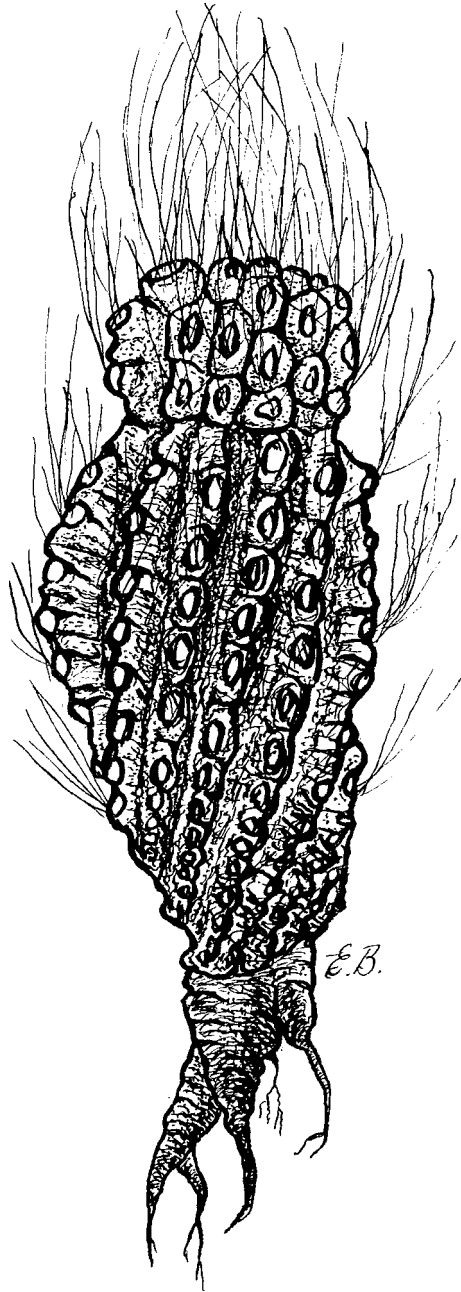


# THE CHILEANS '73

VOLUME 7 NUMBER 25



PYRROCACTUS CRISPUS

ACTUAL SIZE

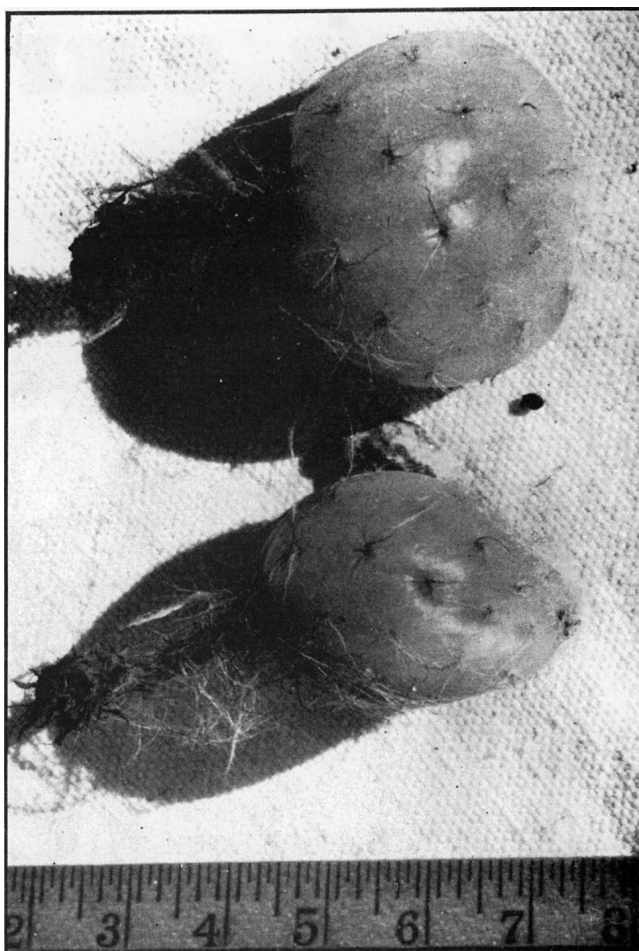
Collection - E.W. BARNES



*Oreocereus fossulatus* v *flavispinus*

PHOTO & COLLECTION

Mrs L.E. McIntosh, New Zealand



*Oreocereus Hendriksenssonianus*  
Fruit

C. & S. JNL U.S.A., XVII.2: 1945



*Oreocereus trollii*

PHOTO & COLLECTION

R.W. Field Australia



*Oreocereus*  
*Hendriksenssonianus*

KRAINZ  
DIE KAKTEEN

## OREOCEREUS FLOWERS by R.W. Field

We are about 120 miles north of Melbourne and cut off from the coast there by a mountain range, which means we escape the rain and cold changes that are Melbourne's lot - giving us better conditions for growing cacti, especially the desert types.

There are dense fogs on some of the winter mornings but fortunately we don't get many of these. The ground is very soggy following rain. Sometimes after what is a lot of rain for us there will be water round the plants for days on end. Weeds are a problem during the winter - we can't do much about it, except running a motor mower among the plants whenever we can use it. Our soil is a heavy clay loam and if allowed to set in summer it is hard enough to almost turn a pick or bounce a crowbar. This could well be the reason that we are free of nematodes - for according to findings they shun such a soil.

The largest plant of *Oreocereus celsianus* we have in the garden has thirty six stems, most of them six or seven feet high and 7" in diameter. This plant developed from a cutting about two feet long that I planted 21 years ago. It flowers abundantly each year with flowers produced fairly evenly around the apex of the stem - other than on any stems that are close up against larger stems or otherwise sheltered on one side. I would say that 95% of the flowers set fruit. As all our plants are grown in the open garden there are bees and insects galore so it is possible that the fruits and seeds are hybrids. The fruits are green at first, at maturity they are a bright lemon yellow or pale golden yellow and packed like sardines on the tops of the stems - with odd fruits here and there on the stems. The fruit is hollow and turgid when collected - the walls are approx. 1/8" thick. There are a few clusters of hairs on the fruit, with between 6 and 20 hairs of between 3 and 10mm long. There is a scale at each cluster, about 2 mm long with a black tip. This summer has been unusually hot and quite a few of the fruit on the *O. celsianus* plants were cooked. We gather the fruit twice daily, when it comes away at a touch, otherwise it falls to the ground and the ants quickly get away with the seed.

I measured one fruit and it was 2 1/2" long and 2 1/8" in diameter; another pod measured 2 1/2" by 2 1/4" - I counted the seed from this one and found there were 1012. This morning - collecting *O. celsianus* pods - I ran the rule over a large one - 3" x 2". The fruit does not split up the side when ripe or open up at the base - if not collected it simply falls to the ground; as with many fruits the mass inside is held in position until it dries up or is collected. The pulp is sparse - semi dry - and all that is needed to extract the seed is to cut 1/2" off the base of the fruit and a couple of taps with the back of a knifehandle is enough to tumble all the seed out.

The seed of *O. hendricksianus* is collected in the same way but the seed of *O. fossulatus* is secure in moist pulp and has to be washed several times in a linen bag and squeezed out to get rid of the pulp.

The *Oreocereus trollii* in the photograph is 3 ft high and the stem is 5" thick: this and other *trollii* in the garden are older than the *celsianus* by two years, but of course only half as high - they are very slow growers with us and shy flowerers.

