

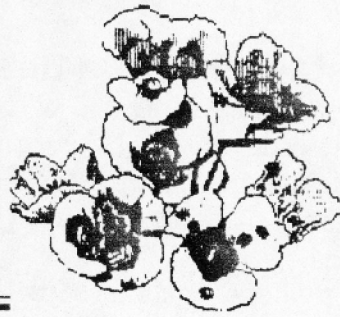
MARIPOSA  
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# MARIPOSA

THE CALOCHORTUS  
SOCIETY NEWSLETTER

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## I. ANNOUNCEMENTS:

It is with a great sense of sorrow that we announce the untimely passing of Mr. L. Ray Godfrey, of Roseburg, OR. Ray had a lively interest in Calochorti, and he was also a true friend. Ray was a botanist with an especial interest in rare orchids. He took an active part in examining the distinctive habitats and the various forces that together shaped the unique local flora. I went with Ray on a daytrip into the Kalmiopsis wilderness along with other ACS members, and soon realized how out of my depth I was. Ray not only knew the diverse flora of SW Oregon thoroughly, but was conversant with its geology and ecology as well. Ray also was responsible, with others, for the publication of *C. coxii* as a new species. We'll miss you, Ray.

## II. Trips

Time to pack up the car again! It was late May, and several species of *Calochortus* would be in bloom. We would be traveling through parts of Nevada, Utah, Arizona and southern California to see them. But before we left California to head east to the Southwest, we decided to also look for *C. excavatus* and *C. bruneaunis* in the eastern Sierras.

As always, we started from the San Francisco Bay Area, but our trip really got underway when we left Interstate 80 to pick up Route 395. We began on this route in western Nevada, where it takes the traveler through the Carson Valley. This is a high, arid valley with sagebrush vegetation, and has the feel of having been frozen in time, specifically into an old Western. As the route continues southward and climbs through California, one can see many very interesting rock formations. One of the most famous of these is the Devil's Postpile, with its long columns of volcanic rock. Still further south, Route 395 takes the traveler to the Owen's Valley, home of *C. bruneaunis* and *C. excavatus*.

The Owen's Valley was almost destroyed by the theft of its water by the Metropolitan Water District of Los Angeles some decades ago. In order to avoid court action, the water company has recently "turned the springs back on" in this area. We were apparently early for *C. bruneaunis*, according to some advice given us by a local member of the CNPS. We searched an entire afternoon for *C. excavatus* in one location, but didn't find any. The next morning, however, we tried a different stand, and found them right away. What a lovely thing this species is! Most of the flowers in the stand were white, although some had gentle shadings of gray, lavender, or a smoky brown. They had dark dots at the bases of the petals, and some had faint green stripes on the outside of each petal. We thought they were like either the graceful *C. catalinae* or a white form of *C. kennedyi* (This isn't a botanical rendering--it's only meant to give you an idea of what the species looks like.)

We headed east toward Nevada and received an unexpected bonus. High in the White Mountains, at about 7000 feet was a lovely stand of *C. kennedyi* with many color forms. They included vermilion, pumpkin, apricot, and yellow dots of color peaking out from the sagebrush in soil that was so filled with rocks that it looked like a patio. We found out later that the high wind in the desert creates such a rocky ledge, as it blows away the underlying soil, and the rock remains. The activity is called deflation, and the result is what is known as "desert pavement."

Here we haven't even left California in our tale, but it's time to stop until next issue. See you then!

### III. Germination Tests--6th Installment: Old Seed

This test was set up to examine the germination rates of old seed. At what rate does older seed germinate, if at all? For this study, initiated during the 1989 planting season, we acquired one-year-old seed (1988), which had been kept dry. The species for this test were *C. albus* and *C. catalinae*. We also acquired three-year-old seed (1986) for both of these species. **[Our thanks to C. Baccus for the seeds.--Ed.]**

The reader should be reminded that these trials are preliminary and should not be taken as conclusive. We must confess that we have only the results of *C. albus* to discuss here. *Calochortus catalinae* proved too tender for the freezing winter of '89-'90 in Livermore, CA. However, less formal testing at Hayward of the same batch of seed indicated that such old seed germinates at nearly the same rate as fresher seed. This proved to be the case with both *C. albus* and *C. catalinae*. Although the 1986 seed germinated at a slightly lower rate than the fresh seed, this could be accounted for by other factors. The evidence points to the viability of older seed.

