the first year there is not the root system to support them and they develop poorly.

One great trouble in its culture is the strong tendency of collected bulbs to go quickly into a soft rot. While I have handled some lots of it successfully I have never found a way in which there is any assurance of doing so. The reader will note that these remarks apply only to the Sierran typical form.

**LILIUM WASHINGTONIANUM MINOR**

This handsome lily is found about the base of Mount Shasta in California and more rarely northwest for about 50 miles. It has a small compact bulb about one quarter the size of the type and bulbs weighing 4 ounces are extremely large for it.

The stems are slender and seldom over 4 feet high and a dozen flowers to the stem are to be seen in well developed plants. The segments of the flower are rather broader than in the type but in fragrance and other points it is the same. The bulb is more easily handled and grown.

In very open woods and among brushy copses it is to be found in a reddish volcanic soil. The altitude is from 3500 to 6000 feet and the winters quite severe. To Californians this is the Shasta Lily.

There is a point in the Siskiyou Range where the following lilies may be found within ten miles. *L. Columbianum*, *L. Washingtonianum minor*, *L. Washingtonianum purpureum*, *L. Bolanderii*, *L. Roezlii* and *L. Kellogii*. I doubt if at any other point in the world as many lily species are found.

**LILIUM WASHINGTONIANUM PURPUREUM**

With a stout stem, and leaves as in the type but it is fuller foliaged, from ten to fifteen flowers, and a large rather solid bulb with heavier scales than in the type and the scales con-
spicuously jointed. While in some bulbs only a few of the scales are two or three jointed I have had lots where they were so much so that in handling them the joints would break off and leave only a truncated base consisting of the lowermost joints.

This interesting feature shows an approach to the rhizomatous bulbs of the *Pardalinum* group. I may say in passing that these scales readily make little bulbs. In sawdust used in packing one may, the succeeding spring, find hundreds of perfect little bulbs formed by scales.

It is in the flower that it is most distinct. The segments of the perianth are shorter than in *L. Washingtonianum* and overlap in the tube to form a short funnel with broad lips. The fragrance is as with the type.

The name is to a degree a misnomer. In some localities it is locally known as the White Lily yet perhaps 90 per cent of the flowers taken at large, open either white tinted purple and soon becoming purplish wine color or open of that color.

As to soils it has wide adaptability. In clayey soils, in volcanic soils or in the good clay loams it is alike at home. Drainage it always has and moisture during its growing season.

About Klamath Lake it meets a climate not very different from New York while in places it is much milder. It is however safely hardy.

From the practical garden point of view it is perhaps notable for the fact that its bulbs are very easy to handle. With any care they are little harder to pack and ship than potatoes. As an extreme instance take this. A collector shipped a thousand to me loosely packed in a large case with only straw packing. This in the heat of a California September. Very few were in any way injured by this rough treatment.

An incident that occurred some years ago may be of interest. In the grain fields of a section of the upper Willamette Valley in Oregon, a land of hop fields too, this lily was quite widely scattered. The plowing for the grain was not deep and only occasionally did a plow cut the top of the deep seated lily bulbs. They thrived wonderfully with this culture and flowered before
the grain was cut. The bulbs were truly enormous. One measured 28 inches in circumference and weighed 4 pounds. The farmers were however so annoyed by people walking through the fields to gather the lovely flowers that the lilies were dug out by them. The same stimulation occurs at intervals where woodlands or brushy lands are brought into cultivation and always to the benefit of the lilies.

In cultivation it can hardly be said that this is a very easy lily yet I usually succeed and it is well grown in many regions in England. A well drained deep soil either gravelly, loamy or even open clay. Shelter from harsh winds, light shade where the summer heat is great, and moderate moisture are the indicated treatment. Not a lily for the careless nor a lily for any one to despair of who takes care.

**Lilium Rubescens**

This was long confused with *Lilium Washingtonianum* and was even called *L. Washingtonianum purpureum* by some. It is very distinct.

The bulb is always solid and ovoid, the foliage similar but with more, and more perfect whors, the flowers are narrowly tubular with recurving tips. When few they are borne in umbels while if many are in racemes. At first opening they are almost white but thickly dotted with purple. The purplish dottings quickly spread till the flower is all wine purple and on one stem may be seen all of the colorations from the opening white to purple. It is a delightful and striking lily.

Almost all notes as to the size of the lilies or the number of flowers are apt to be misleading. It is oftener a matter of soil and situation. For instance I have seen a group of *L. rubescens* 11 feet high with thirty or forty flowers while it is often seen with two or three flowers on an erect stem 2 to 3 feet high. Plants 6 to 7 feet with 20 flowers are common in nature.

