

THE SPECIES LILY

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



Lilium kelloggii

West Coast Species Edition
Autumn, 1997

SLPG GOALS

- * Collecting and 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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Authors Wanted

The Spring Newsletter will be devoted to East Coast Species. Please volunteer to write about these great flowers!

A Species Adventure

June Taylor



In the golden foothills of northern California in early July, the beautiful *L. humboldtii* can be found nodding their orange purple-dotted flowers among the old headstones in the Brownsville Cemetery.

I first heard of these lilies from Sylvia Hulbert at a Golden State Lily Society meeting in 1985. She and her husband Austin had a great interest in species lilies and had traveled throughout California tracing every one possible. They had what they called "Lily Fever."

Since Brownsville is only 50 miles from our home on the valley floor, in July 1986 my husband Bill and I drove over the Feather River into the foothills to see the lilies for ourselves.

Brownsville is a tiny town, population about 1500. It was founded in 1848 by Isaac Brown who made his home there. He gave the land for the cemetery and it is his final resting place. As we drove up we could see lilies everywhere, their colorful blossoms nodding in a slight breeze. What a beautiful sight!

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There were tall clumps growing close to many of the old headstones, some nearly six feet tall. We returned in the fall hoping to find some seed, but found instead that someone had cut the stems and stacked them like cordwood in a small cart. We did not find any seed.

In July of 1996, I returned with two Sacramento Lily Society members, Mirna Hard and Barbara Small. The lilies were blooming but there were not as many stems. Some clumps had disappeared. A new section has been opened and nothing but grass is allowed to grow there. There had been six years of very little winter rain during my ten year absence. Perhaps the drought in addition to someone cutting the stems too soon had taken its toll. Grounds custodians like to take the easiest way to keep things neat. Mow 'em down instead of going around.

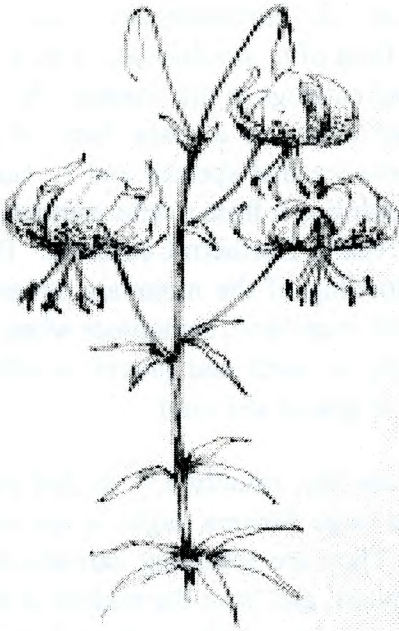
Lily season is over in Brownsville for 1997. Other travels kept me from checking the lilies in bloom in July. In late August Bill and I went to see if there were any stems and seed pods. Not many, a few browning stems with pods which we collected. A Rainbird sprinkler system has been added which is not a good sign for *L. humboldtii* which likes dry land in summer.

I feel fortunate to have seen these lovely lilies in such numbers the first time. I will not forget how breathtaking they were, some scattered among the old headstones in the sunshine and some under the shade of huge cedar trees in an old cemetery beside a small country road.

[Editor's note: Shortly after this last excursion to the Brownsville cemetery, Bill Taylor passed away. For June, these lilies remain a special reminder of their last lily adventure together.]

Lilium pardalinum

Eward A. McRAE



Lilium pardalinum, Kellogg 1859, from the Latin word for 'Leopard,' referring to its spotting.

The Leopard Lily, native to California, is the hardiest and easiest to grow of the American Forest Lilies. It is also one of the most desirable. It is a wetland species and occurs in Northern California and Southern Oregon as well as along the Pacific Coast from Humboldt County south to San Diego County.

On a stout, branching rhizome are several bulbs with many yellow, brittle, multiple-parted scales. The non-rooting flower stem grows 120 to 200 cm. (four to eight feet) tall. The lanceolate leaves are arranged in whorls along the stem. The flower is scentless, borne on an elegant, out-arching stalk with strongly reflexed Turk's-cap flowers around 5 cm. in diameter. The flower color is gleaming orange-red, carmine-red at the tips, marked in the center with strong red-brown spots bordered in orange, with green nectaries and orange pollen. It blooms in July. The seed germinates hypogeally in late fall in cool conditions.

