumn, I was able to acquire a few new and very exciting arrivals—more "unfindables"—namely *Lilium iridollae* and *Lilium ledebourii*, bringing the total species count to 80, grown since 1999 (I have just procured number eighty one—*Lilium henrici,* which, despite being only a seedling bulb, should grow well next spring).

Some of my remaining "unfindables" are *Lilium bolanderi, Lilium catesbaei, Lilium humboldtii* (the type), *Lilium occidentale, Lilium rhodopaeum,* and *Lilium neilgherrense,* as well as *Lilium* × *testaceum* and *Lilium* 'Enchantment'.

However, there is still hope. Indeed, since I joined the Lily Group in 2004, and also NALS a few years later, I have been fortunate enough to meet many lily friends worldwide, which has led to fascinating garden visits, long lily talks and exchange of both rare species bulbs and knowledge, as well as trips abroad and also in Switzerland to see lily species growing in the wild. Only a few days ago, in fact, I was able to get seed of *Lilium bolanderi* and *Lilium occidentale* from a kind American Lily Group member—very exciting indeed!

And a final question you may ask? If I was stuck on a desert island, with no good outcome in sight, and was allowed to take only five lilies with me, that I had never grown or seen alive before, which ones would they be? Well, it is a difficult question, but if I had to pick, I would probably say: *Lilium catesbaei, Lilium occidentale, Lilium bolanderi, Lilium neilgherense* and *Lilium rhodopaeum*. I would probably miss *Lilium arboricola*… since, although it is epiphytic, I don't think it would like sand or the bare trunks of desert island palm trees so, sadly, I would have to leave it behind!


Lilium yapingense

Searching for lilies (and other plants) in Yunnan

*In this article **Alan Mitchell** describes an experience where so much could have gone wrong, but where everything turned out just right.*

One of the fascinating aspects, of being editor of *Lilies and Related Plants*, is that e-mail has enabled me—virtually, if not actually—to travel the world making contact with people who share my obsession with lilies, (and their relatives), and who wish to write about their experience and expertise in relation to this most beautiful of plants. However, perhaps an even more remarkable use of e-mail was when I employed it to organise a trip to Yunnan, which, to my astonishment as an inveterate pessimist, resulted in a tailor-made experience without any hitches or glitches. For that I have Bjørnar Olsen to thank, a young Norwegian plant hunter, (see his website at: Trillium.no), whose resourcefulness, and ability to locate many *Lilium* and *Nomocharis* species, as well as plants from a host of other genera, made my trip a total success.

Long-haul flights are gruelling, even when your destination is Shangri-la, which, unfortunately, did not resemble the utopia described in Lost Horizon, the 1933 novel by James Hilton. However, after 25 hours, flying and waiting to fly, I was shaking hands with my guide, Bjørnar. Later, at the hotel, Bjørnar introduced me to our Chinese translator, Daniel, and then outlined the plan for an early start, next day, to visit a place called Napa Hai. After breakfast, of warm soya milk, steamed parcels containing chopped pork, eggs boiled in tea and cups of green tea, we drove north.

Napa Hai and Tianchi Lake Napa Hai is a huge flat expanse of grassland surrounding a shallow lake. Our objective was to find *Lilium lankongense*, in the



***Above, from left**, Lilium souliei, Nomocharis forrestii* and *Nomocharis meleagrina*.

hills beside the road, which we did—but in bud, not in flower. Bjørnar was also looking for *Cypripedium yunnanense*, which we found without difficulty.

Our next destination, Tianchi Lake, was a three to four hour drive from Shangri-la over unpaved roads. This was the first of hundreds of miles of off-road experiences, driving over potholed and, frequently, flooded surfaces, with our rumps and heads taking equal punishment, as we bounced our way to various plant locations.

It was damp and chilly when we arrived at Tianchi Lake, which, given that it is 4,000 metres above sea level, might have been expected—even in June. Fairly soon we found dozens of *Lilium souliei* plants growing through, and protected by, *Rhododendron impeditum*. The downward facing, deep purple flowers, of this dwarf species, make it difficult to take photographs of the inside of the tepals, but, after some contortions, that resulted in wet knees, I managed to take some images that were suitably sharp. Apart from *Lilium souliei*, there were other interesting plants in flower, e.g. *Rheum Alexandre*, *Meconopsis integrifolia*, the large, and slightly sinister looking, *Megacodon venosus,* which is a pale green relative of the more common, but far more attractive, blue gentian and hundreds of *Primula secundiflora*.

Lijiang, Yulong Xue Shan and Laojun Shan After leaving Shangri-la—heading south—it took five hours to get to Lijiang. As happened frequently, when we were travelling from one place to another, Bjørnar would either spot a plant from the vehicle and shout STOP!—which the driver did promptly—or would know, from the GPS co-ordinates on his mobile phone, where we would find plants. As I recall, our first encounter with a *Nomocharis,* was as a result of Bjørnar's acute eyesight. The species in question was *Nomocharis forrestii*, which had pretty pink, moderately spotted, flowers and was growing in a shrubby grove with, among other species, *Lilium taliense*, which, unfortunately, wasn't in flower. Other plants


Above, from left, *Nomocharis gongshanensis* and a richly-coloured, unidentified *Nomocharis*.

we encountered, when we stopped by the roadside, were *Cypripedium flavum* and *Cypripedium guttatum* and various species of *Arisaema,* the most attractive of which was *Arisaema candidissimum*.

