

**LILIES**  
and Related Plants  
2013-2014



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## **Lilies and Related Plants**

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- Front cover:** *Lilium rhodopaeum* growing in an alpine meadow in southern Bulgaria (see pp. 44-47)
- Back cover:** *Lilium eupetes*, a new species from Vietnam (see pp. 26-34)
- Half title:** A Hummingbird takes nectar from a flower of *Lilium columbianum* (see pp. 48-54)
- Royal Horticultural Society Lily Group page:**  
*Lilium poilanei* (as currently identified) (see pp. 26-34)
- Contents page:** *Lilium iridollae* (see pp. 70-75)

**LILIES**  
and Related Plants  
2013-2014

This issue of *Lilies and Related Plants* is  
dedicated to the memory of Alan Hooker (1936-2013)

Editor  
Alan Mitchell

The Royal Horticultural Society  
LILY GROUP

# Royal Horticultural Society Lily Group



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# NOTES ON AUTHORS

**Tony Willis** has been interested in plants all his life. He bought his first bulbs, of *Lilium auratum* and Bellingham hybrids when he was twelve years of age. He has travelled widely in Europe, the Mediterranean, the Rockies and the Pacific North West of America observing plants in the wild.

**Charlie Kroell** has been enamoured with lilies since the mid 1960s and has dabbled in hybridising for nearly as long. For many years now his main interest has been Div. VI, the Trumpet/Aurelians...especially with regard to markings and adornments such as 'black' nectaries and heavy papillae. And, all species, the loveliest of lilies, nature's introductions.

**George and Mary Knox Finlay** of Keillour Castle (near Perth, Scotland) were the most successful growers of *Nomocharis*. For anyone who is interested in this beautiful relative of the lily, their names are legendary and it is unlikely that anyone will ever surpass their achievements with this genus.

**Julian Shaw** has been fascinated by all sorts of plants and has been growing them from the age of three. He has worked in pharmaceutical botany and more recently in horticultural taxonomy for the RHS, where he is currently International registrar for orchid hybrids. He has worked on Crug Farm collections from Vietnam which resulted in describing *Lilium eupetes*.

**Patrick Bucknell** has been gardening since he was eight, wherever he has found himself, including at his naval quarters, in Hong Kong and on a Wimpole Street roof.

**Caroline Boisset** is Secretary of the RHS Lily Group, having edited *Lilies and Related Plants* from 1997 until 2007. She is currently Editor of the International Dendrology Society's Yearbook and is constructing a new garden in Bradford-on-Avon, in Wiltshire.

**Ole Larsen** has been well known and well regarded in the lily world for many years. He owns Larsen's Planteimport, in Denmark, from which he has supplied many and varied lily bulbs to many and varied lily growers over many and varied lily seasons.

**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.

**Chris Durdin** runs Honeyguide Wildlife Holidays and is Chairman of the Honeyguide Wildlife Charitable Trust, which is funding conservation work for *Lilium rhodopaeum* in Bulgaria.

**Richard Haard** is a senior propagator at Fourth Corner Nurseries, Bellingham, Washington State, USA. In the late 1980s his interests in new product and market development allowed conversion of this nursery's mission from growing ornamental trees and shrubs into a regional supplier of native trees, shrubs, perennials and emergents used for environmental restoration purposes in North western North America. Currently, Richard is propagating lilies and their relatives for the purpose of preserving genetic diversity of natural populations.

**Bob Gibson**, with his wife Diana, started B&D Lilies in 1978, when, as his article reveals, many of the lily pioneers became his friends and advised him about growing lilies. Currently, Bob and Diana offer a wide range of hybrid and species lilies, for sale, from their Washington State-based nursery.

**Neil Jordan** has been growing and breeding lilies for some 26 years. Although working with many different lilies, his particular interest is the smaller pendant species and their mostly unexplored potential for hybridisation.



**Peter Zale** planted his first Lily (*Lilium regale*) at the age of 14. Since that time, his interest in *Lilium* species has continued to grow and he now aspires to study the entire genus in cultivation and in their native haunts. His tenure at the Ornamental Plant Germplasm Center has provided a platform for in-depth studies of the rare Eastern North American *Lilium iridollae*. In December 2013, he is travelling to Vietnam to search for the recently described *Lilium eupetes*.

**Brian Mathew** said when awarded a medal by Kew in 1992, “bulbs were in my blood from a very early age...” As a young student at the RHS in the 1960s, he organised a plant-hunting expedition to Iran after winning a Bowles Scholarship travel grant. Many other expeditions followed, along with a career in the Herbarium at Kew Gardens. Although primarily a botanist, Brian Mathew has published many books aimed at the non-scientific gardener.

**Ron Mudd**, after a number of years working in Asia, retired nine years ago, aged 43, to grow *Fritillaria* full time. “My wife and I garden on two acres of land in East Yorkshire. The *Fritillaria* grow in the garden, in pots outside, and in poly tunnels and glasshouses, depending upon the species. My main focus is on the Subgenus *Liliorbiza*, and the geographical variation found within these species.”

**Dr Ki-Byung Lim** is a professor at the department of horticultural science, Kyungpook National University, Korea. He had experience in the industrial field for 10 years, starting in 1985. He has also had experience at the USDA for one year and at Wageningen University and Research Centre for five years. He started working with lilies in 1990 in bulb growing and genetic research, which was the main focus of his PhD course at the Wageningen UR, the Netherlands from 1997 until 2002. His current research fields are genetics and breeding and the evolution of Korean native lilies using molecular cytogenetics and interspecific hybridization.

**Nhu Nguyen** admits to being obsessed with growing plants. He spends his spare time writing about plants and taking photographs of them in their natural habitats and in the garden. He is actively involved in local bulb societies and when not growing and thinking about plants, he researches into fungal taxonomy and ecology at the University of California, Berkeley, USA.

**Rod Barwick** is proprietor of Glenbrook Bulb Farm, which is a small-scale bulb grower specialising in daffodils, lilies etc. He was awarded a Gold Medal of the American Daffodil Society in 2005 for his work with daffodils. Rod publishes *The Trumpeter*, “a periodic newsletter for lily gatherers” from his home in Claremont, Tasmania.

**Gene Mirro** has a scientific background that informs the painstaking detail he employs to grow his impressive collection of species lilies. His love of gardening, when combined with his rational mind, has resulted in success with even the most difficult species. Gene has also donated a lot of seed to the Lily Group over the years, a contribution that has unquestionably assisted with the conservation of many species.

**Břetislav Mičulka** became interested in lilies when he moved into his own house in 1970. He was intrigued by their beauty and the possibilities of hybridization, so he soon started crossing lilies even when few lilies were available to him. He was also interested in the nomenclature of cultivated plants, which allowed him to organize the registration of the variety names of lilies in the RHS register.

# From the Chairman

The demand for a changed relationship between the RHS and its three Plant Groups was outlined by my predecessor Dr Pat Huff in *Lilies and Related Plants 2007-2008*, on page three. On completion of several years' negotiation the agreement between the RHS and the three RHS plant Groups to satisfy the requirements of the Charities Commission has been finalised. Reflecting the strong and positive relationship between the RHS and the Lily Group, the intention is to provide a mutual co-operative working arrangement ensuring our independence whilst enabling the sharing of horticultural knowledge. For operating purposes we shall remain as 'The RHS Lily Group', but in financial matters, thus separate from the RHS Charity, our title will be 'the Lily Group'.



Nuala Sterling

The main administrative change, which follows on from the RHS Governance review 2012, was the dissolution of the Plant Advisory Committee, the creation of the new Horticultural Board and the new Bulb Committee (replacing the Daffodil & Tulip Committee), which will incorporate two Lily Group committee members and through which we will report to Council.

The 1932 objectives remain '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 Year Book to share that knowledge'.

Our programmes have reflected this desire and our wish to travel. The 2012 AGM and lively Bulb Auctions were held at Hyde Hall RHS garden on a blustery autumn day during the 'Taste of Autumn festival' raising £437 from 90 bulb lots, one group of a tetra cross *Lilium* 'Bornholm' × (*L.* 'Terrace City' × *L. tsingtauense*) raising £40.

In kinder weather, the 2013 AGM and bulb auction was held at the Birmingham Botanical Gardens with Richard Hyde and Harris Howland as auctioneers. An impressive display of bulbs raised £844. An added pleasure was Elizabeth Banks, immediate past President of the RHS, who joined us to present the Lyttel Lily Cup to Pat Huff. In 2014 this event will be held at RHS garden Wisley, linked with talks and a display.

All who visit the RHS Shows are accustomed to the splendid Lily displays of Richard, Elizabeth and Sarah Hyde (H. W. Hyde & Son). We were all delighted when they were awarded the Queen's Jubilee Award for the best display in the



**Opposite**

*Lilium majoense* at  
Peter Shotter's garden

**Left**

*Lilium martagon* var. *album* and below,  
Iris 'Holden Clough' at Peter and Gill  
Regan's garden.



Great Pavilion at Chelsea 2012.

Our April 2013 garden visit was to Nigel Rowlands's nursery, longacreplants.co.uk. He showed us a spectacular array of shade plants, including many Liliaceae. Much discussion on the plants and their cultivation continued over a pub lunch and visits to two other local gardens.

In Kent three gardens of lily enthusiasts were the object of our July visit. Meeting for coffee at Harris and Annie Howland's where we encountered many impeccable examples of how to grow Lilies in pots, in the greenhouse or the garden, we were a group of 15 members led firstly to Drs Gill and Peter Regan's old Farmhouse Garden, which has been created over the past 30 years. Here amidst a range of mature and unusual trees and shrubs, for all seasons, was an amazing wilderness of delight in which thrived the lilies, especially *L. martagon*, *L. martagon* var. *album*, *L. martagon* var. *cattaniae*, *Cardiocrinum giganteum*, *L. monadelphum*, *L. 'Pink Tiger'*, nestled between such gems as Iris 'Holden Clough' and I. 'Gerald Darby'. Exploration of the screebed and the vegetable garden provided yet more interest and much discussion on what might be grown by modification of the natural habitat of heavy Clay and Flint overlying Chalk.

Visiting Peter Shotter's very different garden, which was packed with beautifully labelled species, we started at the disciplined Rock border with bulbs, *Fritillaria*, *Daphne* and *Abies koreana*. Then in discrete island beds were fine shrubs and trees, *Magnolia*, *Rhododendron*, including a *Sinocalycanthus chinensis* in flower,



*Hoberia sexstylosa*(NZ), *Sollya*, *Michelia yunnanensis*. By the pond *Iris siberica* ‘Shirley Pope’ and between these lovely plants a collection of lilies: *L. ‘marban’*, *L. majoense* (8ft tall) *L. wigginsii*, *L. martagon*.

A beautiful sunny day seemed to reflect just what the Lily Group is all about. Plenty of detailed exchanges on soils, suppliers, cultivation and propagation were shared. A truly enjoyable time with the benefits of sharing knowledge, meeting interesting and knowledgeable plant friends and seeing the way others garden was our gain.

A summer visit to Bernard Tickner’s, Fullers Mill Garden is booked for July 2014 in celebration of his lilies, his ninetieth birthday and more than 50 years as a member of the Lily Group.

In June-July 2015 we plan a Lily Group tour to NE Turkey guided by Chris and Basak Gardner.

In response to the RHS re-launch of the AGM six committee members—all with wide experience of growing lilies—have completed the task of a review of the existing awards for *Lilium*. The summary was presented at the Bulb Committee in July. The question of recommendation of future *Lilium* AGM and proposal for trials will be the next task facing the Lily Group and the Bulb Committee.

The Lily Group digitised the entire set of the Lily Year Books and *Lilies and Related Plants* 1932-2012, following the purchase of a complete set. Our intention, as voted upon in the 2013 AGM, is to create a DVD initially available

to all members of the Lily Group, once the 2013-14 edition is complete. Later, a wider distribution of all these fascinating records will be made available. Few members have a full set of this archive and, perhaps, not even horticultural libraries still hold them. The search facility enables easy navigation and prompt access to any year book. Alan Mitchell, editor, has selected W. G. Knox Finlay's 1954 article on 'Cultivation of *Nomocharis* at Keillour' for the forthcoming issue of *Lilies and Related Plants*. However, he might have selected any number of alternatives about interesting plants and personalities, such are the possibilities contained in the many articles spanning 80 years, which are contained in the DVD.

Rising postage costs, especially overseas, for our publications and seed distribution are focusing our attention on ways of containing our budget. As a start, George Battle is planning to issue the 2013-4 seed list electronically to all members with internet access to ensure maximum coverage, but printed copies will be available to all who request them. Earlier attempts to issue the Newsletter thus were hindered by issues of incompatibility of computer software and sometimes of inaccurate email address. Irene Hopton-Scott has trialled an electronic issue of the Autumn Newsletter which has been warmly received in some quarters and is quicker than mail in isolated outposts. When you update your subscription or change contact details please make sure your email address is correct and is matched to your name. The result of the subscription review is that the cost of membership will rise to £15 per annum from January 2015. Historically, membership of the Lily Group has always been at a low cost and despite the increase will still be fantastic value.

## **Alan Hooker (1936-2013)**

*by Harris Howland, Nuala Sterling and Colin Pope.*

Alan joined the Lily Group Committee in the mid eighties. At that time, he hadn't taken on the formidable task of compiling the seed list, which was to come later. This was probably the toughest appointment on the committee. Under Alan's skilful stewardship it grew and grew, becoming what it is today, the most comprehensive lily seed list in the world. Over the years he encouraged many lily growers and seed donors to contribute to the list, so that eventually he had established a circle of seed providers from every corner of the globe, USA, Japan, Russia, Canada, Australasia and Europe. In addition to arranging seed for the list he was also doing battle with some very difficult import regulations and customs.

The period of the seed distribution runs from autumn to well into the New Year. Alan would be gathering and collating seed and compiling the actual seed list himself, a mammoth task for just one person. He gathered the seeds of species

and hybrids, plus other genera. He would then apportion the number of seeds to the number of requests he had for any particular lily or plant. Obviously at times there were only a few seeds of a particular item, usually rare species, and therefore the amount sent would be relatively small. It was definitely a case of burning the midnight oil. The exercise, start to finish, gave him so much pleasure.

Alan was a great ambassador for the Lily Group. He always supported shows the Group staged at the Westminster halls and the many weekend visits to various gardens. In 1988 he organised a Group visit to Holland and Germany for about fifty of our members, going to the likes of Peter Schenk's fine greenhouses in Holland then on to the beautiful gardens of Norgart Martschinke and Otto Beutnagel. We shall always remember Alan's excitement as the ferry approached Vlissingen, as he anticipated the delights in store for us. In Alan's usual faultless manner, it was organised with absolute precision and everybody had a very memorable time. Frequently, members visiting the UK from abroad were generously welcomed by Alan and his wife Cherry, to stay at their lovely London home. For his outstanding services to members, Alan was made an Honorary Life Member of the Group.

Alan was born in Teignmouth, a beautiful town in the West of England where he and his family later spent many happy holidays. Athletics was one of his many interests as a schoolboy and he represented London as a discus thrower at an event in Paris. He qualified as a physicist which led to a research position with Ilford Ltd, the photographic company. Later, he took up a university lectureship with a special interest in computer graphics and networking. Unsurprisingly, he applied his scientific skills to lily embryo rescue as a hobby. His demonstration of embryo release at Harris Howland's garden shed at the 2011 LG visit was a masterpiece of technique, detailed even earlier as '*Embryo culture for the Amateur*' p.65 Lilies and Related Plants 1989 supplement 1990.

Nuala Sterling, our Chairman, wishes to record her gratitude for Alan's special support when she joined the committee, giving her "wise advice" and a depth of historical detail. They used to have coffee and perhaps cake after the committee meetings in one of the many tea rooms close to Vincent Square or at *The Cardinal* pub. He was a font of fascinating stories about past times of the Lily Group but when asked if they could go on record, (pencil and paper, not recorder) he felt that they would be disciplined by the powers that be if the facts emerged!

Our dear friend Alan, will be long remembered, we were privileged to have known him.

As a postscript to this tribute to Alan, it is a delight to record that three weeks before his passing, one of his special German friends, Norgart Martschinke, wrote to him to say that she had brought to flowering and recorded a lily bearing the name 'Alan Hooker'. She commented that it was the finest lily she had grown. It is thought to have come from seed donated by Alan to the 2007/08 Group seed distribution, item 200, 'Foggy Morning' × (Peachwood × Cherrywood).



# Never an opportunity missed

*In this article **Tony Willis** writes about taking every opportunity to pursue his lifelong interest in plants, in cultivation and in the wild.*



## Mount Vermion

For many years my search for plants, growing in their natural habitats, involved annual trips to the European Alps and the Pyrenees during the school summer holidays. This coincided with the peak flowering time for many of the high alpine plants but in addition I managed to see a number of lilies blooming in their natural environments. These included *Lilium carniolicum* in what was then Yugoslavia, *Lilium pyrenaicum* in the French Pyrenees, *Lilium bulbiferum* in the Dolomites and some magnificent stands of *Lilium martagon* in Switzerland.

Later with my offspring having flown the nest it became possible to take trips at different times of the year and for the past twenty five years I have explored the mountains of mainland Greece and Turkey. My trips have always taken place during the first two weeks in May. This is the ideal time to see many of the spring bulbs in flower alongside a host of other plants. With these trips timing has been something of a compromise and depending on the earliness or lateness of the spring the plants I have seen have varied on each trip. Most of the higher altitude flowering plants are found as the snow recedes and this time tends to coincide with midseason for those lower down.



One of my first visits to Greece was in 1987 when I walked up Mount Olympus in early June to see *Jankaea heldreichii* in flower. I will come back to Mount Olympus later in this article. Back then it was necessary to fly to the old airport in Athens and undertake a quite hazardous journey on the single track road that ran up to Thessalonica. On that drive I saw my first Greek lily growing on a cliff overhanging the road, a clump of *Lilium candidum*, an experience which to date has not been repeated in spite of several attempts to relocate it.



*Lilium chalcedonicum*, Mount Vermion.

Several years later in 1993 I decided to go in search of *Crocus cvicii* at its one known site in Greece on Mount Vermion, a few miles north of Mount Olympus. The mountain lies inland, only a dozen miles from the sea across a plain where rice is grown. I have made many visits here and although it's possible to stay in Veria it is a hot and dusty industrial town whilst a more pleasant alternative is Naoussa on the North East side of the mountain. Its claim to fame is that it is the centre of wine production in Greece.

*Crocus cvicii* grows around a ski resort at Seli situated at 1,650 metres and by the beginning of May the area is largely clear of snow. The advantage of the approach from Naoussa is that unlike that from Veria on the south east side where the road passes through rough meadows the road from Naoussa is very different. Once outside the town this side of the mountain has complete tree cover. This starts as mixed deciduous woods and within these numerous orchids are in flower. As the road climbs higher the woods change to mainly beech with carpets of *Primula vulgaris* and also *Galanthus* in seed by early May. The *Galanthus* are a strange mixture varying between *Galanthus gracilis* and *Galanthus elwesii* with every variation in between. Zubov has determined that these are a new species which he has called *Galanthus graecus* but this is still far from being accepted.

Some care needs to be exercised when wandering around in these woods because this whole area of Greece was the scene of very fierce fighting during the Second World War. There are old minefields here which were originally marked by the usual skull and cross bones markers but these have now decayed and lie about in the undergrowth.

Whilst looking for the *Galanthus* I came upon some plants which were



clearly lilies in early growth and decided to collect some scales. Both *Lilium chalcedonicum* and *Lilium martagon* are known from this mountain, but from their leaves I could tell that they were *L. chalcedonicum* which was confirmed when they flowered four years later. It is interesting to see that as the flower stem develops it is covered in leaves along its whole length and these are tightly curved in an anticlockwise direction against the stem.

Proceeding onwards up the mountain, to a picnic spot overlooking the plain, *Ramonda nathaliae* is growing in rock crevices. On reaching the ski resort the ground is carpeted with the *Crocus cvicii* and as this fades there are large numbers of very robust plants of both yellow and purple *Dactylorhiza sambucina* interspersed with scilla and many white *Corydalis solida*.

Moving on from Mount Vermion the third wonderful mountain I have visited is Mount Falackro which is north east of Thessalonica just south of the border with Bulgaria. Getting here is now much easier because there are direct flights from the UK to Thessalonica which eliminates the 200 mile plus drive from Athens. On my first trip I stayed at Drama, a small town a short drive away, but this spring I stayed in a small village at the foot of the mountain. Again, as with Mount Vermion, there is a ski resort with an excellent access road to the top. At the start, huge marble quarries scar the landscape but these are soon left behind. My main reason for visiting here was to find *Crocus biflorus alexandri* and although it grows in many thousands I have missed it by a few days on each of my three visits. I did,

**Opposite**, Mount Falackro with marble quarries scarring the foothills in the middle distance.

**Right**, *Lilium martagon* var. *cattaniae*, Mount Falackro.

on my first trip, find one last flower and have concluded that visiting a couple of weeks earlier might be a better guarantee of success.

Driving upwards the forest is mainly on the west side of the road and here at 1,300 metres it is quite sparse with open glades. Growing there are two orchids *Listera ovata*, a rather nondescript green one, and *Platanthera bifolia*. As the woods thin out there are many plants of *Crocus biflorus alexandri* and *Crocus pulchellus* together with large numbers of *Fritillaria drenovskyi*. Amongst these plants I found several *Lilium martagon* which on my first visit were not showing any signs of flower buds. This year they were in bud, but still a couple of weeks from flowering. Having collected scales, when these flowered I had thought they were *Lilium martagon* var. *cattaniae* but now think that they are better described as var. *sanguineo-purpureum*. It was noticeable how short these were, only 60 centimetres, compared with those in Switzerland which were over 1.5 metres. They are clearly distinguishable from the more common *Lilium martagon* because as the flower stem starts to elongate it is stained purple along its length.



Further up the mountain the hillsides become meadows and every crack in the road retaining wall is filled with large clumps of blue *Viola graeca*. The meadows are filled with the *Dactylorhiza sambucina* and as the ski resort is reached the hillsides are covered with a yellow haze of *Crocus chrysanthus*. The view from the top is quite spectacular looking over the Pirin Mountains to Bulgaria. On the descent just as the forest thickens on the west side of the road the base of a group of plane trees on the opposite side has numerous *Fritillaria pontica* growing amongst their roots.

The fourth mountain I want to write about is Mount Voros, also known as Mount Kymachalan, in north western Greece, the crest of which forms the border with The Former Yugoslav Republic of Macedonia. My reason for visiting here was to see *Crocus pelistericus* again in its only site in Greece. This crocus grows on a

**Right**

*Lilium martagon*, Mount Kymachalan.

**Opposite**

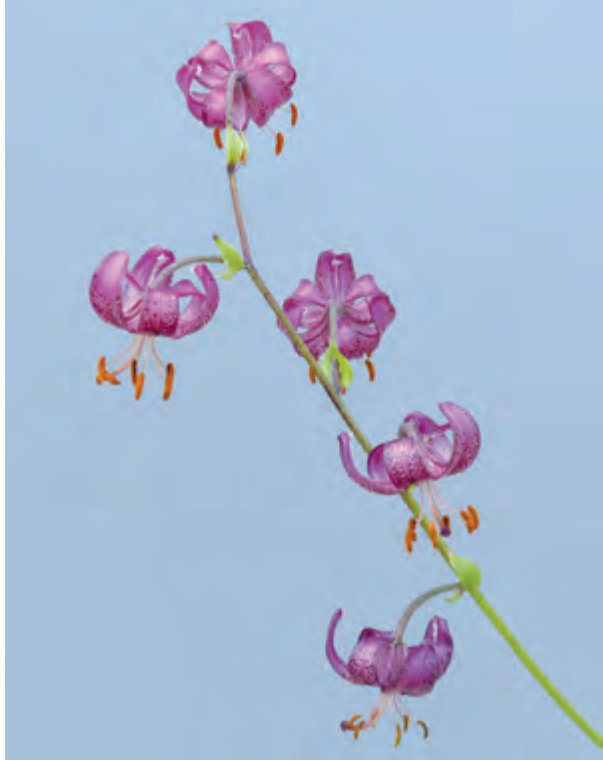
Mount Olympus gorge and summits.

flooded plain at the side of the road just below the summit where again there is a ski resort providing easy access.

Until about five years ago there was only one road up the mountain and this was approached from the west side. It rose up through mixed forests which gave way to pines and then to open meadows. Having found the *Lilium martagon* on Mount Falackro I thought it must grow on this mountain as well, but on two visits I searched this west side and was unable to find it. The Greeks then decided to build a new road on the east side of the mountain from the outskirts of Edessa to the ski resort. This rises at first through several miles of cherry orchards and then steeply through dense pine forest. It is very difficult to get access to the forest because the angle of the hillside is around 45 degrees and the road has been carved out with very high vertical banks. I was able at one spot to gain entry up a forestry track. There was no undergrowth it being so dark amongst the trees. In a south east facing area I found lots of *Lilium martagon* growing as very short immature plants and none clearly going to flower. In 'Growing Lilies' by Derek Fox he puts forward the theory that these plants can exist in this state for many years waiting for some of the trees to die and fall leaving an area with sufficient light for the plants to then flourish. The growing conditions here certainly supported this. These plants have proved to be *Lilium martagon*.

Carrying on up the road the area changes to open meadows and on these are the same dactylorhiza, viola and scilla seen on Mount Falackro and Mount Vermion. The change occurs at the top where just below the ski centre at 2,000 metres there is a large bowl perhaps one kilometre by half a kilometre and at the right time this is a mass of thousands of purple *Crocus pelistericus* growing in dense turf partially submerged in running water. On the drier edges grow many *Crocus veluchensis* in assorted shades from white through to pale blue.

This eastern road is already crumbling in many places with huge cracks and





holes and I think it will soon become impassable unless the Greeks decide to repair it!

Now to return to my first and favourite mountain, Mount Olympus, the highest mountain in Greece, with over 1,700 species of plants growing on it perhaps the most famous being *Jankaea heldreichii*. Visiting any time from early May brings a wealth of flowers.

Most people stay at Liochoron at the base of the mountain which is at 300 metres and drive to Prioni at 1,000 metres which is where the main ascent of the mountain starts. It is possible however to walk from Liochoron through the Enipevs gorge to Prioni. In early May on the path through the gorge it is possible to find the *Jankaea* flowering. With this in mind I walked up the gorge to find it and in a crack, no more than one centimetre wide at the side of the path, found some germinating lily seeds. There was no sign of the parent plants but as the walls are almost vertical and thick with vegetation this was not surprising. Both *Lilium martagon* and *Lilium chalconicum* are known from here and the seedlings have proved to be *L. martagon*. So far they have not flowered.

