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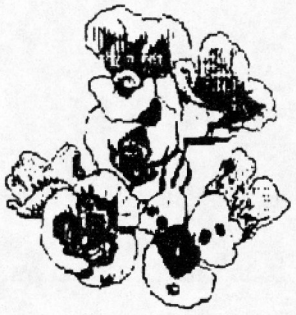

THE *CALOCHORTUS*
SOCIETY NEWSLETTER

OCTOBER, 1992

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AND B. NESS

*** FREE SEED OFFER ***

Once again, it's planting time, and we are offering seed to our members. There are four California species to choose from, and three Mexican. Please send a SASE with your first and second choices to us at the address above by November 30th. You may choose one California species and one Mexican species. We recommend letting us know your second as well as your first choices, since our supplies are limited.

Here's what we have to offer you:

California Species

- Cold, dry-- *C. bruneaunis* This is a lovely sego lily from our eastern Sierra. It is a tall, white *C. nuttallii* look-alike. It is **not** recommended for California gardens, except those east of the Sierras, since it requires a very cold, as well as dry, climate.
- Cold, wet-- *C. palmeri* This pretty *Venusti* grows in wet meadows in southern California. It is a white *Mariposa*, with jewel-tone markings.
- Mild, dry-- *C. striatus* [See Section II--Conservation below.] This *Venusti* has fairly small blooms, but its red stripes make it a very cute one.
- Mild, wet-- *C. simulans* This rare species from San Luis Obispo County looks very much like the graceful *C. catalinae*, but its colors are slightly different.

Mexican Species

- *C. exilis*-Looks a lot like *C. venustulus*, but it has white flowers with reddish sepals, and is hairless. It is probably pretty hardy, since it grows at elevations up to 9500 feet.
- *C. spatulatus*-This one is probably **not** hardy. Its has nodding, reddish-purple bell-shaped flowers.
- *C. marcellae*-Very similar to *C. spatulatus*, above. We only have a few bulbils of this species.

II. Conservation: *Calochortus striatus*

Normally we would never offer seed of a species which is a candidate for protection as a rare and endangered species. This year, however, the abundant rains in Southern California, after years of drought, produced lush conditions in the area, and a "bumper crop" of flowers and seed. After consultations with tne California Native Plant Society, the State Dep't of Fish and Game, the Federal F & G, and the Bureau of Land Management, we have decided to offer, on a one time only basis, seed of *C. striatus*. This will be the ONLY time that wild collected seed of this sp. will ever be offered by the Calochortus Society.

Mr. K. Berg of Federal Fish and Game consented to our offering seed of this species under certain conditions. Members should be informed that while growing such rare species may be a benefit to the species, by preserving in horticulture what may become extinct in the wild, it can never be a substitute for indigenous, wild stands. Further, the horticultural plant may become something other than the wild one through selection, *etc.* Damage can occur to the wild stands through "back-breeding" of such selections with wild stands, however inadvertent, thus reducing the ability of the wild stand to survive in a severe environment (see below). As an insurance policy, then, a quantity of the seed is being sent for long term storage to the Rare and Endangered

DEAR S., THANKS FOR THE SEED! ALSO FOUND C. KENNEDY (THE COLORS) ON E. SIDE OF WHITE MTS. (INYO CO.) NEAR BRISTLE-CONE PINE. DON'T KNOW ABOUT SEED PREDATION, BUT USUALLY LADY-BUGS PROTECT FLORA BY EATING INSECTS WHICH WOULD EAT OUR FAVO-RITE PLANT. BEST, H.

P.S. - DID YOU GET VOL. IV, #1 (FULL)?

Plant coordinator at Rancho Santa Ana Botanic Garden in Claremont. This may allow for the preservation of the genetic diversity of the sp. should the stand ever be wiped out, as such damage can occur. Members are strongly advised never to sow seed of this sp. in the wild, if in the future they are able to grow the sp. successfully. Further, each member will be limited to fifteen seeds.

