

## I. Announcements

1. We regret that many of you who ordered *Calochortus exilis* in October were disappointed. The flowers bloomed nicely, but set very little seed. We assumed at press time that there would be enough seed, as capsules had formed. Unfortunately, there was little seed inside, and, due to a high number of requests, what little was available went quickly. Apparently, many of the Mexican spp. are not pollinated by the local native bees. We noticed the same thing with *C. pringlei*, although the northern Mexican sp., e.g. *C. venustus* do seem to be pollinated by them. Why this occurs is a mystery, but hand-pollination is indicated for next year, if this sp. blooms again. If any seed is available in '93, it will be announced, and those of you who missed out this year can write, and indicate such, and obtain free seed of it above whatever regular seed you request.

2. *C. striatus* seems to be doing well in Hayward, in the pure sand with fertilizer, despite our abundant rains this year. Member Fred Smith relays that he took a trip to an area with this sp. with the Cal. Native Plant Soc. several years ago. The guide remarked that *C. striatus* blooms well when there is 6" or more snowfall in the area. [I presume he means the surrounding peaks; it rarely snows in that part of the desert. --Ed.]

## II. Trips

We were still in the vast Mojave Desert, north of the San Bernadino Mountains. The Mojave is actually part of a larger geologic formation: The Great Basin. The Great Basin is very arid now, with only the Humboldt River in Nevada a perennial interior river. Most other rivers in the Great Basin feed into alkaline lakes. This was not always true. During the Pleistocene era (about 2.5 million to 35,000 years ago), the climate was much damper, and there were at least two very large lakes in the Basin. We discussed this as we made our way past rows and rows of *C. kennedyi* in all their brilliant oranges and vermillions, because we were trying to figure out where best to find *C. striatus* once we were in the vicinity of the type locality.

We were evaluating one theory in particular, that *C. striatus* once grew on the shores of a great lake, but now that lake had evaporated. If they needed water so desperately, wouldn't they be on the banks of some riparian wash that courses through this desert region of southern California?

We went to the type locality, but saw no stream from the car. All we saw were snowy white limestone rocks, gleaming brightly under a deep azure sky. When we got out of the car, we heard, rather than saw the swift swoosh! of such a stream. We got out our camera, and walked until we could see the tall reeds growing on the banks of the spring. We looked and looked, but could not find *C. striatus* along the banks.

This is the time when exploration comes in handy. We walked away from the stream, taking two directions. It was Hugh who found the meadow, ringed by junipers, and filled with tall grasses. There, among the blades that reached two to three feet high, we saw the little peppermint faces of *C. striatus*, their three tiny glands forming a child's inquisitive look. They looked like a group of curious children on tiptoe, straining to see over the high meadow grasses, and eager to greet us. In a corner of the meadow, Hugh tested the soil. It was dry and alkaline, but at about



two and one half to three feet down, it was quite damp. Although we were some way from the stream, its moisture was still available to these *Calochorti*. Once our pictures were taken, and our tests completed, we headed north. There, we saw another small stand of *C. striatus* but there was a house in the middle of it! Luckily, the owner did not put in a lawn or other water-intensive decoration, so we could see the *C. striatus* growing among other plants in that xerophytic landscape. The sun now began its desert descent, making the sky resplendent with dusky pinks and rosy reds. Beautiful as it was, it signaled that the time had come for us to head once again for the Interstate.

### III. Germination Tests--10th Installment: Growing *Calochortus* In Beds, by C.H. Baccus

[This is the second half of the article, by our pre-eminent horticultural advisor, on growing *Calochorti* in the ground. The first half appeared in MARIPOSA IV, 3.--Ed.]

"Next the top soil is removed from an area about five feet in length and one spade depth. This soil has to be set aside to start the main digging. I add phosphate and humus on the top of the exposed area and turn this over one spade depth. Next the soil from the top of the next five feet of bed is shoveled over this and the procedure goes on till the bed is finished. I usually do two adjoining beds in order not to have to wheelbarrow the remaining soil to the other end of the bed. After the beds have been finished thus far, I add more phosphate and humus and then rototill this again as deep as possible. In the past I have fallowed beds for two years or fumigated the beds before planting. Weeds can be a major problem with the young seedlings. These may be hand weeded as I also do with the boxes. A chore, to say the least. Before actual planting, the beds are raked off level and I usually box the bed with two-by-fours. After seeding, the area is covered with about 1/4" of soil and then rolled. I generally use a nitrogen-phosphate fertilizer in the last step, so no further fertilizing seems to be necessary the first year. As a last note I should say that I have experimented with solarizing the soil, but have had mixed results. This may be the best alternative to fumigation if the time is available. It may be necessary to combine this with an application of a post emergence weed killer in order to take care of the perennial weeds.