My objective for my trip in May this year was to try and find *Lilium albanicum* on the border with The Former Yugoslav Republic of Macedonia in the vicinity of the Prespa lakes in the very north west of Greece. Unfortunately the roads had





*Lilium martagon* var. *cattaniae*

deteriorated and my hire car was not up to the task and so this will be my aim for my 2014 trip.

On each occasion I have collected scales these have been stored in damp tissue in a polythene bag until I get them home. I have then placed them in damp perlite in a polythene bag in the airing cupboard where usually within a couple of months small bulbils have formed. These are potted in clay pots using John Innes with extra grit and the pots plunged in damp sand. They have grown well and usually flowered in three to four years. The plants are left outside in an open sand plunge during the summer but in winter I leave the *Lilium martagon* in this but I cover it to keep off excess water. I store the *Lilium chalcedonicum* still in their pots in the garage dry and frost free. My reasoning here is that I live in an area with a very high rainfall and this would prove too wet for them outside—even covered. Seed has been freely produced and has germinated well.

I hope this has given the readers an insight into the mountains of Northern Greece and perhaps whetted their appetites to go and see the wonderful lilies and other flowers that live there for yourselves.

# Ugly ducklings, plain Janes and swans

*Charlie Kroell has produced some lovely hybrid lilies, so it is appropriate that he should, in the following article, cast a critical eye over his protege, Rimmer de Vries's, unexpectedly attractive hybrids.*

Caveat at the outset:

*"Beauty is in the eye of the beholder"* –Margaret Wolfe Hungerford

In the Introduction to his 1979 Booklet *Observations of a Lily Breeder*, published by the Ontario Regional Lily Society, the renowned hybridizer, Charles Robinson (think... 'June Fragrance', 'Ambassador', 'Diplomat', 'Statesman', 'Snow Pixie'... some twenty-six registrations in all\*) writes:

*"...Probably the most important task which faces every breeder is the selection of the parents. Where this has been carried out with care the progeny may offer one or more superior seedlings which are a definite improvement over their parents. Conversely, where parental selection has been at random and without much thought the results will invariably be disappointing. The thought then is that only the finest varieties available should be used. Anyone can begin at the bottom and work upward, but the discerning breeder or prospective breeder will start with the best and go higher."*

This certainly sounds reasonable and is the approach that I (and I would guess the great majority of amateur hybridizers) have always tried to follow. Of course what is "best" must lie in the eye and/or mind of the breeder. Probably most often "beauty" in some form, whether of the flower, some attribute of the inflorescence (e.g. Andreas Winkler's goal of an architecture founded upon the Golden Mean... see his *Beauty as a Task*, 1988 NALS YB), the sight of a stem standing unblemished among others decimated by frost or *Botrytis*... There are many kinds of beauty. But to deliberately choose as a parent a plant of unremarkable attributes, afflicted with some obvious deficiency, or even ugliness, would seem at first thought to be counterintuitive, or even...stupid? Well, maybe not.

There is a celebrated ugly duckling case in the chronicles of *Lilium* that is worth revisiting. It is that of 'Odd Ball' (or 'Oddball'...both spellings appear in the literature), resulting from a cross made over four decades ago by Henry Payne (of the Connecticut Hybrids fame). Per *The International Lily Register*: "Odd Ball cl. ('Connecticut Yankee' x hybrid from 'Snow Bunting') H: F. H. Payne, 1969 N: L. Marshall, 1971..." "pollen absent...petals not recurved, tips incurved, some



remaining partially fused...A monstrous form.” Motivated by who knows what, Payne applied *L. wardii* pollen, of all things, to ‘Odd Ball’. Surprisingly, this was a fertile cross. Per L. Marshall in the 1983 NALS YB:

“In 1971 Henry Payne achieved a cross using *L. wardii* pollen on his badly distorted, most unusual mutant hybrid clone ‘Oddball’. The progeny which resulted were the most varied and strange looking hybrid lilies I have ever seen! Some were upfacing turk’s-caps; some had inner tepals yellow and outer tepals purple on the same flower. Most were distorted; all but a few were male sterile and female fertile.”

Marshall goes on to describe further breeding involving the F1 generation:

“...giving hybrids with spectacularly long inflorescences in deep rose, unspotted cream, palest pink, and subtle buffs, as well as some vivid oranges, reds and yellows.”

He notes that many were pollen-free or possessed male sterility in differing ways...non-opening anthers, tiny anthers or none at all, and adds: “A fascinating albino-flowered clone from Henry’s F1 group is still being used in breeding. We call this clone ‘Albipayne,’ and in spite of its floral distortion, it has given beautiful offspring.” Introductions harking back to ‘Odd Ball’ include ‘Bingo’, ‘Fairest’, ‘Doeskin’ and ‘Annemarie’.

Five years ago Rimmer de Vries received a bulb of something called ‘Highland Fling’ from Alan Mitchell in Scotland and said to have grown for many years like a weed in Alan’s garden (in Star of Markinch, Fife). Note: The following paragraph was added at the eleventh hour after an urgent call to the Editor to “Stop the presses!”...or at least it felt like that:

Alan purchased his ‘Highland Fling’ from the *Highland Liliiums* nursery, near Inverness many years ago but knew nothing about the variety...whether it had a known pedigree or had been registered. It seemed safe to assume that, with such a name, the lily was probably of Scottish origin; and it certainly fitted well with the name of the nursery. However, during a chance review of lilies registered by Minnesota hybridizers, the name ‘Highland Fling’, ‘HF’, suddenly caught my full attention. Such a lily appears in the 15<sup>th</sup> Supplement of the RHS ILR as a 1996 entry, hybridized and grown by Richard Prochaska and Named, Introduced and Registered by Hartle Gilman Gardens, HG. “Parentage unknown.” Digging deeper, ‘HF’ was found to have been a “New Introduction” in the 1997 HG catalogue, with only the HG name given. Price \$12. Two other listings follow: 1998 at \$8 and 1999 at \$6. Alan estimates that he acquired his ‘HF’ from *Highland Liliiums* about 15 years ago, in the general time frame when the HG ‘HF’ was introduced to



*Lilium leichtlinii*



'Highland Fling'

commerce. There are clearly some similarities between Rimmer's clone from Scotland and the ILR and HG descriptions, and one is inclined to believe that they are probably the same. Yet it is curious that neither description notes the traits of leaf axil bulbils or the year-to-year color differences observed in Rimmer's garden. If in fact they should be the same, there would have been a transatlantic journey from Minnesota to Scotland, then back again to Michigan.

The foregoing is simply offered to best express the record as known at this time and is irrelevant to the subject at hand.

Although Rimmer's 'Highland Fling' could hardly be described as an ugly duckling, it might justifiably be labeled a plain Jane by today's standards (but remember the caveat): A 1b/c Asiatic of unknown parentage that makes stem bulbils and has demonstrated a most unusual trait: It appears to be something of a chameleon, the flower color in Rimmer's garden varying rather significantly (reddish, orangey, peachy...) over the past four years (even differences in a single season on different stems): In any event, Rimmer chose to pollinate his 'HF' from what is today being marketed as the type form (i.e., yellow) of *L. leichtlinii*. Several seedlings from that cross first flowered this year and were, unexpectedly, beautiful

pastel flowers of fine form.

But that was not all. Rimmer had also made another cross that I never would have considered. A few years back, I had given him one of my culls that he christened “Twisty Lime”. Indeed, it is endowed with nice coloring...a “creamy/lime” center, papillae and sparse, darker spotting laid upon an otherwise off-white flower. It is vigorous, stiff-stemmed and carries a large well-spaced inflorescence. But the flower form is an abomination to the eyeball (at least to mine)...the tepals twisted, pinched and sharply broken rather than recurving smoothly in the classical turk’s-cap manner. A cull indeed...but Rimmer was a believer and proceeded to pollinate it from Anton Mego’s exquisite ‘Beautiful Victoria’, BV, (named for Anton’s wife). ‘BV’ has, to my eye, as nearly perfect a *henryi*-form of floral architecture as I have seen; and it’s coloring is lovely as well...a soft orange sherbet upon pure white and laden with papillae. From this cross came “The Yeti” (another nickname). Although a touch narrow in the tepals, it otherwise resembles ‘BV’, but with a beautiful “lime/yellow” center and a forest of similarly colored papillae. What might lie ahead?

When Lane Spence, from New Zealand, visited here in 2011 he was taken with a tall, vigorous, pale orange, black heart seedling having long, very prominent dark nectaries...something I had had for years but never really turned me on (insipid coloring, marginally narrow tepals) and which I never used in hybridizing. Lane looked upon it in an entirely different way and asked if I might make some crosses with it and pass a bit of any resulting seed along to him. When he saw this seedling, it was 6-7 feet tall with a high bud count, including a tertiary or two. This spring, two robust stems (never had divided or multiplied in any way before) emerged and were reaching upward like the proverbial homesick angel when the “great freeze of o-twelve” cut them short (at about 24-30”). One stem was blinded completely, the other distorted and stunted but yet able to bear two buds. Both were pollinated and one took. Its pollen however was freely used on several things, including the “Ypsilanti” and “Star” clones of Yellow *henryi*, two *henryi* type seedlings from S-W Gardens in Thamesville, Ontario and three of Anton Mego’s fine seedlings. Some nice pods developed and, although no candling has yet been done, it appears there will be some viable seed. But might they yield ugly ducklings, plain Janes, swans or some of each?

If allowed to indulge in a bit of interpretative license, I will submit one further example of the ugly duckling metaphor within *Lilium*. In his intriguing article in the December, 1994 NALS QB, *An Experiment in Asiatic Lily Seed Selection*, the late Alex Burnett presents a study, carried out in the scientific method, in which the seed from a 1992 Asiatic cross (F. Fellner X8346T × Burnett AB 9243) were divided into four populations of 100 each, according to size: Large, Regular, Small and Faint. Of these, 36 Large, 40 Regular, 38 Small and 32 Faint survived to be planted



Two of the unnamed "beautiful swans" Rimmer de Vries made from an "ugly duckling", a.k.a. 'Highland Fling'.



A spotless pink "beautiful swan"!

out in the garden in early July, 1993. The report for one year later was:

"After a particularly vicious winter of -50 °F temperatures and a violent half hour hailstorm on 2 July 1994, the following seedlings were counted:

<b>Large seed</b>	17 (2 flowered)	<b>Regular seed</b>	28 (4 flowered)
<b>Small seed</b>	27 (4 flowered)	<b>Faint seed</b>	31 (14 flowered)

Preliminary observations:

1. Seedling growth is the reverse of what I had anticipated.
2. Seedling size is similar for all seeds.
3. Faint seed shows better survivability and almost 50% precocious flowering for one year seedlings."

This is an experiment that I have often thought of repeating...but have never done. It always has seemed just too tempting to select the largest, heaviest seed with the longest, best looking embryos.

These ramblings will conclude here with a quote, suggested by Rimmer as a fitting summary of all that has come before...and an elaboration of the maxim concerning beauty and the beholder:

"Beauty is in the eye of the beholder and it may be necessary from time to time to give a stupid or misinformed beholder a black eye." –Miss Piggy

# Cultivation of *Nomocharis* at Keillour

*When the growing of *Nomocharis* is discussed, the names of Major and Mrs Knox Finlay tend to arise—because of their legendary ability to grow this beautiful relative of the lily.*

(Lecture given on 7 July 1953; Col. F C Stern, O. B. E., M. C., F. L. S., V. M. H. in the Chair)

I find that the cultivation of *Nomocharis* is fairly easy if I am content to grow them at an average height of say 15 inches. To get them larger I have to take more care to create the right conditions for fuller development. As they hang their heads it is a great advantage to have them tall so that the flowers can be better seen. My best *Nomocharis* at present are about five feet in height. I have a specimen here which is perhaps a little better than our average for fully matured bulbs; it was lifted from the open at the side of a group. The height is six feet; there were sixteen flowers, the largest of which measured five and three quarter inches in diameter. The species is *N. Mairei*, but other species grow equally well.

I have been asked to come here today to tell you how I grow tall well-flowered *Nomocharis*. After ten years of trial and error I am convinced that the answer to the problem is patience, combined with a study of the conditions required, the main factors of which are as follows: an open situation with no ground cover (any I have planted in the shade are weak); water underneath in quantity at a favourable depth, a free root-run and quick drainage. We have sown seed indoors in boxes, pricked them off, potted and plunged them and have tried numerous mixtures for our experiments. We have also for years broadcast seeds in open shaded frames. There is no doubt in my mind that the sowing of seed in the open and leaving the young bulbs undisturbed produces the best results. A hurried bulb does not produce a first-class plant; it may look well but lacks in stamina. My method of producing good flowering bulbs may take five years or even six but it is worthwhile, and thereafter I always have a young crop coming on.

If you feel you cannot wait for bulbs grown from seed in the open, my advice is to sow the seed in boxes in a cool or cold house, prick them out as soon as possible and winter them in a cold frame. They must be lined out in an open frame early in the following spring and planted out at the flowering stage. As I have said I do not advise this method but it does in some way combine with getting the bulbs into the open as soon as possible and so not forcing them. *Nomocharis* also grow away quickly from scales, thus saving a year or more, but one can only take one or two scales from each bulb, and it is not easy to do this without messing up and disturbing a group of established bulbs.





*N. aperta*



*N. mairei*



*N. pardanthina*

Some of the *Nomocharis* species, which vary greatly, *above* and *opposite*, are mentioned in this article. However, none of the plants in these photos have achieved the impressive sizes quoted by Major Knox Finlay.

Scales are taken when the bulbs are dormant. With bottom heat they begin to form bulblets almost immediately, and very soon roots and top growth. In six weeks' time some of the bulblets are ready to move and nearly all in eight weeks. Most scales form more than one bulblet; these are separated with a razor blade leaving as much as possible of the scale attached. After they have been potted up individually and gradually hardened off, they should be plunged in the open frames. They should be ready to plant out as flowering bulbs in three or four years' time.

My stock of *Nomocharis* has been raised from bulbs I saw advertised in 1942. When I was home on leave, I planted them out and left them alone. It was a lucky planting, quickly done with no special knowledge of their requirements except common sense. Nearly all our present flowering *Nomocharis* have been raised from seeds of these plantings. If I had read as much as I have now about this genus and tried to imitate the natural habitat as described by the various collectors, I am sure I would have done less well, because they appear to have been found growing in hundreds of situations from lush meadows to clumps of Bamboo, which must be the strangest of places to find a soft bulb growing.

I have studied herbarium specimens with special attention to the root retractile





*Nomocharis finlayorum*, the naturally occurring hybrid named after Major Knox Finlay.

question and I think that the bulbs only grow down into soil to a sufficient depth to support the height of their stems. Farrer wrote that the depth of the bulbs he found “were as deep as the plants were tall” but did not mention the height of the plants. Kingdon Ward writes that he found *N. pardantbina* six to eight feet tall, but made no mention of the bulb depth. I can only think that these deep bulbs must have been buried by a landslide or were growing in very slack conditions, perhaps covered by encroaching vegetation. The dried specimens which I saw at the British Museum (Natural History) and the Royal Botanic Garden, Edinburgh, appeared to have been growing at a depth of only two to three inches. At Keillour the bulbs planted out have not gone down after six years of growth, and an annual autumn mulch seems to have made no difference.

So far I have found no proof of natural vegetative increase of the bulbs, but this is difficult to check as my plantings are done in groups. A damaged bulb will, however, increase from the scales. All the examples of herbarium material which I have seen show only single bulbs as do any old bulbs which I have lifted or grown on in pots individually. I have some material here from a small colony of *Nomocharis* also grown from seed. This differs greatly in all characters from anything else we have raised. You can see that the stems are “stoloniferous” or “stoloniform” as some writers use that term when referring to the Asiatic Lilies.

On the side of these stems, bulblets are formed which evidently eventually detach themselves to become separate units forming a colony. From all appearances this

only happens on the juvenile stem; seemingly, once the stem has discarded its one or two bulblets, it changes its habit and grows straight up from the bulb showing no further sign of wandering or forming bulblets. It is interesting to see that there is no stem-rooting on the immature stems; this is only to be seen on the stem of a fully fledged plant. It will also be seen that this *Nomocharis* is not so strong in growth as the other species and when fully developed has brown stems and dark green rounded shiny leaves. It flowers from the juvenile growth sometimes only two inches high, the flowers of course being very much smaller than on older stems. The flowers all come true to type, being quite distinct from any others we have; they face much more outwards than downwards, are of a deep rose pink, with a small scattering of purple or crimson spots near the centre. Owing to the strong resemblance of the habits of the plants, I have been toying with the idea that we have a hybrid cross with *Lilium wardii*, but the experts will not agree to this.

Regarding stem-rooting, this seems to be rather spasmodic. It is only present on some of the stems of the herbarium specimens I examined, and I could find no sign of bulblets having been formed on this growth which is so common with many Lilies. The same applies at Keillour; I have never found a bulblet on a stem-rooting plant and frequently no stem-rooting is to be seen. It is said that we grow *Nomocharis* well because our atmosphere behind the tartan curtain is more humid. With this I do not agree. If it were so, many more gardens would have them. In my opinion you might as well say that we feed them on whisky. Our normal rainfall should be approximately 35 inches. From May 1952 to May 1953 we have only had approximately 15 inches with dry, cold icy winds and then hot weather. There has been much less humidity with us than there has been in the South according to the weather reports, and yet this year we have perhaps flowered our finest *Nomocharis*. Further, the young bulbs are in first-class condition, so there is no use thinking that previous humidity may have done the trick.

I have been making tests regarding the depth of the water table at various places in my garden; I have also been digging holes and then checking the time of drainage during dry weather. I find that my best bulbs grow with a water table three feet deep and a drainage speed of eight minutes. I have found this spring that top watering has been detrimental; a test I made proved that the unwatered bed is considerably the better bed. I have a bed near a pond which is not so happy. Yet one well-known gardener has written "give them adequate moisture". Just what does he mean by "adequate" or "give"?

The trouble about growing *Nomocharis* from seed is that they hybridize so readily. To keep them true, one would have to go to a lot of trouble hand-pollinating and covering. I don't do this. As far as I can, I select by marking but I can give you no guarantee that those I name as I show you my slides, have no hybrid blood in them. If you wish a bed of one type, you must mark them

when they flower in the seed-beds and plant out accordingly. I have never seen two identical plants. If you have studied the individual flowers on one stem of *N. Mairei*, *pardanthina*, *Farreri* or *aparta* as I have, you will have found that each flower shows a difference in the number and position of the spots.

Some years ago we were told by an eminent gardener that if we allowed our plants to set seed we would very much impoverish them; in fact, lose them. We have seeded regularly with no ill effects, but it is probably wise not to let the young set seed.

My seed beds in the open are simply constructed wooden frames six inches high, filled with leaf-mould or old sawdust and sand over underlying forked-over clay. The position is shaded by Conifers. The beds are firmed, the seeds are thinly broadcast, then lightly raked over and left for five years. When it comes to planting out time, I prepare by digging our beds to a depth of 18 inches in an area about three feet by four feet for thirty bulbs. I put as a foundation eight inches of old compost made on the principle of the Indore system and pack it down very hard. Then I add six inches of what I call S.S.B., which means a mixture made up of a barrow load of old rotten sawdust (which is really humus with a pH of 6.3), a bucketful of sand, and a four inch pot of bone meal. The bulbs are placed on the top of this mixture, and another inch or so added to cover them; the soil from the excavation is used to fill up the beds and they are then well firmed down. The beds are then marked off, being surrounded by low rabbit netting. Even the most rabbit-proof garden may not be so, and the young growth of *Nomocharis* seems to be most seductive. Other pests to be dealt with are slugs and mice, for the latter climb up the stems to eat the seed pods. I have read that they also eat the bulbs, but I have never experienced this trouble.

The late Mr Andrew Harley of Devonhall was very successful in the cultivation of *Nomocharis*. I saw them growing in his garden about 1935 and was charmed with them. Many of you must have known his garden. Part of it is a semi-peat bog with, I am sure, a high water table all over. Now there are few flowering bulbs worth looking at. I was allowed to dig up a few to examine them recently; they appeared to be in poor condition, brown and with poor roots. Is it that this genus is short lived, or that the water table is too high at Devonhall? I think that the latter is the answer, coupled with starvation.

I would like to say that I appreciate very much all the help I have had from my wife, and express my thanks to Sir William Wright Smith for his assistance in giving me access to the Herbarium at Edinburgh, and also to Dr George Taylor for the same facilities at the British Museum (Natural History).

This article was extracted from the Lily Group DVD, which contains digitised copies of *Lilies and Related Plants* (or equivalent) from 1932-2012.

# Some Liliaceous plants from China and Vietnam

*In the following article **Julian Shaw** describes some notable Chinese and Vietnamese members of Liliaceae and provides clarification with regards to accurate identification.*

Recent decades have seen a flood of new plant material arrive in cultivation from around the world, and especially so since China and Vietnam have become more open. As a result there is inevitably a host of plants circulating in cultivation either without a name or masquerading under a pseudonym. The following notes examine some of these with the aim of clarifying identifications, and providing new names where appropriate.



## ***Disporopsis***

Each year the *RHS Plant Finder* lists more accessions of *Disporopsis*, many of which are known only by a cultivar name or field number and remain unassigned to species. Recent cladistic analysis of DNA sequences from cultivated *Disporopsis* accessions (Floden, 2012 *ined.*) suggest that more species should be recognised than are presently, in the rather conservative *Flora of China* treatment. For example, Chinese botanists Wang and Tang have annotated some collections in Chinese herbaria as *Disporopsis yunnanensis*, a name which has not yet been published, for a plant that seems distinct. It is like a smaller version of *D. aspersa* with longer petioles and narrower rhizomes.

Another quite distinctive plant that has been introduced to cultivation from northern Vietnam is described

*Disporopsis fansipanensis* in cultivation at Crug Farm.

below as *Disporopsis fansipanensis*. It is also known from neighbouring Yunnan and southwestern Guizhou provinces in China and seems to have been included in *Disporopsis pernyi* in the recent *Flora of Vietnam* (Nguyen Thi Do, 2007), which recognises only *D. pernyi* and the distinctive *D. longifolia* as occurring in Vietnam. In fact, the illustration provided there of *D. pernyi* has been taken from *Iconographia Cormophytorum Sinicorum* (Anon., 1976) and represents Chinese material of that species. Based on his field experience, Bleddyn Wynn-Jones thinks there is probably at least a third Vietnamese *Disporopsis* awaiting identification. Batches of seedlings of *D. fansipanensis* at Crûg Farm are making good growth and display their very attractively marked stems from an early age, which makes them easy to identify. It is likely to become quite popular when released.

### ***Disporopsis fansipanensis***

J. M. H. Shaw, B. Wynn-Jones and  
V. D. Nguyen sp. nov.

Description: Perennial herbaceous monocot, with annual stems arising from a moniliform rhizome. Prophylls 4-13 cm, thin, papery, streaked. Annual stems 35-75 cm tall, up to 9 mm diameter, solid in cross section, slightly arching, green mottled red-brown, the colour dashes merging into larger blotches towards stem base, scabrid-hispid, with minute papillae enations on ridges decurrent from leaf bases, bearing up to 32 leaves. Lower leaves almost paired, upper alternate, more or less distichously arranged, lanceolate to narrowly ovate, 5-11 × 1.5-4 cm, green, lamina upper surface, glabrous, waxy, somewhat corrugated with 3-5 impressed veins, lower surface with main veins strongly prominent, cross veins evident, slightly raised, more pronounced on larger leaves; margins



*Disporopsis fansipanensis* in habitat northern Vietnam.



usually undulate; base rounded to shallowly cuneate, petiolar region very short with a ridge at point of attachment to stem; apex acuminate, shortly upturned at very tip. Flowers 1-2 (-3) in axils of leaves on the lower third of the leafy part of the stem, perianth c. 14 mm long, united for basal 4-5 mm, white to green with strong purple-brown dots and blotches, segments in 2 series, lanceolate. Corona lobes inserted adjacent to perianth segments, 3.5-4.5 mm long, with cleft apex; anthers 1.5 mm, inserted on corona segments in sinus of apical cleft. Ovary round, glabrous, smooth with persistent short apical style; stigma level with anthers, effecting self-pollination. Fruit a globose, blue-purple fleshy berry. Flowering April to June.

Holotype: *BSWJ 12277*, northern Vietnam, Fan-si-pan, 3000 m on ridges (WSY).

### ***Lilium***

Only a few native *Lilium* are known from Vietnam. The *Liliaceae* volume of *Flora of Vietnam* (Nguyen Tien Ban *et al.*, 2007) treats the following taxa, *L. brownii* var. *viridulum*, *L. concolor*, *L. lancifolium* (meaning *L. tigrinum*), *L. longiflorum* and *L. poilanei*. Of these *L. concolor*; *L. longiflorum* and *L. tigrinum* are cultivated introductions, leaving just the two *L. brownii* var. *viridulum* and *L. poilanei* as natives. Probably the most unusual Vietnamese lily is the endemic *Lilium eupetes* discovered by Bleddyn Wynn-Jones and described in 2008 (Shaw, 2008). Perhaps its nearest relative is Kingdon Ward's *Lilium arboricola* from Upper Burma (Stearn, 1954), which shares the unusual epiphytic habit of growing on tree branches high above the forest floor. Now that *L. eupetes* is settling down in cultivation, established plants have produced magnificent inflorescences of seven or more flowers of a stature which is probably rarely attainable in the wild, where one to two-flowered plants are the norm. It is easily propagated from the small bulbils that appear, up to six or seven at a node, in the leaf axils. The specific epithet, *eupetes*, is Greek for 'flies well', a choice prompted by the unique method of bulbil dispersal. As the leaves turn brown at the end of the growing season, they gradually curve in to a sickle shape and then detach from the main stem still bearing their small cargo of bulbils. The sickle shape causes the leaves to spin as they fall and hence fly away from the tree, in the helicopter fashion of sycamore samaras, thus dispersing the propagules. Most of the collections from Vietnam currently in cultivation are labelled as *L. poilanei* or *L. primulinum*, and questions asked about these has prompted me to take a closer look. *Lilium poilanei* is a rather mysterious plant apparently still known for certain only from the original collection in spite of the labels seen in cultivation. I decided to ignore the labels and identify the plants before me, which led me to the conclusion that the Vietnamese *Lilium* generally seen in cultivation is *L. primulinum*. It would appear that both *L. primulinum* var. *burmanicum* and var. *ocbraceum* have been introduced from



*Lilium primulinum* from northern Vietnam.

northern Vietnam, and are often labelled *L. poilanei*. These plants are reasonably well known and useful colour images appear in *Flowers of Western China* (Grey-Wilson & Cribb, 2011 p.544).