I have to admit I find identifying *Nomocharis* species difficult, as there is such variation within species, for example the flowers of *Nomocharis aperta* can be virtually white and almost spotless, or deep pink and heavily spotted. Patrick Synge, in his book *Lilies*, indicates that *Nomocharis aperta* belongs to the *Ecristata* section of the genus, "in which the filaments do not have the wide pantaloons at the base and in which the leaves are alternate or scattered and not in whorls as in the *Eunomocharis* section". I suppose the presence, or absence of "wide pantaloons" helps, if only with *Nomocharis aperta*, but the diversity of size, from one foot to over three feet in height, colour, from palest pink to deepest pink and yellow—in the case of *Nomocharis gongshanensis*—which looks to me like a form of *Nomocharis aperta*, not a separate species—made accurate identification of species very daunting. However, my solution to my confusion was to accept Bjørnar's judgement, regarding the identification of *Nomocharis* species, as after all he was my guide.

While we were based in the old town of Lijiang, which is beautifully preserved, we visit the Yulong Xue Shan, to the north, and the Laojun Shan, to the south west. After Bjørnar and I were dropped off at the roadside, in view of the Yulong Xue Shan, we headed towards the mountains and then traversed into the Gang Ho Ba, which is a long valley leading from the road into the heart of the mountains. The scenery was spectacular, whether looking down the long valley, or towards the tops of the pale grey peaks, which were hidden by white clouds beneath a clear blue sky. Unfortunately, we found, only, stems of *Lilium duchartrei*, in bud, and, even more disappointingly, stems of the very rare *Lilium habaense*, without flower buds. While we were searching the forests for lilies, Bjørnar and I lost each other, so I walked out of the trees and onto a dry riverbed, that ran the length of the

valley, and texted him. Eventually, and to cut a long story short, we managed to communicate by text until we met back on the road. The wonders of modern technology!

The top of the Laojun Shan, (4,247 metres), was the highest point we reached on the trip. On the way there we found *Lilium bakerianum* var. *delavayi*, using GPS. It was interesting to contrast Bjørnar's method of locating lilies, and other plants, with the expeditions of old, involving ponies and porters and all kinds of paraphernalia. We also found *Nomocharis pardanthina*, which was using the protection of *Rhododendron impeditum* to avoid being eaten by animals, notably the pigs that were quite ubiquitous.


Lilium bakerianum var. *delavayi*

Dali and Nujiang We searched for, and failed to find, *Lilium pinifolium* on Cangshan, which is above Dali. Although we didn't find any lilies on Cangshan, Bjørnar published (on his Facebook page) some stunning photographs of *Lilium primulinum* var. *ochraceum*, which he took on Cangshan in September. Before heading west to Nujiang, we relaxed at the Jade Emu hostel, acted like tourists, in Dali, and spent some convivial evenings at the Bad Monkey pub.

After a relaxing time in Dali we moved to the far west of Yunnan where near Pianma, which is close to the border with Myanmar, we found *Nomocharis farreri*, in flower, and one stem of *Lilium primulinum* var. *burmanicum* in bud. It's a pity the aforementioned *Lilium* species wasn't in flower, as I'm sure it would have looked suspiciously like *Lilium poilanei*!

From a place called Liuku it took a day, by bus, to reach Gongshan, at the northern end of the Gaoligongshan, a sub-range of the Hengduan Mountains to the north. Having crossed the Yangtze River, while in the vicinity of Lijiang, we then crossed two of the other great rivers of Asia, the Mekong and the Salween, which made me think of associations with plant hunters like Kingdon-Ward, Forrest and Rock. From Gongshan we took a car to Dulongjiang and beyond (on the worst roads and in rain that never quite stopped). The next stop, heading north, would have been Tibet.

In pouring rain we found *Lilium henrici*—clearly a relative of *Lilium mackliniae*—*Nomocharis meleagrina, Nomocharis saluenensis, Nomocharis aperta, Nomocharis gongshanensis* and other *Nomocharis* plants that were


Above, from left, *Nomocharis farreri* and *Lilium henrici*.

difficult to identify accurately.

The journey back to Gongshan, in the pouring rain and pitch darkness, included driving through a tunnel that was still being built, which was fine while we benefitted from the arc lighting of the construction workers, but things became less fine when we drove—for half an hour—through an orange fog—the orange colour being contributed by our vehicle's headlights.

From Gongshan we travelled south to Fugong and then off-road to Yaping Yakou, a few miles from the border with Myanmar. However, before reaching Yaping Yakou we met a road block, because the road was still under construction. Fortunately, the hawk-eyed Bjørnar spotted some flowering *Cardiocrinum* plants.