Calochortus striatus has a charmingly striped pink to purplish flower. It grows in moist alkali meadows in southern California and Nevada. These meadows are seasonal wetlands, in which snow melt from nearby peaks flows down to more level areas and settles during the spring. The water does not then flow on to the sea, but either evaporates or sinks. As the flow picks up salts during its journey, but then does not drain these to the sea, these desert flats accumulate chemical salts. (Cf. the Bonneville Salt Flats in Utah; but the ones in California are not necessarily table salt: "salt" is a class of inorganic chemicals). Thus *C. striatus* somehow adapted to an extremely salty, but moist environment. More, the "pH" of these meadows is extremely alkaline: about 9.5 and above, as the type of salts involved tend to raise pH above normal. Hence its common name, the "Alkali Mariposa." Add to this the 110°F summer heat and it is no wonder that the species is rare, given such extreme environmental conditions.

As I have no experience growing this species, and its native conditions are so extreme, I would NOT recommend that UCDavis mix, or other commercial mixes be used. Almost all of them are acid, i.e. the opposite of the extremely alkaline conditions which *C. striatus* is used to. If your area is known to have alkaline soil, which is fairly common in the West (ours is alkaline clay), then a weed free area in the ground, which will remain fairly dry in summer, can be used. In other areas, a pot with nothing but pure sand AND fertilizer should be used. This will allow a neutral pH, while providing drainage. While the sp. is a relatively wet grower, for the desert, it should be kept in mind that it grows in the desert. Thus drainage is important, even though the sp. does not grow in well drained conditions in its native habitat. This will be provided by pure sand. Sand, however, does not provide any of the necessary plant nutrients. Thus a complete bulb fertilizer is vital (i.e. one which provides all the necessary plant nutrients, including trace elements, in requisite anmounts) if sand is to be used as the medium for growth. If soil or soiless mixes are to be used, then dolomitic limestone should be added to raise pH.

III. Trips

While driving along some of the routes away from the Interstates, we saw many other stands of the intriguing *C. ambiguus* Just as *C. flexuosus* had been so common in Utah, we were now finding *C. ambiguus* "all over" northern Arizona. In among the stands along one wooded byway, we came across some yellow Calochorti. This was very exciting--what could they be, here, in an area where only *C. ambiguus* was known to grow? As we spotted them from our car, they seemed very short. Could they be *C. aureus*? we wondered. If so, that would mean a range extension for the golden sego lily, since its range was to supposed to end well to the north of our current location.

We got out and examined the stand. Hugh had some trouble identifying the species, but it turned out to be *C. kennedyi* var. munz (the yellow varietal.) We were not yet looking for this species, so this was another unexpected treat. We enjoyed photographing these flowers and their habitat. They were growing in bunch grasses, just outside a barbed wire fence, behind which some cattle were grazing. It was a good thing that we had stopped at that site, since our other targeted sites to the west (on the way to Kingman) yielded no blooms.

We rode through Kingman and continued west to the Mojave Desert. We hadn't been looking forward to it, since the desert can be quite hot. Luckily, we had a cloud cover all the way through, so it was very pleasant. We came to San Bernardino County, and again stopped to look over a stand of lovely, vermilion *C. kennedyi* We also traveled to the type locality for *C. palmeri* We found the latter growing in a grassy meadow by a spring. We could only examine two of the plants closely, since they were the only ones in the stand that stood

outside (yet another!) barbed wire fence. These flowers are closely related to *C. venustus*, but their blooms are somewhat smaller. Still, the famous Mariposa markings are evident, and I found the colors rather striking--creamy white petals, offset by ruby reds and clear yellows. They were more jewel-toned than pastel.

IV. Germination Tests--9th Installment: Growing *Calochortus* in Beds by C. H. Baccus

[The author is a pioneer in growing *Calochortus* and other native bulbs in quantity. He is also our pre-eminent advisor for this newsletter--Ed.]

Hugh has asked me to write an article on bulb bed preparation. I originally started to use beds for tests with various pre-emergent herbicides and had hoped to carry on other experiments, using the same beds. The growth was so successful that with the area around me being built on, I decided that the results were worth the possible predator risk. My soil is a clay loam and although not the best for production, it is much better than some of the real clays. I found that the so-called clay growers may do well in the box culture that I have been using, but they matured a year earlier in the ground, and with much better size. The only drawback was that they would reach eight to nine inches in depth making them difficult to retrieve. I found that *Frittillaria* grew even deeper and was even more difficult to retrieve. I am not sure that this procedure can be utilized for landscape use, but maybe some of the information is applicable.