*Lilium poilanei* itself is said to differ mainly by the flower colour which is pale yellow without the dark maroon speckling and shading found in *L. primulinum* var. *burmanicum*, but with a central line (midrib) of red on each perianth segment. A monochrome photograph of a type specimen is reproduced in Woodcock & Stearn, (1950, p. 238). It is very similar to *L. primulinum* var. *primulinum*, which also lacks the maroon markings in the throat of the flower, and might be better treated as a variety of that species. A table comparing several different descriptions of plants with the protologue of *L. poilanei* and an accession from Fan-si-pan, Vietnam is provided.

The table below indicates that both *L. poilanei* and the collection from Fan-si-pan fall within the range of *L. primulinum*. Although the Fan-si-pan plant is a little larger in some measurements this might be because live rather than dried material was examined and it was greenhouse grown. The longer ovary and variable anther length may be related to subtle shifts in pollinator or breeding system over the wide geographical range. For example, shorter anthers produce fewer pollen grains than long anthers and may indicate self-pollinating individuals, whereas conversely longer anthers are usually produced where out-crossing is required to produce seed.



## Comparison of *Lilium poilanei* and *Lilium primulinum*

NAME	<i>L. poilanei</i>	<i>L. sp.</i>	<i>L. primulinum</i>	<i>L. primulinum</i>
Source	protologue <sup>1</sup>	cultivated <sup>2</sup>	Fl. India <sup>3</sup>	Fl. China <sup>4</sup>
Height (m)	1-1.5	1.4	0.3-1.5	0.6-2
Leaves (cm)	10 × 1-1.5	11.5 × 1.4-2	2-9 × 0.8-2.2	3-12 × 0.8-1.4
Leaf veins <sup>5</sup>	3-5	3-5	3-5	3
Tepals (cm)	9-10 × 2	10.2 × 2	4-10 × 1.2-3	3-9 × 1-1.7
Filaments (cm)	6	6.5	3.5-7	4.5-5.5
Anthers (mm)	12	14	8-10	10-12
Ovary length (cm)	1.5	14	1.5	1.5-1.7

<sup>1</sup> (Gagnepain, 1934)

<sup>2</sup> Collection from Fan-si-pan, by Paul Bonavia. Measurements from living material.

<sup>3</sup> (Dasgupta, 2006)

<sup>4</sup> (Liang Songyun & Tamura, 2000)

<sup>5</sup> The number of main veins per leaf is variable, but generally 5-veined leaves appear to be a juvenile phase, appearing on seedlings, and first flowering plants, while 3-veined leaves appear on mature plants with stems bearing several flowers, also the inflorescence bracts may be 5-veined, on otherwise 3-vein leaved plants.

After examining available materials, my conclusion is that *L. poilanei* belongs within the *L. primulinum* complex and accordingly a new combination is provided. *L. primulinum* var. *poilanei* (Gagnepain) J. M. H. Shaw comb. and stat. nov. Basionym: *Lilium poilanei* Gagnepain, Bull. Soc. Bot. France, 81: 619 (1934).

One of Bleddyn Wynn-Jones's collections of *L. primulinum* from northern Vietnam produced numerous bulbils in the leaf axils during one year, but none in subsequent years. This facultative bulbil production does not seem to be recorded for this species elsewhere, but as it has not repeated this performance since it is inappropriate to provide a formal name, such as var. *bulbiliferum*, as in some other *Lilium* species.

One other small point, the line drawing illustration of *L. poilanei* that appears in Vietnamese publications has been copied or redrawn from the original French *Flore générale de L'Indo-Chine*. Probably due to low resolution scanning, the illustration in *The Illustrated Flora of Vietnam* depicts, amongst other parts, a solitary filament with the margins slightly stepped. The redrawing in *The Flora of Vietnam* has interpreted this as hairs and depicts the filament with linear trichomes; in reality the filaments are glabrous.

### ***Maianthemum***

An attractive spring flowering carpeter for woodland gardens, *Maianthemum bifolium* subsp. *kamtschaticum*, also known as *M. dilatatum*, has of recent years become available from several accessions which differ markedly in size. Small-leaved variants are sold under the names var. *minimum* and var. *pumilum*, however, these names appear to be unpublished botanically.

Variation within *M. bifolium* has been extensively investigated by Japanese botanist, Shoichi Kawano who published several detailed papers (Kawano, 1968). He concluded that there were several entities distinguishable within the subsp. *kamtschaticum* complex, but apparently did not publish names for them. (At least, searching the relevant literature and enquiring of the authors of the forthcoming monocots volume of the *Flora of Japan* did not reveal any.) He demonstrated that plants from the eastern coast of Japan produced small leaves, while those from the western side produced the size usually seen in gardens. A race with exceptionally large leaves was confined to the island of Ullong-do.

Since this miniature plant is evidently represented by more than one clone, and a valid name for the geographical race cultivated in European gardens for its diminutive stature would be useful, the following validation of the name var. *pumilum* is provided.

*Maianthemum bifolium* subsp. *kamtschaticum* var. *pumilum* J. M. H. Shaw var. nov., differs from var. *kamtschaticum* by much smaller leaf size and stature. Petiole 3-4 cm, leaf lamina 24-31 mm long × 14-19 mm wide; flowering shoots c. 7 cm from soil level to tip of inflorescence.

Holotype: cultivated plant, propa-gated from Japanese material, *J. M. H. Shaw*, s.n. 2013, (WSY).

The plant called var. *minimum* hort., is included within the above variety, and if really different requires a cultivar epithet.

Bleddyn Wynn-Jones reported being sold plants purportedly of this variety in Japan, only to discover that they had been artificially dwarfed by cultivation techniques, possibly the use of a growth retardant, as the following season they reverted to the usual size. The genuine variety retains its dwarf form.

### ***Polygonatum***

For several years now, a rather striking, tall, red-flowered *Polygonatum* has been sporadically cultivated. While it is somewhat frost tender, the impact of the flowers and size of the plant, make efforts to cultivate it worthwhile. It graced the Crùg Farm exhibit at the Chelsea Flower Show 2013, prompting plantsman Alan Leslie to remark as he admired the stand, 'That one takes the biscuit!' It is also grown to perfection, along with other Sino-Vietnamese treasures, in a shady lean-to greenhouse by Tom Hudson at Tregrehan, Cornwall. The plant has been known since at least the 1960s



and is generally referred to as *Polygonatum kingianum* red form, although it was described as *Polygonatum vietnamicum* (Abramova, 1986), a name which has unfortunately been overlooked by the authors of the 2007 *Flora of Vietnam*, who again are content to use *Iconographia Cormophytorum Sinicorum* as the source of their illustration depicting a quite different plant. *Polygonatum vietnamicum* was originally described from a collection made in Hoa Binh province, Vietnam, in tropical mountain woodland. Since then Bleddyn Wynn-Jones has collected it in Laos, Tom Hudson has accessions in cultivation from adjacent China, and it has also been offered by Chen-Yi nursery. Apart from differences in the flower, it has a very characteristic rhizome that is vertically compressed and moniliform, looking like a string of miniature doughnuts placed side by side.

### ***Polygonatum 'tonkinense'* and *P. 'punctatum'***

Another now increasingly popular Vietnamese *Polygonatum* has been widely grown under these two names. It is deservedly popular on account of its maroon suffused foliage and purple-red stems. Careful investigation by Aaron Floden has determined it to be conspecific with *Polygonatum mengtzensense* (Wang & Tang, 1936). It has been listed for sale in nursery catalogues and past editions of *The RHS Plant Finder* both as *P. tonkinense*, a misapplied name that is actually a synonym of *Disporopsis longifolia*, and also as *Polygonatum punctatum* under which name

**Opposite**

*Polygonatum vietnamicum*

**Right**

*Polygonatum mengtzense* f. *tonkinense*

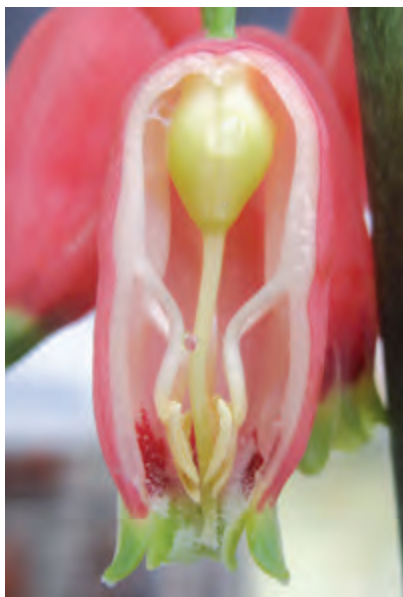
it is treated almost universally (Ho, 1991; Nguyen Thi Do, 2007). However *P. punctatum* is a Himalayan species, which is not found in Vietnam, and is only found in China west of Baoshan in the Dulong Valley, where it occurs with *P. cathcartii* and other Himalayan *Polygonatum* (Floden, pers. com.). It differs from *P. mengtzense* by the leaves spiralled around the red-spotted stem, and strongly urceolate flowers, held on short, erect peduncles.

*Polygonatum mengtzense* is found on Fan-si-pan, and also in Ha Gang and Cao Bang provinces of Vietnam; across the border in China it has been collected in Guizhou, Yunnan and Guangxi. It can be distinguished from *P. punctatum* by alternate leaves on a green or red-spotted stem, and the flowers which are not strongly urceolate, held on pendent peduncles.

*Polygonatum mengtzense* is itself rather variable; there are plants with smooth green stems and green and white flowers, and others from high altitude with purple-red suffused, often scabrid stems and foliage, and red spotted flowers.

In cultivation, as in Vietnam, these are quite distinct, and are usually so in the wild, although Aaron Floden, who is currently revising the genus *Polygonatum*, has found that at Mengzi and near Pingbian in China they grow together. Also he has observed rarely a green plant with scabrous stems and a red-purple one with smooth stems. Consequently, there is only the presence of anthocyanins that absolutely differentiates them; there do not appear to be any morphological features that are universally unique to either the green or red-purple plants. Hence a distinguishing name, which would be useful in cultivation and throughout most of the wild geographical range, is proposed at the rank of forma.

*Polygonatum mengtzense* f. *tonkinense* J. M. H. Shaw, B. Wynn-Jones and V. D. Nguyen forma nov., distinguished from the green and white flowered f. *mengtzense*, by the presence of red-purple pigmentation throughout the aerial parts of the plant. Usually, but not always, with scabrid, rather than smooth stems,





*Polygonatum  
mengtzensis* f. *mengtzensis*

slightly more conical flowers, and generally found at higher altitudes.

Holotype: *B. Wynn-Jones* s.n., cultivated at Crug Farm, North Wales. (WSY).

### Acknowledgements

I would like to thank the following who have kindly shared their knowledge, expertise and sometimes plants, during the preparation of this item: Paul Bonavia, Aaron Floden, Tom Hudson, Bleddyn and Sue Wynn-Jones. Also to V. D. Nguyen, Hanoi, for assisting Bleddyn with the necessary permits and other permissions. Particular thanks and my appreciation for support from staff at K, BM, particularly John Hunnax, and the RHS library staffs.

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# Lilies through the season in a Cotswold garden

*In this article **Patrick Bucknell** describes the lily species he grows (and other plants he recommends) in order of their flowering during the difficult summer of 2012.*

Not all lilies will flourish in calcareous soil. Some species love it; others need to be grown in pots of ericaceous compost. Asiatic hybrids and martagon hybrids should do well in the ground, but oriental hybrids based on *Lilium auratum* will not. Lilies bought in flower in the market will usually flourish and increase in the garden, even if they have been forced into flower out of season. In this article, a follow-up to *Growing lilies on chalk and limestone* [Spring 1995, Volume 17, No. 1], I'll describe the species in the order of their flowering this year in my garden, along with three lilies\* which do not really qualify for inclusion, but which I can highly recommend.

The weather in 2012 has been unusually wet and cold. Some lilies have liked the warm rain and grown higher and finer than ever before, while others have suffered from fungus diseases which unfortunately require chemical intervention. Bright scarlet lily beetles have also been active.

***Lilium pyrenaicum*** is an indestructible plant which increases slowly. It usually grows to about 60 cm, but this year it was nearly 90 cm and really fine, though two or three weeks later than usual. It has an unattractive scent.

***Lilium martagon*** (white) The typical species is deep pink; it doesn't grow tall here but it clumps up well, and is exquisite. The white variety grows more strongly in my garden, 60 cm to 90 cm high, and increases slowly. Martagons are plants for light shade. Their leaves tend to go brown but this doesn't prevent them from flowering well, or from coming up again. One group that I wished to split had gone so deep that I couldn't get them up!



*Lilium pyrenaicum*

Early on, when my tiger lilies were about 145 cm high, I noticed black, soft, rotten leaves near their growing tips. They were successfully tackled with Vitax Yellow Sulphur Powder: the tips grew through





**Left and below**

*Lilium martagon* hybrids

*Lilium* × *dalhansonii* ‘Mrs R O Backhouse’

and the disease did not recur. By the beginning of June, the leaves of many plants began to go brown, starting at the lower levels and spreading upwards. Treatment with Bayer Fungus Fighter, a systemic fungicide, was unsuccessful—perhaps because it was washed off by succeeding showers. Finally, rotten spots appeared on the leaves of auratum hybrids, which the Bayer product took care of. In past years I have been pleased with Rose Clear Ultra, which deals with insects and diseases—I don’t know why I didn’t use it this season.



Lily beetles were not numerous and I picked them off and crushed them. To deal with any that were better hidden, I sprayed a couple of times with Provado Ultimate Bug Killer, but Rose Clear would have done as well.

Next year I intend to spray susceptible plants such as Madonna and martagon lilies regularly with Bordeaux Mixture, from the moment leaves start to develop.

Please do not be put off growing lilies—nearly all plants have their weaknesses. I hope that these photographs and descriptions will demonstrate that lilies make a good show even in disadvantageous conditions.

***Lilium martagon* hybrids.** Various attractive hybrids are available. This is only their second year so it’s too soon to judge their longevity. (One clump developed yellowish leaves and misshapen flowers; they went into the dustbin, in case they were infected by a virus—better safe than sorry.)

***Lilium* × *dalhansonii* ‘Mrs R O Backhouse’**, a 90 cm-tall martagon hybrid which likes a shady position. It was bred almost 100 years ago by the eponymous Mrs B. in Herefordshire. Another good old hybrid, if you can find it, is ‘Marhan’.

***Lilium* × *testaceum*** is claimed to be the first hybrid ever (*L. candidum* × *L. chalcedonicum*). An exceptionally choice lily, with a lovely scent, about 120 cm tall. It shares the characteristics of the Madonna lily, and should be planted just below the surface of the ground. Very long-lived but doesn’t increase—I bought mine at least 50 years ago and at present have only two plants!

**Right and below**

*Lilium regale*

*Lilium candidum*

**Asiatic hybrid, *Lilium* ‘Connecticut King’**, is easy to grow, long-lasting, and about 90 cm tall. Similar lilies come in orange: turk’s cap, upward-facing, outward-facing, etc.

***Lilium nepalense*\*** is exotic and lovely, about 90 cm tall. I grow mine in a large pot of John Innes ericaceous compost. As it is stoloniferous, it pushes itself to the edge of the pot. It spends the winter in an unheated greenhouse and comes out in June. It wants a lot of water and should never dry out, even in winter.

***Lilium regale*** is surely the most beautiful and best-scented lily. It grows 120 cm to 150 cm tall and, once established, competes successfully with neighbouring shrubs but doesn’t increase. This year all my regales were struck down by some fungus disease and this was the only one that flowered. Normally it is healthy and trouble free.

***Gloriosa superba* ‘Rothschildiana’\***. The climbing, glory or flame lily breaks all the rules—but if you have a conservatory, give it a go! I’ve tried it several times—my son gave me one in flower, and this is a descendant. I don’t claim to know the secret of getting it started. It comes from a rain forest and loves humidity, so it needs lots of water and should never dry out in winter.

***Lilium candidum***, the Madonna lily, is a gorgeous, white lily with supreme scent, 120 cm tall. It was in my garden when I arrived, and is a typical cottage-garden plant. It is the only lily that should be planted at surface level where it develops a rosette of leaves on top of the bulb in the autumn. It’s susceptible to fungal infections and this year they nearly all succumbed. It really prefers a sunny spot with not too many neighbours, although the one here is surrounded by thalictrums—did they keep off the botrytis?

***Lilium pardalinum*** just loved the rain and grew 150 cm to 180 cm, which it’s never done before. From California, it likes to see the sun, if there is any. The flowers are striking, though scentless. A very healthy lily, which increases well and is much admired by visitors.

***Lilium* ‘Anastasia’** contains genes from *L. henryi* and from oriental lilies so





**Left and below**

*Lilium pardalinum*

*Lilium lancifolium* 'Splendens'

it's worth trying in calcareous soil. The first year, I grew it in a pot and after flowering put it into the ground. It grew strongly to about 120 cm and flowered well, but the colour has nearly left it—whether from excessive rain or because the soil is unsuitable should be revealed next year.

***Lilium lancifolium* 'Splendens'**, the tiger lily. Despite the advice of various experts, I've kept this lily going, first on chalk, then limestone, for 50 years. It's easy to increase from black bulbils which occur where the leaves join the stems. They come up everywhere, including in pots devoted to more exotic plants! Height 90 cm to 150 cm. It clumps up, does well in shade but is finer in sun. My favourite.



***Lilium henryi*** is a very healthy, long-lived lily, which builds up into huge clumps. Height 180 cm to 210 cm. It tolerates a certain amount of shade, but tends to grow towards the sun and bend over smaller neighbours. Not the most beautiful, but possibly the easiest and most trouble free. A

parent of hybrids which should do well in calcareous soil.

**Oriental hybrids\*** (based on *L. auratum*). These I grow in large pots or wooden tubs filled with John Innes ericaceous compost. I like these lilies, based on the open-flowered *L. auratum* from Japan. Their rich scent spreads round the garden. Here they have survived two icy spells in unprotected pots, but have not grown as high as usual—90 cm instead of 120 cm or even 150 cm. They increase rather fast and need dividing and repotting every three years. I would not be without them.

***Lilium* 'Black Beauty'** seems as easy to grow as its parent, *L. henryi*, but its other parent, *L. speciosum* var. *rubrum*, has endowed it with better looks. It is more erect than *L. henryi*, increases at only a modest rate, growing 150 cm to 180 cm tall.

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# Pat Huff, PhD

*At the Annual Meeting of the Lily Group in Birmingham on 26 October 2013 Elizabeth Banks, past President of the RHS, presented the Lyttel Cup to Dr Pat Huff for her work in connection with lilies and fritillaries and services to the Lily Group. **Caroline Boisset** went to visit her in Cambridgeshire.*

It was a fine autumnal afternoon when I drove into the drive of Castle House, Pat Huff and her husband Graham's wonderful moated seventeenth century home. The cyclamen were flowering abundantly, speckling the beds with every tone of purple, mauve and white; "they came from a few bulbs given to me by Eric Taylor when we first moved here in 1996, and they have been spreading ever since", Pat informed me.

It was Eric, who was at that time Secretary, who introduced Pat to the Lily Group. She more or less immediately joined the Committee and has been actively involved in the running of the Group, at times selflessly, ever since. She soon found herself serving as Membership Secretary and Treasurer, Secretary and Newsletter Editor (at times simultaneously) before becoming Chairman, a position she held calmly and efficiently for six years. Her time as Chairman was marked by difficult negotiations with the Royal Horticultural Society during which Pat with characteristic tact and endless patience supported and steered the Group.

Conservation of plants is one of her passions; she first met Eric when she joined the London Group of Plant Heritage (then NCCPG – National Council for the Conservation of Plants and Gardens) of which she has been a great supporter and edited their bulletin *Plant Heritage*. It is her conviction that conserving plants in cultivation is so important, which has led her to take on the Lily Group annual Seed Distribution as, together with the Bulb Auction, it plays a



crucial role in sharing the gene pool and ensuring that plants survive. She has edited the Garden History Society's newsletter and also now edits the Fritillary Group's journal that is published twice a year. If all this was not enough, this intelligent and energetic woman organises a major plant sale to raise funds for the church of St Hugh of Lincoln, run by the Claretian Missionaries at Buckden in Cambridgeshire. It usually has about 20 stalls and raises £2,000 to £3,000.

Pat grew up in Skokie, a comfortable suburb of Chicago. As one of four children, whose father was "big in the coin machine business" and whose mother was a homemaker, Pat, who had always been interested in plants, had her own patch in the family garden, but she acknowledges that the climate there is savage, with bitter winters and boiling summers, so gardening is difficult. She went to Northwestern University (Illinois) where she majored in English (with a minor in Latin).

It was during a tour of Ireland, visiting James Joyce sites, that she met her husband Graham who was a student at Trinity College, Dublin and was a steward at a Picasso exhibition in the Library there. They were married in the USA soon after and came back to live in London, some 40 years ago. In the early years she did a PhD at Kings College London on Romantic aesthetic theory, Samuel Taylor Coleridge being her hero.

After the birth of her son she did various jobs from running a wine bar in the early 1980s, which was a good experience, learning a lot from the business, to working for Hayat (Lady) Palumbo in her Walton Street shop "Tapisserie", painting needlepoint canvases which allowed her to be near her son's school and fulfil her love of needlework. For the last 30 years, however she has been managing a law firm in Central London, a demanding job in difficult times but one that over the years has given her the space and freedom to embrace enthusiastically the horticultural opportunities presented in her adopted country.

Pat told me, when we were walking round the garden that surrounds her magical home, that she doesn't have enough time to look after her plants. However, and despite that, in addition to lilies her other interests are species peonies and caudiciform succulents (that were about to be brought in for the winter). As we crossed the moat she pointed out her favourite plant, *Euphorbia* 'Silver Swan', and we discussed some of the trees that she had recently planted, among them a ginkgo, a magnolia that she was hoping would flower soon and a quince grown from a seed.

As well as being a keen needlewoman, Pat likes cooking and loves animals. Her two dogs, Daisy, a rescue Yorkie, and Alfie, an English bull terrier, snore by the range in the kitchen, 13 mallard fledglings squabble on the moat and four tups keep the paddock in trim. When I left, she and Graham saw me off with a bagful of plums and a shared conviction that, one of Pat's other loves—the Lily Group, has a bright future.



# An extraordinary man

*John Lykkegaard (1955-2012) was a widely respected and internationally recognised expert in growing and hybridizing lilies, as the following tributes from **Ole Larsen** and **Walter Britton** confirm.*

## **My best friend, John Lykkegaard** Ole G. Larsen

Last year, on the 2nd of October 2012, my best friend, John Lykkegaard Johansen, died suddenly. I had known John for 25 years. We talked, or exchanged emails, almost every day and we always had something to talk about, especially our common interest in lilies.

Apart from his expertise with lilies, John was also a very skilled and conscientious thoracic-abdominal surgeon and I used him as ‘family doctor’ when I had questions about illness in the family.

John and I joined a Lily Club, in Denmark, at the same time. We started by crossing Tetra lilies. We made many crosses and those we did not need we gave to other lily growers who got pleasure from them. The few lilies we kept we exchanged frequently, with each other, so we gradually accumulated more lilies.



At a lily exhibition in Salaspils Botanical Gardens, I saw a lot of lilies that had been grown in Latvia for a long time. I took some of these ‘Tango’ lilies home and gave them to John who hybridized more of these heavily spotted lilies over many years. He made some really good hybrids, which he crossed with lilies that were resistant to Botrytis and Fusarium. The first ‘Tango’ lilies, however, were not so good. John wanted them to remain green until the first frost and after working with them for many many years he succeeded and there are now approximately 15 really good clones.

John made crosses with *Lilium martagon*, which have resulted in plenty of good hybrids. In terms of colour, they range from completely dark pink to completely orange. John was quite proud of his species lily collection, as he had



many—however, his interest was so great that he was always searching for more.

In 1999 John and I made a trip to China to search for species lilies. It was a great experience for us and also for our Chinese friends. We drove 2600 km down through Sichuan looking for lilies. We found many species we had not seen before and we also took some home with us. We had many mutual acquaintances, through trips and Lily Clubs, among them Peter Schenk and Carlo Randag from Holland. They had created some orienpets John and I were very interested in acquiring, so we swapped the species lilies we had brought from China for these. The many hybrid bulbs we received from Peter and Carlo were Tetra and Tetra Orienpet Orientals. These lilies were the result of many years work, which is how long it takes to produce good garden plants.

I think many people will miss John as the person he was, but also for the knowledge and skill he had in relation to the Lily World. I feel so fortunate and honoured that John's family gave me approximately 4000 of his lily bulbs, which I will do my best to ensure are used to continue John's great work.

**Walter Britton**, *in an article first published in the 2005/06 issue of Lilies and Related Plants, writes about the 2004 recipient of the Lyttel Cup who was presented with the award at the Conference dinner.*

In the rolling landscape of the Danish countryside may be found a typical farmhouse large enough to accommodate a family of four sons. The progenitor of this brood is of Swedish ancestry. The farmhouse is flanked by tall hedges to protect it and the garden from the cold winds of the North Sea. The owner is known by his mother's maiden name in order to avoid some confusion at work. He is a physician who studied medicine in Copenhagen and is a practising surgeon.

He is widely known and corresponds with both amateur and professional lily growers from Latvia, The Netherlands, England, The United States, and Canada. He is an international speaker and attended the North American Lily Society Annual Show at Hamilton in 2002 where he was a featured speaker. He is a regular contributor to the *Yaboo Lilium List* on the Internet and is known for his unique witty sense of humour, which is widely admired by his friends. There is a striking similarity between our hero and another Swedish physician with a strong interest in things botanical. While we would not suggest that our hero is the reincarnation of Linnaeus, the similarity is intriguing. He is John Lykkegaard Johansen—this year's recipient of the Lyttel Cup.

John has a wide and keen interest in botany in general and horticulture in particular. As a young man his first interest in horticulture was a balcony garden. Later he grew vegetables and garden plants including grains, fruit trees, berry vines, ornamental shrubs, and flowers. Hidden among his large garden of table vegetables are rows of lilies.