At Yaping Yakou, a place we would not have been able to visit without Bjørnar's resourcefulness and ingenuity, we found *Lilium yapingense* and *Lilium saccatum* (or *georgei*). Within a comparatively small, sodden area, we found the colour of *Lilium yapingense* ranged from the typical pink to white and claret. As for *Lilium saccatum*, Synge describes the flowers as being "rich blue-purple, deepest on the outside". Perhaps we found the brown form, as the flower looked like someone had placed a used teabag on a short lily stem. When I asked Bjørnar about this he indicated that the flowers were fresh and they were actually brown, not as they have been described in lily reference books. On the way back to Fugong, Bjørnar thought we had found a plant of *Nomocharis basilissa*, Synge's description of which—without being ironic—tallies more closely with the actual plant than it does with his description of *Lilium saccatum*. The last species lily we encountered was *Lilium leichtlinii* var. *maximowiczii*, which was growing on an overhang above the road, next to the Salween River.

After the long journey back to Dali, Bjørnar, Daniel and I agreed that the trip had been a success and we had become good friends. Certainly, measured against my very specific criteria, the trip—as they say these days—ticked all of the boxes.

Fritillaria ojaiensis of California's Central Coast

Words and images by ***Michael and Mary Jane Delgado***

In this drought-stricken stretch of the Central Coast of California, there are still some pockets of beauty to be found. We, Michael and Mary Jane Delgado, have been interested in native wildflowers since moving to the Santa Ynez Valley, 24 years ago.

There are many, many micro-climates nestled in the rolling hills between the Santa Ynez Mountain Range to the south, and the San Rafael Mountains to the north. Within these pockets of perfect weather you will find, not only the flower of which we speak, *Fritillaria ojaiensis*, but it is also home to the very important pollinators that buzz past our noses as we hike.

The early Spring days of March and April not only encourage the wildflowers to emerge, but there are at least a dozen busy butterflies living in quiet harmony with the fauna and flora of South Refugio Road. One of these incredible beauties is a tiny butterfly called the Sonoran Blue (*Philotes sonorensis*).

It too inhabits a very small length of earth, and greets us with its fluorescent blue wings each time we turn their corner. South Refugio Road is an aged dirt road of deep crevices, rocks that split the underbelly of your car, and such natural beauty that it is indeed a photographer's dream—between the sunny morning hours of 10–12, that is.

Michael and several of his botanical friends had been looking for *Fritillaria ojaiensis* for years. About six years ago one of the members of our local Natural History Society told Michael that he had spotted a small group of Ojai Fritillaries on the minimally accessible dirt road (Refugio) which displayed the 'perfect storm' of conditions to nurture and protect these lovely bulbous plants.

And so it was, on an early misty morning in March, Michael found the rich green leaves on a twenty-foot stretch of dirt road, on a north-facing slope with cool drainage. It is rocky and moist, and never gets direct sunlight. Michael immediately spotted the three shapes of leaves, which indicate the maturity of each bulb. The smallest, narrow leaf is from the first year bulb. The very long, 12–14 inch but still narrow leaf is displayed during the second year. The very wide heart-shaped leaf means that that plant will shoot out a long, 12–14 inch stalk next years, filled with three to five blossoms of the rarely found and much loved *Fritillaria ojaiensis.*

It's easy to see why so many people have passed right on by this little native garden. There is not much there to draw their attention. There aren't any

Above left, size of leaf of a three year-old *Fritillaria ojaiensis* and ***right***, a Fritillaria colony showing leaves of three different years.

colourful companion flowers to pull your eyes to the south at this point. As a matter of fact, by the time a hiker gets to this spot he or she is looking up at the sunshine corner that lies just ahead. With that perfect camouflage, we were confident that all would be protected and growing strong for our return in two weeks, looking for the elusive flowers.

They're green! The flowers, that is. The *Fritillaria ojaiensis* is rather green on the top side, and a bit of lime green with dark speckles inside. It actually took a few moments to find the first blossoms, but once we were able visually to filter out the riff-raff of weeds, we were like kids in a candy shop. "Look over here! Here's one with three bells." And then, "Wait, wait! Here's one with five!" Where's the camera?!

We couldn't find them fast enough. We were kneeling and poking around, trying to find every last one. Never mind that we were getting muddy, slipping and falling on the loose rocks and natural mulch, we were too excited to notice. The rocky background couldn't have been more picturesque for our first photos of this exquisite flower. Its beauty in the wild is surpassed only by its fragile lure, making us want more.