Like *L. Washingtonianum* this lily has a delightful fragrance which persists in pressed flowers for months. I often trace wild plants by the fragrance.
LILIJUM RUBESCENS
It is only found in the Coast Ranges north of San Francisco Bay for about 150 miles but within that limit meets most varied conditions. In the Redwood forest it is known as the Redwood Lily and is found on open ridges in underbrush in a clay soil. At one point it is on a ridge within 1000 feet of the ocean. Farther east it is on the north or northeast exposure of high peaks in a vast region of close shrubbery locally called Chapparal. There it is the Chapparal Lily. Still further from the ocean it grows in rocky debris among the Golden Oaks. So with clayey soil, gravelly soil or broken down rocks mingled with leaf mold, its soil needs sum up with good drainage, protection from harsh winds, moisture during its growing season.

*Lilium rubescens* is a much better garden lily than either form of *Lilium Washingtonianum*. I was rather surprised to be told by a San Franciscan that he grew it very well in the almost pure ocean sand of that city. Unless collected rather late, say mid October, its bulb also is rather hard to handle.

**Lilium Kellogii**

This is very similar to the others in bulbs and foliage but very distinct in flower. It is a true Martagon with segments closely revolute. The bulbs are of about the size of those of *Lilium Columbianum*, the stems often 2½ to 3½ feet in height, slender and often three to eight flowered, although I have grown them with twenty flowers. The color is a pinkish purple lightly dotted; and with a pleasing fragrance unlike that of any other lily.

Like *Lilium Bolanderii* its habitat is a very small area and probably 50 miles of a very narrow belt reaching from Humboldt County north would cover its extremes.

It is found either in very open Redwood forest or in open pine woods, and in soils always rather clayey.

I have found it quite easy to grow and flower. A very good percentage of mature bulbs will flower the first year and I have never known of wild bulbs producing as fine a bloom as I averaged.
GROUP III. THE BOG LILIES

As this article is designed more to aid in culture than as a botanic treatise it will be well to digress somewhat to remark as to bulbs of this group.

In all of this group the rhizomatous bulbs are not deep seated in the ground nor do they grow where the soil becomes quite dry. In handling out of the ground they should never be allowed to dry out in the least. The trained collector digs and washes his bulbs and packs at once in the field in moist spagnum or green moss. He sees that the stored bulbs never get dry at all. He knows that too much moisture may stimulate root growth in the packing but realizes that this can do little hurt as compared with loss of vitality through any drying. In successful culture with Bog Lilies the first essential is good bulbs full of vitality and fresh.

The purchaser of such bulbs should use like care to keep unplanted bulbs either in moist leaf mold, damp moss or best of all in damp powdered peat. There is no danger of rot unless bulbs have overdried at some time after being dug.

In this group we have lilies with creeping rhizomatous bulbs formed by a narrow core-like substance very densely covered with overlapping scales which are usually jointed. The flowers may be either closely revolute as with L. Pardalinum, broadly funnel-form as with L. Parryii or narrowly funnel form as with L. parvum. All are so called Bog Lilies. They are seldom really so, and no one of them does its best in boggy soil.

L. PARDAVINUM

Of the bog lilies this is distinguished by a rhizone with one or two jointed scales which increases by the growing bulb which may be called an eye of one year forming from one to five new eyes, each of which may produce a flowering stalk and in turn multiply in like ratio. The rate of multiplication of the more prolific strains of this lily when in fine soil is startling. I have seen five hundred closely interlocked bulbs which had come from a single original. No other Western Lily has
this mode of reproduction and no other produces more than
one eye excepting in rare instances.

The smooth light green leaves may be broadly or very
narrowly lanceolate, may be scattered thickly on the stem or
in part disposed in whorls.

The large closely revolute perianth is orange red on the
lower third and some shade of red or crimson on the upper
two-thirds and spotted at the center.

There are innumerable variations in the wild plants so that
the lily is hardly the same in any two localities of the very
extensive region over which it is spread. Some of these vari-
ations have been named but the names have not been consist-
tently kept by dealers and signify little, although there are
variations well worth keeping separate.

The form from Mendocino County, California is often put
out as *californicum* and a most brilliantly colored form was
called *Johnsonii*.

In Southern California there is the very rare form *fragrans*.
The type is not in the least fragrant while this very light colored
form is. I am satisfied however that it is either a hybrid of
*L. Pardalinum × Parryii* or a connecting species, as its bulb
character approximates that of *L. Parryii*.

As a garden lily *L. Pardalinum* is unexcelled. It will succeed
in any garden loam with moderate watering; it thrives either
in sun or shade and flowers freely. In an alluvial soil it thrives
wonderfully.

Botanists have little to say of bulbs but the lily dealer or
collector is forced to pay much attention to that side of the
matter for bulbs differ immensely as to behavior when out of
the ground. Many lily bulbs which are quite healthy when
left alone are simply hopeless when dug and kept for long out
of the ground. Fungi and bacteria seem to have an especial
affinity for them. They go into a soft rot or a dry rot in spite
of all known precautions.