Lilies are John's passion. Lilies can be found everywhere—lilies on the terrace, lilies in the sunroom, lilies in the greenhouse, lilies hidden inside a box hedge. These are not ordinary lilies. He grows rare species lilies from China and evaluates them. He shares his knowledge with his friends around the world.

John's keen interest in Chinese lilies led him to travel to China. He got more than he bargained for. By the time he reached London en route to China, he had already lost his luggage. In Beijing he departed for the interior almost before he arrived. His luggage never did catch up with him. John was to sample rural Chinese cuisine (with cabbage a staple) and lodging. It is an experience he will never forget. Neither will his companions, one of whom lost 18 kg in weight (40 lb). It was up hill and down dale, experiencing brake failure accompanied with the command "Jump" which he took

seriously, rockslides, and the altitude sickness of his companions. Amid this excitement, there was time to see rare lilies such as *Lilium bakerianum* (see *Lilies and Related Plants 2001-2002*, pp. 31-33) growing on the mountainsides.

Returning to Denmark and relative tranquility, John resumed his interest in growing orientals and oriental-trumpet hybrids. Under his care, the oriental trumpets are coached to grow 3 m tall (9 ft). More recently John has developed a strong interest in those highly spotted asiatic lilies called Tangos. He now sees every asiatic lily with Tango spots. He has successfully hybridized them from bulbs received from his friends. In return he now donates his Tango hybrids around the world.

John grows many of his lilies from seed. He has grown European lilies, Chinese lilies, hybrid lilies, and species lilies from seed. He has a unique way of recording them. In his lily bible, written by Derek Fox, John tapes specimen seeds in the margin against the paragraph describing each species lily. It must be the only lily seed herbarium in existence.

John's knowledge, expertise, and skill in lily culture are formidable. His hospitality and generosity makes him an extraordinary fellow in the lily community. It is not surprising that he was awarded the Lyttel Cup. May our good fortunes continue to be enhanced by this Lyttel Cup recipient.



Two orientpets which John successfully bred.

# The 'Odd One Out' revisited

*In this article, the history of *Lilium rhodopaeum* is briefly summarised by the editor, and a novel way of contributing to the conservation of this lily is described by **Chris Durdin**.*

In 1952 a Bulgarian botanist, Dr Delipavlov, discovered a lily, which was named *Lilium rhodopaeum* after its home in the Rhodope Mountains. Since its discovery this rare lily has been accorded the status of a protected species.

In his book *Lilies*, Patrick M. Syngé includes *L. rhodopaeum* with *Lilium carniolicum*, and the then subspecies of *L. carniolicum*, i.e. subsp. *albanicum*, subsp. *bosniacum* and subsp. *jankae*. From a morphological perspective this categorisation seems myopic, as *L. rhodopaeum*, to quote Derek Fox, has “funnel campanulate” flowers, whereas the flowers of *L. carniolicum* and its subspecies are turkscaps. Perhaps it was geographical proximity that suggested this grouping, as the lilies that look most like *L. rhodopaeum*, i.e. *Lilium monadelphum* and its recognisable relatives, grow hundreds of miles away in NE Turkey and the Caucasus Mountains. It would be useful to apply DNA profiling to resolve this situation, but in the meantime, to quote Derek Fox again, *L. rhodopaeum* “is every inch a cousin of the Caucasian species *L. monadelphum*.”

“The Odd One Out” is the title of an article, about *L. rhodopaeum*, written by Derek Fox, in the 1997-1998 issue of *Lilies and Related Plants*. Although never explained in the article, the title could be interpreted as alluding to the geographical isolation of “a cousin” of *L. monadelphum* (and its relatives) in Bulgaria. Whatever the actual meaning of the title, more importantly the author found flowering plants of *L. rhodopaeum* in the Rozen meadows, near the village of Progléd, in southern Bulgaria. One of the differences he noted from the Caucasian species was that *L. rhodopaeum* lacked the purple base to the flower, which is typical of *L. monadelphum* and related species, i.e. *Lilium akkusianum*, *Lilium kesselringianum* and *Lilium szovitsianum*. The author also met Dr Delipavlov and, among other things, they discussed the possibility of *L. rhodopaeum* growing over the border in Greece. It is astonishing, to reflect that *L. rhodopaeum* was discovered in Bulgaria in 1952, Syngé published *Lilies* in 1980 and Derek Fox wrote his article in the late 1990s and yet the existence of this lily in Greece was yet to be confirmed and recorded.

In the intervening years, since Derek Fox wrote his article about *L. rhodopaeum*, interest in this lily and its conservation has increased. This is easily confirmed by visiting the numerous websites that provide information and stunning photographs of this beautiful lily. The website of the European Nature Information System, EUNIS (<http://eunis.eea.europa.eu>), for example, shows two sites where



Plants of *Lilium rhodopaeum* growing in a meadow in southern Bulgaria.

*L. rhodopaeum* can be found in Bulgaria and ironically, given Derek Fox and Dr Delipavlov's uncertainty about this lily's incidence over the border, five sites where *L. rhodopaeum* can be found in Greece.

The other, perhaps surprising, source which has made a contribution to the conservation of *L. rhodopaeum* relates to people with an interest in holidays which involves the study of wild plants and animals. The following is an example of how a holiday company combined providing an enjoyable experience, for its clients, with a significant contribution to the conservation of one of Europe's rarest lilies.

A group from Honeyguide Wildlife Holidays, ([www.honeyguide.co.uk](http://www.honeyguide.co.uk)), were taken to see *L. rhodopaeum* in southern Bulgaria, in June 2012, by their local guide, Bulgarian botanist Vladimir Trifonov, a.k.a. Vlado.

Group members and Honeyguide leader, Dr Chris Gibson, who is a Principal Advisor for Natural England, thought they'd like to help Vlado and his efforts to conserve *L. rhodopaeum*. The source of funds was through the holiday, as £40 of the price of every Honeyguide wildlife holiday is allocated to a conservation project in the country where the holiday takes place. This goes through the Honeyguide Wildlife Charitable Trust, which enables the holidays' conservation contributions to



Wooded hills and alpine meadows, the typical habitat of *Lilium rhodopaeum*.

be topped up by Gift Aid.

This holiday's donation was already earmarked for the Bulgarian Society for the Protection of Birds (BSPB), the BirdLife partner in Bulgaria, which also has a wider biodiversity remit. The Honeyguide charity was able to double the funds raised by the holiday to a total of £800.

Chris Durdin, proprietor of Honeyguide Wildlife Holidays and Chairman of the Honeyguide Wildlife Charitable Trust, arranged that £500 was sent to BSPB to support the designation of Protected Area Tzigansko Gradishte—a *L. rhodopaeum* site—as part of the Natura 2000 network of internationally important wildlife sites. The money covers travel and communication costs for meeting and getting support from local people and authorities, and for the final public hearing. The balance of £300 was for travel and other expenses for botanist Vladimir Trifonov. Vlado is the botanist who co-leads Honeyguide groups, 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. He is also the author of the Biodiversity Action Plan for *L. rhodopaeum*: it would be fair to describe him as the local expert. Vlado is monitoring the privately-owned site where the Honeyguide group saw *L. rhodopaeum* in June 2012. That includes clarifying ownership and, it is hoped, arranging management of the meadow.

The following is an extract from a recent report by Vladimir Trifonov:

## ***Lilium Rhodopaeum* in the locality of the village of Stoykite, Smolyan Municipality, Bulgaria, 2013**

This year the locality of *L. rhodopaeum* was visited on 27 June 2013. This visit was planned in 2012.

The main threats to the population of *L. rhodopaeum* appear to be climate conditions and competition/suppression by False Hellebores. Therefore, the decision was taken to reduce the population of this species by haying. In the summer of 2012 haying was carried out in the meadows where the lilies grow.

The population of *L. rhodopaeum* for 2013 is about 66 individual plants:

- 17 flowering (including three individuals with two flowers and two with three flowers);
- 46 vegetating, i.e. without flowers, (in approximately 10 groups).

When these numbers are compared with the population in 2012, which was about 130 individual plants, there has been nearly a 50% decrease. It may be that this significant decrease is attributable to climate conditions, as the summer of 2012 was extremely dry—to the extent that the lilies did not produce seed. However, it is not uncommon for plants of the lily family to miss seed production for a year or more, when the climate conditions are not suitable.

Unfortunately, it seems that after intervention (haying) the density of False hellebores increased. It is possible the increase is due to the different (more favourable) reaction of the hellebore—to the climate conditions—by comparison with the lilies.

However, it could be that the intervention shows that the numbers of False hellebores were not adversely affected by haying. Perhaps, therefore, this perennial species should be uprooted for better results, but, potentially, that could both disturb and easily damage the already decreasing population of *L. rhodopaeum*.

***Status Report by Vladimir Trifonov, September 2013***

There are many notable things about *L. rhodopaeum*, e.g. its incredible beauty, it has only been known to science for little more than sixty years, its full distribution wasn't known until comparatively recently and many lily growers would love to have it in their collections, but few actually do. However, perhaps the efforts of Honeyguide Wildlife Holidays—and their clients—to assist the Bulgarian authorities—and experts like Vladimir Trifonov—with the conservation of *L. rhodopaeum* is especially notable, as without its conservation this lovely lily could easily disappear.



# Genetic Banking the Pacific Northwest's Tiger Lily (*Lilium columbianum*)

*In this article **Dr Richard Haard**, Propagation Manager, Fourth Corner Nurseries, Bellingham, Washington State, USA, describes a project with the aim of propagating *L. columbianum* as a wild plant, so that it is suitable for reintroduction into its natural habitats.*

*Lilium columbianum* is generally known as the Columbia Lily and also by its common name, the Tiger Lily. This is a plant of the North American coastal forests, prairies, subalpine meadows and interior forests of British Columbia, Canada, and Washington, west to Northern Idaho southward through Oregon and into Northern California.

This spring and summer I've been traveling through part of the range of distribution of *L. columbianum*, first to view flowering specimens and then to collect ripe seed capsules in order to propagate a reference collection for this

*Lilium columbianum* near Arcate, California in coastal foothills with Redwoods in the background.



species that will then be propagated vegetatively in order to increase its numbers.

I'm a plant propagator at a native plant nursery near Bellingham, Washington. Most of my experiences have been propagating trees and shrubs but now nearing retirement I have trained my replacements and have time to pursue this interesting project. We have a 60 acre, wholesale only, nursery and grow our plants as direct field seeded and bare rooted. These plants are harvested for environmental restoration purposes. As a specialized nursery, we are a major wholesale supplier of plants to our client base, despite our small size. Now beyond our twenty-fifth year we are a nursery growing perennials, emergents and to a limited extent native lilies and other bulbs, in addition to native trees and shrubs.

The plants we grow are all produced from seed collected at specific locations from natural populations, seed orchards and farmed in seed propagation blocks. This provides us with a supply with P1 or F1, 2 seed to meet our propagation needs. For us, this seed sourcing standard is required to meet our customers needs for plants with the genetic diversity they require to survive in a dynamic environment and where genes flow to neighboring populations.

Defining seed zones for our production has been a difficult task for us. We have adopted the system developed by EPA geographer, James Omernik who used a weight of evidence approach to biotic and abiotic factors as a means of

*Lilium columbianum* in mixed pine/Douglas fir woodland near Leavenworth, Washington State.



classification. This has resulted in a classification of ecological regions reaching from the Arctic to Central America subdivided into different levels. We have adopted the level III classification that subdivides continental North America into 194 ecoregions. The map (opposite) shows ecoregions of the Pacific Northwest with illustration of distribution by herbarium specimens only in black and my current seed collections in red. It can be seen that of the 24 ecoregions shown, *L. columbianum* occurs in only 12. Furthermore, following the collection records south along zone 9, the Easter Cascades Slopes and Foothills, collections become less frequent. A further classification of ecoregions to level IV is currently underway. This will be used for a more refined analysis when it is available.

I mentioned this background—about who we are—to explain the reasoning behind our interest in propagating lilies and other *Liliaceae* members. There are several reasons to collect seed of species lilies to perpetuate as cloned samples. Our seed collections will create cultural isolations that will be useful both to restorationists and others with an interest in sampling the diversity of the species. Our mission for gene banked propagation is not to establish retail or ornamental markets but to document and preserve their unique genetics. A live gene banking of *L. columbianum* will take many years to implement and hopefully will outlive me.

Those species developing genetic differences across small environmental gradients are referred to as site specialists, and conversely species that only develop genetic differences across strong environmental gradients are called site generalists.

Here is a simple example to illustrate what is often not visible at a glance.

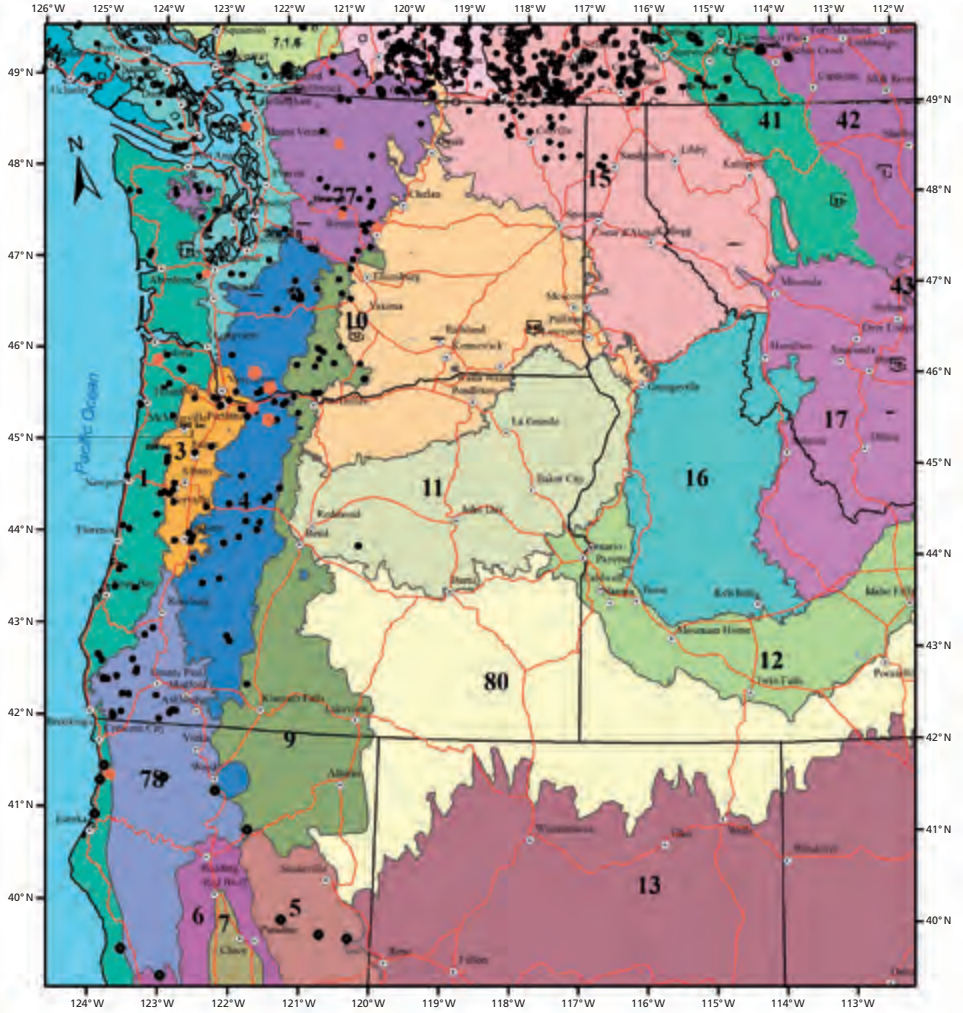
As a grower I have witnessed diversity within the species of many native plants we propagate, especially the woody shrubs. At its distribution extremes it is amusing to see (60 degrees north) an Alaskan ss Scouler willow seed collection (*Salix scouleriana*<sup>1</sup>) defoliate in August at our (44.4 degrees north) growing field and leaf out again in mid winter next to it's local kin showing adapted phenology.

The native, North American lily species are currently fragmented in their distribution across their range. Some are listed as threatened or endangered in the wild. Past bulb and blanket seed collections, urbanization and invasive weeds

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<sup>1</sup> *Salix scouleriana* is a widely distributed willow in North America and Canada. This plant occurs from Alaska and the Yukon Territory to Mexico and east to Manitoba, Canada. Here in Western Washington our local strains of Scouler willow shows adaptation to coastal habitats and as a sturdy tree and dry shallow soils as a short shrub. We have noticed three other intermediate forms of this species in our area and an analog of the coastal form at Atlin Lake, BC Canada, a 58 degrees north.

# Level III Ecoregions of the Pacific Northwest

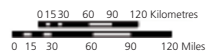


## EPA Level III Ecoregions

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|---|---|
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #008080; border: 1px solid black; margin-right: 5px;"></span> 1 Coast Range              | <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 19 Wasatch and Uinta Mountains   |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #FFD700; border: 1px solid black; margin-right: 5px;"></span> 10 Columbia Plateau        | <span style="display: inline-block; width: 15px; height: 15px; background-color: #008080; border: 1px solid black; margin-right: 5px;"></span> 2 Puget Lowland                  |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black; margin-right: 5px;"></span> 11 Blue Mountains          | <span style="display: inline-block; width: 15px; height: 15px; background-color: #FF8C00; border: 1px solid black; margin-right: 5px;"></span> 3 Willamette Valley              |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black; margin-right: 5px;"></span> 12 Snake River Plain       | <span style="display: inline-block; width: 15px; height: 15px; background-color: #008080; border: 1px solid black; margin-right: 5px;"></span> 4 Cascades                       |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 13 Central Basin and Range | <span style="display: inline-block; width: 15px; height: 15px; background-color: #008080; border: 1px solid black; margin-right: 5px;"></span> 41 Canadian Rockies              |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #FFC0CB; border: 1px solid black; margin-right: 5px;"></span> 15 Northern Rockies        | <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 42 Northwestern Glaciated Plains |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 16 Idaho Batholith         | <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 43 Northwestern Great Plains     |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 17 Middle Rockies          | <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 5 Sierra Nevada                  |

## CEC Level III Ecoregions

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|---|---|
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 6 Central California Foothills and Coastal Mountains   | <span style="display: inline-block; width: 15px; height: 15px; background-color: #FFC0CB; border: 1px solid black; margin-right: 5px;"></span> 10.1.1 Thompson-Okanogan Plateau                   |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #808080; border: 1px solid black; margin-right: 5px;"></span> 7 Central California Valley                            | <span style="display: inline-block; width: 15px; height: 15px; background-color: #008080; border: 1px solid black; margin-right: 5px;"></span> 7.1.5 Coastal Western Hemlock-Sitka Spruce Forests |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #800080; border: 1px solid black; margin-right: 5px;"></span> 77 North Cascades                                      | <span style="display: inline-block; width: 15px; height: 15px; background-color: #90EE90; border: 1px solid black; margin-right: 5px;"></span> 7.1.6 Pacific and Nass Ranges                      |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #4169E1; border: 1px solid black; margin-right: 5px;"></span> 78 Klamath Mountains/California High North Coast Range | <span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; margin-right: 5px;"></span> State and international boundary  |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #FFFF00; border: 1px solid black; margin-right: 5px;"></span> 80 Northern Basin and Range                            | <span style="display: inline-block; width: 15px; height: 15px; border: 1px solid red; margin-right: 5px;"></span> Major roads   |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #668D4F; border: 1px solid black; margin-right: 5px;"></span> 9 Eastern Cascades Slopes and Foothills                |   |







**From left to right**

Warm and cold stratified seed ready to be planted into trays; method of stratification using layered peat mix in plastic trays (warm and cold); and *far right*, *Lilium columbianum* year-old seedlings ready for placement into transplant bed.

have taken a toll, creating large distribution gaps. In environmental restoration we strive to preserve the genetic identity of the species with a good genetic match to its neighboring natural population.

Even though *L. columbianum* is not considered a threatened species it indeed is being genetically fragmented. We must appreciate the risk of losing the genetic tools that are found within the species to adapt to the spectrum of it's environment.

Here is a restoration nursery propagators dilemma, From Wikipedia:

*“Lilium columbianum is cultivated by specialty ‘non-wild collected native bulbs’, native plant nurseries, and arboretums. Plants in the wild should be left undisturbed, as they rarely survive transplantation stresses. The plants, available as bulbs, seeds, and container plants; are grown in gardens, usually within or replicating conditions of its native range.”*

Here then is the essence of our project:

Garden or nursery propagated stock is produced from either nursery seed, or clones that may have been open pollinated or represent strains unlikely to match natural populations where the plants need to be reestablished or supplemented.

Our gene banking project will accumulate seed from populations representing the Omernik classification cataloged to level 4. For each collection, we are collecting 3,000 to 20,000 viable seeds from a single population. Only 20% of the available seed on the day of collection is harvested to ensure that the population is not harmed. To adequately capture the genetic diversity of a population, seeds from a minimum of 50 individuals are collected. In some cases where robust populations of plants are evident considerably more individuals are represented. Once the Omernik zone for a *L. columbianum* seed collection is established no further



collecting in this area will take place. Our goal is to represent this species across its entire range and to study the extent of existing populations.

Once acquired, the lily seeds are processed and samples are prepared for long-term storage. The bulk of each collection however is placed into an immediate propagation protocol for grow-out. Collections are warm stratified in a timely fashion and then direct seeded in the field or with smaller samples into trays.

The lily seedlings are then grown in trays or field plantings for one growing season before harvest and transplanting into production beds for an additional two years. After growout we will dig the bulbs and harvest scales for vegetative increase of the population represented by this seed collection, until we reach a scale that will allow sale of bulbs to customers without sacrificing the original collections. The plants from this subset will never be seed propagated again at this nursery. Certain collections of *L. columbianum* will be targeted for large scale increase to serve our customers needs for plants in restoration and garden projects. Typically in our business the plants we sell go into urbanized areas. It is those specific seed source collections, from their matching Omernik zones, we are producing in larger quantities. Other collections will be maintained as a production garden, transplanted and increased to maintain production for customers with specific requests.

As I am writing this article in early September I am preparing to complete my seed collecting this year of seed pod samples from plants I spotted flowering last July at higher elevation locations in the North Cascades of Washington State and Oregon. It has taken thus far four and a half weeks of my time this summer and has been a wonderful experience to learn about the ecological amplitude of *L. columbianum*. Flowering patterns and seed ripening dates are similar in parallel habitats in coastal Washington State, Oregon and California. I have accomplished a pattern of collections beginning in Washington State Coastal San Juan Archipelago at sea level, to several locations and elevations on the east slope of the Cascade range, 1,000 to 3000 feet. Traveling south I criss-crossed the Olympic range rain shadow prairie and mima formations of Gray and Mason counties in Washington State



collecting in the grassland/ forest interface at 200 to 400 feet elevation. Traveling east from there I collected a transect, beginning near White Salmon on the Columbia Gorge, taking population samples at 500 foot elevation bands up to 4200 feet near Trout Lake. Across the Columbia River in Oregon I found specimens of *L. columbianum* at 300 feet elevation near Portland and then to the west on the hills of the coastal range. Further south in the central and southern portions of the Willamette Valley I have collections at valley floor locations and near 500 and 1000 feet. Lastly into the northern counties of northwestern California I have two collection sites, from stout roadside stands adjacent to coast redwood at 100 and 1500 feet elevation.

I am also collecting at subalpine sites in Oregon and Washington State. Typically the forest overstories have been Douglas Fir with Ponderosa Pine in the eastern Washington State location and Redwood in California coastal south. Next year I plan to finish this collection series with samples from northern Washington State and Idaho band of forested counties. I'm hoping to contact collector(s) in British Columbia to complete coverage at this species' northern range limit.

I would like to continue this gene banking project with a documentation of another wide ranging North American species, *Lilium philadelphicum*. This species ranges from Alberta, Canada across the Great Plains and into the eastern hardwood forest and south to Texas. Cooperation of collectors for this effort will be required.

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# B&D Lilies

*In this article **Bob Gibson** reflects on the plants and personalities he has known since he established B&D Lilies in 1978.*

When Alan Mitchell, editor of *Lilies and Related Plants* asked if I would be interested in telling the story of our life with lilies—and the people we have been blessed to know in both the commercial trade as well as those who simply loved lilies—I felt for a moment that his request was an honor. My next feeling was panic. What to write? When my wife Dianna and I started B&D Lilies in 1978, it was at a time when many of the true lily pioneers were still alive, as well as the explorers seeking a greater knowledge of lilies native to the United States. As I made a list of these people I realized had it not been for their advice, freely shared knowledge and their pure and contagious love for a flower, our now thirty five years with lilies would not have been possible. It is to those special people in our life—with the genus *Lilium*—that this article is dedicated.

As I committed to paper the names of those who touched Diana and me so deeply, with their knowledge and love of lilies, I looked for a common bond. What one thing linked us together—one point where our lives all met? Two days later, while attending church services, I heard a reading from St. James 3:16. “For where you have envy and selfish ambition, there you will find disorder and every evil practice”. While being so closely involved with the lily trade, we saw more than our share of “envy and selfish ambition” as well as “disorder”, and unfortunately an abundance of “evil practice”, but there was a common decency that ran through the lives of those we could truly call friends. In them we found no signs of “envy” in the work or accomplishments of others nor the slightest hint of “selfish ambition”. Some though, they did what they did as part of a job earning their livelihood, shared with the others a common selfless passion for their lilies.

Some of the following names will readily be recognized while others, though less well-known, nevertheless have been special to B&D Lilies as mentors, confidants, and friends.

**LeVern Frieman** quite possibly warms our hearts the most. LeVern started in lilies in the early 1940s with a great deal of his early work being focused on Trumpets, in particular *Lilium sulphureum*. He loved to relate his story of when Jan de Graaff paid his little Bellingham, Washington garden a visit in the early 1950s, a visit LeVern felt humbled by. Mr de Graaff was aware that LeVern had a number of excellent Chinese Trumpet selections, selections that later became the seed parents for the OBF ‘Pink Perfection’, ‘Golden Splendor’ and ‘Copper King’ strains. LeVern related to us that he sold these treasures to de Graaff for a hundred



**Left**

LeVern Freiman

**Below**

Eddie McRae's *Lilium papilliferum*.  
It was his first time to flower the species.



dollars—a full months salary for him at that time. I asked LeVern once if he was sorry that he had not “held out for more” and his answer was a quick and adamant “No!”. He said “Mr de Graaff spread my lilies all over the world, something I could never have done”. I do believe had LeVern any knowledge of the future at that time, he would have simply given Mr de Graaff those bulbs and felt good in doing so, such was his love for his lilies.