### IV. The Horticultural History of *Calochortus*-13th Installment

Wilder, Louise B., *Adventures with Hardy Bulbs*, N.Y.: Macmillan, 1936 [Again, a major treatment, but not so long as L. Roundtree. Useful for northeastern growers, and by extension, wet and/or temperate climates. This is the first of two installments-Ed.]

"Gardeners are accustomed to thrills, not the kind with which they are confronted in the press or on the screen, but those none the less authentic stirrings of the blood caused by the recognition of uncommon beauty or by unexpected success in some field of horticultural endeavor. Amazing and lovely things happen daily in even the littlest garden. But to him who grows successfully for the first time a collection of *Calochortus* may be confidently be promised surprise and delight such as he has not heretofore experienced. These natives of our west country, it seems to me, stand virtually alone among flowers in their strange and fantastic beauty, their amazing diversity. I can call up no words that will give an adequate idea of their pure and brilliant hues, the exquisite brushwork on their satin petals, the startling "eyes" that ornament them, the breadths of Persian embroidery, the silken fringes, the velvet like pile that is the embellishment of many. The doubting Thomases must see them to believe in their reality. They will prove a veritable revelation.

"The *Calochortus* belong to the Lily clan. There are something like half a hundred species, perhaps more, scattered chiefly along the Pacific Coast, from Washington to Mexico, but some species range as far east as Colorado. They inhabit such widely differing localities as the summits of mountains, deep



valleys, meadows, wooded areas and burning deserts. Of the thirty-six kinds I have grown here [N. Y. state--Ed.], all save one (*C. catalinae*) have proved perfectly hardy, surviving below-zero temperatures without loss of life or diminution of vigor, and with only the light covering of salt hay that is given to the rest of the garden. Nevertheless, it must be admitted that these plants are not easy to grow or keep in eastern gardens. I do not pretend to have solved the problem of just why this is so, but the idiosyncrasies of climate, chiefly of rainfall, are among the factors to be blamed... "In the meantime, these flowers may be grown in eastern gardens with a fair degree of success if preparation is made for them. A year's trial proves nothing; almost any bulb will do what is expected of it the first year under almost any conditions--it is the second and the years thereafter that tell the tale. One thing the *Calochortis* seem to require is a complete rest in the late summer and autumn, and the incitement to growth to which they are subjected by our frequent summer and autumn showers, and the watering they receive in the natural care of our gardens is bad for them. They should be kept as dry as possible all through the autumn; otherwise they are apt to start into growth, and this young foliage is fatally injured by the first frosts. In any case, they are not recommended for use in ordinary garden borders. In a well built sunny rock garden, with its deep, well drained gritty soil, they are more than apt to thrive for several seasons; or an exclusive border may be made for them. This should face the south, be protected on the north by hedge or wall, and be raised a few inches above the surrounding ground. The soil should be dug out to the depth of at least a foot and replaced by a course mixture of grit, humus, stone chips, and a little ordinary loam. Thus will heat and light and drainage be assured them. They want moisture during their spring growth; but if we refrain from watering this border after the flowers have faded, the droughty conditions so dear to their hearts during their resting period will be at least partially maintained. To grow them under such conditions is perhaps the most certain to bring success, and it is a very good way if one wants them for cutting (they are lovely for this purpose) or for observation.

"But the rock gardener will not be able to resist scattering these lovely things over his hills and in his valleys, and here, of course, they must take their chance with the treatment that is given the other plants there grown. It is in the rock garden that I have chiefly grown them, and a trial of three years has surprised me by its many happy returns. The longest lived, however, have been among the Cat's Ear type. These have persisted in my own garden and in other gardens that I know of for more than twelve years, though they have shown little, if any, increase.

