THE SPECIES LILY

The Newsletter of the Species Lily Preservation Group
Affiliated with the North American Lily Society

Volume 1 2009

SLPG GOALS

* Growing as many species lilies as possible, especially those rare and in danger of extinction.
* Making excess species bulbs available to members.
* Collecting, preserving, planting, growing and distributing species seed.
* Collecting all possible information on each species: its habitat, distribution, cultural needs, etc.
* Disseminating cultural information on each species.
* Assembling a slide and photo record of all species lilies.
* Identifying areas where specific species grow and seeking protection for these areas.

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New Interest in Lilium iridollae

Marianne Casey, Virginia

A request for information came through the NALS website in early August and caused a flurry of excitement among SLPG members and lily enthusiasts. The request involved information on *L. iridollae*, one of the rarest and most site-specific lilies in the genus. Biologist Michael L. Jenkins of the Florida Division of Forestry's Plant Conservation Program contacted several experts for information about the species in order to best manage a relocation of a small stand of *L. iridollae*. During planning stages of a gas line extension project in a Florida Panhandle county, several stems were discovered in the path of the Right-of-Way (ROW) extension. Michael's department's response to statewide conservation and ecology concerns where rare, endangered, or threatened plants are involved, and the effort to save the plants is underway. While compiling information for Michael, I realized just how little is written about *L. iridollae* and also learned that few members of our lily societies have ever seen it in the field – in bloom or otherwise. As the conservation project moves forward, we will have an opportunity to document more about this lily and to obtain seeds to assist in strengthening its population.

The "Pot of Gold" Lily

In 1940, Mary Henry discovered *L. iridollae* in its habitat, recorded the initial information and named the lily in refer-

ence to a "pot of gold at the end of the rainbow." Her brief but important findings were published in *Bartonia* in 1946, the journal of the Philadelphia Botanical Club, and her findings are cited in the FNA (Floras of North America) Online Database. Mary Henry also authored a less formal summary for the 1949 NALS Lily Yearbook which included her experience growing *L. iridollae* from seed in Gladwyn, Pennsylvania. A synopsis was published in this bulletin's Spring 2006 issue, where little new information was added. While a few books written by *Lilium* experts and growers include a general description or acknowledgement of the species, most have no mention of *L. iridollae.* Some references, such as the USDA Plant database, include the nickname "Panhandle Lily" based on its precise location in the western Florida counties. Not all taxonomists agree it is a distinct species. Those of us with interest or involvement with the relocation project have been presented with an opportunity to clarify doubts about this lily.

Much information on *L. iridollae* was provided by Mark Skinner and Bruce Sorrie of the National Plant Data Center in their report on *L. pyrophilum*, published in the SLPG's bulletin, *The Species Lily. L. iridollae* is considered one of five known *Lilium* species native to specific sites in the United States' southeast region, the other four species being *L. pyrophylum*, *L. michauxii*, *L. catesbaei*, and *L. grayi.* Three other species, *L. superbum*, *L. canadense, and L. philadelphicum,* are native to regions east of the Rocky Mountains where populations are reported to persist in the southeast region. This region encompasses areas in Alabama, Georgia, Florida, South Carolina, North Carolina and Southern Virginia, and in most cases the occurrence of native populations of any of these species is extremely site specific. *L. iridollae* is perhaps the most demanding of specific conditions, hence one reason this lily has been so elu-

sive to many enthusiasts. In general, the southeastern region of the United States is not considered "lily growing country" given its warm winter temperatures and high humidity which are not conducive to the persistence of garden lilies.

The bloom of *L. iridollae* has a fully recurving form, a deep, golden yellow color with more of a buff hue than orange, and purplish-brown spots. Most descriptions state a single bloom is typical, but some accounts report up to eight blooms and that the flower is lightly scented. Mary Henry identified its pollinators, the larger swallowtail butterflies within the species' range. Its leaves are sparse in the top two thirds of the plant, with whorls of lanceolate leaves toward the bottom third. Ed McRae describes the bulbs as small and white forming at the end of stolons. All of these characteristics should be surveyed and confirmed in future observations and, where necessary, more accurately described to distinguish *L. iridollae* from other species.

Note the two small leaves at the top of the stem in the picture of Lilium *iridollae*, photographed in its natural habitat this summer by Conservationist Michael L. Jenkins, Florida Department of Forestry.