LeVern’s greatest sin, against himself, was that he wholeheartedly trusted everyone and it was because of that that people took advantage of him. On two occasions, he related to me, people he trusted and welcomed to his garden stole what they wanted, rather than asking. Though incidents like these left him feeling hurt and betrayed, LeVern never lost his affection for those around him, nor did he become bitter. To his last days, LeVern was always quick to share his creations, asking nothing in return.

**Eddie McRae** Known throughout the world, and respected as a leader in the hybridizing of lilies, we will always hold a warm and special spot in our hearts for Eddie. The countless hours spent with him in his greenhouses, the OBF seedling beds, and especially the species house, along with many shared conversations over lunch, will never be forgotten. Eddie was a lily breeder—one of the best—but,

though he derived his living from lilies, it was obvious that he couldn't have chosen a better life for himself.

Much has been written over the years about Eddie's work with hybrids, but our lives intertwined for the most part with lily species, as we shared a common love for them. I believe that Eddie worked as a breeder just to have the opportunity to spend time with his beloved wild lilies. I still remember an excited call from him, more than 20 years ago, because he had just flowered *Lilium papilliferum* for the first time and urged Dianna and me to "get down here right away, you have got to see this!" No short trip, as his flower was nearly 250 miles away, but we headed out the next morning. Upon arriving, we were greeted by an almost giddy man who could not wait to show us his new flower. Also in bloom at that time was a nearly solid black *Lilium taliense*, which he was wondering what he should do with. Though he had flowered *L. taliense* a number of times, this was so heavily spotted it was near black and he knew, because of that, there was a place for it in his gene pool.

Many hours were spent with Eddie talking about species lilies. He gave us boxes of slides of wild lilies, which he had flowered over the years. Some of these images can be seen on our species knowledge base website, which is a project that took over three years to assemble. The website, which continues to be built upon, was dedicated to Eddie, as we felt almost an obligation (though that is not the correct word) to honor his friendship and his love for the flower that was so important in his life and all the hours of that life he freely shared with us. To this day we still feel grateful to Eddie for his time, his friendship, his firsthand knowledge and infectious love for lilies.

**Leslie Woodriff** The most colorful person in our lives, and a friend we truly cherished, was Leslie Woodriff. We did not meet Leslie until he was in his declining years. Our first trip to McKinleyville, California (some 600 miles distance from our home) was filled with excitement and anticipation. Not only a visit to meet a legend, the creator of 'Star Gazer' and considered by all to be the father of the Oriental Hybrid, we were also on a family camping trip as well. On the first, of what became an annual trip, we were dismayed, upon arrival at Leslie's property, by the site of crumbling greenhouses and felt we couldn't possibly be in

Leslie Woodriff's Atomic #9





Leslie Woodriff's 'Black Beauty'

the right place. However, we were, as, pulling up in front of his house, we were enthusiastically greeted by Winkey, his daughter, who said “Dad has been waiting to meet you” and led us to the row of wood framed greenhouses that had seen better days.

Instructing our two boys to wait outside, we entered what could only be described as a jungle. Potted lilies and begonia's were everywhere, with not an empty space on the benches or the floors to be found. To walk between the benches also meant holding back plants so as not to step on them while also keeping an eye for those pots hanging from the rafters. Then all of a sudden, there emerged Leslie with a smile bigger than life. We soon forgot our fears of being caught in a collapsing structure and spent all that afternoon struggling to keep up with a man who was walking with the support of two canes while we weaved our way through his primeval jungle.

What was so fascinating on this first visit was that Leslie had pockets full of match boxes all containing mixes of pollen. Whereas we could see no markings to identify what was what, Leslie would stop from time to time, pull out several matchboxes, select the one he wanted and make a cross without missing a beat, or there being a break in the conversation. After relating our meeting to another

breeder, who is not mentioned here, we found that this person looked down on Leslie as being little more than a crackpot or an old coot that in their words “knew nothing” about lilies. What Leslie forgot in his lifetime, though, is more than this breeder will ever learn in theirs. He was looked down on, as he did not keep paper records. This genius of a man kept it all in his head and I truly believe he remembered the parents of every cross he ever made.



Leslie Woodriff's 'White Henryi'

Leslie and Jan de Graaff had an immense respect and admiration for each other. Leslie once related that he named a lily 'Empress of Mars' after telling de Graaff “you have used up all the good names”. Leslie claimed that at the end of Lily shows, de Graaff could be seen carting out all of Leslie's entries at one end of the building while Leslie was carting off all of de Graaff's entries at the opposite end. I believe both men turned a blind eye to the theft of their entries thinking they were getting the better of the deal.

Our fondest memory of Leslie is that, on each and every visit, the same story was related to me whenever we came upon 'Black Beauty'. Keeping in mind this was during the 1980s and at the height of the Cold War, Leslie would always stop and say, pointing with his cane, “You know Bob, they say if there is a nuclear war, only cockroaches and rats will survive. My 'Black Beauty' will be there, though, for them to look at.”

Leslie's life ended in poverty. A man who one Dutch acquaintance told us was looked upon in Holland as almost a god, as with LeVern, with whom he shared genetic material and knowledge, Leslie was a breeder and lover of his plants, not a business man. As such, as with LeVern, he was taken advantage of, but never lost his love of life nor his zeal to share his love for lilies with others.

Perhaps the strangest thing that happened, on our first visit to Leslie's, was when we took our boys on a week long camping trip, as, at each stop, we unloaded six pots of lilies—all in full bloom—and set them around our tent, so as to make sure they got enough light. A few people asked about them, but most campers only looked on in wonderment.

### **Harve and Ruth Strahm**

The Strahm's were very involved with Leslie Woodriff in the early years, because Ruth worked for Leslie and when, occasionally, he could not pay her she would happily take lilies instead. Along with their son Gary and his wife Sonya the





Harve Strahm's 'Midnight Star'

Strahm name became synonymous with the best of the best in Oriental Lilies and both families were key elements in the growth and success of B&D Lilies. Our first meeting with Harve and Ruth was at the peak of bloom at their home in Brookings, Oregon. As we pulled up to their farm, we were met with acre upon acre of magnificent Oriental hybrids and in every direction were ribbons of white, pink and red. Entering their display greenhouse, we marveled at

the 8 and 10 foot giants surrounding us, noting that everything was labeled for their visitors and the Strahm's were buzzing around like hummingbirds answering questions. Ours was a relationship that spanned some 30 years. Gary and Sonya have recently retired.

Again what we found with the Strahms was the willingness to share—with all—what they had in their gardens and their firsthand knowledge of their lilies. They loved what they did and derived much of their pleasure in life in sharing that love for lilies with others. A close-knit family, they all worked together, Harve as the breeder, Ruth in marketing, Sonya handling the cut flowers, and Gary out on the tractor in the field. None of them were ever too busy to stop and talk about flowers with visitors. Our visits to the Strahms were always met with an offer of something to eat and a place to sleep for the night. The most amusing story I recall, from Harve, was while out in the field plowing for that fall's planting, he hit something "big" that broke the shear bolt off his plow. Knowing that field had been cleared of rocks he went back to investigate what he had hit, only to find about 4 bushel baskets of Oriental lily bulbs from the neighboring field. It was the food store of a family of gophers for the coming winter!

**Julius Wadekamper** Julius was a gem among gems. My first contact with Julius was through a letter written in 1978 shortly after the time Dianna and I became growers for Rex Lilies, which had just moved their shipping location to Port Townsend.

Trying to build a species lily collection, I had found Julius's name in a NALS yearbook and received one of his 'Borbeleta Gardens' catalogs, which was for me like discovering that Santa was indeed real. I wrote to Julius with a multitude of questions, but not really expecting a reply. Not only did I get a reply, but an invitation to write back if I had any further questions. Julius had a wonderful



Julius Wadekamper's 'Patricia's Pride'

collection of species lilies and I wanted them all, but knew I lacked the knowledge to be successful with everything he grew. However, Julius soon became my mentor and a dear friend. We first met in person at a NALS show in Des Moines, Iowa. One of the show "principals", Julius dropped everything upon our arrival and took us to lunch. An encyclopedia of lily information, Julius was an open book and an easy read.

Upon his retirement and moving to Hood River, Oregon, many were the hours spent among his lilies and hemerocallis. Again, Julius was never too busy to share his time or his love for the plants that surrounded him. Our last summer with Julius was one in which he asked if we would be interested in introducing his new plants, a request we felt honored by and answered with a very enthusiastic "Yes". He said he was getting "tired" and felt he just could not keep up with his mail order business any longer. We came to an agreement and set everything in motion for the following year. That November however, Julius called asking "do you have a few minutes to talk Bob"—as if he needed to ask! I told him, "always for you Julius". He then told me he had been diagnosed with congestive heart failure, the reason he had been feeling so tired, that it was inoperable and he would not see his next year's lilies bloom. We were devastated by the news. That phone

conversation was followed, the next day, with a hasty trip to Hood River, some five hours away and we were still in the midst of our busy fall shipping. However, we simply dropped everything to make time to visit our dear friend knowing it was the right thing to do. Our last time with Julius was when he and Eddie McRae stopped by our sales booth at the Portland Flower and Garden Show in Oregon that following March. Julius looked tired and attending that show was a real hardship for him, but he knew it was his time to say “goodbye” and passed a short time later.

Julius was a man who never envied the work of others and I believe felt modest about his own success. Following his death, his Hood River garden was pillaged by individuals who justified their actions by saying they were “saving” the lilies. They were not aware that Julius had already funneled off the best of the best to his circle of true friends that previous fall.

**Don Egger** My first meeting with Don Egger was while standing in a field of about 50 acres of Oriental lilies just south of Portland, Oregon. At a time, before the closing of the old Oregon Bulb Farm, I had just come from a meeting with the then CEO Jack Krone who had taken an early interest in B&D Lilies. Jack readily went out of his way to help us wherever he could, something he did not have to do, but something he wanted to do. On a scale of the size of OBF, we were but a gnat, but Jack always had time in his day with an open door policy (no appointment needed) for us and even after the closing of OBF, we maintained close contact with Jack until his death years later.

On the day I met Don, having just left Jack’s office, directions in hand for a field I had never visited, with a signed business card as the land was posted, I had worked my way through about 80% of the acreage in bloom, having already shot a dozen or more rolls of 35mm slide film. All of a sudden, this ‘crazed man’ came crashing through the lilies towards me, obviously upset about something and stepping on everything in his path. Don’s first words were “I can have you



Don Eggers HF-44 an upfacing trumpet selection from which was bred ‘Lord Samuel Hood’. Don never released HF44 as he felt it was too valuable as a breeder. It was destroyed when Don’s Oregon operation was closed down.

arrested for trespassing” to which I replied, “I don’t think so” which stopped him in his tracks. I presented Jack’s business card and told him who I was. Don had just taken the position as head hybridizer with OBF and though he knew of B&D Lilies, he had never met either Dianna or me. Long story short, we became close and life long friends up until his far too early death.

With the demise of the old OBF, Don contacted people in Holland who as I understand it, bought up most of the R & D material giving birth to Cebeco Lilies, with Don now being in charge of the operation. From that day forward, until Cebeco closed the Oregon breeding operation, I was given free run of the fields and the breeding houses and from time to time over lunch we re-lived our first meeting with humor. As it had turned out, new lilies were being stolen from that isolated field and Don thought he had caught the guilty person, pollen stains and all, when he discovered me in the field. I believe I was the only one trusted with a set of keys to the seedling houses and was never searched before leaving such was the friendship that developed. Asking questions about the parentage’s of his new hybrids was a fruitless task, as that was private information that belonged to Cebeco, but any general questions about breeding were followed by a PhD level dissertation. To Don I owe much of my understanding of genetics.

Don took a great deal of pride in his accomplishments and was justified in doing so. But, he was not one to flaunt his knowledge, nor to brag. He learned early on that you did not keep all your eggs (lilies) in one basket as his seedling houses, which were skinned only in polythene, were often cut into and bulbs were taken. He remarked, it amazed him how often it happened, when a certain person was in the Portland area, it was always the night before that person caught a flight out of PDX back to Holland.

One of the highlights of my life with lilies was the first time Don dropped by with some new seedlings (first time in bloom) and said “what do you think Bob?” remembering that 12 years earlier he was going to have me arrested. From that first encounter, of “I can have you arrested”, we progressed to the point where he truly wanted my opinion about his new selections. Over the years B&D Lilies introduced over 90 of Don’s creations.

**Johan Mak** Unlike all those mentioned earlier, Johan is still very much alive and is I believe the top breeder in the world though I would never admit it to his face. I tell him he is in the top three believing it keeps him on his toes. When he asks “who are the other two” my reply simply is “you know”.

I honestly can’t remember when I first met Johan, but it has to be at least 25 years ago. It was after the closing of the old Oregon Bulb Farm that Johan went into production with his own lilies and after turning that operation over to his son, he became a full time breeder. Many have been the weekly summer

trips—over the years—to his home, to wander through the seedling beds and tag lilies of interest in the greenhouses. These past years have always been a joy, as Johan almost leads me by the hand on each visit through towering plants in his breeding and seedling houses asking “what do you think”? One memorable moment was back in 2008 when we stopped next to a new selection. “What do you think?” to which I replied, “I like it”. Johan asked, “Got any idea what it came from?”. My reply, “I see ‘Barbaresco’ in it but no guess after that.” Johan stood there and finally said, “how did you know that?” That lily is shown on our web site at 2008MIOT5. Though it did not make it through garden trials, it truly was then and still is one of the most breathtaking lilies I have viewed in my life.



Johan Mak’s ‘Gabriel’s Wings’. A cross between (‘Pink Perfection’ × ‘Unnamed White Oriental’).

I owe much of my knowledge of lilies to Johan. Never has there been a subject or a question that was off limits as we talked about his work. Johan never held back any information knowing that what was talked about in the greenhouse or the field stayed there when I left. Though it usually takes about 20 minutes into each visit to get my mind to filter out the heavy Dutch accent, Johan always proves to be a flowing fount of information.

There are others, lesser known individuals, who are near and dear to Diana and me, but who are not named here. To try to name them would be impossible and would take hours of going through file-drawers of letters spanning over three decades and covering contacts across much of the world. From directors of world renowned Botanical Gardens to simple back yard “pollen dabblers”, to all of them we owe much. We only hope, that through the years, others have found us to be as helpful, as our friends and mentors have been to us, in nurturing the love of the genus *Lilium*.

★ ★ ★

# *Lilium wardii* – shared experience overcomes distance

*In this joint article Neil Jordan, of Tasmania, and Alan Mitchell, of Scotland, discuss their experiences of growing Lilium wardii – a beautiful lily with a singular fragrance – that is easier to grow than it is to find!*

## **Background**

It is just possible that more people know who discovered *L. wardii*, and where, than actually grow this “martagon-type” lily. However, it is always useful, when writing about lilies, to provide some historical context, before retreating into the garden to focus on the requirements and attributes of the chosen subject. Hence, *L. wardii* was discovered in 1924 in the Tsangpo Gorge, south-east Tibet, by Captain Frank Kingdon Ward, after whom this lily is named.

## **Distance no obstacle**

When Neil Jordan and Alan Mitchell walk out into their gardens, to contemplate their plants of *L. wardii*, many thousands of miles separate their respective deliberations, but, as the rest of this article shows, that great distance is made insignificant by the close connection in relation to their experiences of growing this lily.

## **Neil Jordan writes:**

Probably my earliest success with *Lilium* species was with *Lilium wardii*. This absolutely superb lily – graceful, ornately detailed and delightfully perfumed – soon established itself, from seed, some 23 years ago. The plants grew under an apple tree and have thrived like natives ever since. Frankly, I couldn’t believe my luck, with *L. wardii*, at the time, and for many years I worried that it would succumb to virus infection, as all the standard lily texts suggest might happen.

From soon after I started to grow *L. wardii* I deliberately located my plants in a range of garden situations. I also reasoned that the best way to beat virus attacks was to grow fresh stock from seed every year. My *L. wardii* plants have continued to thrive in almost all situations and my success with this lovely species has been acknowledged at local shows where I have won champion stem awards with stems of over 30 flowers. However, given the long pedicels and pendant aspect, a single flower may be displayed on the show bench in such a way as to arrest the judge’s attention, such is the beauty of this lily.

Living on Tasmania, an island state to the south of Australia, the only practical way to build a good collection of *Lilium* species, (or any plant genera), was by





Photographs of *Lilium wardii*, showing variability in their flower colour; *left*, in Tasmania and *right*, in Scotland.

growing from seed. Even in this age of necessary bio-security controls, obtaining seed is still relatively simple, economical and has the obvious advantage of producing clean stock.

My good fortune in producing abundant quantities of *L. wardii* seed, (I do not wish to seem immodest, but I think I must have contributed much of the world supply of *L. wardii* seed over the past decade or two), has not been the experience of others who grow this lily. A fellow grower, from another state, has been unable to set any seed on his *L. wardii* plants. However, this could have been because the supplier of his bulbs grew them from scales and, hence, they were self-sterile. Unfortunately, many of the species lily bulbs commercially available are the products of scaling, tissue culture or other means of vegetative propagation and, in consequence, are very likely to be self-sterile. Sadly, if this trend continues, lily growers may soon be faced with entire species that are no longer fertile. My plea, therefore, to species lily growers is that they seek out diverse sources of lily bulbs and ensure, after they flower, that their plants set viable seed. Also, that they look for variations in their lily species populations and hand-pollinate these forms to maintain variability and viability.

It always amuses me that so many people think of a species as being like a clone—strictly identical with no variation. This assumption is, of course, quite incorrect, as any naturally occurring species will exhibit some variation among

its populations. From the outset, I have noted that the flowers of my *L. wardii* plants have displayed interesting and subtle variations. Some have tended to have pale, rose-pink flowers, while others have deeper mauve-purple flowers. Stems are also quite variable. In my coastal garden stems grow to around one and a half metres and although, generally, standing erect, they tend to assume a graceful, willow-like habit with well-spaced long pedicels. However, a friend's garden, which is nearer mountains, at a higher elevation and several degrees colder, produces stems, of *L. wardii*, that are shorter, more rigidly erect and with shorter internodes. Furthermore, the flower colours tend to be darker.

While I normally try to adopt "best practice" and grow *L. wardii* from seed every year, I have had specimens in my garden that have been growing for more than 10 years. As with all lilies, virus diseases can take their toll on *L. wardii* over time. However, despite the susceptibility to virus the standard lily reference book always mentions in relation to *L. wardii*, I have no reason to believe that this lily is more virus prone than other Asiatic species.

Apparently, *L. wardii* has been found not too amenable to hybridization. Some would ask, "How could you improve on perfection?"

#### **Alan Mitchell writes:**

I live in the Kingdom of Fife, which is about a 40 minute drive north of Scotland's capital, Edinburgh. I should explain that Fife was a Pictish kingdom more than a thousand years ago, but the name, Kingdom of Fife, has persisted for some obscure reason. I should also explain that the Picts were an ancient tribe who, apparently, repelled the Romans, but given Scotland's climate perhaps the Romans were happy to be repelled. However, unlike the Romans, my *L. wardii* bulbs, which—in Tibet—grow at altitudes between 1525 and 3050 metres seem quite happy growing at near sea level in my Fife garden.

I purchased my bulbs of *L. wardii* in 1995 from a shooting star in the lily firmament, called Bruce Robertson, of Cairngrow nursery. I often regret that Bruce exited the lily cosmos as suddenly as he did, because, apart from being the only supplier of *L. wardii* bulbs I have known, he also stocked a truly impressive range of species lilies and *the* most impressive range of North hybrids. Of course Bruce's stock had an impeccable provenance, as he obtained it from Dr Peter Waister—(Chris North's colleague and friend).

Lily experts suggest that the reasons *L. wardii* is not more common in cultivation are because it exhausts itself by producing seeds and bulblets (on stolons) and it is prone to virus attack. Apparently, this combination of traits has resulted in there being "no records of very long lived colonies" of this lily. However, the statement quoted is itself "very long lived", as are most of the pearls of wisdom contained in the standard lily reference books. It would be interesting, but impossible because



of the problem of mortality, to ask the authors, of ambiguously written statements like the one quoted, whether my 18 year old colony and Neil Jordan's 24 year old colony, of *L. wardii*, would qualify for the description of "very long lived", or not? On the other hand I would agree with lily experts when they indicate that *L. wardii* is not one of the most difficult species lilies to grow, as it is tolerant of most types of soil, providing there is a high humus content and good drainage. As *L. wardii* can be found growing among pine trees, in its natural habitat, it has been suggested that a pine-needle mulch may be beneficial. Having tried mulches of this type I can confirm that my *L. wardii* plants have benefited from the applications.

While, like Neil Jordan, I have planted my *L. wardii* bulbs in different situations in the garden, their favourite location is in a large bed of deciduous Azaleas, where the soil medium is acidic, rich in humus and free-draining. Although my bulbs came from seed, not scales, they seldom produce seed, preferring instead to increase stoloniferously. I am not sure why my experience in this regard should be so different from Neil Jordan's—who, while supplying most of the world with *L. wardii* seeds also supplied me—but perhaps the openness of the medium my bulbs grow in encourages them to increase by developing bulblets on stolons, rather than by producing seed. Had some virus been responsible for the characteristic just described, I am sure I would have lost my *L. wardii* bulbs years ago, but they

**Right and opposite**

*Lilium wardii* in flower in Scotland.

are still with me to show the beautiful countenances of their flowers every summer. Recently, I had a stroke of luck when Susan Band, of Pitcairn Alpines ([www.pitcairnalpines.co.uk](http://www.pitcairnalpines.co.uk)) sent me a flowering-sized bulb of *L. wardii*. When this bulb produces flowers (hopefully next summer) I will exchange pollen between them and my own flowers in the hope of producing seed. With my thoughts on the possibility of Susan becoming a supplier of *L. wardii* bulbs,

(something that is rarer than hen's teeth!), I sent her some of my bulbs, so she might obtain seed by exchanging pollen from the flowers from those bulbs and the flowers from her own bulbs. To give point to my bracketed comment about the rarity of dentition in hens and the lack of availability of *L. wardii* bulbs, a few years ago three of my bulbs were bid for at a Lily Group Bulb Auction and made £65.00!

The variation in flower colour is something I, initially, found puzzling in *L. wardii* and for a while I thought I might have said lily and something closely related. However, I now think, like Neil Jordan, the colour differences between "rose-pink inclining to mauve-purple with carmine spotting" (to quote Derek Fox) in the flowers are just variations, rather than anything more significant. One of the reasons I came to this conclusion relates to an American species, *Lilium kelloggii*, and the variations in flower colour I saw when I visited California in 2007. Generally, *L. kelloggii* is, like *L. wardii*, a pink lily, but like *L. wardii* it varies from pale/rose pink to a colour that could be described as mauve-purple. In fact, the similarities in flower colour (and flower shape etc.) were so pronounced that they started me thinking about the environmental influences that can produce lilies that look so similar despite the great distance, in this example, between Tibet and western America. However, I will leave further deliberation – of environmental influences on the appearance of lilies – for a future article.



# The work of The Ornamental Plant Germplasm Center

*In this article **Peter Zale** describes working with Eastern North American *Lilium* at the Ornamental Plant Germplasm Center at the University in Columbus Ohio, USA*

## **Background**

The Ornamental Plant Germplasm Center (OPGC) is located at The Ohio State University in Columbus Ohio, USA. Like other units, in the United States Department of Agriculture's National Plant Germplasm System, its primary mission is to collect, grow, bulk, and distribute seeds and other germplasm to interested professional horticulturists, plant systematists, botanical gardens, plant breeders, and conservationists.

Research at the OPGC is focused on six priority genera: *Begonia*, *Coreopsis*, *Pblox*, *Rudbeckia*, *Viola*, and, *Lilium*, although the collection includes representatives of nearly 180 genera of herbaceous ornamental plants. As I have a personal passion for lilies, I have been working to expand the OPGC collection of these plants. To minimize duplication of research efforts with *Lilium* germplasm, that is ongoing among various research and breeding collections around the world, I am initially focusing my activities on *Lilium* species native to the eastern United States, some of which are poorly studied, such as *Lilium iridollae*, and to intensively examine additional species that occur in our state (Ohio) and associated regions. This effort involves a combination of field work, communication with numerous botanists and nurserymen, and a review of pertinent literature. Through these activities the OPGC is gaining a modern perspective on the nature of U.S.-native lily species germplasm, both in the U.S. and elsewhere, and I have begun testing recently introduced or rare *Lilium* species from around the globe in order to assess the adaptability of these plants to our climate.

## **Germplasm acquisition through field work:**

### **Eastern North American native species**

Despite a rich history of popularity, fieldwork, selection, and breeding, eastern North American lily species remain rare in horticulture in the United States, and are typically coveted and grown by collectors and specialty nurseries (see Emsweller, Henry). Perusal of the eastern North American *Lilium* literature indicates that numerous cultivar selections were made by several enthusiasts and researchers over the years, but it is likely that some of the best horticultural selections and primary breeding lines are now lost to cultivation. Coupled with modern day

concern that eastern North American lilies have become rare and possibly endangered in their respective habitats due to threats such as the introduction of the Lily leaf beetle (*Lilioceris lili*), and the exponential growth in populations of the white-tailed deer (*Odocoileus virginianus*), these charismatic plants deserve a revitalization of interest from both a horticultural and conservation standpoint.

### **Work with *Lilium iridollae***

My initial efforts focused on obtaining seeds of the rare and possibly endangered pot-of-gold lily, *Lilium iridollae*. Since being described in 1946 by Mary Gibson Henry, very little has been written about this ‘mythical’ species and despite reports of plants being successfully cultivated it seems to have come and gone from horticulture. Feeling inspired by the article written by Marianne Casey in *Lilies and Related Plants 2009-2010*, I developed a relationship with the Florida Division of Forestry that led to the acquisition of *L. iridollae* seeds in 2011. From this collection more than 60 individuals flowered for the first time in late summer of 2013; through hand-pollination I have successfully produced thousands of seeds from these plants that can be distributed and used in seed biology research at the OPGC. We were also able to test the compatibility of *Lilium iridollae* as a parent in interpecific hybridization experiments. Preliminary results suggest that it can be successfully crossed with *Lilium michauxii*, but that crosses with west coast species and hybrids failed, although partial development was apparent in some crosses. Further observation and experimentation with interspecific hybridization should yield continued selection of unique, vigorous, and easy to grow clones, and increased distribution to other growers.