That first year, for us, was a treasure trove of discovering new and exciting wildlife that hides just below our line of vision. This dirt road, which heads up and over the Santa Ynez Mountain Range (and passes by President Reagan's Ranch),

Fritillaria ojaiensis blossoms with curly leaves and bud.

ends up at a popular ocean beach. Centuries ago, this same road was an Indian path used by the Chumash tribe of the inland valley to trade food and supplies with the Chumash tribe on the coast. Surprisingly, as we walked up to check on our favourite bulbs, Michael stepped on an obsidian arrowhead. Was this from the original tribes? We like to think so. We wonder if the tribal members knew

about the Ojais? Did they maybe use it in some way for rope, or a colouring agent, or medicine? Anyway, it's fun to imagine all the history of this area, both human and botanical.

Back to the *Fritillaria ojaiensis*. We hiked up to this patch of excitement a few more times over the next two months, before the blossoms began dropping their petals and exposing the tiny, multifaceted green seed pod. The pods grow to about an inch in length, and continue to mature until they are toasty brown, and just as crispy. We never counted the number of seeds in each pod, but it looks like 10 seeds in each of the four pod chambers. Like all of nature, each seed pod is so perfect, so symmetrical, so bursting with life—it is a photographer's dream.

Mary Jane gets the honour of photographing every little nuance of these perennial bulbs. That first year she must have taken at least 200 photos of the 21 sprouts found. Of course this meant getting down in the muddy mulch again, but getting a photo of the stunning inside was well worth it.

Michael, who is deep into propagation, took a few mature seeds that first year, in late April. He waited until the fall and planted them in his backyard nursery. Why? Because the challenge was there: could he successfully propagate a rare wildflower through all its four stages, and then successfully return it to its native soil? Of the approximately 25 seeds he used, about half of them did not emerge with a shiny, narrow leaf. Of the ones that did emerge, Michael returned three to their natural habitat. Of those, two sprouted a small but healthy stalk with three flowers, hanging downward, as fritillaries do, enticing the observer to take notice. A proud adventure indeed!

From then on, Michael has taken those wildflower propagation skills and has successfully brought to fruition the lovely Chocolate Lily (*Fritillaria biflora*), the tall, colourful Humboldt Lily (*Lilium humboldtii*), and the Blue Dic (*Dichelostemma capitatum*) as well.

That was then. Now, in the fourth year of drought, we found only nine plants with smaller seed pods than usual. The Fritillaries were breathtaking, that first year, and are still a delight to share with other enthusiasts. Hopefully, the hundreds of seeds that lie in the oak mulch, will emerge when the rain comes to the nooks and crannies of that stony north slope.

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Footnote

This article was first published in Journal 37 of the Fritillaria Group of the Alpine Garden Society and is reprinted here by kind permission of the Society.

My passion for lilies

Alain Jean Denis *grows an impressive number of species* Lilium*, as evidenced in the following article, which confirms the "passion" he feels for his favourite plant.*

I'm a French — and fresh — member of the RHS Lily Group and would like to share my passion for lilies. Like most of you I have been growing *Lilium martagon*, with success, for a long time. My martagon bulbs were grown from seed received from the SAJA — Société des Amateurs de Jardins Alpins, (The French Alpine & Rock Garden Society), of which I'm its Bulletin's editor.

In 2009 I was invited, by John and Hilary Birks, to take part in a four week trip to north-western Yunnan where I encountered and photographed *Lilium bakerianum* var. *delavayi*, *L. lophophorum*, *L. souliei*, *L. nanum* var. *flavidum* and a species that was still in buds, probably *L. lankongense*.

After this trip I wanted to grow some of the lilies I saw, so I bought bulbs from Chen Yi's Nursery, which I planted in the Vosges where I had just bought a chalet — in the wild — at an altitude of 830 m on a field of 1,800 square metres. The acidic soil, deeply drained by screes, allowed me to plant about 40 Rhododendron species, which grow in western China, or in the Himalayas. I planted *Rhododendron auriculatum*, *R. bureavi*, *R. fortunei*, *R. taliense*, *R. yunnanense*, *R. wardii*, and others, as well as the bulbs received from ChenYi. Unfortunately, to begin with, only *L. bakerianum* var. delavayi and *L. papilliferum* flowered, but, among

Lilium papilliferum

Lilium bakerianum var. *delavayi*

others, *L. lophophorum*, *L. lankongense* and *L. primulinum* var. *ochraceum* duly flowered and set seed.

In the Autumn of 2013, I decided to dig up all my species lily bulbs and to plant them in pots, in my greenhouse, in the southern region of Paris, as I wanted to see them flowering, but also because I had formed the idea that by producing more bulbs I could have them growing in both locations, i.e. Paris and the Vosges. I also planted some other species, bought in local nurseries, or exchanged with friends. In 2014, some species flowered: *L. davidii*, *L. pumilum*, *L. lankongense*, *L. bakerianum* var. *delavayi*, *L. henryi*, *L. leichtlinii* and *L. lancifolium* 'Splendens'. The other species did not flower, perhaps indicating that they preferred not to be disturbed for a time.