L. iridollae may differ from most southeastern species by its tolerance to wet conditions, and, as suggested by Jim McKenney via email correspondence, the bulb may actually be submerged in water for an extended period of time. Jim once grew *L. iridollae* and describes its requirements as "wet, acidic soil that would rot any other lily quickly" and mentions that *L. catesbaei* also prefers similar soil condition. "In nature both are almost semi-aquatic in the sense that during at least part of the year the bulbs might be submerged."

The newly discovered small stand consists of about six or seven stems, located as expected in a sandy, peatbog site. One of Michael's main questions involved the bulb type, i.e., what to expect when the soil was moved for the relocation and how to plan the amount of soil space to include around the stems to ensure safety of the fragile bulbs. Both Ed McRae and Carl Feldmaier indicate *L. iridollae's* bulb type is stoloniferous. Feldmaier's description of the stoloniferous structure suggests what *L. iridollae* stolons may appear like under the soil surface: "one or two underground stolons [growing] from a point where the stem leaves the bulb. They are finger-like and fleshy, forming, after ¾ to 1½ inches growth, new bulbs with scales. In the course of only a few years a whole network of stolons, all terminating in bulbs, is built up." It may not be a safe assumption that such an extensive network of bulbiferous stolons exists for this particular stand of *L iridollae*, however, without knowing how long the stand has been situated.

November 2008 Soil Analysis

During a visit to the stand in late summer 2008, Michael took a soil sample for analysis. As one would expect, the soil's texture classification is "sand," specifically: 96.318% sand, 0.178% silt, and 3.504% clay. Details of the soil analysis are below.

EMS-200 : Complete analysis for soils (Mehlich-III/ H2O extraction)

Components		Results		Range			Interperative Guide
		ppm	cmols	low	medium	high	
MACRO NUTRIENTS (ppm)							
Nitrate Nitrogen	NO3-N	ND		▽			8 - 100
Ammonium Nitrogen	NH4-N	0.20		▽			5 - 35
Phosphorus	P	7.00		▽			30 - 75
Potassium	K	23.67	0.06	▽			170 - 430
Calcium	Ca	94.82	0.47	▽			800 - 2,000
Magnesium	Mg	14.59	0.12	▽			100 - 300
Sulfate Sulfur	SO4-S	11.34					
MICRO NUTRIENTS (ppm)							
Sodium	Na	157.33	0.68			△	1 - 60
Iron	Fe	95.68				△	5 - 50
Manganese	Mn	1.47		▽			8 - 50
Boron	B	1.10				△	0.50 - 1
Copper	Cu	0.76		▽			1 - 12
Zinc	Zn	0.77		▽			3 - 20
Molybdenum	Mo	0.30			◇		0.20 - 50
Aluminum	Al	203.15					
PH & EC							
pH	pH	3.95					
Soluble Salts	EC	0.08					
CEC			1.34				

Base Saturations (%)		Ratios		
Potassium	K	4.55	Ca / Mg	3.91
Calcium	Ca	35.57	Ca / K	7.81
Magnesium	Mg	9.09	Mg / K	2.00
Sodium	Na	50.78	(Ca+Mg)/K	9.81

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www.qal.us

Finding a Pot of Gold and Relocating It

The Florida Department of Forestry's Endangered and Threatened Plant Conservation Program's goals are "to restore and maintain existing populations of listed plants on public land and on private lands managed for conservation purposes. Previous or ongoing projects address demography, monitoring, reintroduction, germination, pollination, and other aspects of population ecology." The *L. iridollae* project will be Michael's first experience working extensively with the Genus *Lilium*; however, he is familiar with relocation efforts of many other rare and fragile plants. His current tasks include saving forty *Platanthera* orchids (*ciliaris, cristata, integra*) and *Sarracenia rubra* and *leucophylla.* During initial planning of the *L. iridollae* relocation, Michael consulted with Mark Skinner (who worked with *L. pyrophylum)* for methods used in handling fragile bulbs and found his plan to be suitable.

When preserving a rare plant, one practice is to exhume the soil surrounding the plant by using a container to create a "plug." The container, with a diameter of at least 18 inches, creates a large ring that is tapped into the ground giving wide berth around the stem and bulbs, and is driven to a depth of at least 12 inches. When the plug is unearthed, the container holds the area soil intact. The plug is then moved and planted wholly in the new spot to reduce transplant trauma to the species bulbs.

This season's effort will also involve collecting and sowing seed in an effort to increase the population. The actual ROW extension plan is slated for 2010, but with the OOW (out of way) site already selected, seeds can be started in it this fall. A conflict on the germination type exists, but its closest relatives are hypogeal, often immediate hypogeal.