"Mr. Purdy has advised digging up the corms after the foliage has matured, and storing them in a dry place as is sometimes done with Tulips; but this is a chore that most busy gardeners will shirk, and it seems to me that the surest way to enjoy these flowers is to devise the best possible conditions for them, and then not to expect too much of them in the way of longevity. We may experience happy surprises, but... we shall not be cast down by failure. The bulbs are inexpensive, and even if we replant them every few years, the cost will not be excessive. They are well worth their price even for a single season's delight, but it is safe to say that if they are given the maximum of sunshine, drainage and late summer and autumn drought, more than a single season is assured.

"Because of their tendency to make an early fall growth, the corms should be put into the ground as late as possible. I like to wait until after Indian summer, in November, in this New York neighborhood; thereafter the cold will keep them in bed, and after the ground is frozen a light covering of salt hay or oak leaves will prevent their starting up too early in the spring, which they are inclined to do with the first warmth. Altogether, they are fidgety things, and their restlessness must be circumvented. The corms, Tulip-like, should be put into the ground at about twice their own depth, and if you want to cover them with sand it will do no harm, and perhaps some good. Remember that when they begin to

grow in earnest in the spring, they want water--if the heavens do not supply it, the hose must be resorted to--and do not be tricked into taking the winter blanket off the moment you see the little impatient tips piercing the ground; remove it little by little, hardening them off by degrees and protecting them from their own impetuosity."

## V. Conservation: "Root Project"

Lynne Dee Oyler, field ecologist and botanical/biological surveyor for the "Root Project" has offered seed of *C. clavatus* and *C. obispoensis* to those willing to grow bulbs. This project involves transplanting bulbs of these species out of a Canyon in San Luis Obispo Co. which is being developed, to save them. She requests that one third of the bulbs grown from such seed be allocated for return to the project, so it can be replanted in its native range. Members should contact Mrs. Oyler at 4280 Buena Vista Drive, Paso Robles, Ca. 93446

## VI. Thoughts on the Classification of the Mexican Cyclobothras

Instead of doing a species this issue, some comments on the classification of the Mexican Cyclobothras as a whole will be featured in this issue. In the classification we have followed so far (Vol. III, #4-Vol. IV, #2), as in treatments of previous sections, we have followed the *Monograph* of M. Ownbey, the recognized authority for the species. Prof. Ownbey brought order to chaos in *Calochortus* classification, named several new species, and laid down criteria for classifying future finds. Unfortunately, he did not have a great deal of Mexican material at his disposal, and some of what he had had been collected over one-hundred years or more before. While he did excellent pioneering work on identification and classification, certain addenda to his work can be made.

A. One point of difference between subsection *Barbati* and subsection *Ghiesbreghtiani* is that only the latter are erect, the barbati are all nodding. However, *C. pringlei* is included in the barbati, and it is erect. It was described as erect by Painter in 1911, but this must have been overlooked by Ownbey, possibly because his specimens were old, or depauperate, and had "nodded" from age. Be this as it may, the species is indeed erect.

B. Another point concerns petal hairs. Subsection *Barbati* is supposed to be "hairier" on the petal surface than subsection *Ghiesbreghtiani*. However, two of the species in the latter subsection exhibit a significant covering of petal hairs, viz., *C. ghiesbreghtii* itself, and *C. ownbeyi* (ined.), the latter of which, of course, was not available to Prof. Ownbey.

C. Still another point of difference between the two subsections is in the production of bulbils in the leaf axils. Subsection *Ghiesbreghtiani* is almost never supposed to exhibit bulbil production, (while the barbati do so more often). However, with the exception of *C. vanustulus*, all the species in this subsection have produced bulbils, under cultivation, while *C. pringlei*, a barbati, has not. One factor involved here may be the lack of a pollinator, which, since no seed is being produced, may direct the plant's energy into bulbil production (cf. the practice of some growers of chopping off the flowers of Hyacinth spp. in order to increase offsets). *C. vanustulus* has been pollinated here, which may account for the lack of leaf-axil bulbils. In any case, bulbil production is not a clear point of difference between the two subsections.

D. The third subsection, the *purpurei*, also are split between hairy and relatively hairless species; and between bulbil producing and non-bulbil producing species.

E. Finally, some species fall in between subsection *Barbati* and subsection *Purpurei* in their characteristics, notably *C. nigrescens*, *C. balsensis* and *C. spatulatus*. These have the hairy petals of the typical barbati, but the amplexicaul, wide, upper cauline leaves, and the greenish sepals of the *purpurei*.