### **Native lilies in Ohio**

The OSU herbarium has provided a platform for identification of *Lilium* sites and orientation of fieldwork throughout Ohio, and revealed potentially unique populations within species. An overwhelming number of herbarium vouchers were collected decades ago principally in mowed roadside ditches. Due to changes in land use and increased use of herbicides, along road right-of-ways, lilies appear to have become rare in such habitats. However, my fieldwork has also shown that native lilies might be far more common than herbarium records might indicate, albeit more difficult to find. An example is a population of lilies in a local ravine on the property of the Ohio School for the Deaf in Columbus, OH. Despite frequent botanizing of all ravines in the Olentangy River drainage by local flora classes and botanists, there were no herbarium specimens deposited in the OSU herbarium for any species of *Lilium* from this site. When I visited there for the first time in May of 2011, I was surprised to find hundreds of non-flowering stems of an unidentified *Lilium* within the first half hour of being there. Plants in this region are either



**Opposite page and right**

Profile and habitat of a non-flowering stem of potential hybrid of *Lilium canadense* × *Lilium michiganense* at the Ohio School for the Deaf, Columbus, Ohio.

*L. canadense* or *L. michiganense*, but what makes this find even more exciting is that it occurs in the area where these species are sympatric, and past botanists have speculated that hybrid swarms can occur in such areas. Additionally, numerous herbarium specimens at OSU are from putative hybrid lily populations that occur at the western edge of the Allegheny Plateau and eastern edge of the Glacial Till Plain, where the ranges of these species meet, but such reports have never been substantiated. Observation of these plants leaves little doubt as to why the plants have been overlooked; the vast majority were not of a large enough size to flower, and those of flowering size, were trimmed by the resident white-tailed deer population. In fact, I have visited this site each year since that time and have managed to find only one plant that has even produced a flower bud, despite the thousands of stems that are produced among the various population clusters on a yearly basis. Most plants emerge in early April, and if they do not produce a flower bud then are usually dormant by the first of July, and even earlier if drought conditions prevail. Considering these circumstances, it is easier to understand why the plants may have been overlooked in the past. A small number of bulbs have been collected from this site and brought into cultivation. The plants have yet to flower, but the yellow bulbs and narrow leaflets suggest that plants are likely to be *L. michiganense*, but observation of the flowers is necessary to confirm whether the plants are hybrids or pure *L. michiganense*. Other putative hybrid populations in Ohio have yet to be studied. These plants are not only interesting from an evolution and ecology perspective, but have the potential to be more broadly adaptable forms of Eastern North American *Lilium* worthy of widespread cultivation.



I have also discovered numerous populations of other *Lilium* species throughout the Eastern United States. In particular I have been able to make seed and bulb scale collections of *L. canadense*, *L. michauxii*, and *L. superbum* that allow



for further evaluation of such germplasm for adaptation to nursery and landscape conditions and for use in interspecific hybridization experiments.

### **Germplasm acquisition through networking**

Through various botanical organizations, nurseries, and independent operators, I have been able to acquire unique germplasm of Eastern North American *Lilium* species. Some of these collections of rare, unique variants have historical significance, while others are recently described cultivars and at least one could be considered among the rarest of all variants of eastern north American lily species.

Through the efforts of a collaborator and lily enthusiast from North Dakota, I



have been able to obtain and successfully cultivate the rare yellow, spotless Canada Lily, *Lilium canadense* “var. immaculatum”. The name “var. immaculatum” appears here in double quotes because this is not a currently, formally recognized taxon within *L. canadense*. This clone has held a tenuous place in cultivation because of fastidious cultural requirements and seeming lack of vigor even under in vitro conditions. Material I obtained from tissue cultured germplasm has proved to be vigorous under our conditions and has grown faster in container culture than TC conditions. While I have been growing this material for a short time and it has yet to flower, future goals include crossing this form to other yellow-flowered, spotted forms of *L. canadense*. This will allow testing of the inheritance of the spotless phenotype. This knowledge could be applied to conserving this phenotype as a seeds, rather than as living plants which might be susceptible to virus build up, extreme climatic events, and potential damage from the lily leaf beetle.

I have also been evaluating cultivars of native species released by Nearly Native Nursery in Fayetteville, Georgia. Through extensive fieldwork throughout the southern United States, Jim Rodgers has identified unique populations of *Lilium michauxii* and *Lilium superbum*. Among these, *Lilium superbum* ‘N<sup>3</sup> Redneck’ is one of the most unique, with rich, almost tomato-red flowers; a true color break from typical orange *L. superbum*. Another, and my personal favorite is a cultivar of *Lilium michauxii* called ‘N<sup>3</sup> Chief Red Eagle’. As suggested by the cultivar name, this selection boasts vividly colored red, yellow, and white flowers, differing markedly from the typical orange and yellow forms of this species. We are particularly interested in this cultivar selection as parent in interspecific crosses with *Lilium iridollae*. Such crosses were made over the past summer, and resulted in seed.



**From far left**

*Lilium superbum* 'N<sup>3</sup> Redneck'  
from Nearly Native Nursery.

*Lilium michauxii* 'N<sup>3</sup> Chief Red  
Eagle' from Nearly Native Nursery.

A spontaneously occurring cream-colored flower variant *Lilium catesbaei* from a seed collection made in Louisiana.

Collecting and growing seeds of various provenances for each species can result in some fascinating surprises. Perhaps the biggest surprise this year was the spontaneous occurrence and first-flowering of a cream-colored flower variant of *Lilium catesbaei*. This plant was grown from seeds obtained from a responder who answered a request on my blog ([www.botanicazales.com](http://www.botanicazales.com)) for *Lilium catesbaei* seeds. The seeds supposedly originated from a population in Louisiana, but neither the county level description or further information was provided. *Lilium catesbaei* is present, but considered rare in Louisiana and is at the western edge of its range; it is possible that these color forms are more abundant in that region. One picture of a similarly colored *L. catesbaei* is posted on the Pacific Bulb Society website and is said to occur in the Florida panhandle. The Louisiana form differs in its wider tepals with prominent orange-red spots near the base of the tepals. Of six plants that flowered from this population, only one was cream-colored and the rest were the typical orange color. Our observations and experience with *L. catesbaei* in cultivation suggest that this species is monocarpic, so the cream-colored plant was crossed with an orange-flowered sibling. Germination and subsequent flowering of these progeny will help elucidate the inheritance pattern of the white-flowered variant so that hopefully it can be maintained as a seed strain.

**Future Prospects for *Lilium* germplasm at OPGC**

Work with *Lilium* at the OPGC is supported by government mandate and strong personal interest on my behalf. The current work is providing a basis for academic studies in the culture of native lilies and their use in trait inheritance and hybridization studies. This work has been expanded to include all species *Lilium* that may warrant special consideration and further trial in our climate.



# Fritillaria: Commemorative epithets and those who named them

*This article is based on a talk to The Fritillaria Group in October 2012. Words and images by **Brian Mathew**.*

In order to have some meaningful arrangement I decided to go for a—at least in part—geographical sequence, starting in the Far East with a well-known species that commemorates Carl Peter Thunberg (1743-1828), a Swedish student of Linnaeus and early traveller/botanist who worked in Leiden. In 1771 Thunberg was commissioned to visit the Dutch colonies and Japan to collect plants. He travelled via South Africa and stayed for three years learning Dutch and collecting prolifically. As a result he is now sometimes known as the ‘Father of South African botany’. Japan at that time allowed trade with the Dutch East India Company, which was confined to a small island off Nagasaki. That is where Thunberg was based from 1775, accepted by the Japanese as a Dutch trader. He had been ship’s surgeon on the journey and contrived to exchange his medical knowledge for plants brought to him by the Japanese. He wrote *Flora Japonica* (1784). Much

*Fritillaria thunbergii*





*Fritillaria davidii*



*Fritillaria ayakoana*

later *Fritillaria thunbergii* was named in his honour by Friedrich Miquel, Director of the Rijksherbarium, Leiden, and there are many other plants named '*thunbergii*'.

Staying in the Far East, another prominent botanist/plant collector was Carl Maximowicz (1827-1891) who became director of the St Petersburg Botanic Garden. Maximowicz travelled to the eastern provinces of Russia from 1853 onwards and also to China, Korea and Japan in the footsteps of Thunberg. He collected the plant described as *F. maximowiczii* by Freyn in 1903. Maximowicz described many plant species including *F. przewalskii* (1882) and *F. ussuriensis* (1882), the latter named after the Ussuri region and the former after General Nikolai Przewalski. He was another explorer of the region: Ussuri, China, Tibet and Central Asia. On a three-year expedition (1870-1873) he recorded and collected extensively: some 5,000 plant specimens, 3,000 insects, 1,000 birds and 200 animals including a 'new' horse and a gazelle, both of which were also named after him.

While in the region we should remember the rather later *F. koidzumiana*, named in 1937 by Jisaburu Ohwi after Genichi Koidzumi (b. 1883), a specialist on the Rosaceae and Acer. I shall also mention the even more recent *F. ayakoana* (1979), named after the wife, Ayako—of one of the botanists who described it. It is from S. Honshu, a very rare species related to *F. amabilis* but with a different nectary shape.

As we begin our journey westwards, we come to China and the territory of a string of great plant hunters of the nineteenth century. Here I pick out two, both French missionaries and avid collectors. Armand David (1826-1900) was a naturalist who collected 250 species new to science, often travelling under appalling conditions—for example taking two months to travel just part of the way up the Yangtse River and suffering from malaria and typhus. The genus *Davidia* is named after him and *Fritillaria davidii*, perhaps the most distinct of all the species. A contemporary was Jean Marie Delavay (1826-1895) who, although not a naturalist, was encouraged by the botanist Adrien René Franchet to collect for the



Muséum d'Histoire Naturelle in Paris and amassed some 200,000 specimens which turned out to include 1,500 newly discovered species. *F. delawayi*—another very distinctive species—was named after him by Franchet. The slightly later explorers of south-western China such as Henry, Wilson, Rock, Farrer and Kingdon-Ward had, in *Fritillaria* terms, been upstaged by the French and missed out on these two unusual species, although they did of course collect and introduce a huge number of other fine plants.

Before leaving the region we must stray to the Himalaya where the widespread *F. cirrhosa* is the most likely to be encountered, replaced in the western part of the chain by *F. roylei*. This commemorates John Forbes Royle (1798-1858), a surgeon working for the British East India Company. Royle studied the medicinal properties of plants and was in charge of the BEI Company's botanical garden. The species which bears his name was described by William Hooker in 1851.

Moving further westwards now into central Asia, we enter bulb-rich country and the realm of the nineteenth century Russian explorers following the great expansion of the Russian Empire into the region. The story, certainly from the *Fritillaria* angle, centres on St Petersburg Botanical Garden and Eduard Regel (1815-1892). Although of German origin he was involved with the garden for 40 years, 20 of these as its Director. He was essentially a horticulturist but did much botanical work and described many new species—perhaps as many as 6,000. He founded the prestigious journal *Gartenflora* as well as writing a monograph of *Allium*, a feat to be marvelled at! In the genus *Fritillaria* he named and described *F. raddeana*, *F. walujewii* and the genus *Korolkowia* with its species *K. sewerzowii* (now *F. sewerzowii*).

Gustav Radde was a German pharmacist who founded the Caucasian Museum in Tbilisi and collected widely in the Caucasus and adjacent regions. Korolkow was a Russian General in Central Asia (several of the plant collectors were military men), while Sewerzow (various transliterations, such as Severtzov) was an explorer who published a book about the Tien Shan. Regel had many plants named after him including the *F. imperialis* relative *F. eduardii* (described by his son Albert) and *F. regelii* which was named later, in 1935 in the Flora URSS. The genus *Eduardoregelia* (related to *Tulipa*) combines both of his names. His botanist son Albert Regel also collected many plants on his travels while a physician on military service in Central Asia and sent them back to his father in St Petersburg. Fortunately a lot of these newly discovered bulbs found their way into cultivation as Regel was in close collaboration with Kew and various notable gardeners and researchers such as Michael Foster, John Baker and Ellen Willmott, as well as nurserymen like the Hoog family of van Tubergen and Max Leichtlin in Germany. *Fritillaria regelii* is sometimes treated as a subspecies of *F. olgae* and this species introduces another Russian botanist, Olga Fedtschenko (1845-1921). She travelled and worked with

her son Boris who became Director of St Petersburg Botanical Garden. Olga did name one species, *F. seravschanica* but never validly published it. Instead of validating this name, the prolific botanist Alexei Vvedensky, a monocot specialist, appears to have changed Olga's temporary epithet to *F. olgae* and formally described it in Boris Fedtschenko's *Flora Turkmenistan* (1932); perhaps this was at the suggestion of Boris in honour of his mum.

Heading westwards again, leaving central Asia we arrive in the rich bulb area of the Caucasus, Iran and Turkey. The flora of the Caucasus is inextricably linked with the name Alexander Grossheim, director of the Botanical Institute in Azerbaijan. He compiled the multi-volume *Flora Kavkaza*, still the essential reference for the region. Grossheim described *F. grandiflora* in 1919, now a subspecies of *F. kotschyana*, and *F. tatarica* about which little seems to be known. Losina-Losinskaya named *F. grossheimiana* in his honour but this is now considered a synonym of *F. crassifolia* subsp. *kurdica*. The Iranian *F. kotschyana* had been named much earlier, in 1844, by Dean William Herbert, one of our greatest nineteenth century 'monocot' botanists. Curiously he named only this one fritillaria in spite of being extremely prolific in describing new species. This brings us to Theodore Kotschy, one of the greatest botanical explorers of the mid-late nineteenth century, who collected some 300,000 specimens, had many species named after him and described a lot of new ones himself. Before leaving the Caucasus we should mention Alexander Fomin, a contemporary of Grossheim and a botanist at Tbilisi Botanical Garden. He described many newly discovered monocots in a range of genera: *Galanthus*, *Allium*, *Iris*, *Bellevalia*, *Muscari*, etc., and also wrote a *Flora of the Caucasus*. One of his new species was *F. michailovskyi*, collected by S. J. Michailovsky in Kars when Russia occupied that part of what is now north-eastern Turkey.

Travelling southwards we come to south-eastern Turkey, Iraq and western Iran, home to *F. straussii*. This was named in 1905 by Bornmüller after a German businessman Theodore Strauss who worked for an English firm in the export business for 30 years, based in Sultanabad (now Arak). Surprisingly he seems also to have been the English Vice-Consul in Sultanabad and collected plants for the German firm of Max Leichtlin in Baden-Baden. The specimen which became the type of *F. straussii* came from Mt Elwend; he also collected the original specimen of *F. chboraniba*. The photograph is of John Watson's 1966 collection of *F. straussii* from Hakkari. Staying in western Iran, we come to *F. reuteri*, described by perhaps the greatest name in Mediterranean/Near East/Middle East Botany, the Swiss Edmund Boissier. The species was named after his colleague at Geneva Botanic Garden, the French botanist Georges Reuter who ultimately became Director of the garden. He travelled widely with Boissier in North Africa, Spain and western Asia and co-authored many of his works and descriptions of new species.

Edmund Boissier (1810-1885) compiled the multi-volume *Flora Orientalis*, the indispensable reference work for the whole region. He described 15 *Fritillaria* species, some of them commemorating other botanists or collectors. The southern Turkish *F. elwesii* honours Henry John Elwes (1846-1922), a British traveller, sportsman and natural historian who travelled widely in Greece, Turkey, the Himalaya. If it is possible to pick out specialisms of someone with such eclectic interests, he is perhaps best known for his books on trees and lilies. Christian Pinard collected in Egypt, Israel, Syria and Turkey (notably in Caria) where he found the plant described by Boissier as *F. pinardii*. It is of note that another of the species



*Fritillaria karelinii*

described by Boissier was *F. gibbosa*, the first collection of which had been made by Th. Kotschy at Persepolis in Iran. Boissier teamed up with Orphanides, a Greek professor of botany in Athens to name *F. ebrbartii*, after (obviously) Erhart who has proved to be a rather elusive collector, as does the individual after whom *F. rhodokanakis* is named. The epithet of the latter species in turn links up the names Orphanides and Baker and this leads us into John Gilbert Baker, Kew botanist of the second half of the nineteenth century and ultimately Keeper of the Herbarium. His extensive survey of the enormous lily family in its widest sense (*Handbook of Liliaceae*, 1870) included a detailed classification of *Fritillaria*. This was a time when the British Empire was being explored extensively and botanical collections were pouring in, particularly to Kew. In addition, Baker was in contact with people such as Regel and Leichtlin, further adding to the information available to him: networking is nothing new! Baker described hundreds of new species including 11 *Fritillaria* spp., five of which were named after people. Karelin's discovery of the species that was to bear his name, *F. karelinii*, was made in the 'steppes and deserts of the Indersky Sea' and was at first described as a *Rhinopetalum* by D. Don, then transferred to *Fritillaria* by Baker in 1874.

Guillaume Olivier (1756-1814), a French doctor/naturalist undertook a lengthy survey of the Ottoman Empire, starting in 1793 and visited Turkey, Persia, Egypt,



*Fritillaria whittallii*

Iraq, Syria and Lebanon, publishing a large tome on the subject. Among the plants and animals he collected as dried material was the species named *F. olivieri* by Baker and introduced to cultivation by Th. Strauss via Max Leichtlin. In 1874 Baker described *F. forbesii* to commemorate the Manx botanist Edward Forbes who, in 1842 was the naturalist aboard HMS Beacon. One

of the expedition's aims was to bring the marbles from the ancient site of Xanthos back to Britain, a feat which failed because the ship was not up to the job. However, the collections made by Forbes were remarkable and represented several unknown species, one of them the fritillary which now bears his name, *F. forbesii*. He also collected the first specimens of *Chionodoxa forbesii*, also named by Baker. Forbes' two-volume work *Travels in Lycia* make fascinating reading. Incidentally, a second expedition (presumably with a larger ship!) did extract the Xanthian marbles and they are now in the British Museum.

Even earlier than Forbes' travels, John Sibthorp (1758-1796), professor of botany at Oxford, had set out in 1786 on a two-year expedition to collect and identify the plants included by Dioscorides in his first century herbal. He travelled via Vienna to view the unique manuscript of the herbal, the *Codex Vindobonensis*, and to take on the botanical artist Ferdinand Bauer to travel with him. Some 2,000 specimens were collected, 300 of them representing previously unknown species. It was J. E. Smith who named the 'frit' species after Sibthorp but as *Tulipa sibthorpiana*. It was Baker who formally made the transfer to *Fritillaria sibthorpiana*. In 1893 Baker described *F. whittallii* after Edward Whittall who had an export business in Smyrna (Izmir). He had a great interest in the plants—particularly bulbs—of Asia Minor and employed locals to collect for him. Many were exported to the trade and as gifts to Kew (hence Baker's involvement) and some were planted in a garden at the summit of a nearby mountain (Nymph Dag—Nif Dağ)

#### Footnote

This article was first published in Journal 32 of the *Fritillaria Group of the Alpine Garden Society* (Spring 2013) and is reprinted here by kind permission of the Society.

# The subgenus *Liliorhiza* (an amateur hobbyist's view)

*In this article Ron Mudd focuses on his main area of interest, in relation to Fritillaria, the species in the subgenus Liliorhiza.*

## Introduction

I have long been fascinated by members of the genus *Fritillaria* and began attempting to cultivate them in the early 1980s. The number of species available to me at that time was limited, as was my ability to grow them. One species in particular, *Fritillaria camschatcensis*, proved to be consistently 'un-growable' for me, and so became my favourite plant! This seems rather silly today, when this species is so easily grown and readily available. The problem was the lack of good, easily available, cheap (was setting up first home) information. The common advice was that if it was a *Fritillaria* it needed to be kept bone dry in summer! Eventually I learned how to grow this wonderful, wandering Frit. My passion for growing these plants ignited, and my understanding that various growing regimes were required also grew, in line with my collection.

Today my focus has become the subgenus *Liliorhiza*. (I use this name, in what I believe is the common understanding, to cover all of the Northern American species, plus *Fritillaria dagana* and *Fritillaria maximowiczii*.) These plants grow in widely different environments and conditions, and this is what makes this collection so interesting to me. Some grow as 'snow melt' scree dwellers, others occupy heavy clay soils that are both 'wet and sticky' and 'dry and hard' annually, some in amongst tall grasses, others in woodland environments and some in areas prone to flooding and submersion by salty water. The colour range of the flowers is wide, with red, orange, yellow, green, pink, purple, (almost) black, white and various browns and bronzes all represented. Flower markings are also very variable. Some species are only a few cm high, others are recorded as sometimes reaching over one metre. Flower numbers on a single stem range from one to over thirty!

In a series of short articles for this *Fritillaria Group Journal*, I hope to give a view of the history, distribution, environment and cultivation of each of these species, wherever it is possible for me to do so. I am in no way a botanist or professional scientist and am writing these articles, in a non-technical way, in the hope that they may inspire a few more people to persevere with these species, and enjoy them as much as I do. It is not my intention to produce a definitive manual for cultivation (I can only say how I grow them), nor to produce a classification for the *Fritillaria* or to challenge anyone's published view of how this should look. Some of the plants



*Fritillaria affinis tristulis*

that I will write about as species are considered subspecies by some, possibly even hybrids. I like to appreciate the plants for what they are; their taxonomy becomes a convenient but constantly changing rack upon which various observations can be hung.

The plants that I will be considering as of the Subgenus *Liliorhiza* are:

<i>Fritillaria affinis</i> (Schult. & Schult.f.) Sealy	<i>Fritillaria agrestis</i> Greene
<i>Fritillaria atropurpurea</i> Nutt	<i>Fritillaria biflora</i> Lindl
<i>Fritillaria brandegeei</i> Eastw	<i>Fritillaria camschatcensis</i> (L.) Ker Gawl
<i>Fritillaria dagana</i> Turcz	<i>Fritillaria eastwoodiae</i> R. M. Macfarl
<i>Fritillaria falcata</i> (Jeps.) D. E.Beetle	<i>Fritillaria gentneri</i> Gilkey
<i>Fritillaria glauca</i> Greene	<i>Fritillaria liliacea</i> Lindl
<i>Fritillaria maximowiczii</i> Freyn	<i>Fritillaria micrantha</i> A. Heller
<i>Fritillaria ojaiensis</i> Davidson	<i>Fritillaria pinetorum</i> Davidson
<i>Fritillaria pluriflora</i> Torr. ex Benth	<i>Fritillaria pudica</i> (Pursh) Spreng
<i>Fritillaria purdyi</i> Eastw	<i>Fritillaria recurva</i> Benth
<i>Fritillaria striata</i> Eastw	<i>Fritillaria viridea</i> Kellogg

Of these 22 species, 19 are only found in the western United States (all but two of these, *F. gentneri* and *F. camschatcensis* can be found in California). One species, *F. camschatcensis*, occurs in Washington state, British Columbia and Alaska, across





*Fritillaria biflora* showing contractile roots.

the Aleutian Islands to the Kamchatka Peninsula and down into Japan. Two species, *F. dagana* (in the Khamar and Sayan mountains of Siberia close to Lake Baikal) and *F. maximowiczii* (Eastern Siberia and north-eastern China) are found in Eastern Asia. These latter three species are (traditionally) the stoloniferous ones.

I do not intend to reproduce detailed descriptions of each plant. If required these can be found at such excellent websites as [www.efloras.org](http://www.efloras.org).

The bulbs are lily-like and scaly. They are all generally quite fragile and the scales are easily broken off from the main bulb. We can see three distinct forms to the bulbs:

1. The stoloniferous species (see above). Seed-grown plants of these species produce a bulb very close to the surface of the growing medium. Seed production low, vegetative reproduction high. (N.B. Some 'forms' of *F. camschatcensis* do not behave in this way, and it may be possible that other differences between plants currently grouped under this species could be quite dramatic).
2. Those species producing large numbers of 'rice grains' (e.g. *F. affinis*, *F. recurva*, *F. pudica* etc.). Seed-grown plants of these species produce a bulb within a few inches of the surface of the growing medium. Seed production middling, vegetative reproduction high.
3. Those species producing few or no offsets (e.g. *F. biflora*, *F. liliacea*, *F. pluriflora* etc). This group produces thick contractile roots to anchor themselves at the optimum depth for growth. Seed grown plants produce a bulb at a depth of around 25 cm where this is available. Seed production high, vegetative reproduction low.

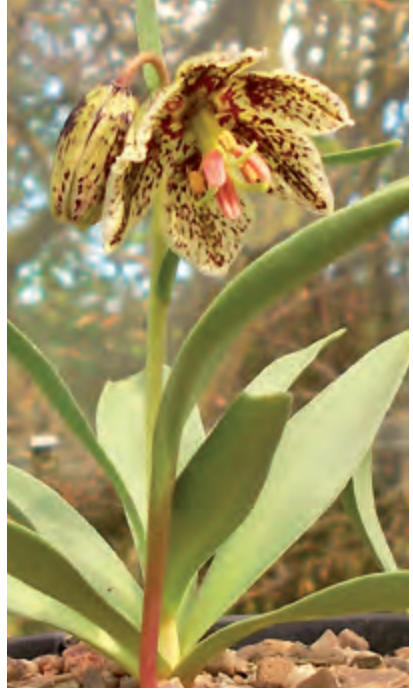
Seed germination is above ground for all species. Flowering time, in nature,

## *Fritillaria purdyi*

extends from February through July. In cultivation here, this can be December (*F. striata*) to July (*F. camschatcensis*).

### **Cultivation**

Carl Purdy writes in *The Garden*, March 1897, “An English correspondent writes me regarding *Fritillaria recurva* as follows: “The bulbs when sent over grow and generally flower once, but they will not establish themselves, and, so far as I can find, they have never been established, possibly (as has been suggested) because the bulb after flowering splits into several smaller ones”. This is still a common comment to me today (but often without the flowering part!). Purdy goes on to explain “Each year an entirely new bulb



is formed by early summer, and the old bulb is seen as a thick scale on the bottom of the new one. The new bulb is larger or smaller than the old one according as the soil or other conditions have been favourable or otherwise. The largest bulbs are found on plants which did not flower that season. Only a small percentage of the total number of bulbs flowers during any season, and the largest percentage of flowering bulbs is to be found the year following a good season for bulb growth. Bulbs which have flowered are apt to be exhausted and to need several years of rest to recuperate their strength for another flowering; this, be it observed, in their native homes. It is true that some do flower two years in succession, but that is where conditions are very favourable to bulb growth. Collectors soon learn to leave flowering bulbs alone, and to select such as have grown a large radical leaf... It will be seen from the foregoing that the trouble of which my correspondent speaks is simply what will happen in the nature of the plant, and is unavoidable... In nature the large bulbs are oftenest found in woodlands which have been burned over... They are early growers and during their growing season the rainfall is heavy”. 115 year-old clues regarding feeding and watering!