### Comments on Oreocerei

..... from Mrs R. Howard

"I have some very lovely *Oreocerei*; one *O. ritteri* is a very strong plant covered in white wool and with thick orange spines about 4" long - it is really magnificent. I also have an *O. ritteri* (?) with thick curly wool tipped chocolate colour which also has long spines.

"*Oreocereus fossulatus* v. *rubrispinus* is a thin plant, about six feet tall and flowers well for months on end. The flowers are a dull mushroom colour and long - about 4" or 5" long. *O. fossulatus* is a rather brighter, greeny pink shade and about 3" long, a slim tubular flower slightly curved at the end with an oblique tip. It has a protruding bundle of stamens and the

pale green stigma well beyond that. The flower stays open all the time for some days.

"*Oreocereus hendricksenianus* branches from the base and is very woolly. It flowers at less than two feet and carries flowers most of the year; they stay open for several days. The flower is almost reddish purple, broader petals, opens wider, tube curved, stamens yellow and stigma green."

..... from Mrs L.E. McIntosh

"In my collection I have a plant of *Oreocereus fossulatus* var. *flavispinus* which I grew from Winter's seed, sown eleven years ago. The plant is now 36" high and grown in a container; it flowered for the first time this year.

"The seeds were catalogued as FR 100 and entitled *O. fossulatus* type (*flavispinus*), the *flavispinus* in brackets was possibly added to differentiate it from the var. *rubrispinus* which was also listed. My plant and others in the district has straw coloured centrals and sparse, long, silky white hair. My *Oreocereus ritterii* has the same colour central spines but it is a complete white mass of hair.

"I would be inclined to think that this species flowers by age and not by size, for checking with other growers round here I find that others of the same age have flowered round here, although they are much smaller than mine. All but one are grown in containers - the one grown with free root run has not flowered. I have not learned of another *Oreocerei* in this district that has flowered yet, the oldest of them being about 15 years of age.

"When I first noticed the buds on my plant they were just shiny green dots about the size of a small pea just above the top of the areole, on the side of the plant away from the sun. They grew slowly and steadily for about a week forming a tube shape with a pointed tip. When about half this length they started to turn dark reddish green in colour. The tube then elongated further but the tip filled out somewhat and started to tilt downwards, like the bud in the photograph. This took about another week. The tip of the bud then took another four days to open wide, by which time the tube was about  $2\frac{1}{2}$ " long, the petals being a further  $\frac{3}{4}$ " in length.

"I thought the flower shape was very like that of *Matucana* but whereas the flower tubes of *Matucana* have scales with hairs, my *Oreocereus* flower had quite long sepals and no hairs. The flowers opened at 4.00 p.m. and then remained open for three days without closing at nights.

"The flower consisted of nine narrow pointed outer sepals, purple brown in colour like the tube, nine pointed inner ones light green in colour with a dark greenish brown mid stripe; then an inner row of nine petals proper, wide and blunt,  $\frac{1}{2}$ " long, pale lilac pink with a very faint green stripe. There were a great many bright purple stamens slightly shorter than the petals - coming to just beyond the top of the tube. The stigma was green with eight green lobes; it extended an inch beyond the petals.

"The flower was not self-fertile but I managed to set one flower by crossing it with *Seticereus icosagonus* by using a brush. I also tried with *Trichocereus*, *Echinocereus* and *Lobivia*. This one pod is ripening now and is very like the seed pods on *Submatucana*; it was very dark green at first but about eight weeks after cross-pollination it gradually changed to a much lighter shade, over a period of two weeks. The seed pod then fell from the plant of its own accord."

..... from H. Middleditch.

"The seed pod referred to above was received from New Zealand, being exactly seven days in transit. It was about 1.5 cm in diameter when examined, this probably being smaller than when it was on the plant due to shrinkage in transit. There were about a dozen minute depressions on the outer surface bearing faint wisps of white hair. It is very probably that there would be similar minute hairs in the axils of the tube scales, as mentioned by J.D. Donald in relation to *Matucana*



(Chileans No. 16 p. 10) though they would not be visible on the flower tube. The flower remains were strongly adherent to the fruit, just over 3 cm in length. The wall of the fruit was app.  $1\frac{1}{2}$  to 2 mm thick and quite turgid. The seeds were held in a pulp rather reminiscent of a *Cleistocactus strausii* which once set fruit for me. I expect that the pulp in the *Oreocereus* fruit would (like that in *strausii*) have been white when fresh - it had darkened in transit, presumably. The seeds were black, about 1 mm across, and I counted eighty of them in the one fruit. It was not too difficult counting them as they could be segregated one at a time with a pen-knife whilst the pulp prevented the residue getting lost.

"It appears that the first *Oreocereus* seen in Europe were collected by Thomas Bridges and that one or two of these plants found their way into the collection of Salm-Dyck. The first description of an *Oreocereus* appears in the comprehensive catalogue of the plants in Salm Dyck's collection, *Cact. Hort. Dyck. Cult.* 1849, in which it was described as *Pilocereus celsianus* Lem.

"Backeberg expresses the view in his *Die Cactaceae* that the description of Salm-Dyck's plants is a composite of *O. celsianus* and *O. trollii*. Both these species are to be found in northern Argentina and southern Bolivia, apparently extending towards the valley of the Rio Pilcomayo. The route taken by Bridges to Potosi and beyond would bring him into the region in which these plants grew.

"*Oreocereus fossulatus* is to be found further to the north, between the Rio Pilcomayo and La Paz, in Bolivia, whilst *O. hendriksenianus* occurs in southern Peru.

"Most habitat photographs show these plants growing in conjunction with low-growing bushes which are fairly widely dispersed with much bare ground between them and apparently little grass. This would suggest that the photographs were taken in the 'herb-poor' zone between about 3,500 and 4,000 meters altitude. In Backeberg's *Die Cactaceae*, an upper limit of 4,000 m altitude is mentioned for *O. trollii* and a location of 3,000 m is noted for *O. hendriksenianus*.

"The long, slim, tubular flower might suggest that the humming bird was the typical pollinating agency for these plants. Proctor and Yeo (*The Pollination of Flowers*) note that "In the tropics, the flowers are largely adapted to bird pollination, there being a comparative dearth of highly-developed flower visiting insects. Bird pollination is known to occur up to a height of about 12,000 ft. in the mountains of South America, the birds migrating locally to these altitudes. Bird flowers are scentless, for birds have little or no sense of smell; they are, however, highly sensitive to colour. Red and orange are commonly found among bird flowers. A feature of the colouring of bird flowers is the prevalence of harsh colours and the frequency of peculiar colour combinations, such as a mixture of green, yellow and scarlet."

"The uppermost altitude given for the occurrence of *Oreocereus* would appear to be barely within the reputed upper limit for humming birds, but the red petals, yellow protruding stamens and green exserted stigma would suggest a flower designed to attract birds. Some bird-spotting in the high Andes would seem to be desirable for more precise information."

..... from F. Ritter (Winter catalogue 1953)

"*Oreocereus trollii* FR 44, curly white hair, red or yellow centrals, one of the most beautiful novelties of South America. This variety stands the most cold of all cacti as originating of sections (=occurring in places? - H.M.) over 4000 m (14,000 ft) above sea level. Yearly average temperature of 45° Fahrenheit. Fr. Ritter found these plants with flowers and absolutely covered with hoar-frost."