I faced another problem, with bulbs bought from Chen Yi's Nursery, when I realised almost all of the bulbs were in fact misnamed. On her list, *Lilium lankongense* was named *L. duchartrei*, pink variety, *L. papilliferum* was *L.* sp. from Tibet and *L. leucanthum* var. *centifolium* was *L. davidii*, with *L. bakerianum* var. *rubrum* as var. *delavayi*. Fortunately, I think they are now correctly named, including those that I have not seen in flower. The lesson for me, is that bulbs sold on the net—by this type of "non-nursery"—are dug up in the wild, rather than cultivated properly, and this is why most of them are misnamed.

This is the reason why, during the past three years, I have ordered seed, of

all species available, from botanical societies: AGS, SRGC and AGC-BC and from private collectors too—but mainly from Bjørnar Olsen—and I was surprised how easy it was to germinate the seed I received. I'm aware that flowering lilies from seed may take a long time, and I'm often impatient, but they germinate rather quickly and this is also the best way to get bulbs free from virus and thus to grow healthy plants.

I'm currently growing around 85 species lilies, of which 60, have come from seed. 25 different species *Lilium* bulbs are cultivated in pots or in the garden, six species are grown from bulbils, two or three from scales, but only from wild bulbs like *L. bakerianum* var. *delavayi*, which seems quite easy to grow—in a pot or in the garden—provided it has a moist well drained soil during the flowering season, but is kept dry in winter, either under a snow cover or in a steep scree, as I do (or both).

Now, with my limited experience, I'm more and more attracted by the Asiatic species, of which I grow the majority of species, but I also have an interest in most species of the candidum group, including the rare *L. ledebourii* and *L. polyphyllum*, which both germinate easily, when pots are placed in the fridge for three months, and I hope to see them flowering if I'm lucky enough. I have noticed that species, from this group, have a better germination when placed in the fridge for a time.

However I'm aware I still have much to learn, for instance when I began to cultivate these wonderful plants, some important information was frequently missing, for example:

- when must seedlings be planted out?
- is it necessary to feed the seedlings and when?

Opposite
Lilium bakerianum var. *delavayi* growing in the greenhouse.

Right
Lilium lankongense

- some "flowering-sized bulbs" have never flowered, (although I received them three or four years ago), like *L. sulphureum* (which produces bulbils) and I don't know why. Perhaps these species are better grown in the garden, which retains humidity during the flowering season?
- after flowering time, I usually reduce watering and stop when leaves turn yellow, but I don't know if it is the correct way to proceed?
- is it necessary to dig up the bulbs in late autumn, every year, or is it better to keep them undisturbed in pots, or in place in the garden?

I found the following helpful site on the web which became my 'Bible', not only to enable me to identify my Chen Yi bulbs, but also to collect much information: www.the-genus-lilium.com/index.html created by Dr. Markus Hohenegger.

Then, I discovered the RHS Lily Group's website, where I was happy to find most answers to my, aforementioned, questions under the heading "About lilies" and this is why I decided to join the RHS Lily Group, to benefit from its members' experience and share our successes, as well as our failures, but overall to share our common passion, *Lilium*.

When Alan Mitchell asked me to write an article for the RHS Lily Group, I accepted, but then I wondered what was so extraordinary that I could impart on the subject, of species lilies, as I'm a true novice in lily cultivation. However, one always finds something to say, some experiences to share, and I hope I will be able, in future, to submit another article on difficult lily species, which I have grown successfully.

Lilium polyphyllum in the Wilds of Uttarkhand, India

Lilium polyphyllum is a very rare member of the candidum group of lilies, which is seldom seen in the gardens of lily growers. In the following article, ***Vijay Chandhok*** *describes finding this beautiful species in its natural habitat.*

I grew up in the Valley of Kashmir in the foothills of the western Himalayas and spent much time trekking in the alpine meadows of Kashmir. More recently, we have built a house in a town called Mukteshwar, in the State of Uttarkhand, at an elevation of 7,000 ft., near the southwestern border of Nepal.

As I had become interested in lilies, especially species lilies, I joined the North American Lily Society. I went on several group trips locating and photographing species lilies in Pennsylvania, where I live, and in the Pacific Northwest.

I had read several articles about *L. polyphyllum* growing in mountainous areas ranging from western Pakistan to Uttarkhand in India. It is known to grow at altitudes ranging from 7,000 to 12,000 ft. The reported sightings were in Kashmir near Pahalgam, Manali in Himachal Pradesh, and in Gangotri National Park. This latter sighting is in the general area where we had built our house, leading me to plan a trek to see if I could find it in places far from tourist destinations.

L. polyphyllum is known in India as Kshirkakakoli and the bulb is collected for medicinal and cosmetic purposes. It is not grown commercially so it is becoming depleted in the wild.

Opposite
Our first view of the Bhagirathi peaks.

Right
This spectacular path to Gaumukh was another reason we went on this trek.

I decided to go to the Gangotri National Park in the first week of July, 2009, as it is the blooming season for this species. July is not a recommended time for trekking in the Himalayas. It is the monsoon season, which makes roads and trek paths dangerous. I was joined by our son Vic and granddaughter Mana on this trek. We were lucky as we had perfect weather except for a few showers at the highest elevation.