I have found through trial and error, and a study of weather patterns and relevant



*Fritillaria recurva*

geology, that a variety of growing conditions are required. It is not possible to give general cultivation guidelines that encompass the whole of the subgenus. It is a good 'rule of thumb', however, that the 'rice grain' species should be planted close to the surface of the growing medium, and the others more deeply, if planting freshly purchased bulbs. Seed of all species should be sown on the surface of the chosen growing medium and covered with the thinnest achievable layer of mulching matter. Obviously those grown from seed will find their own correct depth at which to form the bulb, dependent upon moisture, temperature, etc. Specific requirements will be dealt with in each species article. In the main, my growing medium is based on heavy loam and smooth grit. The heavy loam I use is the kind commercially available for the planting of aquatic plants.

Suffice to say that the comments of Carl Purdy are still good today, but with careful watering and feeding we can flower our plants most years. However, the only way to **guarantee** flowers each year is to grow lots and lots of plants!

#### **Footnote**

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# Korean species lilies (*Lilium tsingtauense*)

*In the following article Professor Dr Ki-Byung Lim, of Kyungpook National University, Daegu, Korea, writes about Lilium tsingtauense, a member of the Martagon section and a species with a wide distribution in Korea.*

The genus *Lilium* comprises more than 100 species and subspecies. About 60%, or more, of *Lilium* species are distributed in Asia and North America. East Asia is especially regarded as a major source of species of the genus *Lilium*.

There are five species known from the Martagon section in the genus *Lilium*, these are *Lilium martagon*, *L. distichum*, *L. hansonii*, *L. tsingtauense* and *L. medeoloides*. *L. martagon* is a well-known species to the European and American people—as a garden lily—and lots of hybridizing/breeding activities have already taken place in the non-commercial sector. However, the other four species are less far advanced with regard to their commercialization. Currently, few commercial companies, or institutes, are attempting to make crosses with *L. hansonii* and *L. tsingtauense* as parents.

*L. tsingtauense* is one of the important species from the Martagon section, not only for commercialization, but also scientific research. The five species belonging to the Martagon section all have distinctive characteristics. For example, *L. tsingtauense* has upward-facing flowers, which is a unique characteristic among the lilies of the Martagon section. *L. tsingtauense* is a species that is widely distributed in Korea. It grows in mountainous areas where all environmental conditions are satisfied, such as correct temperature, humidity, soil moisture and light intensity. *L. tsingtauense* is very sensitive to environmental conditions, especially the incidence of light. Light intensity, during the growing period from spring to autumn, is an important factor in its natural habitat. The typical environmental conditions, of *L. tsingtauense*, are indicated below:

- Light: dim light during the summer season, with penetration through a canopy of tall trees, but if the light is too low (below 2,000 lx) this leads to weak stems and poor flower formation;
- Temperature: not above 28°C during summer, but humid, cooler conditions are preferred;
- Humidity: air humidity is an important factor, higher air humidity with wind from lower site to upper is preferred;
- Soil: rich humus, well drained, covered with leaves.

## The detailed characteristics of *Lilium tsingtauense*

### Flowers

Flowers are 5-7 cm in diameter and mostly orange in colour, mostly regular (formal) flower tepal arrangement, upward-facing flowering, no odour or scent (aromatic), many dark purple spots, often large-sized with fewer spots, or small-sized with many spots. The tepal shape is often narrow and long by comparison with other Martagon species, such as *L. distichum* or *L. hansonii*, which are geographically closely distributed. Flower number, at most habitats, is one to three flowers per stem. However, a maximum of nine flowers is possible in higher light intensity.



### Stems and leaves

Stems have 9-11 mosaic whorled leaves, mostly one-layered whorled leaf, four to five scattered leaves above whorled leaf, one or two bract leaves attached on the base of flower, stem diameter below whorled leaf is much bigger than the stem above the whorled leaf, one or two scale leaves above the soil often one scale leaf below the soil. Scale leaf is soft and thicker, no mosaic pattern but good material for tissue culture propagation. Stem diameter below whorled leaf is about 4-5 mm, however, stem diameter above the whorled leaf is dramatically

The leaves of *Lilium tsingtauense* showing a wave-edged profile without mosaic, *below left*, compared with the plain-edged and mosaic patterning, *right*.





### **Opposite**

Beautiful orange flowers of *Lilium tsingtauense* in its habitat in Korea. Flowers upward-facing, flat and regular in form, without scent.

### **Right**

Bulb and scales of *Lilium tsingtauense*. The scale colour is often light cream with few jointed.



reduced often 1-2 mm almost half of the lower part of stem. Stem surface in most cases is smooth with cuticle layer. Whorled leaves from early stage to middle stage (until September) show mosaic pattern and later fade out after flowering stage.

### **Bulb and scales**

Bulb and scale colour is light cream yellow, few jointed scale as compared to *L. distichum* which shows often many jointed scales. Flowering bulb size is about 9 cm or higher in circumference, Basal roots with healthy stem roots are a prerequisite to make compact bulb growth and set flower buds for next year's flowering.



### **Distribution of *L. tsingtauense* in Korea**

*L. tsingtauense* is one of the common wild *Lilium* species, together with *Lilium tigrinum* and *Lilium amabile*, in S. Korea.

As Korea is now separated into two states, i.e. the South (Republic of Korea; ROK) and the North (Democratic People's Republic of Korea; DPRK), and it is not possible to survey *L. tsingtauense* in North Korea, I have had to omit information—about *L. tsingtauense* in northern part of Korea—and confine my research to the more than 26 habitats of *L. tsingtauense* surveyed in S. Korea. *L. tsingtauense* is widely distributed over all of the mountainous areas of S. Korea. However, its actual habitat is restricted to a very narrow, small area, where the specific environmental conditions allow its growth. As stated previously, the specific





A good habitat for *Lilium tsingtauense* in a mountainous area of South Korea, –600 to 800 m above sea level—near a valley with water, where there is more sunshine, light and cool humid conditions during the summer.

environmental conditions are considered to be: temperature, light, air humidity, soil composition and drainage. Habitats of *L. tsingtauense* mostly face north in the mountains, at altitudes from 100 m to 800 m above sea level. The habitats, in the mountains, are mostly situated close to valleys, where there is more sunlight to be diffused to both sides of the valley and into the forest. For the last 40 years cutting down trees, without permission, has not been allowed. This policy has resulted in abundant tree and shrub cover, which have created darker conditions than *L. tsingtauense* requires to grow successfully. Light intensity that is too low (below 2,000 lx)—in most of the habitats—is the main reason for weak stem growth and reduced flower numbers, in that it often results in *L. tsingtauense* plants flowering every two years. When plant growth starts in April there is a higher percentage (about 20%, 5,000 lx) of full light intensity, i.e. (25,000 lx). This is because, in April, most trees have not sprouted their leaves, therefore more light intensity can penetrate where the emerging plants of *L. tsingtauense* grow. However, in June—when the trees are in full leaf—lower light levels and cooler conditions, under the trees, impair the growth of *L. tsingtauense*. The evidence would suggest, therefore, that over the past 30-40 years, *L. tsingtauense* has become more widely dispersed because of the restriction of light caused by increased forest cover.



The habitat of *Lilium tsingtauense*. The habitat is often situated near to the north side of a valley with a stream. Plants of *Lilium tsingtauense* growing in relatively low light intensity with cool humid air conditions.

### **Light intensity**

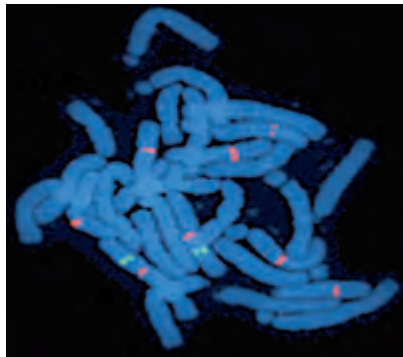
The minimum light intensity for *L. tsingtauense* is about 2,500 lx to 20,000 lx (maximum) in their natural habitat. The light intensity within the habitat, from April to October, is consistent, although light intensity outside the habitat changes. Rarely, some plants of *L. tsingtauense* are found growing in fields, near to roadsides, or in grass growing areas. These plants grow more strongly and have thicker stems—with higher flower numbers—by comparison with plants growing in forest habitats with poorer light conditions in summer. Better light conditions produce plants with thicker stems and more flowers and in rare cases two layers of whorled leaves. Most *L. tsingtauense* plants possess one layer of whorled leaves, compared to *L. distichum* which have mostly two layers and *L. bansonii* which has mostly three layers of whorled leaves.

### **Morphological variations**

Morphological variation, of *L. tsingtauense* in S. Korea, is mostly limited to flower colour. *L. tsingtauense*, from 26 locations distributed all over S. Korea, showed only one flower colour variation, which is pale yellow. A few plants also showed fewer spots and wider or very narrow tepals.



A yellow-flowered mutant, of *Lilium tsingtauense*, found in South Korea.



The chromosome complement showing eight signals of 45S rDNA loci on the chromosome #3, 4, 6 and 10, respectively. FISH (Fluorescent in situ hybridization) techniques reveal two coloured signals on the ribosomal DNA domain.

### Chromosome analysis

The *Lilium* genome has 12 chromosomes and all wild species are diploid ( $2n=2x=24$ ), and few species such as *Lilium tigrinum* (a.k.a. *Lilium lancifolium*) is triploid ( $2n=3x=36$ ). The genus *Lilium* has one of the largest genome sizes (1C value 35.95pg) after *Fritillaria*, which is the largest genome (1C value 62.70pg) in the plant taxa. *L. tsingtauense* possesses 24 chromosomes showing eight loci of 45S ribosomal DNA domain. The conventional chromosome data where *L. tsingtauense* showed four sets of secondary restriction on the chromosome #3, 4, 6 and 10, respectively.

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# What is a species?

## Concepts, hypotheses, and musings from a plant grower

*In this article **Nbu Nguyen** poses the question, “What is a species?” and then provides insights into advances in taxonomy that should, over time, provide the answer.*

I am somewhat obsessed about growing plants, in particular bulbous plants. I spend my spare time repotting, taking pictures, and writing about plants in both habitat and the garden. Currently, I am president of the Pacific Bulb Society and administrator for the PBS Wiki. When not growing and thinking about plants, I do research in fungal taxonomy and ecology at the University of California, Berkeley, USA.

What is a species? Can we see it? Can we measure it? Can we describe it? These are the questions that have plagued taxonomists for centuries and probably will for many more. I will answer that yes, we could see it, we could measure it, and we could describe it, but what we could see, measure, and describe does not make something a species. In short, despite the practice of taxonomy for over 200 years and the many technological advances in the last few decades, we still do not have a definite answer to what a species truly is. Are we still in the dark about what makes something a species? Absolutely. However, we have become efficient at describing and classifying something as a species in a human context. Below, I describe the basic ideas of our current understanding of the concept species. This would be broad enough to encompass any group of species, including the favourite of this audience, the Lily.

### **The species concept**

Species concepts are conceptual ways of thinking about what makes up a species. Unfortunately, since the inception of taxonomy, with much more limited communications than today, scholars studying each group of



*Lilium ledebourii*  
(currently in the *candidum* group)



*Lilium martagon*  
(currently in the *martagon* group)

organisms conceptualized their ideas separately and applied those ideas to classifying their group of organisms specifically. As a result, in the modern day, we have accumulated more species concepts than the counts of digits on a human body, some of which are broadly applicable, others very specific. Several stood out on top. One of these is the well-versed Biological Species Concept, conceived by Ernst Mayr, an ornithologist. It goes something like this: something is a species when they reproduce sexually and produce viable offsprings. This concept works really well for sexually reproducing animals, but the main thing is that it works best for animals. Most of the organisms on earth aren't animals. Plants for instance will mate perfectly well between species (and genera) and still produce offspring that go on to produce many generations of hybrid offsprings. If this concept were applied to plants, we would have many, many more biological species at the store when we buy hybrid lilies. So clearly this concept does

not work for plants. For the same reason, it does not work for other organisms like bacteria because they don't reproduce sexually.

Thus, a more comprehensive concept has to be created to reconcile non-sexually reproducing organisms such as bacteria and many fungi. One of the better-applied modern concepts is the Evolutionary Species Concept, one that applies to all organisms since all living things are under the influence of evolutionary processes. It is one of the main driving forces for all the major changes in taxonomy in the last two decades in every major group of organisms. This concept states that all organisms at one point had a common ancestor that gave rise to what we see now as distinct entities.



*Lilium rubellum* (currently in the Oriental group)

Currently, one of the best tools to test, and hypothesize evolutionary history (we can only hypothesize evolutionary history since we were not there to observe it) is the lively field of Phylogenetics. The result of phylogenetic analyses are evolutionary trees or phylograms. These trees show the evolutionary relationship between a group of organism at any taxonomic level (e.g. kingdom, genus, species, subspecies, populations, etc...) and beyond. Groupings within phylograms are called clades, and these clades can be translated to any taxonomic or non-taxonomic level, according to the author. The raw input data to produce phylograms can be any characteristics such as morphology, physiology, and other traits, or they can consist only of just DNA bases (sometimes thousands of them per organism multiplied by the number of organisms involved). With that much data, it is impossible for the human brain to process it all and understand the relationship. So, we build a conceptual framework using phylograms as a powerful way to visualize relationships.

### **Species recognition**

I will say that even though we don't yet truly know what a species is, we are getting closer to that point every day. What we have been becoming really good at is recognizing species at some semi-subjective level, and then describing the species at that level. It is what we call a "species description" (in text form) but in contextual form, it is more of a description of a "species hypothesis". It is a hypo-thesis because we don't know what a real species is. As such, when one



reads of a new species being described, it is the published work of a species hypothesis being recognized. Being able to recognize some entity, whatever you want to call it, has many important downstream applications. Many levels of society use this recognition, from management, to law-making, to fundamental sciences. Therefore, the recognition of species is a first but crucial step in advancing our knowledge about what a species may be.

Species recognition relies on what we can observe. For many centuries, we have only been able to observe morphological, developmental, or physiological traits. However, since the understanding of DNA as the genetic code, we have been able to observe the DNA bases (A, C, T, G) by ever-advancing technology. First, single genes were used in relation to recognized species, followed by multiple genes, followed by parts of a genome (such as the chloroplast or mitochondrial genes), and at the current time, whole genomes are being used in relation to recognized species. The amazing power to sequence DNA and hypothesizing species occurred within the last 30 years, and with such a revolution starting from single genes to whole genomes, we have gone through many iterations and reiterations, testing and retesting of species hypotheses, each time coming closer to the ultimate goal. The above is another reason for the actively fluctuating changes in taxonomy.

### **The future**

Now that we are able to extract all of the genetic make-up of an organism, where do we go once we have analyzed whole genomes? Can it really tell us what a species is? Well, the answer isn't so straightforward. The fundamental idea behind being able to sequence the whole genome is to know every gene that exists within that genome and even more importantly what the genes do. Once we have found the genes, we can theoretically relate them back to morphological characteristics

**Below left**, *Lilium sargentiae* (currently in the Trumpet group) and **right**, *Lilium bakerianum* var. *delavayi* (currently in the Asian group).





**Above left**, *Lilium superbum* (currently in the American group) and **right**, *Lilium dauricum* var. *alpinum* (currently in the *dauricum* group).

(because genes should be in control of everything about an organism). But we find that for many of the genes within a genome of a new organism we sequence, we have no clue what they do. And the fact that it probably takes more than one gene, plus the complex interactions between those genes that produce the morphology, makes things even more complicated.

Even if we could understand a species based on genomes, we at the current time cannot make genome-based species recognition applicable. No single person has a genome sequencer in his/her house, and it's worse when we want to recognize something in the field. We are still at the whim of morphological characteristics because hand-held genome sequencers do not yet exist. So, in the last few years, it has become clearer to taxonomists that even though we use DNA to recognize species, it is important that we correlate morphological characteristics to the species defined by DNA. This way, we solve the fundamental balance of taxonomic progress and satisfy the end user of such taxonomy, such as the home gardener. Sadly, this idea is still relatively new, so it will take a little longer before we are able to see this happening across all taxonomic disciplines.

So I bring us back to the question of what is a species? The answer is we don't yet know for sure, but we're getting closer every day! It is our great hope that the public understands why there have been so many changes, and has the tolerance for these changes as we together plough through the taxonomic revolution of the technological age. For a taxonomist, this is a great time in history to be alive and be a part of the great flux of change. It can truly be frustrating sometimes, but in a hundred years, I have high hopes that the more enlightened humans will look back and see that the flux we're in is an age of renaissance for taxonomy after several hundred years of morphological stagnation.

# We do lilies differently, 42 degrees south of the equator

*Charlie Kroell introduced me to **Rod Barwick** whom I liked immediately, not just because of his love of all things Scottish, but because he treats life with a certain irreverance (as most serious people do), as is reflected in the following article and his singular publication, The Trumpeter.*

## The little Elf

*I met a little Elf-man once, down where the lilies blow.  
I asked him why he was so small, and why he didn't grow.  
He slightly frowned, and with his eye he looked me through and through:  
'I'm quite as big for me,' he said, 'As you are big for you.'*

John Kendrick Bangs

The cultivation of lilies is currently widespread in Tasmanian gardens. Tasmania is Australia's southern-most state, separated from the mainland by the often stormy waters of Bass Strait, and regularly described as "a small island with a Mediterranean-style climate." The description of climate is only a broad generalisation for within Tasmania there are considerable regional differences in annual rainfall received, temperatures recorded and, of course, soil conditions encountered.

The ramshackle old cottage here at Glenbrook, around which many lilies are scattered, is situated in the back-hills of Claremont, an unfashionable suburb just eight miles north (and on the "very wrong side") of Hobart which is Tasmania's picturesque capital city. Hobart is on the west bank of the River Derwent—in the southern part of the state.

Locally, our entire annual rainfall is usually a very modest 17 to 20 inches, mostly coming in the winter-spring period, while the summer is generally long, hot and dry with the ever-threatening danger of raging bushfires. There are some areas in southern Tasmania with wonderfully fertile soil in lush river valleys. This is highly-valued, prime agricultural land. But, most of the people growing lilies (at least the ones I know) garden on fairly shallow, often hard, soil or else resort to planting their bulbs in pots and tubs.

[*These notes are not sketching a very appealing picture, thus far, for lily cultivation are they?*] Intriguingly, too, lily growing doesn't seem to have taken the fancy of many of Tasmania's more affluent citizens. There are plenty of well-to-do Hobartians with handsomely landscaped gardens tended by professional gardeners but, curiously, lily-growing here is largely practised in the gardens and back-yards of the "working classes". I imagine that any prominent horticulturist

An early, colourful example of *The Trumpeter*—Glenbrook’s official (and probably only) dedicated lily enthusiast’s publication, produced on the 42<sup>nd</sup> parallel south.

from overseas would be quite shocked to find that Tasmanian lily-culture is so very humbly situated.

Given that the climate in which we garden is far less than favourable it is not surprising that hardly any lily species have been established in “naturalised garden plantings” locally. There are a few historic Tasmanian sites where *Lilium candidum* has survived for more than a century—but these sites are few and far between. *Lilium tigrinum* is an incredibly hardy bulb here, the lily most commonly grown, and very long-lasting. Of other species, the only ones that I’m aware of as being long-lived are *L. henryi* and *L. regale* along with *L. martagon* and *L. pardalinum* in just a few cooler gardens at higher altitudes. Many other species are grown here, but either they require highly skilled cultivation or else they are not very long-lived.

Older named varieties still in cultivation here include ‘Black Beauty’ and ‘Louise’ along with Trumpet lily strains such as ‘African Queen’, ‘Black Dragon’, ‘Golden Splendor’ and ‘Pink Perfection’. There is also an old Aurelian widely grown, sometimes under the name ‘Glowing Star’, which I think is probably the same plant as ‘White Henryi’. In fact, I have a very happy memory of this particular bulb being exhibited on a number of occasions at Claremont Lily Shows in the 1990s. The exhibitor, now long deceased, was a delightful man, shortish, an ardent bulb grower inclined to colour-up quickly and he drove his big blue Volvo in an exceedingly bullish manner. It was a case of “Look-out everyone” if Bob was about! Anyway, around 1997-98 I friskily asked Bob about his ‘Glowing Star’—where the name came from and was there any difference at all between it and ‘White Henryi’? Not a man to be “messed with”, Bob was soon to be heard loudly instructing the Claremont Show crowd about his bulbs of ‘Glowing Star’. “and, And, AND...” he said, in rising tones while pointing at your scribe, “Don’t let that bugger tell you it’s ‘White Henryi!’” [Oh, if only the RHS Lily Group could





*attract a few such members!]*

For most of us in Tasmania the gorgeous Oriental lilies grow well in pots and tubs—where presumably the drainage is still good in winter. But, I don't know of anyone who has managed to “keep the bulbs” once planted-out in the garden. I guess our cold, wet winter period is the death sentence for them. Thus far, however, the hybrid Orien-pet lilies are proving much more garden hardy with cultivars such as ‘Leslie Woodriff’ regularly making giant, tree-like growth. They are exceptionally impressive and seem fairly disease-resistant too.

In the very early 1990s it was thought that there was enough interest, along with sufficient lily

bulbs being grown, for us to hold a Lily and Summer Flower Show at Claremont. The second weekend in January was the chosen date and the shows, from the very first to the most recent, have proven to be wonderful community events. I especially want to emphasise *community events* because there is no Lily Society of any kind in southern Tasmania. Instead, the shows are run by a local band of garden enthusiasts operating under the name of The Claremont Flower Show Group and participation at the show is both *free* and *open to everyone*. No-one exhibiting flowers at Claremont Shows has to be a *member* of anything!

The Claremont Show schedule lists classes for Seedling Lilies, Open Competition, Amateur classes, Restricted Level classes, Novice/Local Grower classes and a section for showing single lily flowers. In the ‘Seedling’ and ‘Open Sections’ the competition is of fairly high standard (I suspect near international level), often with many fine exhibits in each class. It is, of course, unreasonable to expect small-scale home-gardeners and newer growers to exhibit their flowers at this intense level of competition hence the other show sections are there to get people started and keep them involved. In those sections almost every class (depending on entries) is sub-divided prior to judging so that virtually every exhibitor receives a prize card, of some sort, in recognition of their efforts. Purists, I know, despise this form of encouragement but there are nowhere near enough “purists” in southern Tasmania to make up a decent-sized lily show. Anyway, their



lofty notions and expectations are catered for in the Seedling and top Open sections at Claremont.

Elsewhere in the show “Encouragement to Grow Lilies” is the key ingredient and it does seem to be working well. At the January 2013 Claremont Show, over 80 exhibitors participated, benching more than 400 lily entries—a new record total. Many sections of the show were crowded with flowers brought along by plenty of smiling gardeners. That’s how we like it here!

Turning to a more personal gardening note, I still look back with pleasure to my first experiences with planting bulbs here at Glenbrook in early 1972. The results were very pleasing. Two years later I retired from well-paid employment as an accounts clerk and took up gardening for my livelihood. In 1976 I exhibited flowers for a first time at the Hobart Horticultural Society Show and have benched flowers there every year since. In 1977 I did my first cross-pollinations and by 1980 was able to issue a first *Glenbrook Bulb List*. From 1983 onwards I have made my full-time living by growing bulbs on the home property. I wanted to mention all of this because for someone with a feeble, dwarf body, eccentric views on almost everything, a powerful inclination to be one of “life’s loners” and no formal horticultural training of any kind it really has been an incredibly lucky life!

For 15 years, from 1980 to 1995, I gave much time to doing “garden club talks” at many locations around Tasmania and, despite my reclusive tendencies, hosted many visits to the bulb plantings at Glenbrook. The plantings were then, and are still now, tended entirely by hand—no mechanical equipment and no herbicides, just mattock, hoe, sickle, rake etc. About 12 years ago I realised “the advancing years” were not going to continue to permit me to host open-garden visits for much longer or, indeed, to keep working the requisite 14 hour days, seven days a week. But, I still wanted to continue to give **something** back to bulb-growing—after all it was and still is bulb-growing that has given me a better life than I could ever have hoped for. So, despite being a high school drop-out with no ability at “literature” I decided to try publishing a Lily Newsletter. To the best of



my knowledge there wasn't much in the way of lily publications being produced anywhere in Australia at the time so the door was open for something—however amateurish it might be. I christened this *enfant terrible* of lily writings *The Trumpeter*, gathered a few articles from willing contributors and posted off copies of the end product to some thirty or so people I thought might be interested—or at least amused. No “great tree” has grown from this lily “acorn” but a 22<sup>nd</sup> issue of *The Trumpeter* will hopefully be produced shortly. Some of the articles printed over the past decade have been skilfully-written, intellectual and elegant pieces devoted seriously to lilies, other contributions have been newsy, down-to-earth writings and some delightfully comic. One of the most remarkable things about lily growers in southern Tasmania is that we are happy to laugh about ourselves—not, I think, usually a common occurrence among show exhibitors in other places where “benching winners” seems to be the order of the day.

The essential *raison d'être* for *The Trumpeter* is to promote the growing of lilies locally and to encourage people to bring them along to the Claremont Show. Near the end of each December issue there are open invitations given to attend “How to Show” sessions and the annual Claremont Lily Show Party.

Just as with the first, and every subsequent, issue *The Trumpeter* will be distributed free to anyone interested. It is Glenbrook's contribution to bulb growing. The only condition to receiving a copy is that recipients contribute lilies, or something, to the Claremont Lily Show or else write a piece for *The Trumpeter* now-and-then.

I am fully aware that those of you who have read this peculiar essay will now know there is a very strange approach to “lily-things” in this far-distant little corner of the world. For me, it is amusing to ponder on just how John Kendrick Bangs might have written his *Little Elf-man* rhyme had he ever visited the Claremont Lily Show under the auspices of the RHS Lily Group.

Would it possibly have gone thus?

*I met some little Elf-folk once down where Tasmanian lilies blow.  
I asked them why they were so small and why they didn't grow.  
All of them grinned and  
with knowing-eyes they looked me through and through.  
'We're quite as big for us,' they said, 'As you are big for you.'*

Perhaps? Maybe perhaps? Possibly maybe perhaps? Who knows? But, one thing is certain. We do lilies differently, 42 degrees south of the equator.