A sweetly-scented form of *L. pardalinum* found on river sides

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(*L. pardalinum*: continued from page 5)

and seeps in the Cuyamaca mountains of San Diego County was named *L. pardalinum* var. *fragrans* by Carl Purdy; it may well be a hybrid with the fragrant *L. parryi*.

The plant formerly known as *L. harrissianum*, Beane & Vollmer, is now considered a form of *L. pardalinum*. This lily, known in American commercial catalogs as the 'Sunset Lily' or 'Red Giant,' has been treated either as a giant form of *L. pardalinum* or as a hybrid between that species and *L. humboldtii*. Beane and Vollmer described it from a wild population on the banks of Van Duzen Creek in Northern California. The rainy climate and frequent flooding of the mountain streams result in the lily being frequently inundated, sometimes when in flower. The rhizome, growing in earth and gravel, is often washed out and deeply buried in gravel and sand.

This extraordinarily magnificent lily, usually 150 to 200 cm. (five to seven) feet tall, bears large flowers, eight to ten cm. (three to four inches) wide. They are gleaming carmine-red inside from the tip to the midpoint, and from the middle to the base, chrome-yellow, tinged in the throat with green, with large spots, usually gold ringed in chocolate-brown.

Lilium pardalinum, especially in the giant form, is very amenable to cultivation. It prefers a cool, rather moist soil with shade at the base and full sun on the upper part of the plant. The rapidly-multiplying bulb should be dug, divided and replanted every three or four years. The loose scales that break away by accident will produce tiny bulblets that grow on to maturity in their pockets of soil.

L. pardalinum has been crossed with many West Coast species, including *L. kelloggii* and *L. parryi*. Some authorities also

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(*L. pardalinum*: continued from page 6)

believe that certain West Coast species, including *L. kelleyanum*, *L. pitkinense*, *L. vollmeri* and *L. wigginsii* are simply forms of *L. pardalinum* or hybrid populations.

Derek Fox writes in his book *Growing Lilies*, 'Behind every American hybrid — well many of them — stands a smug *L. pardalinum* immodestly declaring it is all her own work.' *L. pardalinum* is indeed the most important parent plant among the American species. With another important parent, *L. humboldtii*, it produced the famous Bellingham Hybrids. 'Shuksan,' perhaps the greatest of these, is a good sixty years old and still going strong. *L. pardalinum* produces hybrids with a special stamina, so all gardeners can grow and enjoy them.



L. washingtonianum from Seed

Gerald Kennedy



I knew panther lilies, *L. pardalinum*, were native to the Sierra Nevada because of backpacking and camping in the 70s and 80s; I thought they were just another pretty flower. Barbara Small gave my wife a tiger lily in the early seventies, so I moved some rocks and dumped in some purchased topsoil and it grew and prospered as our garden did in Truckee, California at approximately 6,000 feet elevation. In 1988 I got into gardening for myself and my peace of mind; I set about removing rocks, building retaining walls and inserting truckloads of topsoil. My wife

planted what she wanted, and I planted Oriental and Asiatic lilies (more pretty flowers). I did not know Oriental or Asiatic, just LILY. They were pretty, available at nurseries and hardware stores and they grew and prospered in Truckee (I could grow something).

As I learned about lily differences, size, color, up-facing, down-facing, I found out that there were other lilies that grew naturally in the Sierra. When I learned from my father-in-law about an

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(L. washingtonianum: continued from page 8)

intriguing white, aromatic lily that grew near Plumas Eureka State Park off the trail to Jamison Lake, the search was on for this new phantom lily, but I could find no information. I finally asked Sarah (at the Truckee Villager Nursery) who told me about the Washington Lily which gave a name to my phantom lily at last. Her business partner Rob showed me some pictures and told me areas where he had seen them. Just where he had told me I found approximately 20 mature (three to five foot) plants in full bloom on a south-facing slope at about 6500 feet elevation (July 1992). Beautiful, aromatic, white flowers. I went back to this area many times and watched as the flowers set seed pods. I questioned Sarah and Rob about growing from seed, so Sarah gave me texts she had used at the University of California at Davis. There wasn't much information available, so I went back to nature for clues. I dug in the soil around the growing cluster to examine the bulbs at the different depths. I built a growing area at my house that would resemble the conditions around the growing cluster. As the seed pods grew and matured, I went back often in order to pick some of them when they were mature and dry. I gave seeds to Sarah and Rob and I went home to plant.