This is another yet another characteristic which needs to be confirmed. Depending on the quantity of seed available, seed may be offered to interested growers. Michael is sensitive to keeping locations of populations private, however, and he and others in his department will not disclose locations of the stems.

Threats to *L. iridollae*

In the past, primary threats to the species were noted as open grazing and loss of populations to development. Today, however, Michael believes the main threat is a combination of factors that affect the characteristics of the lilies' preferred site. "Factors of drought, the drawdown of the water table and springs, and fire suppression give a hard punch to species," Michael observed in our conversation, emphasizing that *L. iridollae* definitely needs fire as a maintenance factor. "The species is gone or absent from fire-suppressed areas and can only be found where either cows or fire keep the wetland shrubs down." In the 2005 report on *L. pyrophylum*, Mark Skinner and Bruce Sorrie likewise stated a primary factor in sustaining that species' populations is a fire requirement, and they noted that much research was needed to determine the exact role and importance of the fire factor.

Grazing by feral hogs, deer, and cattle is not denied as a threat, however. In one aspect grazing serves as temporary assistance because plant life surrounding the stem is thinned and removed providing more room for the species lily. This assistance is indeed temporary, as sooner or later the stem itself is consumed. In areas where hunting is not allowed, grazing becomes detrimental at an exponential rate: the higher the population of deer, the higher the rate of consumption.

Lilium iridollae and a glimpse of its surrounding habitat.

For this species, the need for fire and water stability is paramount to naturally occurring site requirements and is aptly summarized by the United States Botanic Garden on their web page for *L. iridollae*: "The balance of the habitat of this endangered plant is dependant on periodic, naturally-occurring fires caused by lightning strikes that reduce competition from other plants and release nutrients and organic matter from burned peat moss and leaves into the acidic, nutrient-poor soil. Its sensitivity to changes in drainage patterns and water quality make *Lilium iridollae* particularly vulnerable to disturbances in its ecosystem such as overgrazing by livestock and urban development in nearby areas."

The USDA Natural Resources Conservation Service lists *L. iridollae* as Endangered under Florida state jurisdiction, and

as Threatened status in North Carolina. At this time, no federal lists include *L. iridollae* as Endangered or Threatened.

While visiting the *L. iridollae* stand to get the soil sample and check for seeds in November 2008, Michael found another stand of fifteen or so stems nearby, and wrote that this stand too would be subject to protective measures.

New Information, New Interests

Michael's department participates in the Flora of North America (FNA) project, and he will provide the FNA administrators data as it is encountered in the field so the FNA database may be updated accordingly. New or updated research would be enlightening, particularly on the existing populations of this lily compared to the approximate twenty locations Mary Henry reported in the 1940s.

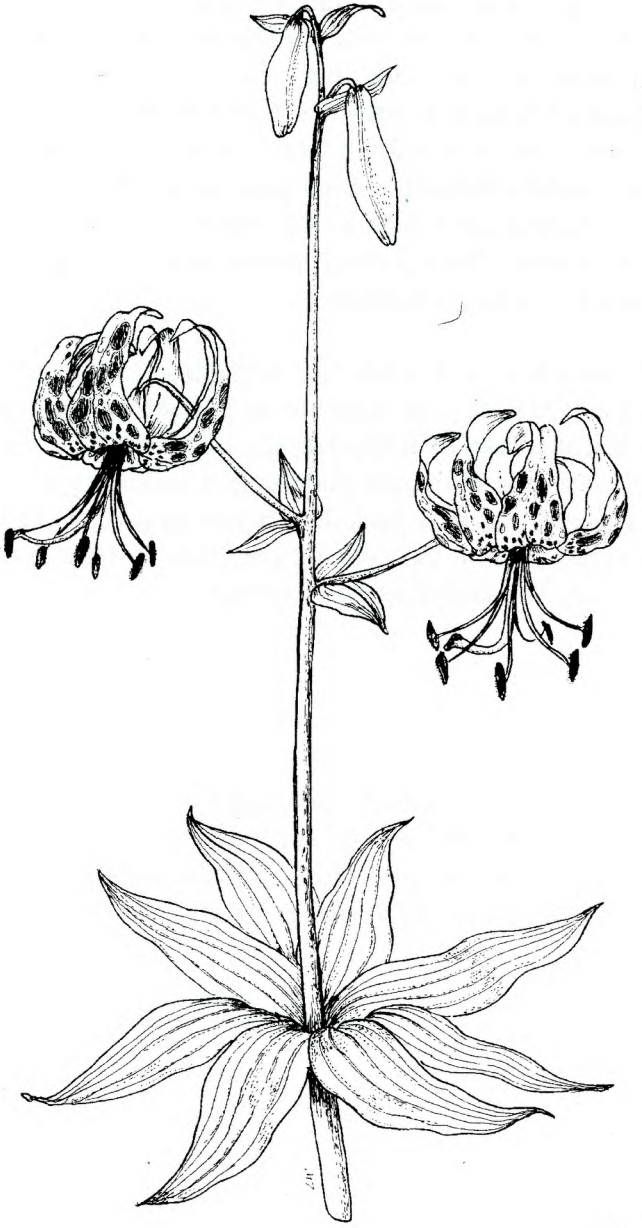
The small bits of information on *L. iridollae* lead only to other questions: To what level must the soil characteristics be emulated in order for the bulbs to persist in cultivation? Just how much water can *L. iridollae* bulbs withstand, or how low a winter temperature? Does foliage appear above ground throughout the year as noted in some reports? Is it prone to virus and what is its tolerance to fusarium? Michael also monitors stands of *L. catesbaei* in the area, which appear distinctly different in form yet require similar, though slightly drier growing conditions. Their presence invites a study of two or more of the Southeastern Region's *Lilium* species and closer look at their origins. During our correspondence, the availability of NALS research trust funds was mentioned in respect to making further research possible, perhaps on the fire factor as previously mentioned, and confirming other traits of the species that would benefit our collective knowledge of the southeastern region *Lilium* species.