Again, older refrigerated seed germinated at rates close to fresh seed. A batch of *C. superbus* seed from 1985, donated by the late Ray Godfrey, and kept in his refrigerator until 1989, germinated readily in 1989. It is now approaching maturity.

The reason behind this particular test was that it had long been noted that there have been years where few *Calochortus* have bloomed. In particular, these have been the very dry or drought years in California and other parts of the American West and Mexico. Since seed cannot always be gathered of every species every year, we tried to determine the viability of seed gathered in previous years. Since the results clearly indicated that old seed is indeed viable, we have wondered whether or not this ability is not a necessity to the species' survival during those very dry years. In any case, buying seed from back years should not prove a problem to the gardener, if this evidence is correct.

### IV. The Horticultural History of *Calochortus*--9th Installment

Wister, John C; **Bulbs for American Gardens**; The Stratford Company; Boston, Massachusetts, 1930. Mr. Wister wrote this article while Secretary of **The Pennsylvania Horticultural Society**. The 1930's proved to be a time of great interest in *Calochortus*, as opposed, for example, to the 1950's, when there was nearly none. While your editor had to delete many portions of the article because of botanical inaccuracies, we found that the article was an excellent record of horticultural experiences for this genus in gardens outside its native ranges, such as New York, Ohio and in wet temperate climates overseas.

"Nearly all are wonderful plants for the California gardener, but they vary a good deal in their adaptability to other climates. Farrer writes, '*Calochortus*? No!...the utmost they will do in England is to arise just once...wave at the world their painted waxen heads and delicate fringes and then go on to join the onoclytus Iri[s] in a better land.' **[We beg to differ.--Ed.]**

"Fortunately, this is not equally true here, for they can be grown in many parts of the United States if proper care is given....Some resent any new home as much as Farrer has suggested, but many of the best ones are worthy of extended trial by the gardener who wants something his neighbours have not.

"All are apparently hardy to extreme cold but easily injured by the typical freezing and thawing of a Middle State's winter, and mild winters tempt them into too early growth. Plant rather late, about mid-November, to prevent an early leaf-growth in a warm November. Give a sheltered, sloping position with a well-drained porous soil with plenty of leaf mold, and sand or other grit, and, if possible, some charcoal. It may be advisable to cover with some kind of matting to turn the fall rains, and then after ground has frozen, a good mulch of leaves or salt hay should be put on.

"By use of different species and varieties flowers can be had for nearly three months. After flowers are done and foliage has ripened and disappeared the bulbs had best be lifted and stored

in a dry place until planting time, for in most of the places where they grow wild they are subjected to a long dry season and get a thorough baking from the hot sun.

"For early bloom bulbs should be potted, six to twelve to a six-inch pot, and grown under glass; but they will not force rapidly and should not be given extreme temperatures. Like Tulips, they should be kept about six weeks in a dark cellar before being brought into the light. Like many flowers, the colours are finer under glass, and when grown outdoors, some gardeners like to shade the flowers with cloth or burlap to make them finer and more lasting. All are splendid in coldframes and here they need not be lifted in the summer; instead, the glass should be kept on all summer to keep off rains.

"In California, they should be planted in October, in slightly raised beds that are not watered at all in summer. If bed is to be watered, then bulbs should be lifted each summer and kept dry. No manure should be used but leaf mold, sand and grit are desirable. They should be set about two inches deep. They need no artificial water until buds show colour, then water liberally. Gophers are fond of the Bulbs and must be guarded against.

"...It was of [*C. albus*] that John Muir wrote, 'A spotless soul, a plant saint that everyone must love and so be made better. It puts the wildest mountaineer on his good behaviour. With this plant the whole world would seem rich though none other existed.' Stephen Hamblin, former Director of The Harvard Botanic Garden, reports this species tender in Boston....

"*C. amabilis* is a yellow species, flowering about June 10th. This also is tender in Boston, but John G. Eisenbach of Toledo, Ohio, reports it hardy without protection and states that it flowers for five weeks....[California Star Tulips and Pussy Ears] also have proven tender at The Harvard Botanic Garden....

"[*C.*] *Nuttallii* has been reported hardy in Massachusetts, New York, Ohio and Illinois. Most garden collections, however, tend more to horticultural strains than to species. Among those most to be recommended is *Vestaf[e]*. It likes full sun and heavy soils and has three- to five-inch flowers; is white flushed with lilac and rosy purple, red at center and purple on the backs of the petals. *Venustus*...is hardy in Boston but rather short lived...."