My theory was that, since there were no new plants that I could see in the growing cluster, the seeds couldn't get to the ground. The duff was four to eight inches deep. The brush was waist high and at least eight to ten years old with older trees in the area. I had no idea how the seeds landed to germinate in nature, so I had to guess. In September of 1992 I planted my three-foot-square prepared parcel (one layer of seeds covered with 1/4 inch of topsoil, then another layer of seeds covered with 1/2 inch of crumpled pine needles, and a final layer of seeds covered with six inches of pine needles. My hope was that one of the layers would germinate. IT SNOWED!!!!!!!!!!!!!!!!!!!!!!

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In June 1993 (when the snow disappeared) the growing area had duff packed down to about one inch. When I carefully lifted the duff from the ground, I found lily shoots as thick as blades of grass. That summer they produced single shoots about two inches long and died back. The bulbs were the size of rice grains. (I did not let the area dry out.) I also started a new growing area (three x five feet) and planted one layer of seeds 1/4 inch below the soil and covered with eight inches of pine needles. IT SNOWED!!!!!!!

In June 1994 the original growing area looked like a duplicate of the year before, but then a second growth started with double sprouts and wider, taller leaves. The bulbs that summer were rice size and large BB size. I think two layers germinated a year apart. (I did not let the area dry out.) IT SNOWED!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

In June 1995 the growing area looked like the first year with single shoots, then looked like the second year with double shoots, and then there were taller sprouts with leaves coming off of short stems. I potted what I considered to be third year growth into 60 four inch pots.

We sold our home and had to move in two months. I was digging lilies the day escrow closed a half hour before the new owners took possession. I moved the planting beds into plastic 18 x 24 x 6 inch deep trays with a square-point shovel and transported five trays of *L. washingtonianum* to the 2,300 foot elevation at Weimar, CA.

In September of 1996 I transplanted the four inch pots into one gallon pots (52); the bulbs were 1/4 inch in diameter and had moved themselves to the bottom of the pot. I've let the trays rest for the two years I've lived here and only last month transplanted them into other containers according to bulb size (dime size to BB

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(L. washingtonianum: continued from page 10)

with roots). I now have 58 one gallon pots, 33 four inch pots, and 40 six-pacs. In five years not a bud has been produced from seed yet, but one bulb that was given to me still prospers and blooms after six years.

In September 1997 I started about a 1/4 cup of seeds in Perlite in baggies in the refrigerator in order to see if this method works better. I had been disappointed at the lack of speed until I talked to another grower who had had success with sprouts the first year, only to have them all die the second year. I felt better when I read that this species is a slow grower and with ideal conditions requires at least five years to bud. I am now concerned with El Niño providing too much water and causing rot, so I'm covering these dry land lilies to divert excess water.

For fertilization of the seedlings I have been using Osmocote slow



release in early spring and Miracle Grow after sprouts or stems are up. With the producing stem I also use a rose systemic for aphids as the stem grows. Any time the leaves on any of my lilies are not dark green, I give them some Miracle Grow. All my lilies are in plastic pots in Weimar; in Truckee they were planted in the ground. Someday I'll be able to put some in the ground where they should be, but they're still **PRETTY LILIES!**

Lilium parvum

Barbara M. Small



The first lily I ever saw growing in its native habitat was the delicate species *L. parvum*. When the trail reached the high mountain pass in upper Yosemite National Park, I paused to take in the grandeur of the rugged granite peaks around me (and

to catch my breath at this 11,000 foot altitude). On the far side of the pass, snow was still melting on this July day, with little rivulets merging into a tiny stream. As the trail wound downward and the first stunted trees appeared, small ferns and other moisture-loving plants gradually replaced the stark but richly-colored lichen from the higher elevations. Eventually, at about 9,000 feet, the stream spread out into a mountain meadow with stunted willow bushes marking its passage. As I dipped my cup into the cold stream (those were the days when it was safe to drink the water), I was immediately struck by a bright red-orange flower rising gently behind native grasses and ferns. Until this time, my only knowledge of species lilies had been *L. tigrinum* growing abundantly in my garden. This was certainly a lily, but far more charming and graceful than my tiger lilies. The memory of that striking lily remained with me until I rediscovered the species many years later behind Donner Lake in the central Sierra Nevada. There were so many that I thought nothing of digging bulbs for my own garden in Truckee where they multiplied; many now reside in my daughters' gardens.