After a day to recover from our 14-hour flight from Newark to Delhi, we started by car for our house in Mukteshwar. The distance is only about 300 km, but with traffic and winding roads up the mountains it takes about nine hours with one stop for lunch. We stayed in Mukteshwar for two days to get adjusted to the altitude before going higher up on the trek.

We drove to Gangotri from Mukteshwar in Uttarkhand State. Travelling up one mountain and down another, the car trip from Mukteshwar to Gangotri took two days. One of the highlights of this trip was crossing over the Tehri reservoir on a one-lane suspension bridge.

Everyone voted to skip this bridge on our way back. We crossed the bridge and looked back, then wondered why we had gone on this thing. We took a longer route back to Mukteshwar on our return.

Gangotri is a noted pilgrimage location in India at an altitude of 10,000 ft. We were able to book rooms in a hotel on the internet, which was interesting, but when we arrived at the hotel they had no computer and no record of our reservation. We showed our confirmation on our laptop and after some phone calls they gave us the required accommodations. We spent the night in Gangotri to adjust to the elevation. Gangotri is a lively town with temples, but the main attractions for us were the waterfall and exploring the town and the temples where there were a lot of antique coins for sale. We found a good place for dinner at a "Dhabha" where they made food to our required chillies level and used this place for food on our return also.

The trek route follows the Bhagirathi River, at about three hundred feet above the river bed, to the Gaumukh Glacier and the Bhagirathi Mountains. The Bhagirathi River is the main tributary of the sacred Ganges River.

The distance from Gangotri to Gaumukh ("Cows' Mouth") at an elevation of 13,500 ft. is about 24 km in a steady climb.

One can get mules to ride for 19 km, but in a few places it is dangerous to ride on a mule as the path is very narrow and unstable. The last five kilometres to the glacier and back have to be done on foot. We hired four mules for the trek; I was the only one who rode for part of the way. The mules are not allowed to spend the night near the Gaumukh area so they go back to Gangotri. They returned on the day we planned to leave.

There is a camping site and shelter in Bhojwasa, about five kilometres from the Gaumukh glacier. Originally we had planned to stay there overnight after trekking 14 km and then go to the glacier in the morning and return back to Gangotri from there. We made the mistake of not following this plan and went to the Gaumukh glacier the first day and then returned five kilometres back to the shelter for our overnight stay. This made a total of 29 km in one day; we paid for this mistake by leg cramps and headaches for almost all of us that night.

The Uttarkhand authorities have removed all the vendors from the path in the last five years. For this reason, the trek was very clean, which is unusual for a pilgrimage path in India. However, there is no food available anywhere on the trek except for some tea at Chirbasa, the midpoint on the trek. As there is good water available from spring fed streams, taking some cookies or crackers is advisable.

Fortunately for us, there was food available at the shelter in Bhojwasa where we spent the night. They even had hot chocolate for us in the evening and for breakfast. Dinner was also very good and served in the kitchen where it was warm. The kitchen was well equipped with cookies and other snacks. To top it all, they had a western style bathroom and hot water for washing up.

Getting back to *Lilium polyphyllum*: A few miles from Gangotri we entered the Gangotri National Park, which is a restricted area requiring a special permit to enter. This took a few hours to arrange. The rest of the path to Gangotri is inside the Gangotri National Park.

The soil was very dry in most of this area and the path very narrow on the

Opposite and right
Lilium polyphyllum in bloom as we climbed the path towards the Gaumukh Glacier, Gangotri National Park.

side of the mountain, with the Bhagirathi River (which forms the Ganges further down) flowing below. The growing area was almost 60° steep with no chance of water accumulation, showing this lily's favorite growing conditions. The other areas where *L. polyphyllum* has been sighted are in similar places with very steep growing areas.

About a mile from the start of the National Park, we saw the first sign of faded flowers on *Lilium* stems. As we went further and higher, we saw *L. polyphyllum* flowers in their prime, growing on the side of the mountain in granite dust soil.

The plants were surrounded in most places by thorny wood rose bushes and thus were protected from animals. There are herds of Ibex in the area which are protected by the Forest Department and it is hard to believe that this lily could survive here without these natural thorn barriers.

Mana holding a piece of the ice from the Gaumukh glacier.

About eight kilometres up the path the *Lilium* flowers were no longer visible. Possibly this is because it is the end of the range where it grows or it is an area where the Ibex and other animals are more prevalent.

Mana was able to get some nice closeups of the lily. One of them shows ants on the flowers. They may be the pollinators for these flowers. We also saw last year's dried stems with seed pods but no seeds. The best time to collect the seeds is in October and I have been planning to do that, but October is also when the snow begins in this area and there is a chance of roads closing. I still plan to do seed collecting one of these years. I understand that the snow can be 8–10 ft deep in this area in the winter. Recently it was reported that motion activated cameras photographed snow lepoards in the area.