## V. Conservation--Mariposa Foundation for Conservation, Inc. (Non-Profit Foundation)--Dr. R.D. Watson

[When we originally wrote about this foundation in **MARIPOSA**, Volume I,#3 (January 1990) issue), we had just learned of its work. Since then, we have become members of the Mariposa Foundation, and various members of the Mariposa Foundation are also members of **ACS**. To give our reader an overview of what the Mariposa Foundation's goals are, we are publishing its objectives as so kindly explained by Dr. Watson. In addition to being the founder of the Mariposa Foundation for Conservation, Inc., Dr. Watson is also **Professor Emeritus** of the University of Idaho's Department of Plant and Soil Sciences in Moscow, ID. The Mariposa Foundation's address is given at the end of this article. Interested readers may themselves become members, and/or send donations of seed or cash.--Ed.]

"The objective of the Mariposa Foundation is to create and encourage an awareness of the values of conservation. We will foster the concepts of conservation that are realistic and achievable including those of human resources through the sponsoring of volunteer services especially of retired persons. We will encourage the development of educational programs which foster these concepts of conservation.

"The development of a pilot conservation program using wild lilies (camas and sego) for the revival of valuable plants is one of our major goals.

"The preservation of our natural heritage through native plant resources development is the concern of all nature lovers and requires the aid of various forms of conservation to identify the ecologically valuable plants and to preserve them through all available means...These different

seedlings should then be propagated to develop permanent "gene bank" plantings where annual harvest of seed can be made for a sustained planting program without damage to the "wild" stands or their natural increase.

"The purpose is to reestablish these endangered and ecologically important plants into their native ranges of adaptability...

"A pattern for future projects is with the lily family of plants. It would be logical to concentrate on the two most important genera that once were wide spread and a part of the native ecosystem. They formed an important part of the food supply for the native Americans and later the trappers and pioneers and are highly prized by wild animals as food. Both of these genera (*Calochortus Pursh*, commonly called the butterfly lily, mariposa lily, sego lily, star tulip or cats-ear and the *Camassia Lindl*, commonly called camass were once wide spread and an important part of the local flora in many locations. These species have been greatly restricted in their range and some area strains are presumed to be lost. Many more strains are endangered with only remnants now existing, that if lost might greatly reduce the wide genetic basis, limiting to that extent their wide adaptability and hence chances for survival.

"Procedures for the pilot project are:

1. Locate native sites of the lilies in as many diverse locations as possible for each species and mark these locations for future research, reference and for site improvement.
2. Collect seeds from as many species and/or strains within each genus and from as wide a variety of sites as possible to assure a broad genetic base which will improve the chances of their ultimate survival.
3. Develop methods for improving existing sites to prevent further reduction of native stands and to bring about in them the maximum level of revitalization.
4. Develop effective seed treatment procedures that will enable the lilies to produce bulbs that are "disease-free" for planting.
5. Establish permanent seed producing areas to conserve native seed sources for natural increase on the site.
6. Establish new stands of each species and/or strain through planting of seeds or bulbs in acceptable locations.
7. Conduct a basic taxonomic study of the wild strains or types of a species that occur naturally on widely differing sites. Compare these by growing them under the same conditions to determine if there are significant differences among them and determine the genetic validity of the species concept used in classifications."

**Dr. R.D. (Ross) Watson, Mariposa Foundation for Conservation, Inc. (Non-Profit Foundation)**

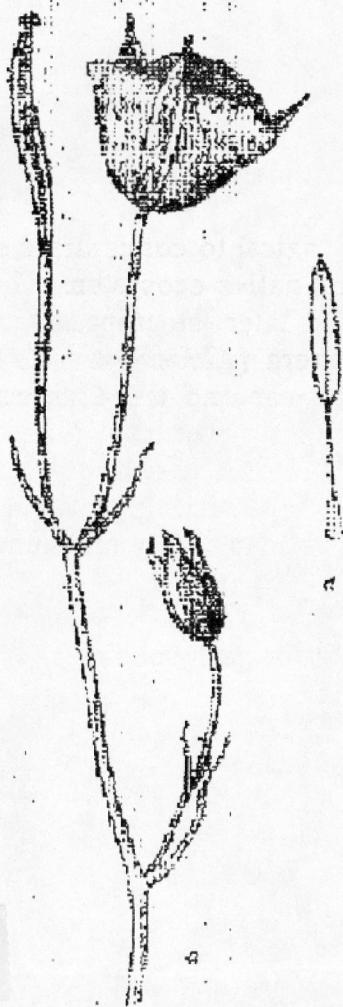
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## VI. Species This Issue--*Calochortus plummerae*