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(*L. parvum*: continued from page 12)

L. parvum, strikingly similar to *L. maritimum* growing along the northern coast of California, is native to the mountainous regions of California certainly as far south as Yosemite and northward into the area around Mount Lassen. Both *L. parvum* and its cousin *L. pardalinum* enjoy extremely moist conditions; small, meandering streams often flow over the lower few inches of stem during much of the growing season. But although *L. pardalinum* may be found mostly on the western slopes of the Sierra Nevada, *L. parvum* seems to be happy on the eastern slopes as well, despite the drier climate. Generally speaking, *L. parvum* inhabits more rugged terrain at higher altitudes than *L. pardalinum*. Both species enjoy filtered shade at their lower elevations, but *L. parvum* can grow in full sun at higher elevations.

L. parvum's white bulb is rhizomatous but does not seem to make such an extensive mass underground as does that of *L. pardalinum*. Leaves are generally whorled toward the bottom of the stem and more often scattered at the higher end. Flowers are small (between one and two inches) and bell-shaped, usually facing outward. The stigma and filaments are shorter than the tepals.

Several sources have described *L. parvum*'s height and color as being related to growing altitude; however, my own experience has not proved this true. *L. parvum*'s height varies between eighteen inches to well over six feet. While one would suspect that those growing at higher elevations would be shorter to make the best of an extremely condensed growing season, this is not the case. The tallest *L. parvum* I have seen were in Pole Creek Canyon in Placer County at approximately 8,000 feet elevation. Plant height seems to depend on the richness of the soil and the amount of water available during the growing season. Growing conditions also account for the variance in flower numbers —

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(*L. parvum*: continued from page 13)

from a few to over sixty in several cases.

The lily's color has also been related to altitude — yellow at the 4,500 foot level, turning orange and finally red at extreme elevations. However, those colonies of *L. parvum* I have seen at elevations between 5,000 and 8,000 in El Dorado, Nevada, Placer and Sierra Counties are essentially orange with varying shades between yellow-orange and red-orange within the colony. The yellow form, *L. parvum* var. *crocatum*, grows at approximately 5,000 feet near Graniteville in Nevada County. Spotting patterns also vary tremendously in color as well as in intensity. Some *L. parvum* may be uniform in color with no visible spots while others in the same meadow may have paler throats with contrasting spots. The pink form, *L. parvum* var. *hallidayi* may be found in Kings Meadow in El Dorado County between 5,000 and 6,000 feet elevation. Its throat is pale cream to white with pronounced spotting.

One of the most interesting and useful aspects of *L. parvum* is its proclivity to cross-pollinate with other West Coast species lilies. Although *L. parvum* and *L. pardalinum* grow literally side by side near Lake Spaulding in Nevada County, there are no nearby hybrids of the two. However, a charming natural hybrid colony grows near Verdi Peak in Sierra County (close to the Nevada border) which certainly must be a cross between *L. parvum* and *L. pardalinum*. The plants' overall form is that of *L. parvum* while the flowers themselves have the distinctly more pointed, red tips of *L. pardalinum*. Curiously, there are no *L. parvum* or *L. pardalinum* in the immediate vicinity.

Just east of Georgetown, at approximately 3,000 feet in El Dorado County, grow the famous 'Ditch Lilies,' a natural cross between *L. parvum* and *L. parvum* var. *hallidayi*. Here, alongside the ditch

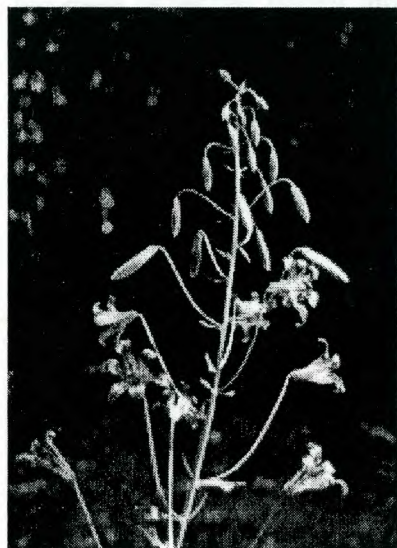
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which carries water to the small community, one finds innumerable variations on the theme — red, orange, peach, dark pink, pink (a double!) pale pink, beige lilies with red, orange, brown or beige pollen and small or large spots in brown, red, orange or shades of pink. One particular lily reaches at least six feet with over sixty flowers; others are barely two feet. There is a preponderance of pink shades as if this particular hybrid eschews the orange forms. Apparently no other forms of *L. parvum* grow nearby.