It was interesting to see that the ice breaking off the glacier was crystal clear. See the above photograph of Mana Chandhok holding a piece of the ice. The Gaumukh Glacier has receded about eight to nine kilometres over the last few decades and the rate of melting has increased in the past few years.

I did try to get to the bulbs of the *Lilium* but they were more than eight inches deep and the only tool I had was a walking stick. I managed to get a small bulb which broke into scales.

I attempted to access another location for finding *L. polyphyllum* in a place called Dhanolti, also in Uttarkhand State at an elevation of 7,500 ft. A friend had told me that they had seen it growing in this area. We drove from Delhi in the second week of July and got to Dhanolti by late evening. We checked into the Apple Orchard Resort. At about 10 p.m. it started raining and it rained all night. We got up next morning, had breakfast, got directions for the flower area, and bought umbrellas. It kept raining and we got word that the road had been closed in both directions, but it should open soon. After getting drenched, we gave up the hunt for the lily and decided to go to the road blockage. As we were watching a few guys trying to clear the road of a four feet in diameter tree with axes, to no avail, another tree fell a foot in front of our car. The rest of the details of the story are scary! We drove all day and until 3 a.m. to get back to Delhi, as all major roads were closed and I had a flight to catch back to the U.S. that night. I have been banned from going on other lily hunts for a few years!

Conservation update: *Lilium rhodopaeum*

In Lilies and Related Plants 2013–2014*, (in the article: The 'Odd One Out' revisited), an interesting collaboration, between Bulgaria's Ministry of Environment and Waters and Honeyguide Wildlife Holidays, is described. The aim of which is the conservation of the very rare* Lilium rhodopaeum*. The following report by* ***Vladimir Trifonov*** *is an update on how conservation efforts are progressing.*

Report on the status of the rhodopean lily in the locality of the village of Stoykite, Smolyan municipality, Bulgaria, 2014.

The locality of the Rhodopean lily was visited, on 26 June 2014, with a group from Honeyguide Wildlife Holidays, who assisted with ascertaining the status of this lily. Individual plants were counted and the incidence and nature of threats to the population, of the plants found, were observed and recorded.

In total, 53 individual plants were identified, of which 42 were flowering (including three with two blossoms, two with three blossoms and one with four blossoms) and there were 11 non-flowering individuals grouped around the flowering ones.

Compared with 2013, there was a reduction of 10 plants, about 16% of the total population. Also, there was a change in the proportion between flowering and non-flowering individuals, i.e.

2013 17 flowering/ 46 non-flowering individuals (63 total);
2014 42 flowering/ 11 non-flowering (53 total).

The steady decline, in the total numbers of individuals in the population, is recorded in the table below. The data from the annual census shows that the population's number, in 2014, is only 29% of that for 2008. During the seven years period, the minimum of flowering plants was reached in 2013, with just 17 flowering.

Results of the annual census studies, 2008–2014

Rhodopean lily, village of Stoykite: 2008–2014					
Year	**Number of flowering plants**	**No. of non-flowering plants**	**No. of damaged plants**	**Total number of plants**	**increase decrease "–"total number plants by % to previous year**
2008	122	66	28	188	–
2010	96	–	19	96	-48.94
2011	145	–	–	145	51.04
2012	78	52	–	132	-8.97
2013	17	46	–	63	-52.27
2014	42	11	15	53	-15.87

27 July 2014

There were a great number of plants that had been gnawed and damaged by insects (almost half of the flowering plants) as shown in the photographs above. This could pose a serious threat, with regard to seed propagation of the species in the local population, as it appears that the population failed to form seed capsules during the period the plants were observed.

- Individuals — with flowering parts — that survived insect attack numbered approximately 15.

- Formation of the seed capsules had begun. Fortunately, few of the seed capsules were damaged by insects, i.e. only two or three.

The situation with false hellebores (*Veratrum lobelianum*) and other competing species (like bracken–*Pteridium aquilinum*) appeared to be normal, with grass overgrowth lower than in previous years. This may, or may not, have been due to mowing in 2012. The fact that, in 2014, there was a relatively large increase in the number of flowering plants led me to decide that it was not necessary to organize mowing in 2014.

9 August 2014

Another visit was carried out, in the field, in order to identify the success of seed production. No change was found in the status of the seed capsules of the lilies, so there were no additional negative factors detected.

23 August 2014

The growing area, near the village of Stoykite, was unchanged from the previous visit, i.e. there were no further developments with regard to the seed capsules. There were, however, dead and rotting stems, of lilies, which had not been able to form seed capsules.

At this time I also visited the nearest locality, to the village of Stoykite, where the Rhodopean lily grows, near the village of Progled. My aim was to make a comparison of developments with the situation near Stoykite. There I found numerous mature seed capsules. This suggested to me that it was most likely, with the Stoykite (i.e. Progled)population of Rhodopean lilies, that they reproduce, via seed capsules, once every few years and during the rest of the period they propagate by vegetative means from the bulbs.