The bulb of *L. Pardalinum* is one of the easiest to handle
out of the ground. Of course it should never be allowed to
get dry, but if packed in moist moss, sphagnum, or peat it carries
LILIAM PARDALINUM
CALIFORNICUM
and keeps perfectly for a long period. This insures its reaching the grower in good order and that fact alone might perhaps account for the difference between success and failure. A few years ago an English gardening paper published a series of reports from lily growers of their experience with different lilies and I think that no other lily had been a success in so many places.

As I have said it is very widely distributed on this coast and is found from the Mexican line near San Diego to Northern California. It is found in both the Coast Ranges and the higher interior ranges from sea level to about 5000 feet altitude.

In the Northern Coast Ranges it is more likely to be along the banks of some small living stream well up in the mountains where, rooted in a sandy sedimentary deposit, its roots run down to the water for a sure supply. Shrubbery lightly shades it or it overtops a strong growth of perennials. If the banks are lined with alders its growth is more slender and graceful but its flowering poorer.

Again in the same region some spring bursts out of the brushy hill slopes and moistens quite an area of soil which is loose and rich with mold. In these little meadow-like expanses Pardalinum is most happy and often forms dense colonies.

Almost as happy and much taller, it grows where a spring seeps under a deposit of gravelly soil or the debris of a shaly cliff. Here where apparently the soil is quite dry but where abundant moisture is to be found a foot to two down the very finest specimens grow.

In the Sierras they are not nearly as widely distributed but at times are far more abundant for in the Sierras the best moisture conditions are to be found in open meadows of black soil, a sand rich with humus. In one such meadow-like valley I once saw tens of thousands scattered all over its expanse. Later it became a hay field (timothy) and the lilies were even happier.

I have said that there were no varieties of L. Pardalinum distinct enough for botanical notice although many are well
worth while propagating for garden color. I should however make an exception for *Lilium Wareii* or *L. Pardalinum Wareii* which might well be called the Lost Lily. *L. Wareii* has a bulb between *L. Pardalinum* and *L. Parryii*. Its perianth is closely revolute and of about the size of *L. Pardalinum* and the flower is very fragrant. The color is a clear solid rich yellow, a most desirable shade. It is a really one of the finest of world's lilies and its history is most interesting.

F. A. Miller of San Francisco had it from a collector who found it somewhere in the back country of San Diego County thinking that he was collecting nothing but *L. Pardalinum*. Mr. Miller sent it to T. S. Ware of London, one of England’s great horticultural growers of the day, and when Ware flowered it he found that he had a most unique lily. It was named *Lilium Wareii*, was described in the *Garden* of London, was the subject of one of the *Garden*’s superb chromo lithographs and in that way its identity is perfectly fixed.

Ware wrote to me for further supply and gave me his data which I followed up, and used the original collector, then an old man. Not another bulb of this fine lily has ever since been found. I am of the opinion that research in the peninsula of Lower California will bring it back, for near the Mexican Line I have found *Lilium Pardalinum fragrans* which is *L. Wareii* in all excepting that there is quite a little red suffused through its yellow base color. When *L. Wareii* was to be had $10 each was the price for its bulbs.

*Lilium Parviflorum*

Might be and has been called *L. Pardalinum minor*.

It is a distinct species, and a much smaller lily than the other. The bulb differs in having more than two jointed scales and very rarely producing more than two eyes, never more. It is therefore a solitary lily and propagates by seeds only.

Its stem is slender and the light green leaves are rather narrowly lanceolate and either scattered thickly or somewhat in whorls, according to the size of the plant. It is often 2 to 3-
feet high with a few flowers but at its best it is 6 feet with as many as twenty blossoms.

Its color varies very greatly, just as does *L. Pardalinum* but nearly always with an orange center and outer sections of some shade of red and most usually of crimson. The inner third is lightly dotted, and it is always fairly fragrant.

I have seen one form in the Southern Sierras in which the flower is orange yellow throughout but dotted. This form was confused by botanists with *L. Columbianum* which is a far different lily. This confusion has led botanists to attribute the latter to the Sierras where it never occurs.

As I have said *L. parviflorum* is an extremely variable lily and there are forms which are very strikingly colored and desirable. None have been named or distributed horticulturally.

The habitat is well marked. Beginning in the Kings River country of the Southern Sierras (California) it is to be found at from 3000 to 5000 feet altitude as far north as the base of Mount Shasta and in the granitic ranges west of Mount Shasta. It is not found in Oregon or in the Coast Ranges proper. It is to be found along small streams in alluvial soil or in small meadows where the soil is alluvial and moist. More often it is associated with tall perennials or low shrubs which it outtops. I have never seen it in soil which could be called boggy.

It is a good lily, not quite as adaptable as *L. Pardalinum*, but its fragrance and earlier flowering give it a place. There are no difficulties in its garden culture in any good loamy soil where ordinary garden moisture is maintained. It could not help thriving in a well prepared lily bed.

*Lilium roezlii*

Has a bulb almost identical in formation with that of *L. Parryii* with scales often three jointed. A perfect bulb is a very beautiful thing, pearly white and almost lace like with the innumerable fine jointed scales. The stem is slender and graceful with very long slender leaves scattered