Unfortunately, some official has recently sprayed the southern banks of the ditch to kill all vegetation. I gathered the remaining seed and planted it on the north bank, praying that the same fate would not befall that area.

When I moved from the mountains to the Sacramento Valley, I brought several *L. parvum* along. To my horror, they died immediately and it was years before I had the heart to try them again. However, I now have many tiny *L. parvum* still alive (although not very happy) growing from seed collected at the lowest elevations I could find. More importantly, I have used *L.*



parvum and 'Ditch Lily' pollen successfully on *L. pardalinum*, *L. shastense*, *L. vollmeri*, *L. pitkinense* and *L. washingtonianum*. Although these resulting lily babies have yet to bloom, I suspect that at least some of them may be pink in the first generation, especially those created from the 'Ditch Lily' pollen. In any case, I will be delighted if they grow and bloom in my garden — a wonderful reminder of those alpine meadows.

Some Notes on *L. columbianum*

David Sims

Lilium columbianum has the widest geographical distribution among the West Coast lily species. Its range reaches from Humboldt County in Northern California northwards into Oregon, Washington and British Columbia and eastwards to Idaho (1). I live in Northern Idaho, approximately 30 miles south of the Canadian border, and *L. columbianum* is abundant in this area. The diverse growing conditions that occur across the range of *L. columbianum* result in considerable variation, making it an interesting species to study.

L. columbianum is generally described as growing from three to six feet in height, with whorled leaves and a pyramidal inflorescence of recurved pendant flowers. Plants with scattered or alternate leaf arrangements are occasionally reported. The flower color is usually described as orange with brown or purple spots, although flowers ranging from lemon yellow to deep red occur (2,3). Pollen color is usually yellow, but red pollen has also been reported (4). It is considered a dryland lily, requiring a period with very little moisture after flowering. Areas where dryland lilies grow receive most of their annual precipitation during the fall, winter and spring, with dry summers. The climate in Northern Idaho fits this description, with most of our winter moisture in the form of snow. *L. columbianum* is considered a very hardy lily: our USDA zone in Northern Idaho ranges from zone 4 to zone 6.

I have observed many hundreds of *L. columbianum* plants grow-

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(L. columbianum: continued from page 16)

ing wild in this area. Flower color is predominantly orange with purple spots and with varying amounts of green in the throat, but occasionally a yellow flower is found. Spotting ranges from a few spots to spotting so heavy that the spots nearly coalesce. I haven't found a flower without spots, but I continue to search! The size of the recurved flowers ranges between 1.5 and 2 inches in diameter. The number of flowers per stem is usually between one and six, but I have found plants with up to 12 flowers. This is considerably fewer than the maximum number of flowers reported in the literature; some accounts report over thirty flowers per stem. Flowering plants are usually between three and four feet tall, but occasionally six-foot tall stems are found. The flowering season in Northern Idaho is mid June, the same time martagons bloom in my garden.

L. columbianum grows in a wide variety of soils in this area, ranging from poor sandy soils to heavy clay soils. The soil the plants grow in has a significant effect on the growth pattern of the plants. Plants growing in poor sandy soil have fewer flowers and die back by the middle of August, while those in heavier soils are more robust and remain green until the middle of September. Bulbs are found between four and six inches deep, measured to the top of the bulb. *L. columbianum* is most abundant in areas that have been partially cleared or logged and along the road sides. The tallest and most vigorous plants are found on south-facing slopes in full sun. They are also found in the forest in dense shade, although these plants seldom have as many flowers as those growing in locations with more sunlight.

L. columbianum is usually described as having no scent (3,5,6). Yerex (7) reports finding a group of *L. columbianum* that were much shorter than the type, being between eight and twelve inches

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tall and having scattered leaves. He remarks that the flowers were fragrant, unlike the type plant, and describes the fragrance as "resembling that of *L. washingtonianum* but more delicate." The only other reference that I have found describing *L. columbianum* as being fragrant is an account by Clifford Hannum (8) describing *L. columbianum* growing in the Cascade foothills in Northwestern Washington. He states the flowers are "mildly fragrant." The *L. columbianum* growing in Northern Idaho are most definitely fragrant. Of course, fragrance is a subjective matter, but I would describe the fragrance as fruity. The intensity varies from plant to

plant but can be strong enough to detect several feet away. I am interested in hearing from other people who have experience with *L. columbianum* found in other areas, to determine the range of plants that are fragrant.