Right, top, The rotting stems of *Lilium rhodopaeum* and ***below,*** the mature seed capsules of *L. rhodopaeum*.

Conclusions

After four visits, to the Stoykite locality, I think it can be concluded that the total number of the

The beautiful *Lilium rhodopaeum* in full bloom, growing in an alpine meadow in southern Bulgaria.

population, of the Rhodopean lily, remains low. Furthermore, there was a change in the ratio of flowering/vegetative individuals in favour of flowering. In 2014 the most significant negative factor was insect attack, which may be due to external factors like climate change. The local population is not very successful in flower and seed production every year. This particular year, 2014, although the seed capsules remained until the end of August, they did not form seeds and, instead, withered. One reason, for this, may be related to lack of pollination (due to very wet or very dry summers, or lack of suitable pollinators). In respect of this, in such years there is no seed production. Another conclusion, from this study, is that competition from other plant species does not appear to significantly threaten the survival of the Rhodopean lily.

Postscript

The conservation plan, for 2015, is to carry out at least three visits to areas where the Rhodopean lily grows. The first visit will take place before flowering, when plants are beginning to develop, to establish whether there are limiting factors during this period, e.g. early mowing, grazing, insect damage. The second visit will take place when the lilies are in bloom, to count the numbers of flowering and non-flowering plants. The third visit will take place during the period when seed capsules are forming.

★ ★ ★

About the RHS Lily Group

www.rhslilygroup.org

The Lily Group is now organised as an independent separate legal entity with a formal agreement between the Lily Group and the RHS to use their expertise and resources to promote interest in lilies and related plants.

The principal benefits to members of the Group are:

- The **Seed List.** Members of the Group and others, at home and overseas, send their surplus seed from lily species and hybrids, other Liliaceae and many other garden plants and these are offered to members early each year. This distribution has become a major factor in increasing the availability of such plants.
- The **Bulb Auction.** Members' surplus bulbs of lilies and other plants are auctioned in October each year at different venues around the country.
- **Meetings and outings.** Meetings for lectures or discussions are held each year at venues around the country. Outings or week-ends are arranged each year for members to visit gardens of interest to lily enthusiasts.
- **Newsletters.** Three newsletters are distributed to members each year with short articles, correspondence and news of current events in the fields of interest of the Group.
- **Lilies and Related Plants.** Articles on plants, gardens and people associated with the Lily Group appear in a booklet which is published every two years.

Details of the current subscription and any of the above are available from the Group Secretary. See opposite the content page for a list of officers and committee members and key contact details.

- The **Lyttel Lily Cup** is awarded annually by the RHS Council, on the recommendation of the Lily Committee, to a 'person who has done good work in connection with lilies, nomocharis or fritillaries'.
- The **Lily Bowl** is awarded by the Lily Group for the most meritorious single exhibit in a July co-operative display of lilies at an RHS show.
- The **Paul Furse Cup**, first awarded in 1992, for the best fritillary or other plant related to lilies but not of the genus *Lilium* exhibit as part of a Lily Group Co-operative stand at an RHS show.
- The **Voelcker Cup** is awarded to a person in recognition of our international role in promoting lilies.

INDEX TO PLANT NAMES

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Guidelines for authors

Contributions for publication in the Royal Horticultural Society Lily Group yearbook, *Lilies and Related Plants*, are invited on any aspect of lilies and related plants – growing, cultivation and breeding, species and cultivars, history, people who have made a significant contribution to the subject and nurseries or gardens. Any questions concerning articles can be addressed to the Editor, Alan Mitchell.

It is a condition of acceptance that contributions are the original work of the author(s) and that the Editor should be notified if they have been previously published or are under consideration for publication elsewhere. The Editor reserves the right to refuse any contribution and to make minor textual changes without reference to the author.

Contributions can be submitted in any format, hand-written, typescript, double-spaced on one side of the paper, or, preferably via email, in a format that is compatible with Microsoft Word for either PC or Apple Macintosh. If submitting materials by post, on disc etc., a hard copy equivalent should also be supplied.

High quality illustrations, colour transparencies, prints (in colour or black and white), or A5 high-resolution digital pictures (these should be at least 300 lines, dots or pixels per inch) are welcome. Authors must remember that it is sometimes necessary to print an illustration in black and white at the discretion of the Editor. Maps, diagrams and line drawings are also welcome and should be drawn clearly in black ink within a minimum base line width of 110mm. If artwork and illustrations have previously been published elsewhere or are the property of another, it is the responsibility of the author to obtain any permission needed for reprinting, and to forward a copy of the permission to the Editor. Authors should also be aware that, as the lead-time for an issue can be up to two years, any illustrative material may be in the care of the Editor for a long period of time.

The present Editor's policy is to publish the author's original words as far as possible but should any changes be necessary the author will be consulted. Proofs will not normally be sent for approval prior to publication.

References should be cited in the text referring to a list of references at the end of the article.

Where the Editor considers it necessary he will refer manuscripts to members of the Lily Group Committee for their consideration and advice.