## THE GENUS WEINGARTIA

In the early 1930's Curt Backeberg undertook several lengthy cactus collecting trips to South America, spending much of that time in southern Peru, Bolivia and northwest Argentina. During these trips he covered quite a lot of territory in Bolivia which had previously only been searched for cacti either superficially or not at all. In his report on his 1933 expedition (J.C. & S.S.G.B.) Backeberg observes: "When we were approaching Argentina, on a fairly successful expedition of considerable duration, I found a wonderful Echinocactus, which is now showing beautiful red buds in cultivation and seems to be a *Neoporteria* - *Echinocactus fidaianus* sp.nov. The spines are all colours from yellow to purple black, and the grey ribs are almost tubercled. A very attractive plant which has a small relation resembling *Echinocactus mandrogora* with the same swollen root. These are probably the representatives of the genus *Neoporteria* which have pressed furthest towards the east."

Evidently this plant must have flowered for him, for later in 1933 Backeberg described the plant and flower under the new name of *Spegazzinia fidaiana*. This new genus was named after Dr. Carlos Spegazzini who had carried out a considerable amount of work among the cactus family. However, it was then pointed out by Prof. Werdermann that this name was already in use for a genus of algae. In place of the name *Spegazzinia*, Werdermann proposed the generic name *Weingartia*, after the well known cactus collector W. Weingart, and this new genus appeared in 1937.

The two species upon which the genus was established were discovered by Backeberg not far from the border between Argentine and Bolivia, at an altitude of about 10,000 ft., within the broad band of peaks, high plateaux and valleys of the eastern cordilleras. This location is in the vicinity of the highest chain of mountains which bound the eastern side of the Altiplano, roughly a third of the way from the east to the west flank of the Andes. At this place, the scant rainfall of perhaps 12 inches per annum may often come as sleet; the daytime temperature will rarely exceed 50° F in the shade and on most winter nights the temperature falls below freezing point. In his harsh climate, low bushes of *Psila boliviensis* abound on gentle slopes, where they are usually found occurring spaced a few yards apart. *Adesmia horridiuscula* and *Fabiana densa* are almost as plentiful and a few other species of low bushes are found in smaller numbers. In hollows and valleys the tola bush *Parastrephia lepidophylla*, *P. phyllicaeformis*, and other species of the genus, will be found, again only low-growing. On the plains and in marshy places many species of grasses will be found, almost covering the ground in places.

In the middle reaches of the Quebrada Humahuaca and the Rio San Juan, one finds a greater variety of vegetation. There may be even the occasional low tree in the valley bottom, such as *Prosopis ferox*, *Schinus aureira*, or *Baccharis salicifolia*, together with a much wider variety of low bushes which may exceed a yard in height, and not many grasses. On the rocky slopes various bromeliads grow, such as *Abromeitiella brevifolia*, *Tillandsia gilliesii*, *Tillandsia pusilla*, *Deuterocohnia strobilifera*, *Puya fiebrigii*, *Puya dyckiioides*, etc. This vegetation gives way to one comprising more grasses and fewer bushes at around 9,000 ft altitude, but on favourable slopes the steppe vegetation rich in bushes and bromeliads may climb to 10,000 ft. altitude. The information available for the finding place of the very first two *Weingartias* would suggest that they came from around this transition altitude.

Various species of *Cleistocactus*, *Lobivia*, *Parodia* and *Trichocereus* are found in fairly large numbers up to about 9,000 ft. altitude. As the climate becomes harsher above this altitude, one or two species of *Lobivia* and *Rebutia* and the odd *Parodia* are to be found, but only *Helianthocereus*, *Trichocereus poco*, *Oreocereus trollii* and various *Tephrocactus* are to be found in abundance, together with these two *Weingartia*. In the drier parts of the Andes, further to the west towards the borders of Chile, only *Neowerdermannia* and various *Tephrocacti* are to be found, with some tough grasses and a few bushes.

In this habitat, it is hardly surprising that these first two *Weingartia* were found to have

developed a swollen root - more correctly described as a buried stem, connected to the more orthodox body by a somewhat narrowed neck - although not as greatly narrowed as those found on some *Neochilenia* and *Pygmaeocereus*. In the early 1930's (*Pygmaeocereus* having not then been discovered) very few plants were known to possess this particular root formation and so it was quoted as a diagnostic characteristic of the new genus. The buds and flowers were quite naked of hair or bristles on the ovary and tube, like *Gymnocalycium*. Spines were fairly stout, outstanding, centrals and radials virtually indistinguishable, all standing fairly close together almost like a broom head, spreading a little more later but still quite outstanding as opposed to radiating.

The first two species were named *W. fidaiana* and *W. neumanniana* by Backeberg. Only two years afterwards a further species was added - *W. cumingii*, which had appeared as *Echinocactus cumingii* as far back as 1849. In the 20th century this particular plant was moved from one genus to another as various authors attempted to ally it with plants having similar characteristics. Finally Backeberg put it into the genus *Weingartia* in 1935. This was based largely upon the naked flower, for the rootstock of *W. cumingii* was not swollen, the flowers were only about half the size of those on the then two existing species, and the spination was less robust, the spreading radials being finer than the centrals. This new species of *Weingartia* came from a location some 300 miles to the north of where the first two *Weingartias* were discovered, in the Cordillera Oriental on the eastern edge of the Andes. The western flank of the Cordillera Oriental falls rapidly down to the lowland jungles of the upper Amazon tributaries. These windward slopes are liberally watered and the leeward side has an annual rainfall of no less than 25" per annum, which would explain the absence of any swollen rootstock.

The 1959 edition of Borg's *Cacti* included this last species *cumingii* but also repeated the original diagnostic feature of the swollen root under the description of the genus, a combination which can be somewhat confusing.

In 1950 Backeberg added a further plant to this genus, *W. hediniana*, with an appearance somewhat akin to *W. cumingii* but emanating from a locality about 60 miles to the south, not far from Sucre. In 1951 the collecting work of Freidrich Ritter and Martin Cardenas produced a flush of new *Weingartia* species names, spread from the vicinity of the growing place of *W. cumingii* to over one hundred miles south of Sucre. In 1951 the collecting work of Freidrich Ritter and Martin Cardenas produced a flush of new *Weingartia* species names, spread from the vicinity of the growing place of *W. cumingii* to over one hundred miles south of Sucre. This left a gap of just over one hundred miles between this northerly zone of growing places and that of the two original species further south.

The most southerly of these new species was *W. lecorensis* Card., which came from a locality as high and nearly as harsh and dry as that in which *W. fidaiana* and *W. neumanniana* were to be found. Cardenas did not refer to the nature of the rootstock in his diagnosis but his accompanying photograph depicts a plant with a thickened root in the form of two or three descending tubers.

In 1957 Paul Hutchison described *W. westii* (as *Gymnocalycium westii*) from Cuchu Ingenio, South of Potosi, a habitat almost as harsh as that supporting *W. fidaiana* and *W. neumanniana*. This plant, too, was quoted as having a swollen rootstock and a narrowed neck. Then in 1958 Cardenas closed still further the physical gap remaining between the northern and southern distribution areas, with the discovery of his *W. cintiensis*. In his *Kakteenlexikon*, Backeberg states that this plant was not described, but this must be an oversight since a valid publication of the name had previously been made. In the *Kakteenlexikon* there is a fine colour photograph of one of these plants taken in habitat by Rausch, who had also come across this species in his perambulations around the Andes.

Lau recently recollected most species of *Weingartia* and Knize also offers some species; one of Lau's new discoveries was found in the "gap" between the two original species and the many species to the north, in the shape of Lau 905. The name "*hediniana*" applied to this plant will have to be revised, for it would seem to have affinities with the *fidaiana*-*neumanniana*-FR 50 complex.