I use beds which are 3' x 20', although I still have some that are 3' x 8'. I use a French Intensive method, which provides a loose soil approximately 14 inches deep. I first rototill the area and irrigate when possible. This is followed by again rototilling as deep as I can (about eight inches.)...[Continued next issue--Ed.]

V. The Horticultural History of *Calochortus*-12th Installment

Roundtree, Lester, *Hardy Californians*, New York; Macmillan: 1936. **[Continued from last issue--Ed.]**

"Since the gardener has only a limited control over the environment of his plants, it is up to the plant to make whatever compensating adjustment it can. Plants from the mountain tops, the true desert and the Redwood region proper will brook no half-way measures. If you cannot give them what they want, do not attempt to grow them. Plants from coast and valley, foothill and chaparral areas are more docile and may cooperate although many of them too are exacting. Plants like people develop complexes and inhibitions when they find themselves in unhappy environments. They too grow grouchy and indulge in temperamental flare-ups. Growths appear on the twigs of bushes; foliage turns an uncanny shade; plants become of abnormal shape; unpleasant symptoms develop; or, overwatering will spur them to a swift colorful existence and they will soon pass out.

"Loose soil and ample drainage are among the requisites for most native California flowers. It seems many, many years since I began beseeching would-be growers of native plants to supply stone or sand in heavy soil,--or to provide a slope,--or to somehow insure a *long, loose* root run....

"Another cultural pitfall is the tendency to cosset. More California flowers have been killed by coddling than by neglect. They are distinctly annoyed by too much attention. In looking back over my efforts to grow these species in northern New Jersey I am now sure that over-attention was the cause of many of my failures. I would like to have another try at it.

"I would have a bank in the sun with rocks in it and very light soil between the rocks for the species from foothills and valleys and mesas. At 9one end there would be some high shade and a lot of humus in the soil. The alpines would go into the rock garden proper with pure gravel or gravel and humus in the pockets, remembering the Sierra peaks and the conifer needles and old wood, blown on and mixed with the gravel caught in the crevices of the boulders. In the greenhouse I would grow some of the choicer coastal plants. On the hilltop and in the woodland could go some from the Redwoods. Other Redwood plants

would go into the cold frames. I would build a sun parlor for plants of the high deserts, eschewing entirely all those from the low hot lands....I would save all those barrow loads of stone which used to be thrown away and with some broken rock and leaf mould work them into the rather hard garden loam. I would give the Redwood plants much peat, and I would develop that steep eastward slope more intensively, because that is where I had the best luck with California plants.

"It is by no means an established fact that a plant will flourish under cultivation only if it has a soil and exposure identical with that of its native habitat. Nevertheless, knowledge of these natural inclinations are a guide to the gardener,--also familiarity with a flower's associates gives a clue which may avert a disaster."

VI. Species this Issue: *Calochortus purpureus*

Genus *Calochortus* Key:

A. Section *Calochortus*
B. Section *Maripasa*
C. Section *Cyclobothra*
1. Subsection *Weediani*
2. Subsection *Ghieshreghtiani*
3. Subsection *Barbati*
4. Subsection *Purpurei* often very bulbiliferous in the upper leaf axils, upper leaves wide at base and amplexicaul, flowers nodding, sepals often greenish on exterior, petals moderately to scantily hairy.
a. Nectary depressed
i. Plants small to moderate in size, leaf axils extremely bulbiliferous, flowers purple, reddish- purple, or yellowish-purple, petals moderately covered with hairs, nectary round, hairy ..... *C. spatulatus*
b. Nectary not depressed, leaf axils very bulbiliferous
ii. Plants small, flowers usually purplish with a yellow interior, petals conspicuously bearded, nectary blotchlike, naked ..... *C. cernuus*
iii. Plants moderate to large, cauline leaves extremely long, flowers bluish-purple (?), petals sparsely bearded, nectary rounded, naked... *C. foliosus*
iv. Plants moderate to large, flowers purple, purplish-brown, purplish-red, often with a yellow interior; petals sparsely bearded, nectary naked and distinctively "flower-" shaped..... *C. purpureus*
c. Nectary not depressed, leaf axils rarely bulbiliferous
v. Plants large; flowers purple, reddish-purple, or yellowish-purple, often with different colors on the inside and outside, usually yellowish within with purplish lines around the edges; petals hairy only in a narrow area along the midvein and petal margins; nectary sagittate to triangular, naked *C. hartwegi*

Range: This species has a fairly wide range, from southern Chihuahua in its northern end to about northern Oaxaca at its southern end. The known stands are in the west of Mexico, i.e. not in the Sierra Madre Oriental.