The bulbs of *L. columbianum* are reported to be made up of unjointed lanceolate scales, with the type of bulb variously described as being concentric (9), ovoid (10), or a form intermediate between a concentric and rhizomatous type of bulb (11). I rescued a number of *L. columbianum* bulbs this fall from an area scheduled for development, and the bulbs fit the description of a 'sub-rhizomatous' bulb as described in *Lilies of the World*. (10). The scales are attached to a nearly horizontal rhizome or rootstock, and new scales are formed on the same end of this rootstock in succeeding years. The length of the rootstock increases with age, giving the bulb a flattened appearance. The rootstock does not branch, and all of the bulbs that I have dug have had a single stem; I have never observed a plant that appeared to have more than one stem per bulb. Are there different types of bulbs that occur in *L. columbianum*? It is conceivable that if juvenile bulbs with a short rootstock were examined, they might be described as

(*L. columbianum*: continued from page 18)

concentric or ovoid. Most accounts of *L. columbianum* are of plants growing in the wild and descriptions of the bulbs are not given because the bulbs are not usually disturbed. It does appear that some variation does exist. Carlton Yerex (7) clearly notes two different types of bulbs of *L. columbianum* in describing a variety of *L. columbianum* named after Douglas Ingram, variety *Ingrami*. In describing the variety, he states that var. *Ingrami* has a "heavier and semi-rhizomatous bulb in contrast to the ovoid bulb of the type species." Walker (4) notes a form identified as the "umbellate form" found in the Victoria district of Vancouver Island, British Columbia. One of the characteristics of this form is that it "occurs in clusters of 5, 6, or 7 stems." Unfortunately, no description is given of the bulb, but a cluster of five to seven stems suggests that the bulb may be fully rhizomatous. Other characteristics of this form are quite different from the type: flowers arranged in a double umbel (as opposed to a pyramidal flower arrangement), foliage that is scattered, and an arching (rather than erect) stem. The characteristic of this form suggest that it may be a hybrid, but I am not aware of any other species endemic to British Columbia. I am interested to know if this form is still being grown or if it is still found in the wild.

The range of *L. columbianum* overlaps the range of other Western American species, and natural hybrids with *L. occidentale* (2,12,13), *L. kelloggii* (14) and *L. bolanderi* (2,12) have been reported. It has also been used in deliberate hybridizing programs. Shride (14) reports a hybrid with *L. washingtonianum* that was intermediate between both parents. Sturgeon (15) describes an interesting group of hybrids with *L. rubescens*, with flowers ranging from cream to yellow to bronze, and some that were white or pink with red or purple petal tips. It also crosses with the wetland Western Americans (8), including *L. parryi*, *L. pardalinum*, and *L. pardalinum* var. *giganteum*. I have a number

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(*L. columbianum*: continued from page 19)

of *L. columbianum* hybrid seedlings in various stages of development, and I am anxious to see them bloom.

The many variations of *L. columbianum* make it an interesting species to study; however, its most endearing quality is its simple gracefulness. I have admired it since I was a child, and it is undoubtedly responsible for my fondness and appreciation for pendant type flowers in all types of lilies. There are many lilies that have larger and more showy flowers, but the elegance of *L. columbianum* is equalled only by other American species and hybrids.

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Hybridizing West Coast Lilies

[Selections from *The American Lily Yearbook*, George Slate, editor, 1942]

The Burbank Hybrid Lilies

Carl Purdy

I think that it was in 1890 that Luther Burbank made me a visit at my Ukiah home and that began a close intimacy that lasted through his life.

Soon after that I visited him at Santa Rosa and saw his experimental gardens there and went with him to the larger place at Sebastopol eight miles west from there where he grew his larger lots of hybrids. I think that it was on the occasion of my first visit that he showed me a large number of seed flats in which he had seedling lilies from plants that he had hybridized.

This experiment was a very extensive one. He had chosen as the female for most of his crosses *Lilium pardalinum*, a species of great vigor and easy culture. For the male species he had taken pollen from fully thirty world lilies including such as *L. candidum*, *L. speciosum*, *L. auratum* and a number of other Old World species.

He had made crosses of about all of the West American species that were obtainable at the time. I do not think that *L. humboldtii magnificum* was amongst them for I am very sure that I did not reintroduce it till later.