All these plants are yellow flowering with the exception of the southernmost FR 50, which is more orange-red in its flower. Currently the following species may be encountered:-

*W. chuquichuquisensis* Card.  
*cintiensis* Card.  
*corroana* Card.  
*cumingii* (Werd) Marsh.  
*erinacea* Ritt.  
    v. *catarirensis*  
*fidaiana* (Backbg) Werd.  
*hediniana* Backbg.  
*lanata* Ritt.  
*lecorensis* Card.  
*longigibba* Ritt.

*W. multispina* Ritt.  
*neocumingii* Backbg.  
*neumanniana* (Backbg) Werd.  
    v. *aurantia*  
*pilcomayensis* Card.  
*platygona* Card.  
*pulquinensis* Card.  
*riograndensis* Ritt.  
*sucrensis* Ritt.  
*vilcayensis* Card.  
*westii* Hutch.  
*torotorensis* Card.

#### Comments on Weingartia

..... from Mrs L.E. McIntosh

"I am most surprised that your Weingartias are reluctant to flower - I have several different plants which flower profusely from early spring through summer and well into winter.

"A large plant of *W. multispina*, now 6 years old 3" tall and 4" broad, last summer produced two flowers from each areole from all the areoles covering the top of the plant, all at one time, then flowered again from the same areoles later in the season. This is not abnormal for the Weingartias in my collection, but I don't know of any other species of cactus having done it.

"The flowers vary in shades of yellow. *W. neocumingii* is the darkest - nearly orange - with only a little difference amongst the others. *W. pulquinensis* also flowers profusely with slightly smaller flowers than *W. multispina* but also two flowers per areole. I have still to flower *W. lanata* and a few other 2 year old seedlings. *W. riograndensis* has very heavy spines and looks more like a *Pyrrhocactus* - this is one that has not yet flowered. I would also put *W. hedini- niana* in this group.

"Last season I crossed *W. multispina* with *Sulcorebutia steinbachii* and got seeds from both plants without any trouble."

..... from R. Zahra

"All my plants of Weingartia have flowered for me when very young. Weingartias *lanata*, *chuquichuquisensis*, *fidaiana*, *hediniana*, *sucrensis* and FR 816, have all flowered after 2 to 3 years from seeds. This year they are producing masses of flowers. It is perhaps enough to say that one plant of *W. lanata* has 24 buds showing (early in May) and more appearing. I found out that they don't really set seed unless cross-pollinated. Because of this I have only obtained seeds from *W. lanata* where two plants opened their flowers at the same time.

"However, I have at least two plants of each species and here in Malta Weingartias continue to flower over a long period of time; the best period for flowers is May-June but there is another period in August and still a few flowers in September. So whenever both plants of one species are in flower, I cross-pollinate and expect to have more species set seed. The fruit is round and yellowish-green. The remains of the flower persist on the fruit to the very end. The fruit is quite small, only about 3 mm in diameter. The seeds don't fall, but persist in the fruit even when this has completely dried up and turned brown. Only when the outer skin of the fruit starts to disintegrate do the seeds start to fall around the plant.



"The fruit of *Weingartia* is very different from all the others, but if I had to compare it with that of another genus, I would think that it is closer to that of *Rebutia* and *Sulcorebutia* than anything else.

"Not only is it quite common to have two flowers on the same areole, I have even had cases where each of the two flowers on one areole has set fruit and produced seeds.

"My plants are now all between 60 and 80 mm in diameter. They are almost four years old and have been growing in almost full sun without any shade at all, summer and winter."

..... from R. Ginns

"All my mature *Weingartias* flower freely and whilst they have often had two flowers from one areole and each plant bears dozens of dead flowers, I could only find one ripe fruit - this on *W. lanata* (seed enclosed). The fruits are very small, in contrast to those of *Gymnocalycium* and in my opinion form one good reason for keeping the genera distinct. In the past they have escaped my notice altogether but have evidently been present, as self-sown seedlings have appeared in the pots. No precautions have been taken against cross pollination but artificial pollination has not been carried out.

"In 1960 I received seeds from Winter of Ritter's collection of the following: *W. lanata* FR 814, *W. cintiensis* FR 373, *W. hediniana* FR 817, *W. multispina* FR 372, and *W. riograndensis* FR 813. These plants (or offsets from some of them) are still in my collection. All flower very freely, but *W. lanata* is the best. It is far superior to *W. hediniana* in view of the very woolly areoles, and I see no good reason for making it synonymous with *hediniana*.

"The plant of *W. cintiensis* is tuberous rooted but the tubers are much smaller than those on *W. neumanniana*. This plant has not offsetted. Ritters' seedlings of *hediniana* and *riograndensis* have produced offsets, as has *chuquichuquisensis*, a seedling from Donald, and also *pulquinensis*, a young import from Roanoke.

"My *W. cumingii* came from Churchman in 1952 - it is 5" in diameter but is not increasing in size now. It flowers well - it can have fifty flowers open at once.

"I have always been surprised that *Weingartias* are so seldom seen in collections. They are easy from seeds, quick growing, free flowering and showy. What more is needed?"

..... from R.E. Hollingsbee

"I note that in the Chileans you request information from those who have established imported *Weingartias*. I have established two plants of *pulquinensis*, flowered them, cross-pollinated, obtained seed, germinated it and grown on the seedlings to marketable size (but they were quickly snapped up !)

"I obtained my first *Weingartia pulquinensis* in October 1965 and the second in April 1967; these came from Cardenas via Roanoke at Ipswich and the work of establishing them had practically been done by the time I got them. I can't recall any difficulty in growing them on - I think they had been collected carefully in the wild and not roughly uprooted as many plants are and Roanoke's technique seems to be almost foolproof - i.e. a clay pot, not much bigger if at all than the plant, and an extremely sandy soil with very little nutriment. The emphasis is (or was) on growing the plant hard. Buyers of plants which might have been a bit shrivelled were advised to give a good soak by plunging it in rainwater before planting up. I have turned out one of my plants to see what kind of roots it has and find that, like my *erinacea* v. *catarirensis*, it has fibrous roots.

"These plants are much more densely spined than my *W. cumingii*. They are free flowering plants although I have not seen two flowers from one areole on a *Weingartia* as yet. *W. pulquinensis* opens its flower completely but the accompanying shot was of the plant flowering for the first time in cultivation and it may be that there wasn't quite enough sun to persuade it

to open fully. If anything this species has a slightly reflexed flower. Alan Craig has chosen a colour slide of the same plant for the Chileans slide library and that does show a fully open flower.

"It could almost be guaranteed that the two plants would be from different clones. In fact when in flower you can see slight differences in colour. By cross pollinating I mean transferring pollen from one of my plants to the other. I would think that all the flowers whose stigmas were dusted with pollen set seed. I have no trouble at all provided that the pollen is ripe and coats the brush. It is probably a lot easier to get plants to set pods down here than up north since conditions are very good. The seed pods are small, yellowish, fleshy at first, fading off to white or cream and, at an early stage, they are translucent and one can clearly see the black seeds.

"I don't see how one could compare them in any way with *Parodia* fruits which are very woolly and have minute seeds that one often finds by accident. *Weingartia* seeds are a reasonable size. Pods are up to about  $\frac{3}{4}$ " in diameter when dry. The pods don't split, as far as I can see, but no doubt in the open air the dry, papery pod would disintegrate under the influence of weather or other means."