From the hybridizing perspective, what could be gained

from using *L. iridollae* as a parent? Of course the challenge of finding species that will successfully hybridize with it would need to be met first, but then … would it be possible to obtain traits such as late-season bloom, persistence in wet soil, and short vernalization time? What if *L. iridollae* can be successfully hybridized and pass on the trait of heat tolerance, thereby providing a new lily hybrid suitable to hot weather zones? Such a result would be a pot of gold at the end of a hybridizer's rainbow.

SLPG members and other lily enthusiasts involved in the relocation project look forward to further correspondence with Michael and to following the status of the relocation effort, seed collection and planting. A follow-up to this article is likely and may include a report on a visit to the area for a closer look at the delicate conditions where the population of *Lilium iridollae* is threatened.

Cover photographs
Front: *L. humboldtii* var. *ocellatum* by Jeff Johnson
Back top: *L. nepalense* from Ed McRae's slide collection
Back bottom: *L. irodollae* by Michael Jenkins



L. humboldtii var. *ocellatum.* Drawing by Leslie Wilson
In Derek Fox's *Growing Lilies*

Lilium humboldtii var. *ocellatum*

Jeff Johnson, California

The ocellated Humboldt lily is the most common native lily in southern California. Hikers in the lower canyons of the San Gabriel Mountains commonly see the bright orange flowers blooming brightly by the trails in June.

L. humboldtii var. *ocellatum*, if that is what the lilies should properly be called, is commonly found near streams. Unlike *L. pardalinum*, it is not wet-footed but grows back from and higher than flowing water, if only by a little. Unlike *L. humboldtii* proper, it does not grow on dry, exposed ground, but is found only within root-run of constant moisture. The lilies may be well away from the actual stream channel, back in rough ground that is made up of alluvial and colluvial debris and fallen plant material. Often the lilies are found in pockets of soil surrounded by bedrock near water. One advantage of rocky conditions might be that tunneling, bulb-eating animals can't get to the bulbs.

The lilies are usually found growing under the oaks and laurels that are the ubiquitous trees in the woodlands of the lower canyons of the San Gabriels. Where the trees make heavy shade, the lilies either do not appear or do not do well where they do appear. Like the lilies in your garden, they lean to the light and fall over. Where a tree limb falls and leaves a patch of open sky over a patch of ground by a stream, lilies often spring up and have a few years of robust growth and blooming. Once the trees close in again, the lilies

lean and dwindle. In one good lily spot that I have visited every year for 15 years at least, I have seen this boom and bust cycle repeated a couple of times. Another advantage for the lilies of areas of exposed bedrock is that the big trees don't close in so completely and the plants underneath don't get shaded out. Or it may just be that streams cut down to bedrock and, since the lilies grow near streams, they are often necessarily near bedrock.