Botany: With its dark purple exterior and yellow inside, *C. purpureus*, the purple Calochortus, is one of the loveliest and showiest of the Mexican Calochorti. In Michoacan state it is referred to as "campanita:"

"little bells," in reference to its nodding habit. The flower varies in color from purple to maroon to multi-colored, with streaks of various dark shades intermingling. The inner nectary looks like a schematic drawing of a tulip. As with some of the Mexican spp., the nodding habit may aid in avoiding damage to flowering parts during the summer rainy season. As far as I know, this sp. has not had a chromosome count completed.

Subsection *Purpurei*, named after our species by Prof. Ownbey in his famous monograph of the genus, is distinguished from the other subsections of *Cyclobothra* by range (the weediani), nodding habit (the weeediani and ghiesbreghtiani), generally less hairy petals, wider cauline leaves, and, except for *C. hartwegi*, extremely fecund bulbil production in the axils of the cauline leaves (the barbati. From one *C. spatulatus* I gathered over *one hundred* bulbils!)

Calochortus purpureus is distinguished from the other species of the subsection by range, nectary features, et al. From *C. spatulatus* it is distinguishd by its generally larger size, generally darker colors, its less hairy petals, larger, more distinctively shaped and less ciliate nectary, wider range and less shaded habitat. From *C. ceanus* it is distinguished by its larger size, generally darker colors, less hairy petals, larger, more distinctively shaped nectary, wider range and less restricted habitat. From *C. foliosus*, which I have not seen, it is apparently distinguished by color (although this is uncertain), its considerably shorter leaves and its wider range. Finally, it is distinguished from *C. hartwegi*, a similar looking plant, by its slightly smaller size, its bulbil production, somewhat less hairy petals, distinctive nectary and larger range.

Calochortus purpureus is a medium to large Calochortus, which grows in grassy meadows and, less frequently, in conifer-oak forests, above the plateau of central Mexico. Its habitat is flatter and more like a meadow than that of the other Mexican sp. we have discussed in the newsletter. Also, it grows in full sun, although its base is shaded by grasses.

History: This species was, understandably, mistaken for a frittillaria, with its nodding, campanulate flowers and dark colors. Named in 1816 as *Frittillaria purpurea*, it was later separated into what was then taken to be a separate genus, *Cyclobothra*, as *Cyclobothra purpurea*, by D. Don in 1829. Finally, the similarities between *Cyclobothra* and *Calochortus* were recognized, and the species was brought under the genus into its present status as a species by Baker in 1874. Other names under which it has been known include *Calochortus bonplandianus*, and *C. grandiflorus* Prof. Ownbey distinguished and named the subsection in which *C. purpureus* is placed.

Horticulture: *Calochortus purpureus* blooms in late summer through autumn, during or after its summer rainy season. Like *C. barbatus*, different stands receive differing amounts of rainfall. The more temperate, northern stands receive less, while the subtropical, southern stands receive more. This varies from about 18" (40 cm.) in Chihuahua to more than 50" (about 90 cm.) in Oaxaca. Almost all of this rain falls between May and October, even in the south.

The plant does well in UCDavis mix of spagnum peat moss mixed with an equal volume of sand. It also responds well to fertilizer. In its native range it seems to prefer full sun, although it tolerates shade, and may prefer it in lowland conditions. One inch per week of rain or water is generally sufficient, during the summer; the plant should be dried off during the winter. This sp. is hardy to about 10°F (about -12°C) in its northern stands, but plants of more southern origin may prove to be more tender. A large pot is recommended, as the plant can get quite tall. The sp. tolerates somewhat wetter conditions in the ground than average.