There were *L. Washingtonianum* X *pardalinum*; *L. Humboldtii* X *L. pardalinum*; *L. parvum* X *pardalinum*; *L. Parryi* X *L. pardalinum*; *L. columbianum* X *L. pardalinum*; — I am sure. Four or five Western lilies were not included because I did not introduce them [sic] into culture till later. There were also a few

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crosses in which other Western lilies were used as the female plants. I do not, however, recollect just which. ...

The soil [near Sebastopol] was most excellent being a friable sandy loam and the location was where summer fogs were frequent yet with enough sunshine for all of the deciduous fruits. The lilies were planted like corn in rows about three and one-half feet apart with each seedling having enough room for best development.

It was a wonderful sight. The plants varied from a couple of feet to as much as eight feet. Of course, there were some blanks where seedlings had died but at large it was one great mass of flowering lilies. Strangely enough, there was not the faintest trace of the influence of the Old World lilies but there were endless combinations of the West American species.

Many had the fragrance of *L. Parryii* and *L. washingtonianum* but none came white or clear yellow although many approximated the latter color. There were literally thousands of crosses which would be considered achievements now and the task of selecting from so many was monumental. Perhaps the notable were grand lilies of the *L. Humboldtii* x *L. pardalinum* cross. The exceedingly strong growing bulbs were intermediate between rhizomatous bulbs of *L. pardalinum* and the ovate bulbs of *L. Humboldtii*.

... One summer there was a glorious bloom and that fall when I dug here [sic] the bulbs should have been I found only masses of white tissue. The disease struck other plantings of lilies on my place and for years I could grow no lilies on my place. I have never seen the disease since nor have I heard it described.

...

Burbank Hybrid Lilies
From Garden and Forest 8: 328-329, 1895
Carl Purdy

The work of Luther Burbank in the improvement of plants and fruits by hybridization, cross-fertilization and selection is well-known throughout the horticultural world. His work with lilies began some eighteen years ago with a form of *Lilium pardalinum*, one of the native plants of this coast. ...

Some bulbs, of a form found near the Geysers, were first cultivated and the seeds planted. Extreme types of these seedlings were selected and cross-fertilized. The same process was repeated several times. Several years ago I saw a field of these lilies, the result of this crossing, and the variety was wonderful. Every intermediate form could be found, from giants nine feet tall to dwarfs from six inches to a foot in height, while the flowers range in color from yellow centres and scarlet tips through orange to light yellow centres with pale red tips. These variations, although valuable in themselves, only formed a base for succeeding work for when by repeated cross-fertilization a form begins to break, it is more susceptible to the influence of the pollen of another species.

Using some of these varieties of *Lilium pardalinum* as pistillate parents, Mr. Burbank crossed upon them the following lilies: *L. auratum*, many varieties; *L. Battemaniae* [sic], *L. Brownii*, *L. candidum*, *L. Catesbaei*, *L. chalcedonicum*, *L. Humboldtii*, *L. tongiflorum* [sic], *L. Martagon*, *L. Parryi*, *L. parvum*, *L. speciosum*, *L. superbum*, *L. tigrinum*, *L. Washingtonianum*, *L. purpureum*, *L. columbianum*, *L. Wallichianum*, and some other Pacific coast lilies were also used in this experiment. ...

Among so large a number of hybrids with so many violent

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crosses, freaks and monstrosities were to be expected but, outside of a few exceptions, it can be said that all are symmetrical in form and beautiful in coloring. In form the range is from the closely recurved form of the typical *L. pardalinum* to a very flat flower, in which the petals approach the horizontal, a form which, so far as I know, was heretofore unknown among lilies, and most nearly approached by *L. candidum* and *L. tigrinum*. Then there are many running into the trumpet forms, but none with the long trumpets of the *L. longiflorum* type.

In color the flowers range from the usual yellow or orange centre and scarlet tip of *Lilium pardalinum* to dark red on one hand and rich orange red, lemon, and a few white and pale lemon or straw-colored flowers on the other. Nearly all are spotted or dotted, many faintly, and some are clear lemon-yellow. The traces of all the staminate parents can be seen in the leaves and in the bulbs. My own examination and Mr. Burbank's information is that the result is equally various. In Burbank, I need hardly say, is a careful and successful grower, yet with very many of the lily species he has the sort of success so many of us are too well used to. His bulbs dwindle away or suffer from disease until a few bulbs are all that are left to represent a plantation of hundreds. These hybrids, however, have inherited the strong constitution of *L. pardalinum* and its freedom from disease. In most cases, also, they inherit its tendency to rapid propagation. I also noted that hybrids of *L. parryi* and *L. Humboldtii* show a vigor which neither parent possesses.