The plant most intimately associated with *L. humboldtii* in southern California is poison oak, another native plant that likes sun and moisture. Anywhere you find *L. humboldtii* here, you can be almost certain to find poison oak within sight — you probably need to push your way through poison oak to get to the lilies. One of my fortunate advantages as a lily looker is that I don't react badly to poison oak, though even in hot weather I do cover up defensively when I crawl though the underbrush.

In the San Gabriels, I have found *L. humboldtii* most commonly below 4000 feet and above 5000 feet only in well-protected canyons. This is more or less the level below which snow does not lie on the ground for long. It also seems to match the upper limit for poison oak. South of Los Angeles, however, I have seen *L. humboldtii* growing at close to 6000 feet near the summit of Mt. Cuyamaca, under very little cover.

L. humboldtii can grow to a height of ten feet and have dozens of flowers on a stem. But that is only in a spot where the bulb has had several years of good growing conditions and has good overhead sunlight to keep the stem straight and vertical. Most plants, of course, are much humbler, just skinny stems and a few leaves. Where they are near traffic, the lilies are often mildewed and blasted, visited by pests and ants, and miserable looking. They are more likely to be clean and un-diseased in higher canyons, away from traffic.

The distinctive feature of the flowers of southern California *L. humboldtii* is the ocelli, the photogenic spots within spots, like little eyes. Even these are not constant throughout the area. In San Diego County, I have seen *L. humboldtii* with less ocellated spots near plants with spots that are not ocellated at all. I don't know whether these are identifiable horticultural varieties or just random variations found in the different areas where they grow. I have never dug a bulb or had any success trying to grow lilies from seed, so I don't know whether or not the variations would stay true in a garden.

Seeds of southern California *L. humboldtii* are often available in the NALS seed exchange and for sale at the Theodore Payne Foundation and other native plant organizations. Serious lily growers elsewhere have told me they have had relative success growing the *L. humboldtii* from this area, much greater success than with that other southern California lily, *L. parryi.* Under the right conditions, our *L. humboldtii* is big and bright and very impressive, and the blooming period for a big plant can stretch over weeks. At my house, though, I can't seem to make it happen and I have given up the struggle. Instead, I prefer to go into the mountains and find them where they take care of themselves and where, on a bright sunny day, under a blue sky, surrounded by all the other plants in the mountains, they are more interesting than any plant would be in my garden.

Lilium nepalense: Nepal Lily

By Edward A. McRae
Formerly of Washington

Nepal was a closed country for many years and the discovery of this species did not occur until the early part of the nineteenth century. The species was later discovered in the central Himalayas, including Assam and Bhutan, and seed became readily available through an Indian company under the name *Lilium nepalense* var. *robustum*.

In Western Oregon, *L. nepalense* was grown for years with no losses due to winter injury. *L. nepalense* did not emerge until May (ensuring protection from spring frosts) and flowered in July to early August. The species has a stoloniferous habit, stems frequently wandering one to two feet underground before emerging. Our mission for years was to find plants with less of this habit! Bulbs were planted in four-foot beds and shaded with lath shading. Stems carrying four to five flowers were produced in the second year after planting the seedlings.

L. nepalense is easy to grow from seed and has immediate hypogeal germination. Bulbs are white with light purple shading, turning deep purple when exposed to light. The foliage is broad lanceolate, quite short and somewhat sparse. The emerald green flowers have strongly reflexed petals and purple-violet centers. The species also has a strong, nocturnal fragrance, pleasing to some and displeasing to others. I admired the variety *concolor* in Victoria, Australia, a few years ago; this variety has no purple coloring in the center of the flowers and appeared very vigorous.

The first hybrid I viewed from *L. nepalense* was from Leslie Woodriff and was named 'Oriental Charm' (*L. speciosum* var. *rubrum* x *L. nepalense*). The plants were tall with flowers pink and strongly recurved, the anthers never dehisced to reveal pollen. I was privileged to view a hybrid from *L. nepalense* produced by Japp Spaans in The Netherlands a few years ago (*L. nepalense* x *L. japonicum* hybrid). The plant habit was almost identical to *L. nepalense*, the flower, however, was totally different with no green coloring. This hybrid is still under study and propagation in The Netherlands. Hybrids with trumpet lilies have been reported, but not verified to my knowledge.

L. primulinum has a close affinity to *L. nepalense*. I have grown both species, however, and find they are vastly different in growth habits and overall performance.

L. nepalense is a truly exotic and charming species that can be difficult to flower due to its stoloniferous habit. Many have grown the species in black pots to overcome this. Whatever methods used, flowering this species can be considered a triumph.