**Range:** The Transverse Ranges of So. California, from Ventura to Riverside Counties, usually at low elevations.

**Botany:** *Calochortus plummerae* not only represents a new subsection of calochorti, but a new section as well. Although it is commonly known as Plummer's Mariposa, it is not a Mariposa in the technical, botanical sense. This species has been classified under section *Cyclobothra*, the third and final section of Calochorti, and not section *Mariposa*. We will cover the four subsections of section *Cyclobothra* this year. Three of the subsections are entirely Mexican, but subsection *Weediani*, to which *C. plummerae* has been assigned, is centered in upper and Baja California.

Section *Cyclobothra* was distinguished by Prof. Ownbey due to the fibrous-reticulate (netted) bulb

*Calochortus plummerae*

coats of the bulbs. The other two sections lack this feature. From section *Calochortus* the *Cyclobothras* are also distinguished genetically, although many have not been tested (sect. *Calochortus*' haploid chromosome count is 10, while that of the spp. tested in sect. *Cyclobothra* is 9 or multiples of 9). From sect. *Mariposa*, it is distinguished by the bulb coat, broad ungrooved leaves, narrower seed pods, generally smaller seeds, and chromosome count (except subsection *Gunnisoniani* of the Mariposas, which like the *Weediani*, has a count of 9).

The *Weediani* are distinguished from the other subsections of *Cyclobothras* by range, habitat, and morphological features. Unlike the *Barbati* and the *Purpurei*, their flowers are upright, not nodding, and they do not bear leaf-axil bulbils. From the *Ghiesbreghtiani*, they are distinguished by generally larger flowers (except *C. obispoensis*) and larger, more depressed glands.

*C. plummerae* is distinguished from the other spp. of *Weediani* by color, range and the lack of a hairlike fringe on the top edge of the petals. It approaches certain color varieties of *C. weedii* both to the southwest (var. *intermedius*) and the north (*C. vestus*) with respectively whitish-pink and whitish-red strains, but the unfringed, unserrated petal edges seem to consistently distinguish it.

This is another southern California charmer. It comes in various shades from very light pink through rose, lavender and purple to light red, often with bicolors. The plant is often tall, as it grows in chapparal (shrubby hillsides) where it must compete for sunlight with bushy neighbors. The flower is tulip-shaped, but is distinctive in that the sepals are often longer than the petals. Inside the flower there are yellow "hairs" on the lower portion of the petals, each set in a small purplish-brown spot. On the outside of the petal the gland or nectary is visible as a rounded depression near the base, conspicuous in profile.

Although it does not bear bulblets, either stem or leaf axil, it has been noted at least since Purdy that the bulb itself tends to divide more rapidly and readily than other spp. (generally true of this subsection).

**History:** This species was first considered a color form of *C. weedii*, eg by Watson. It was separated by Greene in 1890, but Purdy in 1901 still thought it a variety. It was Hansen who first noted the unfringed petal edges of *C. plummerae*, which are the clearest specific difference.

**Horticulture:** In its native range this species grows in rocky clay soil, gets about 10-20" (about 25-50 cm.) of rain per year, and grows with its base partly shaded but its flower in full sun. Its rainy season runs from Nov.-mid May, but it can be grown as a spring grower. Most strains are from areas with very mild winters, so the plants require little in the way of chilling. Even greenhouse conditions may be tolerated in cold climates; this will require testing. However, alpine houses may be sufficient.

This sp. is relatively easy to grow in both pots and the ground, so long as its water requirements are met. This includes moderate water during the spring and complete drying out during summer and fall. Despite the rainfall schedule, the sp. blooms in early summer, up to a month after the end of the spring rains (*C. vestus* blooms even later, in August!). UCDavis mix and bulb fertilizer work well, although *C. plummerae* is not fussy.

**Note:** This sp. was listed as "common" (Hansen) 90 years ago, but is now approaching rarity, due to widespread development in its S. Cal. habitats (also due to fire suppression: chapparal fires burn off competing shrubs in late summer, while leaving the bulb of this sp. unharmed.) It may soon become protected.