..... from H. Middleditch

"I am intrigued by the imported *pulquinensis* with the fibrous roots, for five years should be long enough for some sort of swollen rootstock to develop in cultivation. We find Donald and Hutchison saying that *pulquinensis* "like *westii*, has buried stems" (N.C. & S.S.J. 14.2:1959). Were they all really looking at *pulquinensis*? *Pulquina* is a far less arid and harsh locality than the more inland *Puna* where swollen roots/buried stems are to be found - no other *Weingartia* from the northern group occurring between *Pulquina* and *Sucre* appear to have been reported with buried stems."

..... from J.D. Donald

"*Weingartia* is a fascinating genus with strong links to *Lobivia* and *Sulcorebutia* on the one hand and *Gymnocalycium* on the other. It is also quite impossible to ignore *Neowerdermannia* in any discussion on *Weingartia*, indeed they are accepted by many authors as part of *Weingartia*. Paul Hutchison went further than anybody and placed *Weingartia* and *Neowerdermannia* in *Gymnocalycium*.

"*Cumingii* and *fidaiana* are the two poles around which *Weingartia* has largely evolved. I notice that the species list given above does include both *W. cumingii* and *neocumingii*. Paul Hutchison showed that *W. neocumingii* Backbg was synonymous with *W. cumingii* as known on the ground. (See his and my own articles on *Weingartia* in the N.C. & S.S. Journal of Sept. & Dec 1958 and June 1959). Martin Cardenas accepted that this was so, thereby questioning the need to have *W. pulquinensis*, since it was obviously part of the same population as *W. cumingii* found by Bridges many years ago at *Pulquina*. This left the variety *corroana* in the air - so Cardenas instead of making *corroana* a variety of *cumingii* elevated it to specific rank, which it hardly deserves.

"The variation within the *cumingii* complex is large, with two dominant types - the green calyx types and the red calyx types. The green calyx flowers are invariably paler in tone, i.e. pure yellow, than the red calyx flowers which are rich yellow to orange. Other variations concern the extent of wool in the floriferous areoles; narrow lanceolate linear perianth segments or broad spatulate acuminate segments; large raised tuberculate bodies or flattened tuberculate bodies; multiribbed or few ribbed bodies; multiflorous or single flowered areoles; longtubed or short tubed flowers. These can be permuted and from these permutations arise most of the described species and many of the undescribed forms that exist among the collected plants from the Ritter, Lau, Rausch and Knize trips to Cochabamba and Chuquisaca.

"*Weingartia torotorensis*, Lau 327, appears as an isolated species in a morphological sense and not at all closely related to either *cumingii* or *fidaiana*. Superficially the body of this

plant is close to *W. sucrensis* and *W. erinacea* but it also has a unique flower - the colour of rosy-mauve associated with *Sulcorebutia* but with an extremely short, broad tube - the fruit and seeds are virtually *Sulcorebutia*. Without much stretch of imagination it is easy to accept this plant as an intermediate between *Weingartia* and *Sulcorebutia*. There are other plants collected by Lau and Rausch which fill in on either side of this intermediate, such as the *S. flavissima* and *S. oenantha* of Rausch, Lau 337 and Lau 958a.

"*W. cumingii* and *fidaiana* are further apart than *cumingii* is from *Sulcorebutia*. The *cumingii* group as a whole is close to *Sulcorebutia*, whilst the plants centred around *fidaiana* are closer to *Gymnocalycium*. It would be a great pity to lose the genus *Weingartia*, but this must happen if the type species is really a *Gymnocalycium*, and the other species fit in with *Sulcorebutia*, all despite the fact that *Weingartia* is the older name. One cannot designate a new type, if there already exists a genus that could accommodate the remaining species after the departure of the type. Even so there are some quite large difficulties in this apparently facile solution. There is a group of *Weingartia* that are part way between the *fidaiana* group and the *cumingii* group - i.e. the *riograndensis* section - maybe these also ought to be regarded as bridging species between the *Sulcorebutia*-like *Weingartia* and the *Gymnocalycium*-like *Weingartia*. The *riograndensis* section consists of *W. riograndensis*, *W. longigibba*, *W. pilcomayensis* and *W. platygona*, all of which are closely related forms of each other - a group which is characterised by large broad shallow ribs and a long-tubed flower. Ritter's FR 813, 814 and 815 are also close to this group.

"These three lead naturally to the more *cumingii*-like forms of *W. chuquichuquisensis*, *W. sp. Rio Chico* (ex Lau, no number), and *W. lanata*, all of which still possess the very woolly and multifloerous areoles of the *riograndensis* group. These in turn lead to the *cumingii* group itself via *W. erinacea* and *W. sucrensis* - again these two are perhaps just the one species with two names. The flower is now reduced in tube length and the tube itself widens. *Weingartia multispina* and some forms of *W. pulquinensis* again tend to show very much more wool than the *cumingii*/*neocumingii* at the flowering areoles. *Weingartia erinacea* var. *catariensis* and *W. corroana* would appear to be largely only stronger spined forms of the species *erinacea* and *cumingii* respectively. *Weingartia erinacea*/*sucrensis* still show some tendency to multifloriferous areoles but it only shows rarely in the *multispina*-*cumingii* group. *Multispina* itself is perhaps only a good variety.

"Ritter's FR 816 is a very interesting *Weingartia* and is a perfect bridging plant between *W. cumingii* (*neocumingii*) with a red calyx and *Sulcorebutia krahnii*. The habitats are also not very far apart. FR 816 is the northernmost form of the *cumingii* complex. Its flowers are virtually identical with those of another *Sulcorebutia* i.e. *S. glomeriseta*, in both form and colour - yellow with orange base to perianth segments and an orange tube. *S. glomeriseta* is an oddity and its quoted habitat of Naranjito on the flanks of Mount Tunari is quite removed from the *Weingartia* habitats in eastern Cochabamba. Even so, the two plants *S. glomeriseta* and *Weingartia* FR 816 side by side are remarkably similar except in habit; *glomeriseta* form clumps of relatively small round heads, whereas FR 816 forms a large short cylindrical body but spination in colour, number, and distribution, areole siting and form, as well as flower, are remarkably similar. *S. krahnii* differs only in having a wholly yellow flower. Could it be that FR 816 is a natural hybrid? Could *Sulcorebutia glomeriseta* also be one, despite its way out habitat?

"Now to place *W. hediniana* - without much doubt it belongs to the *W. cumingii* group as a very robust form - larger flowers and stronger spines. It is an altogether larger plant than any other *Weingartia*, at least to judge by the metre long specimens that I have seen at the Jardin Exotique, Monte Carlo, however, these may have been grafted. There are some differences in plants of this name, depending upon the source. The original plants grown were obviously old imports under the name *Lobivia cumingii*, but differed largely by their more robust appearance from other *L. cumingii* then in cultivation. Seedlings were distributed in the early 1950's but I suspect they were hybrids *cumingii* X *hediniiana* as they did not differ greatly from the cultivated *cumingii*. Ritter's seedlings however did show stronger plants altogether and these

have been confirmed by the Knize plants.

"Weingartia vilcayensis I do not know, but I believe it may be Lau's Weingartia sp. Rio Chico. If so, it is of the intermediate group. Lau 324 is also a Weingartia, and not a Lobivia as distributed - it has yet to flower for me.