Lilium nepalense drawing by Leslie Wilkinson in Derek Fox's *Growing Lilies*

Lilium chalcedonicum

B. A. Robinson

Formerly of the UK

For sheer brilliance it is difficult to think of a combination more arresting and pleasing than a bed of the pure, unadulterated and brilliant sealing-wax red of *Lilium chalcedonicum* associated with the large golden yellow heads of *Achillea Eupatorium (filipendulina).* It would appear that Nature intended these two intense primary colours to be associated together, for both plants are natives of Greece, and the effect of having, say, 300 to 400 scarlet Turn-caps [sic] intermingled with the gold is a regal sight not easily forgotten.

To the enthusiastic grower there is a seductive satisfaction of something attempted — something done.

Apparently there is a fairly widespread uncertainty, even amongst trade growers, as to the exact differences between the two major varieties of *L. chalcedonicum,* vix., *L. chalcedonicum* (true) and *L. chalcedonicum maculatum.*

For over seven years the two varieties have been grown side by side with considerable success in the writer's garden in the heart of the Northumberland hills.

The whole garden is composed of hot sandy soil terraced on a steep hill, facing south and east, about 300 feet above sea level. In pre-historic days the hill probably was formed in a lake by the accumulation of sandy river silt brought down from the mountains. Today no sign of the "lake" remains except the encircling ring of clay-covered, rocky hills, bisected by the River Tyne. The hill has no clay nor rock whatsoever and for a depth of at least a hundred feet clean river sand can by dug by the cart-load. The garden problem of such a soil obviously is the retention of

sufficient moisture and plant food. To supply a moisture-retaining humus, broken peat about the size of walnuts has been dug in the beds from time to time during the last ten years as opportunity occurred.

Under these conditions roses will not grow, and there is not a rose bush in the garden; but lilies, irises and a fairly large collection of herbaceous plants simply revel here.

Here *L. chalcedonicum* thrives superbly. It requires no fussing, is quite hardy and reproduces itself freely. Although subject to severe frosts during the winter months, especially from February to May, the bulbs are left in the ground the whole year and no protection given.

As a result of observations and careful measurements made on about 700 bulbs during the last seven years, it has been found that when grown under the same conditions there is no difference between the two varieties in size of plant or number or size of blooms. In both varieties the actual size of bloom varies slightly from year to year, dependent on the climatic conditions during the flowering period. During the "dry" season the blooms average about 1 7/8 inches in diameter as an average as compared with the maximum of 2 1/2 inches in a warm and wet period.

Measurements taken on 700 blooms in 1932 gave the following average results [on page 17]:

Thus the fundamental difference between the two varieties is that *L. chalcedonicum* has clean scarlet petals, whilst the variety *maculatum,* as its name implies, has petals exactly the same color, but freely speckled with black small spots.

The difference in the scarlet sepals is also interesting.

	L. chalcedonicum	**L. chalcedonicum maculatum**
Height of stem	4 ft.	4 ft.
Number of blooms	4.5 or 6	4.5 or 6
Length of buds	2 1/2 "	2 1/2 "
Diameter of blooms	2 "	2 "
Number of petals	6	6
Number of stamens	6	6, 7 or 8
Length of anthers	12-14 mm.	9-11 mm

It will be noted from the figures above that in the type the anthers are appreciably longer than those of *maculatum.* Further, in the type there invariably appear to be no more and no less than six stamens, whilst in *maculatum* the number can be six, seven or eight in flowers on the same stem and irrespective of the age of the bulb. Does not this suggest that the variety *maculatum* has been produced as the result of a cross with another type?

From mature "mother" bulbs generally three or four bulbils are produced annually provided these are removed each year from the parent bulb. When two years old these bulbs usually flower for the first time and then have only one bloom. The following year two blooms are produced. To reach maturity usually takes a total of five years, and each bulb then produces usually six blooms, although in subsequent years as many as nine or even ten blooms on a head frequently occur.

The preceding article originally appeared in the Royal Horticultural Society *Lily Yearbook,* 1934, pages 30-33. It was reprinted with the kind permission of the Lily Committee.

A number of attempts have been made to reproduce each variety from seed; but, although now and again seed has set, none of it has subsequently grown. Two crosses between *L. chalcedonicum maculatum* and *L. davidii* have been obtained, but neither appears to be stable or hardy.

L. chalcedonicum
Drawing by Leslie Wilkinson
in Derek Fox's *Growing Lilies*