There is another and, doubtless, very potent reason for their vigor. In Mr. Burbank's work with lilies the doctrine of the survival of the fittest has been carried out to an unusual extent. About 2,000,000 seedlings have been grown [sic] altogether; and in this lot a 100,000 are left out of 4,000,000. There must certainly

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have been a pretty thorough elimination of the less vigorous seedlings. A healthier lot than the survivors would be hard to find.

In fragrance the seedlings rather follow the fragrant staminate parents than the odorless *Lilium pardalinum*. Practically all are fragrant, many exquisitely so. With a favorable wind the odor from these great lily-fields can be perceived at a distance of five miles. To describe all of the variations to be found in this wonderful field would be impossible; to describe even the striking ones would require a volume, since scarcely any pair of plants are alike, and a thousand forms as distinct as named *Gladiolus* could be selected.

All are extremely floriferous, thirty to forty flowers to a plant being common, and a few having over a hundred. One of the most curious forms was one in which *Lilium pardalinum*, var. *minor*, had been crossed with an unknown species. This might be called a Tree Lily. The bulb threw up many stalks. One of these branched about a foot from the ground into eight branches. The largest branch had forty-three blossoms, while the bulb bore two hundred and seven — this at six years from seed. An equally wonderful plant is a cross between *L. pardalinum* and *L. Walkacei* [sic], which, at the same age, had thirty-seven stalks flowering. Many plants clearly show the influence of *L. elegans* in the very dark red flowers, and in the leaves of others can be seen the blood of *L. giganteum*. Crosses between *L. pardalinum* var. *minor*, and *L. maritimum* are remarkable for vigor and very numerous fine flowers.

The cross on *L. pardalinum* gives a vigorous constitution with such vigorous hybrids of nearly every type, lilies must soon become the flowers of the people.

Our Species Bulbs

Ed McRae

The seed of a group of hypogeal-germinating lily species native to North America, Europe and Western Asia were planted at Fairdale Nursery near Wilsonville, Oregon, on the 27th of August, 1996. The majority of the seed was purchased through the Seed Exchange of the North American Lily Society; a number of species seeds were also gifts from friends.

We used a standard liner mix: 2 parts sphagnum peat, 2 parts well-decayed bark dust and 1 part sharp pumice to which slow-release nutrients were added. The pH was 6.5. The trays and pans were kept moist and were maintained in an unheated greenhouse. The results were excellent in most cases, with 80% of the species producing true leaves in the spring of 1997. Most emerged early in March when the weather was still cool.

The West Coast species planted were outstanding with the following producing excellent seedling bulbs with fine root systems:

- *L. humboldtii* (Yuba County, California) with bulbs the size of a woman's small finger
- *L. kelleyanum* (Fresno County, California)
- *L. kelloggii* (Humboldt County, California)
- *L. pardalinum* (two lots, both excellent)
- *L. parryi*
- *L. parvum* (El Dorado County, California)
- *L. shastense*
- *L. vollmeri*
- *L. wigginsii*

The bulblets (with leaves still attached) were carefully trans-

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planted into outdoor beds in fumigated soil at Parkdale, Oregon, on the 7th of September, 1997. They look happy in their location and we are hopeful that most will flower in 1998.

The results from the European and Western Asian species were also most encouraging. I was fascinated to observe that some species — *L. carniolicum* and *L. chalcedonicum* — produced large cotyledons rather than true leaves in the spring of 1997. (I would be most grateful to hear from anyone who has grown these from seed.)

The following species bulblets were also planted in outdoor beds at Parkdale on the 7th of September, 1997, the majority with their leaves still attached!

- *L. bulbiferum* var. *croceum* (bulbs were large with copious leaves; a few had flowering stems)
- *L. carniolicum*
- *L. chalcedonicum*
- *L. monadelphum*
- *L. martagon* (three sources)
- *L. martagon* *daugava*
- *L. martagon* var. *album* (one tray produced 250 excellent seedlings with two and three leaves)
- *L. pyrenaicum*
- *L. tsingtauense*

The only Eastern American species to germinate and grow well was *L. michauxii*. *L. canadense*, *L. canadense* var. *rubrum*, *L. michiganense* and *L. superbum* were all sown in trays, but none germinated. Although the seed was from several sources, apparently none of it was fresh and viable.

THE SPECIES LILY

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L. parryi

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