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# Growing lily species in the Pacific Northwest

*Gene Mirro is well known for his ability to grow many species lilies, including the most difficult ones, as the following, visually-stunning article shows.*

## Introduction

This article started out as a Microsoft PowerPoint® presentation, which was delivered to the Seattle, Washington State, chapter of the North American Rock Garden Society (NARGS).

My hope is that the visual detail in the article will engage the reader in a similar way to a more, textually, detailed piece. My other hope is that the range of species *Lilium* represented will convey my love of the genus and the importance of considering every detail required to achieve successful outcomes with these beautiful plants.

*Lilium canadense*





**Above** from left, *Lilium formosanum pricei* 'Snow White' (fragrant), and right, *Lilium henryi*.

## SEED GERMINATION

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**Western US Species** *Lilium columbianum*, *L. humboldti*, *L. kelloggii*, *L. pardalinum*, *L. parryi*, *L. rubescens*, *L. washingtonianum*

- The western lilies have distinct below-ground and above-ground germination phases.
- The below-ground bulb development occurs during the cool, moist days of Fall and early Winter. Allow three months at 60-70F.
- The above-ground leaf development begins after a period of chilling during Winter. A few months should be enough for the chilling period.
- Three to four years to bloom.

**Eastern US Species** *Lilium canadense*, *L. superbum*, *L. michiganense*

- Almost all are delayed hypogeal and slow. They will need about four months at 70-80F, followed by at least four months at 40F.
- Three to four years to bloom.

**Chinese US Species** *Lilium amabile*, *L. duchartrei*, *L. henryi*, *L. lancifolium*, *L. lankongense*, *L. maximowiczii*, *L. pumilum*, *L. taliense*, *Nomocharis* species and hybrids

- These are immediate epigeal germination, but some seeds may come up after a cold spell. Sow at 55-65E. Germination takes place in two to six weeks.
- Two years to bloom.

**Japanese Species** *Lilium auratum*, *L. japonicum*, *L. rubellum*, *L. speciosum*

- These are delayed hypogeal germination. They will need about four months at 70-80F, followed by at least four months at 40F.
- Three to four years to bloom.

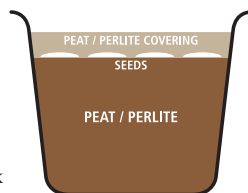




**Above**, from left to right, *Lilium regale* (fragrant), *Lilium candidum* (Madonna lily, fragrant), *Lilium lankongense*.

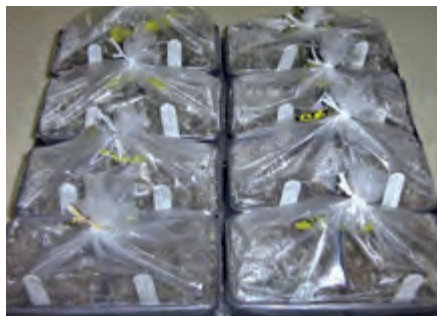
## SOWING THE SEEDS

1. **MAKE A POTTING MIX** of 50% sphagnum peat and 50% perlite. To each gallon of mix, add a teaspoon of dolomite lime and a teaspoon of bone meal. Place in a plastic bag with a little water. Close the bag and knead vigorously until the medium is uniformly slightly moist.
2. **SELECT CONTAINERS** at least 3 inches deep. Fill with mix to the top. Firm the mix. Refill to within ½ inch of the top.
3. **DISTRIBUTE SEED ON THE MIX**, no more than nine seeds per square inch. Cover seed with mix. Firm the mix. Water lightly to settle the mix around the seeds. Do not soak. Label the containers. Place the containers in small plastic bags, preferably the type that uses tie wraps. Seal the bags closed with tie wraps or whatever.



### **The Magical Nursery Fridge** *pictured below right*

Regulates at 40F whether the outside temp is warmer or colder than 40F. So you can put it in an unheated space. Great for germinating seeds, storing marginally hardy bulbs, etc.





## GROWING THE SEEDLINGS

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Check the containers every week or so for above-ground growth. Also make sure the mix is not getting dry. When growth commences, feed with a dilute liquid fertilizer and place in a cool (50-60 F), bright location, such as under fluorescent lights in the basement, or in a cool greenhouse. Do not expose lily seedlings to full sun.

### Lighting setup

It's in a corner of the kitchen, so no rafters to hang the lights from. So I built a frame out of 1x2's that mounts to the 4x4 foot base. I keep the lights about 4-6 inches above the plants. This setup lets me move the lights up for easy access to the plants. You can see the rigid foam insulation pieces around the edges that reflect the light back in to the plants. You can also see the propagation domes, filled with moist air. The whole thing sits on a 30 inch x 5 foot long office table from Office Depot, with some plastic film and bubble wrap on it to protect the table from scratches and moisture. This places the plants at just the right height.

### Flourescent lighting

I use cheap 4-foot shop lights with cool white or daylight lamps. I use pieces of white insulating foam to reflect light back towards the plants. This keeps them from leaning in towards the center of the lit area.

I keep my house cool during the Winter, around 60F. At around 70F, the seedlings grow long and weak, and have disease problems. For some seedlings, like European alpine Gentians, 60F is too high.

The fixtures are ancient 48 inch shop lights with two lamps per fixture. Each of them has a new ballast in it, secured by the two bolts that you can see on top. I use cool white lamps, with a couple of daylight lamps mixed in.



## GROWING-ON TIPS

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### Keep them cool

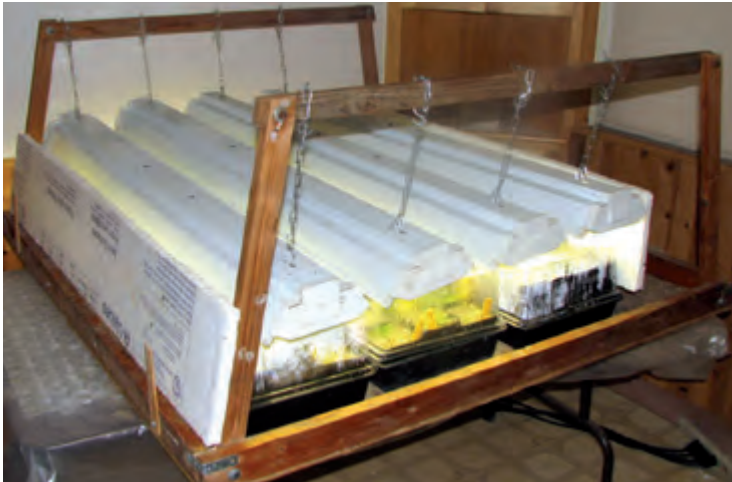
If the potting mix gets too warm, the bulbs will all rot. Get the seedlings into the soil by late May. Plant them where they are shaded during the hottest part of the day. They will grow slower, but they will survive. Mulch with bark mulch. You **MUST** protect from slugs (bait), birds (use plastic netting), moles (trap), deer (fence, repellent). Do not let them get too dry. If they go dormant, let the soil dry and provide lots of shade and mulch to keep the soil cool. Do not let the soil bake in the sun.

### Growing lily seedlings outdoors

Lily seedlings growing on the east side of the house (*pictured right*). They are shaded by the house during the afternoon, which is the hottest part of the day. They get some partial shade from the sunflowers in the morning. The sunflowers also keep the soil on the dry side. Growth of the lily seedlings is slower, but they survive. The cooler your climate, the less you need to worry about this.



DIY flourescent lighting setup; an inexpensive and easy to install solution.



## SOIL PREPARATION

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Most lilies like sandy loam soil. Some will grow in clay loam. I would not try any of them in heavy clay. The water table must be well below the bulbs at all times of the year. Most lilies like slightly acid soil (pH = 5.5 – 6.5). Most Pacific NW soils are heavily leached and acidic. Add lime and fertilizer. They will do best with regular feeding and watering. I water once every 10 days or so.

If the soil is wet AND warm, the bulbs may rot. Mulch, grow companion plants, shade in the afternoon to keep soil cool.

You should do most of your soil prep before you begin planting, preferably with a tractor with a bucket and tiller. Modifying soil in small areas by hand in established plantings is very laborious.

### Converting clay loam to sandy loam

My native soil is very stiff clay loam. The plants I like to grow will not do well in this soil. And it is very unpleasant to garden in this soil, especially if it is very wet or very dry.

1. Till as deeply as possible (at least 6 inches) and spread at least 1.5 inches of coarse sand on top, as well as compost or bark if you've got it.
2. Sprinkle a handful of dolomite lime on each square foot of soil and till in as deeply as possible.
3. Rake the soil into roughly its final position. I use raised beds.
4. Use rocks, logs, land-scape timbers, etc. to retain soil and define the beds. Rake and shovel the soil into place.
8. It is helpful to have a few yards of this modified soil in reserve for filling and shaping the growing areas.

Good lily soil is also beneficial for other choice plants; *below left*, *Campanula choruhensis* and *right*, *Physoplexis comosa*.





Rare species lilies, *clockwise* from top right:

*Lilium bakerianum delavayi*, *Lilium maritimum* (northern California coast),  
*Lilium grayi* (eastern USA), *Lilium parryi* (southern California, Arizona mountains),  
*Lilium speciosum gloriosides* (China).





Above, from left, *Lilium mackliniae*, *Lilium canadense* and *Lilium mackliniae*, dark form.

## PESTS AND DISEASES

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### Animal Pests

Keep your critters fat and happy, and they won't eat the bulbs.

Mice and voles: Mouse bait, traps, cats, dogs, predatory birds, hardware cloth around bulbs.

Moles: They don't eat the bulbs, but make a mess, and their tunnels are used by mice. Scissors traps; Molecat (very effective, \$70); Talpirid mole bait (effective, expensive).

Rabbits: Gourmets; love expensive, rare plants.  
 : Havahart trap doesn't work. They won't go in. It might work if you surround the metal trap with wood.  
 : Cats and dogs may or may not chase rabbits.  
 : In the country, a 22 rifle is effective.

### Insect Pests

Red lily beetle; Aphids (carry lily virus); Slugs (eat bulbs and leaves)

### Diseases

Lily virus (no cure - control aphids); Fusarium bulb rot (keep soil cool and dryish); Botrytis (caused by wet, cool conditions, poor air circulation).

## SPECIES THAT DON'T LIKE OUR CLIMATE

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*Lilium alexandrae*, *L. formosanum* tall forms, *L. nobilissimum*, *L. wallichianum* (seed ripens much too late; do not get enough heat to stay healthy for more than a year or two); *Lilium speciosum* (grows fine, but will not set seeds here); *Lilium nepalense* (mine survive outdoors, but will not bloom); *Lilium auratum*, *L. henryi*, *L. sargentiae*, *L. sulphureum* (grow fine, set seed very late. Seed pods and foliage may get Botrytis in dark, wet Fall weather); *Lilium canadense* (some people say it won't grow here. Mine grow like weeds. It's worth trying).



# H. W. Hyde & Son

*On 21 May 2012 Her Majesty Queen Elizabeth II presented the first Queen's Diamond Jubilee Award for the best exhibit in the Grand Pavilion at The Chelsea Flower Show to H. W. Hyde & Son for their outstanding exhibit of lilies. **Caroline Boisset** recently went to see Richard, Sarah and Elizabeth Hyde working at the nursery.*

It was late summer when I headed east from home to visit H. W. Hyde & Son in the village of Ruscombe which is situated just over 35 miles west of central London. Having had a quick look at the nursery website before and read about some of the history I had imagined a small country village in bucolic surroundings but found the short drive from the motorway took me through traffic lights and roundabouts serving commercial sites and housing areas. The sign on the gate to the nursery, however, was simple and clear and as well as detailing the address, other contact details and opening times reminded me that the business had been there since 1926 and was a winner of Chelsea Gold Medals.



Herbert William Hyde

I found Richard and Sarah in a shed sorting bulbs. Richard had just come back from Canada with a consignment of 1500 lily bulbs of cultivars he couldn't get anywhere else in the world, including martagons from a lily grower that he met at a NALS conference last year. One bulb each of 100 new varieties were being selected for bulking up with 20 going for tissue culture and the others going for scaling to a friend in Holland. Sarah, who was diligently removing damaged scales and keeping a few for propagation, commented that "in Holland they have a phenomenal skill for growing on the lilies; they can't sell them but they can grow them". Richard explained that the industry was very compartmentalised with some doing the breeding, others the growing and others marketing. H. W. Hyde fall into the last category.

The nursery was started in 1926 by the present owners' grandfather Herbert William Hyde who was head gardener at a local estate, when the opportunity of buying some land came up. He started off during the depression mostly growing



Liz, Richard, Ann (mother) and Sarah.

vegetables and a few cut flowers such as scented roses to sell locally. He also had a passion for orchids and when he was given a collection he built a stove house for them. There were at the time six or seven staff working on the nursery. During the Second World War the nursery converted to producing seed for vegetables and soon after the war Herbert's son David joined the business, Sarah told me that "he was expected to join". By then the nursery was producing mainly cut flowers—mostly dahlias, chrysanthemums and gladioli that were displayed at county shows until Herbert died in 1965. David also grew orchids in the greenhouses. In the 1970s the range grew to include some lilies, alstromerias and other flower crops that would sell well.

It was while delivering flowers that David met a young florist, Ann, who was to become his wife. He was made a partner in the business just before he and Ann got married.

As the family grew and more revenue was needed the firm opened a shop in Reading to sell the flowers direct to the public. Ann Hyde was a very good florist and the retail business thrived until the mid 1990s when the area was pedestrianised, making access difficult and Liz and Sarah, who had both worked there, returned to the nursery.

Richard has always worked in the nursery, as has Sarah. Liz did a jewellery course and worked for a number of years for a stone merchant in London, before

returning to the family business.

After David's death they started off with bedding plants and continued with other cut flowers including phlox and a few others but by 1990 they realised that it was alstromerias and particularly lilies that made the money.

In order to improve the business a website was constructed in early 2000 to sell direct to florists but the Hydes soon found that while the florists were happy to buy from them they were being given credit by bigger suppliers which was not a proposition for their nursery. However, because they were selling all the newest varieties, in order to get them known they featured them on the website and found they had enquiries from the public asking to buy them from the nursery. Therefore, they thought that rather than sell direct into the trade in large quantities they would sell to the public. This was just the beginning as it transpired that although cut flowers sold well, the public also wanted to buy the bulbs to grow the varieties themselves.

In response to this the nursery website was completely redesigned to not only be educational in informing people about the different varieties but also actually sell the bulbs. They already had a lot of knowledge, and contacts in Holland through the cut flower business, so transition from growing flowers to supplying bulbs was a reasonable proposition.

The website is now on its fourth update in 13 years, supervised by Richard with the help of a webmaster, John; "we work very well together and as it is a commercial website it is worthwhile for John to try new things".

It is perhaps the ability to respond to market demand and willingness to constantly be innovative that makes the nursery successful—that and an evident attention to detail, a definite streak of perfectionism and a lot of hard work.

Over the years, as a very cohesive team, they have found their own role: Liz is in charge of showing; Sarah runs the retail side of the business while Richard is responsible for the technical aspect of the nursery (tractors, heating etc). By dividing the tasks they have found that continuity is ensured and it works remarkably well.

In July 2004, H. W. Hyde & Son were asked to arrange a display for the International Lily Conference and in September of the same year Richard, Sarah and Elizabeth decided that it was time for the company to start showing again after 40 years. They took lilies to the RHS Wisley Autumn Show and received a Gold Medal and great acclaim for their exhibit of lilies and Bob Sweet of the Royal Horticultural Society invited them to apply for Chelsea in 2005 where they won their first RHS Chelsea Gold Medal. It has been Gold Medals ever since with their ninth awarded in 2013. They also exhibit at the Hampton Court Show and many of the RHS shows held at Vincent Square. They now exhibit at all the major shows in the U.K. and a selected few in the E.U.

They have identified a definite drive from the public to see new cultivars and it is mostly a huge variety of the large showy hybrids that they exhibit. They did once try to exhibit species at Wisley but found that they made no impact; they had plenty of lookers but no buyers. Richard told me that he prefers species but is sanguine enough to know that he will not make a living trying to sell them. His extensive knowledge he attributes in part to joining the Lily Group of which he is now a valued member of the Committee.

The day I visited, Richard and Liz had just been to a trade show which they find is useful for maintaining contacts for the purchasing of pots, compost, heaters and all the necessary hardware that is required to ensure the smooth running of the nursery. They don't use pesticides and find that picking off the red lily beetle, on a daily basis in the season, is by far the most efficient way of keeping the pest down. They have three cats to keep down other pests, i.e. mice.

The next show on the calendar, at which H. W. Hyde & Son had an exhibit, was the Harrogate Show to which only Richard was going, as it costs a lot to do a small show that is relatively far away. After that was an event in Germany and then a London Show. For all these events pots of both lilies and tulips were being grown on. They told me that they had been trying for some time to perfect a technique to have martagons in flower out of season and although there are some finer points that still need tuning they think that they have cracked it which "is quite nice!".

As for Chelsea 2014, which will be their tenth, they have worked out what they want to do and even if the displays are never entirely as planned, as some varieties reach perfection for showing on the right day and some don't, they also have some varieties that they have wanted to release for some time, so it promises to be another outstanding display. Furthermore, they have already selected the cultivar that they will put forward as the plant of the year at Chelsea.

One could think that this busy schedule would be enough to occupy Sarah, Richard and Elizabeth, but they told me that for several years now they have been wanting to move nearer to London to a bigger site where they can have more visitors and give talks. It sounds exciting to me, I will be watching their space and wish them well for the future.

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★ ★ ★

# Lilies of the *Lilium lancifolium* / *Lilium tigrinum* complex

*In this article Břetislav Mičulka discusses the vexed question of the correct identification of *Lilium lancifolium* / *Lilium tigrinum*.*

“Tiger lilies” have long been cultivated, not only in their area of origin as food plants but also elsewhere for their decorative flowers. Kaempfer illustrated one as early as 1712 as “oni-yuri”, a wild lily from Japan (Synge 1980). They are widely distributed, ranging from eastern China and eastern Russia to Korea and Japan. Ker-Gawler first named *L. tigrinum* (arguably, literally, meaning “leopard-spotted” – Woodcock & Stearn 1950 after Stoker), and described it in Latin, in 1810, on account of its flower colours/markings. Slate (1939) states that, according to Dr A. B. Stout, Ker-Gawler’s *L. tigrinum* was based on a triploid plant. Only later did it transpire that lilies of this type—described inaccurately from a specimen with undistinguishable, small flower buds—had been called *L. lancifolium* by Thunberg as early as 1794 (even though the name *L. lancifolium* had by that later time become used in lily classification for plants of *L. speciosum* Thunberg 1784). This previously found, but inadequately described plant in the herbarium was nearly forgotten.

Relatively recently Ingram (1968) studied again the lily stored in Thunberg’s herbarium as a lectotype of *L. lancifolium* Thunberg 1794. Collected at the small-bud stage, this is in fact barely identifiable as *L. lancifolium*, as the markedly erect buds are also common in up-facing Asiatic hybrids. Ohwi, in *Flora of Japan* in 1965 (Ingram 1968), also upheld the name *L. lancifolium*, even if Thunberg incorrectly described the flowers, as had Koidzumi (Baranova 1990) who, after working with Thunberg’s herbarium in 1925, admitted the possibility that this may be that lily. Finally Stearn (1970) confirmed that *lancifolium* should have priority. For that reason, this name gradually replaced the earlier name *L. tigrinum* Ker-Gawler (syn. *L. sinense*), although some leading lily taxonomists stuck with the name *L. tigrinum*: for example, Synge (1980) doubts if he can validly attribute Thunberg’s name and description to *L. tigrinum*; Woodcock & Stearn (1950) had earlier observed that flowers described as *L. lancifolium* by Thunberg do not match any Asiatic lily; and the *Flora of China* (2000) also retained *L. tigrinum* Ker-Gawler. The doubtful name *L. lancifolium* Thunberg 1784 was given priority in *Flora Republicae Popularis Sinicae* (1980 Chinese edition), and then adopted by other authors including those for *Flora Europaea* (possibly in relation to escaped plants in Austria?) and by registrar V. Matthews in the *International Lily Register and Checklist* (2007) for cultivars.

Taxonomy of these lilies was further stirred up by Dr Shozo Noda and other,



mainly Japanese, taxonomy researchers, who showed the hybrid origin of some populations in these taxa. Noda (1974, 1986 and 1991) suggests that the most common tiger-lily populations are more vigorous and sterile allotriploids of orange-red type, with larger flowers of hybrid origin (see also Stewart & Bamford, 1943). This triploid lily ( $2n = 3 \times = 36$  chromosomes) probably arose from an unreduced diploid egg ( $2n = 2 \times = 24$  chromosomes) from taxon *L. tigrinum* fertilized by pollen of *L. maximowiczii* (formerly *L. leichtlinii* var. *maximowiczii*). This was also supported by Comber (1949) by including both species in the same subsection, 5a. Even in the phylogenetic chart of Hohenegger (2010), triploid ( $3 \times$ ) *L. lancifolium* is shown next to *L. maximowiczii* and diploid ( $2 \times$ ) *L. tigrinum* with *L. concolor* var. *stictum*. This triploid hybrid lily arose spontaneously in the wild in several places where the two taxa grow together. These hybrid lilies are characterized by lanceolate leaves intermediate between the very narrow leaves of *L. maximowiczii* and the broader lanceolate leaves of the diploid species *L. tigrinum*. It is interesting that these allotriploid sterile hybrids known as *L. lancifolium* differ significantly from the initial species, even though S. G. Haw (1986) doubted the hybridity of triploid plants. Yet until now the allotriploid taxon has not received its own true “species” epithet, but has been treated at the level of variety of the earlier taxa (or as cultivar, for ornamental value).

The karyotype analysis of allotriploid *L. lancifolium* (Son 1977) using C-banding shows two identical (homologous) sets of chromosomes (type A, *tigrinum*) and below a set of type B (postulated type *maximowiczii*). The next figure shows schematic idiograms of both A and B types. Despite its practical sterility, when pollinated using tetraploid lily relatives this allotriploid gives triploid seeds, and these are viable as shown by Strasser (1983).

Autodiploid plants are similar in colour, less vigorous with smaller flowers and they are fertile, with two sets of homologous chromosomes. They were used for breeding, especially the variety ‘Diploid’, which was imported to Canada from Japan in 1930 and described by Isabella Preston. It has narrower tepals and smaller flowers. It is fruitful and has been used mainly for breeding.

Through natural mutation from fertile autodiploid plants arose the yellow-coloured form *flaviflorum*, also grown under the cultivar name ‘A. M. Vollmer’. From that cultivar was selected the (less aesthetically impressive) clone ‘Yellow Tiger’. These varieties generally produce fewer bulbils than allo-triploid plants.

The allotriploid species is so genetically different from the autodiploid kind that its Latin epithet should be different, as pointed out by Schmitzer (1983) and later by Mičulka (1987). Inserting a multiplication sign ahead of the introduced species’ name (*L.  $\times$ lancifolium*) would be useful, although Noda disagrees (see Schmitzer 1985), because he considers this species, which originated

spontaneously in nature, to be a taxon which has reached the category of hybridogenetic species. According to the aforementioned factors, it should be safe to assert that the valid name for the allotriploid type should be *L. ×tigrinum* Ker-Gawler 1810 (pro sp.).

To this species, *L. ×tigrinum*, belong mostly ornamental cultivars (e.g. ‘Splendens’); those with small colour mutations (e.g. ‘Adam Byden’s Variety’, ‘Burnham Variety’, ‘Malmo’); and those such as ‘Fortunei’, ‘Flore Pleno’, etc., originally described as botanical varieties; also, tiger lilies grown primarily as crop-plants.

In order not to increase the anarchy in tiger lilies, and also because Makino originally coined the name for the diploid variety *L. lancifolium* var. *flaviflorum* in 1933, the insufficiently descriptive name *L. lancifolium* Thunberg 1794 is therefore left for the entire group of diploid taxa. Only one clone of prolific orange colour (‘Diploid’) is now well-known (although it was also originally classified under the species *L. tigrinum*).

### Changes in scientific names

Originally used names	Currently used names	New proposed names
<i>L. tigrinum</i> Ker-Gawler 1810	<i>L. lancifolium</i> Thunberg 1794	<i>L. ×tigrinum</i> Ker-Gawler 1810 (pro sp.) <i>emend.</i> Mičulka 2011. (3x = 36) – prospectively <b>Tigrinum Group</b>
<i>L. tigrinum</i> Ker-Gawler 1810	<i>L. lancifolium</i> Thunberg 1794	<i>L. lancifolium</i> Thunberg 1794 <i>emend.</i> Mičulka 2011. (2x = 24)
<i>L. tigrinum</i> var. <i>flaviflorum</i> (Makino) Stearn 1933	<i>L. lancifolium</i> Thunberg 1794 var. <i>flaviflorum</i> (Makino 1933)	<i>L. lancifolium</i> Thunberg 1794 f. <i>flaviflorum</i> (Makino 1933) <i>emend.</i> Mičulka 2011. (2x = 24)

In *The Plant List* (Anon. 2010) only *L. ×elegans* is recognized as a “hybrid species”. A progressive solution, rather than using the “hybrid species” *L. ×tigrinum*, might be to use **Tigrinum Group** (for all, esp. cultivated) triploid forms derived from diploid *L. tigrinum* apparently pollinated with *L. leichtlinii* (two *tigrinum* and one *leichtlinii* chromosome set).

Lily cultivars or Groups as examples with new designations (Mičulka 2011)

**Tigrinum Group** or *L. ×tigrinum* ‘Splendens’ (Division I, as an interspecific hybrid–newly Section 1).

*L. lancifolium* Thunberg *emend.* Mičulka 2011 ‘Diploid’ (Division IX, as an infraspecific hybrid–newly Section 1).

*L. lancifolium* Thunberg f. *flaviflorum* (Makino) *emend.* Mičulka 2011 ‘Yellow Tiger’ (Division I, as the mutation–newly Section 1).

## Other older cultivars

- L.* 'Seneca' (Tigrinum Group × *leichtlinii* var. *maximowiczii*)  
*L.* 'Skookum' (*lancifolium* f. *flaviflorum* × *leichtlinii* var. *maximowiczii*)  
Tigrimax Group (Tigrinum Group × *leichtlinii* var. *maximowiczii*)  
'Uncle Sam' (*lancifolium* f. *flaviflorum* × *leichtlinii* var. *maximowiczii*)  
'Victory' of de Graaff (*lancifolium* × *leichtlinii* var. *maximowiczii*)

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# 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.

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