"This leaves only a few southern species to place. Weingartia lecorensis and W. westii are almost certainly identical. They differ perhaps only in size - lecorensis tending to grow larger and flatter individual heads. The flowers are identical. Paul Hutchison never "discovered" Gymnocalycium (Weingartia) westii, he observed it growing in the University of California Botanic Garden at Berkeley. The plant was originally collected by James West in 1937 at Cuchu Ingenio and deposited at Berkeley, but not described until 1957. W. cintiensis could be a white spined form of W. fidaiana; this latter can be either yellow, brown, red, or black spined. Usually the spines are long and straight and arranged in bunches like a besom, but not always. Some plants, especially Lau 908 show strongly curved shorter black spines.

"Weingartia Lau 905 is not a Weingartia after all - it was certainly never W. hediniana under which name it was distributed. Lau 905 is Lobivia cintiensis is one of its many forms. Any Weingartia labelled 905 is almost certainly Lau 908 - which I for one have seen at Sargent's nursery labelled 905! Lau's 5 and 8 are often muddled in the dealer's hands. Lau 908 is apparently a form of W. fidaiana, not wholly identical with Backeberg's plant.

#### Gymnocalycioid Weingartia

W. fidaiana  
cintiensis  
neumanniana  
FR 1102  
westii  
lecorensis

Neowerdermannia vorwerkianus  
chilensis  
peruvianus

#### Intermediate Weingartia

W. platygona  
longigibba  
pilcomayensis  
? vilcayensis

riograndensis FR 814  
chuquichuquianus FR 815  
lanata sp. Rio Chico

#### Sulcorebutioid Weingartia

W. cumingii/neocumingii  
multispina  
hediniana  
pulquinensis/corroana  
erinacea/sucrensis

torotorensis  
FR 816  
FR 812  
FR 813  
UN 615

..... from H. Middleditch.

"I found the comments from John Donald very interesting, especially since the groups or sections seem to match the geographical distribution of the various species. However, there are several points which appear to me to be open to question and yet others which offer magnificent opportunities for following up when browsing round the greenhouse.

"The plants of W. westii and W. lecorensis which I have seen are far from identical, differing in many respects other than size. I cannot recollect seeing a lecorensis with a thin neck between the thickened rootstock (buried stem) and the aerial body, but this appears to be the root form on westii. W. lecorensis has fairly long thin spines almost straight, not quite as compact and broom-like as fidaiana, but rather more spreading. The spines on westii seem to be stouter and more incurled. Certainly Cuchu Ingenio, the location of westii, is but 25 or

30 miles from Lecori; but half way between these two places is Vilcaya, which is presumably the location of Cardenas's *W. vilcayensis*. Further observations or comments on this particular species could thus help to throw light on the relationship between the other two.

"At a local Chilean's get-together here in the north-east, a discussion was held on Weingartias with the benefit of plants on hand from several member's collections, including a fine specimen from G. J. Swales labelled Lau 905, but which we must evidently regard as Lau 908 *W. fidaiana* form. This was a collected plant and was exhibiting a quite columnar growth, being three to four times its own diameter in height; perhaps it was a mental comparison between this and the *W. hediniana* growing columnar in the Jardin Exotique, to which J.D. Donald refers, which led to this particular batch of plants being distributed under the name of *hediniana*.

"I find it very difficult to swallow the suggestion that *W. cintiensis* is only a white spined form of *W. fidaiana*. Looking at Rausch's colour photograph in the Kakteen Lexikon of *W. cintiensis* one is struck first perhaps by the clumping form with a few heads all of fairly large size, without a main head towering above the basal offsets. The offsets have evidently been basal, so that the first thought on seeing the photograph in question is that one is looking at a *Copiapoa*. The spines curve somewhat upwards and the spines in the crown seem to be a chestnut brown colour. A single headed imported plant examined at the local get-together also exhibited both the brownish spines in the crown and the rather upswept spines round the body. Examination of other slides and plants of *W. neumanniana* showed offsetting from the sides and even the shoulders of the main body, but there was nothing to hand to show if and where *W. fidaiana* offsetted.

"Turning to *W. hediniana*, and John Donald's comment that this species belongs to the *cumingii* section; I am not clear whether he intends to mean that it belongs to the northern group of *Weingartia* as opposed to the southern group round *fidaiana*, or whether he means that it belongs in the *cumingii* section of the northern group. That it belongs to the northern group seems fairly certain, but the plants which I have seen labelled *hediniana* seem to be very distinctive from the *multispina-cumingii* section. These latter seem to me to have fairly small closely-spaced areoles, very little wool at all at the top of the areole, short spines of a honey-yellow colour and owing to the closeness of the areoles the plant looks quite spiny. On the other hand, *hediniana* looks to me to have much more widely spaced areoles and although I regard the spines as rather longer than *cumingii*, the latter seems on appearance to be the more spiny plant. There seems to be more wool evident at the top of the areole on *hediniana* and one can see the hump of the tubercle more readily, owing to the more open nature of the spination. Have I got a correct picture of these plants?

"The idea that FR 816 is a bridge between *W. cumingii* and *Sulcorebutia krahnii* is most intriguing. I must see if I can locate the finding places of these species; the problem here, I suppose, will be the usual lack of data on the discovery place of the Ritter collected plant.

"Recently I had an opportunity to see some plants at Hexham and amongst these was a very nicely growing specimen of *Weingartia erinacea* var. *catariensis*. A narrow, but quite acute groove was apparent between adjacent areoles, but instead of the areoles running together to form ribs and the groove running between them, the bottom of the groove disappeared into the top of the areole below. The areole was not placed quite vertically on the tubercle but slightly on the skew. This brought quite forcibly to my recollection the "areole on the skew with the upper part sunk in a groove" which was the first characteristic used by Backeberg to distinguish *Sulcorebutia*. I see that I shall now have to examine each *Weingartia* I come across in future to see whether and to what extent this feature is repeated; presumably one does not expect to find it on the southern species round *fidaiana*.

"The reference to *W. torotorensis* brings to mind the visit which we paid to De Herdt's nursery near the close of our 1971 Cactus Tour. In his new greenhouse he had a number of trays containing imported plants rooting up in perlite. Amongst these were some *Sulcorebutia* up to about 2½" across but quite flat, with dense golden spines. Close by was another tray of very similar looking plants, one or two even slightly larger, one of which was replete with two or three



rosy-mauve flowers apparently about to open, about two inches to the tips of the petals and with a fairly thin tube typical of a *Sulcorebutia* flower. There was only one puzzle. The label described them as *Weingartia*, Lau 327. I immediately went off to seek De Herdt who was busy serving other members from his main stagings. Shortly we returned to this prize, whereon I was firstly informed that the label was indeed correct, and secondly (despite all my blandishments) that nothing would persuade him to part with a single specimen from that tray. However, I think I am now sufficiently composed to enquire whether any of our members have a specimen of this plant in their collection and whether it has flowered - but, be warned, I shall be asking if a flower can be removed for preservation! "

..... from C. Webb

"My plant of *Weingartia lecorensis* was imported from Knize in Peru in summer 1972. It is tap rooted with a narrow neck above the bulbous root. Six months later it had still not rooted. The spines are up to 4.5 cm long, with a 'Y' shaped groove above the areole.

"*Weingartia cintiensis* came from Hallett in April 1971; even with constant bottom heat it was very slow and difficult to root, but it had rooted by Autumn 1971. The spines are straw coloured tipped brown when young, later pale horny; 2 to 3 cm long in habitat, new growth with me has spines shorter, 1.5 - 2.2 cm long and not quite so stout.