In order to take these factors into account, a revised classification might be proposed, with more subsections. To this end, the following classification has been drawn up, which groups species in a novel



way. As it has not been done by a professional botanist, it is only a suggestion, and needs critical scrutiny by a specialist. It is a preliminary effort. For what it is worth, then, it is:

**Group I.** Generally low bulbil production, erect flowers, hairs confined to the base of the petals.

- a). *C. exilis* b). *C. fuscus* c). *C. venustus*

**Group II.** Low to high bulbil production, erect flowers, hairy area extends well above base of petals.

- a). *C. ghiesbreghtii* b). *C. ownbeyi* c). *C. pringlei*

**Group III.** Low to moderate bulbil production, nodding flowers, hairy petals.

- a). *C. barbatus* b). *C. barbatus* var. *dihualhuanus* c). *C. marcellae*

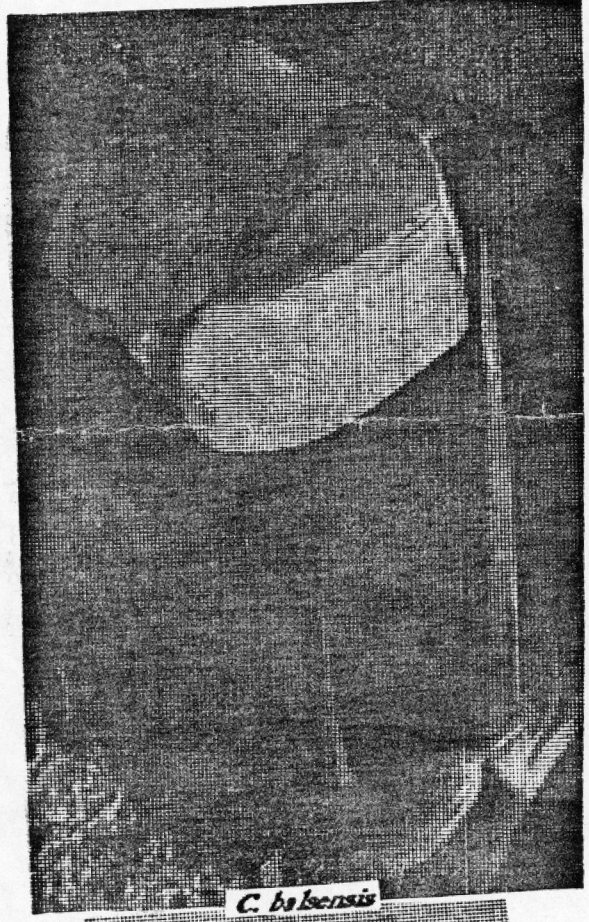
**Group IV.** No to high bulbil production, leaves amplexicaul and wide at base, nodding flowers with greenish sepals.

**Subgroup I.** Petals with hairs extending over most of the surface. a). *C. balsensis* b). *C. cernuus* c). *C. nigrescens* d). *C. spatulatus*

**Subgroup II.** Petals with hairs limited to certain areas of the petals. a). *C. foliosus*(?); b). *C. hartwegi* c). *C. purpureus*



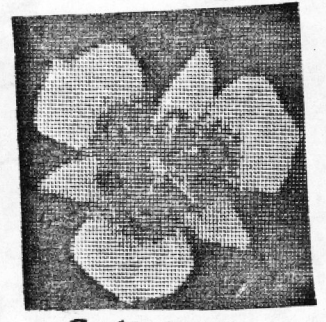
*C. marcellae*



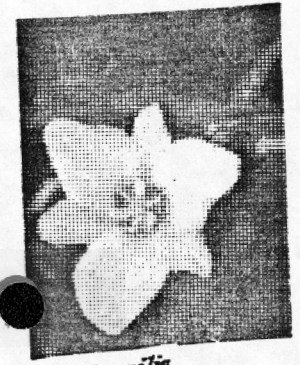
*C. balsensis*



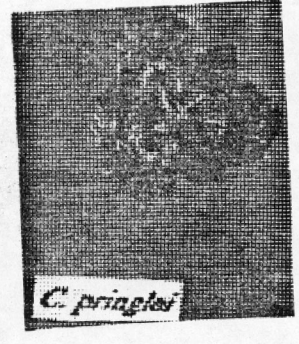
*C. hartwegi*



*C. ghiesbreghtii*



*C. exilis*



*C. pringlei*