"*W. erinacea* v. *catariensis* came from De Herdt as Lau 983 in June '71. It was very difficult to root and often lost its roots at first. It finally rooted in June '72.

"*W. pulquinensis* has been in my collection over four years and flowers profusely each year. There is one fruit this year, 4 mm long, 3 mm diam., orange red with large pale scales greenish at the margins. Fruit has no stalk and is well embedded in the areole wool (similar to *Neowerdermannia*).

..... from R.D. Swan

"Through a friend I received (in November) imported plants of *Weingartia westii* Kz 498 and *W. riograndensis* Kz 507 which Knize had recently airmailed to him. Both plants were small (about 1" diam.). In December they were placed in plastic pots in a very warm spot against the kerosene furnace used to heat the greenhouse, and kept moist. *Weingartia riograndensis* shows no roots forming after a month, but *W. westii* is firmly rooted and the body has visibly swelled and shows new green growth. No other special treatment was given."

..... from G.J. Swales

"I have no trouble at all in growing seedling plants of *Weingartia*, but my experience with imported plants of this genus has been very mixed. About four years ago I bought a few imported *Weingartias* - *longigibba*, *lanata*, *pilcomayensis*, *sucrensis*, and *erinacea* var. *catariensis*. These have been in and out of seed trays, on and off fresh compost, put in the sun for a time and then in the shade, kept moist for some time and then kept dry, but whatever I did they just did not seem to want to do anything. They just hovered for a long time but at last they seem to be showing some signs of growth.

"Last year I obtained a plant from Sargent which, to judge by its appearance, could be a form of *fidaiana*; this only took a month or two to establish and the new growth has nearly doubled the height of the plant. The new spines are very nearly as long and as stout as those which grew in natural surroundings. The appearance of the plant is rather spoilt by the narrow neck between the old growth and the new. More recently I received a plant of *W. westii* from Knize - this has had little more than the winter months on the staging, but it looks as though it is now established in its pot."

ABOUT THE GENUS WEINGARTIA Werd. by C. Backeberg

(Translated by H. Middleditch from Cactus (France) 20.85:1965)

Having recognised as early as 1934 that this genus was formed by a completely independent group of species, I gave them the provisional name of "Bridgesia" in the B.f.K. This group of plants, originally classified by Y. Ito in the undescribed genus of "Gymnantha" should encompass plants characterised by the markedly sunken-in appearance of the flowers and likewise by the simultaneous appearance of several flowers on a single areole. But as the flowers in the genus *Gymnocalycium* (section *Schickendantziana*) would also appear to be just about similar, I restricted the definitive characteristics of these plants in 1934 in only taking into account the appearance of several flowers upon a single areole and proposed in 1933, in "Der Kakteenfreund" (p. 90) the name of *Spegazzinia* Backbg., in honour of the Argentinian botanist who was the first in his country to study the cacti of its regions in a thorough fashion.

It is however not easy in our time to portray the obstacles formerly encountered in the establishment of a new and systematic nomenclature. Misfortune moreover had followed me, my new nomenclature having not been retained. Werdermann, in effect, indicated four years later that the new designation had already been used to denote a genus of fungus and the same author gave the name of "Weingartia" to the new genus, in memory of my old friend of those days and connoisseur of cacti, Wilhelm Weingart. It is because of these circumstances that the name of "Spegazzini" has not been honoured, at least to designate a genus; however one is aware of "*Aylostera spegazziniana*" Backbg.

More recently there has even been a tendency, in the United States, to incorporate these new species in the genus "*Gymnocalycium*" (in the first place by Hutchison in C. & S.J. XXIX. 11-14; 1957). This proposal, considered aberrant by the connoisseurs, has not received general acceptance up to the present.

The type species of the new genus was "*Echinocactus fidaianus*" Backbg. and the only representative known at the time of Britton and Rose was "*Echinocactus cumingii*" S.D. (non Hopff., non Regel & Klein). The genus *Weingartia* has been confused by Britton and Rose with "*Echinocactus cumingii*" Hopff., of which the flowers were hairy and which constitutes a species which is no longer definable. Moreover as the name of Salm-Dyck was not the first, this species has been described under the name of *Weingartia neocumingii* Backbg. I will leave aside the other combinations leading to confusion (Kreuzinger classes these plants in the genus *Oroya* and Y. Ito in the genus *Gymnantha*).

If one classifies this group of species in the genus *Gymnocalycium*, it would obscure our understanding of those characteristic features common to all of the group. These features are as follows:- flowers pretty small and very short, fruit small, with few seeds, roots napiform, thickened in part and narrowed at the upper part; there are sometimes simultaneous formation of flower buds on one and the same areole. All these features never appear together in the plants of the genus "*Gymnocalycium*".

Cardenas in 1951 considered *W. neocumingii* as a species "practically unidentifiable" (Rev. Agriculture Cochabamba 6:26-29, 1951), although numerous examples of this plant were still to be found - in different European collections - (of which Cardenas would doubtless be unaware). This latter author described the plant under the name of *Weingartia pulquinensis* Card. (see photo). Those who are familiar with this species as well as *W. neocumingii* and the new names established by Ritter - such as *W. erinacea* Ritt., *W. longigibba* Ritt., may express doubts as to the necessity for retaining such a large number of different names to distinguish these species, when their appearances are rather similar and without variation. But this is a matter of personal opinion and I would not press the point any further.

In 1959 I expressed the view that Cardenas would be the first to determine the area of distribution of those representative examples of the genus *Weingartia*, described for the first

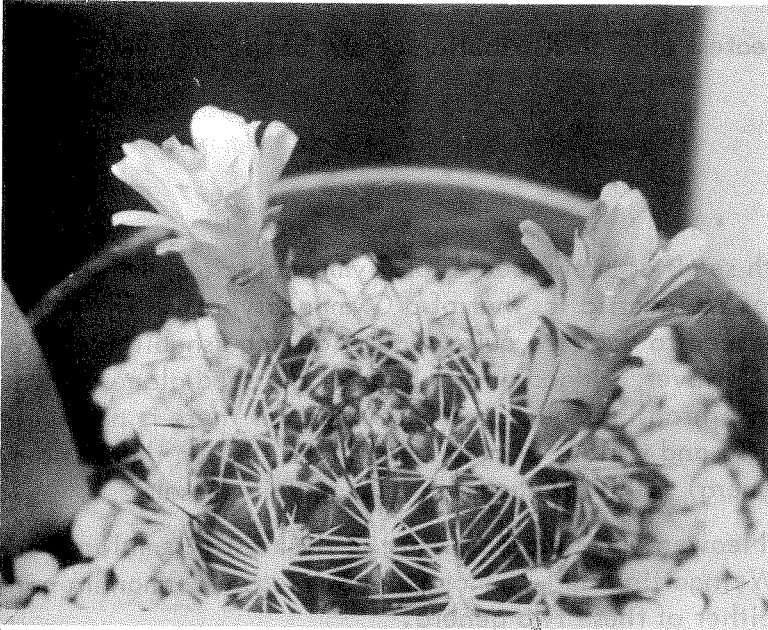
time and unknown up till then and I think that *W. pulquinensis* is part of this group. The accompanying photograph shows that this plant is furnished with a large number of very fine spines, but it will suffice to recall the great variation observable in the case of the varieties of *Lobivia famatimensis* (Hort = *L. densispina* : H.M.) to exemplify the doubts about this which surrounds the new names attributed to this group of plants. As in the case of Ritter, I have raised here - for the same reasons - the names of Cardenas, but I stand firm on the point that, despite this new nomenclature, these two authors have never met with or described a fresh *Weingartia neocumingii*, which may appear rather odd.

The characteristics of the species reproduced here (i.e. in the accompanying photograph - H.M.) are as follows:- Plant globular more or less elongated, of 10 cm in diameter, up to 20 ribs. Areoles round or elliptical, 5 to 10 mm apart. Spines all pretty well alike, 20-30, from 5 to 20 mm in length, very slender and slightly sharp, yellow at first then grey and partially recurved. Flowers yellow, of 2.5 to 3 cm in length. Tube and ovary pale green, carrying large scales. Lobes of the perianth spatulate and pointed. Origin - Bolivia, Province Florida, Department Santa Cruz, in the vicinity of the Pulquina-Taperas road, altitude 1,750 m.

It is impossible, with the assistance of these characteristics, to differentiate *Weingartia pulquinensis* from *W. neocumingii*. This latter plant has the particular characteristic of elongating and tapering off at the topmost part in the course of cultivation. This peculiarity is also to be found in the case of *Weingartia fidaiana* Backbg., found by me at Tupiza, which gives rise in old age to an enormous root recalling the shape of a turnip, which forms a fine characteristic of this species (outside of the important distance which has separated them geographically from the other species in the eastern part of Bolivia). The same peculiarity is to be observed in the case of *Weingartia westii* (Hutchison) Backg. (*Gymnocalycium westii* by the nomenclature of Hutchison). In the latter case, the same observations outlined above are applicable, that is to say that one may express serious doubts about this nomenclature and one may ask oneself if we are not simply dealing with a variety of *W. fidaiana*. On the other hand, the elongation of the plant does not occur in the case of *Weingartia neumanniana* Backbg. and its variety *aurantia* Backbg. (described in "Cactus" Nov. III. 15:1963). These two plants are to be found in the northern part of Argentina and are of low height, producing on maturity numerous offsets and difficult to extricate from their surrounding rocks on account of their napiform roots. The flowers of these two varieties have an intense orange-yellow colouration.

The disappearance of *Weingartia ambigua* (Hildm.) Backbg. seems likely. This plant was characterised by its wavy ribs, similar to those of an *Echinofossulocactus*, and it produces violet flowers of a medium height. We are unaware of its place of origin (Chile or Bolivia, according to Schumann). It is quite likely that this species may chance to be met with again in the vicinity of trails which would be little used in our time.

The species known under the name of *Neowerdermannia* Fric. would likewise assuredly belong to this genus, as I have indicated in "Die Cactaceae" III, p. 1795, 1959. Its description had been written, in ignorance of the nature of the flowers, in *Kaktusar* I:II, 85. 1930 and, moreover, with an incorrect reference to the origin of the fruit (growing "in situ", which is false: the minute fruit with but few seeds is in effect substantially located in a hollow.) Werdermann, in *M.d. D.K.G.* 227: 1930, admits with circumspection not knowing if its name is indeed justified. The characteristic features in common with the genus *Weingartia* are as follows:- small flowers, naked and scaly, fruits small and containing few seeds. There is therefore no clear dividing line between the two genera, so that I have been converted to incorporating *Neowerdermannia vorwerkii* Fric and *N. chilensis* Backbg. in my *Lexikon* into the genus *Weingartia* (see also *Cactus nov.* III 16:1963). In taking this step one has a better idea of the overall area of distribution of these plants, which is bounded to the north by the high plateaux of Chile or Bolivia. In the latter case, the area of distribution reaches as far as the western frontier of this country and towards the east as far as the Rio Grande and starting from Lane Titicaca, reaching into the interior of northern Argentina (one species only: *N. vorwerkii*). This genus therefore occupies a very extensive territory and the



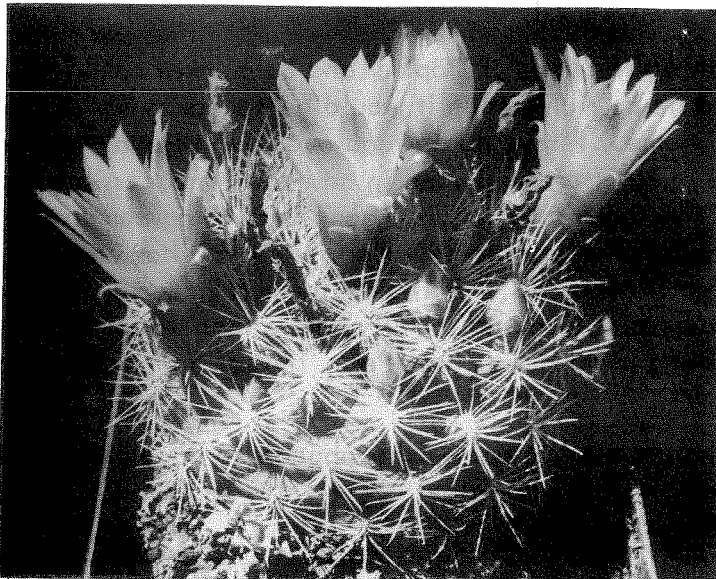
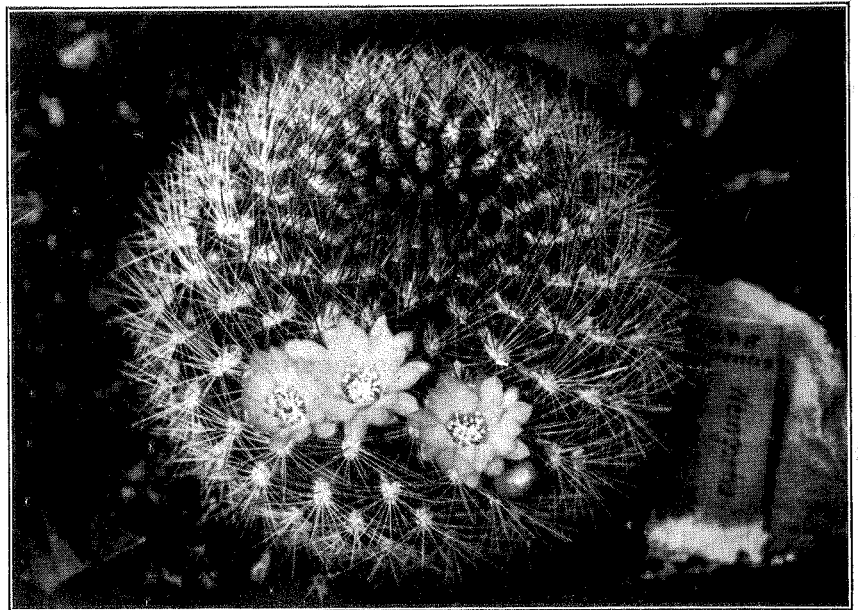
WEINGARTIA  
PULQUINENSIS

PHOTOGRAPH & COLLECTION  
R.E. HOLLINGSBEE

WEINGARTIA  
PULQUINENSIS

CACTUS (FRANCE)

20,85:1965



WEINGARTIA FR. 816

PHOTOGRAPH & COLLECTION  
R. ZAHRA.

abovementioned species exhibits the greatest area of distribution of any of the globular cacti.

#### Comments

..... from G.J. Swales

"Having a passing familiarity with seeds of many species of *Gymnocalycium*, I think that I would be unlikely to mistake any seed of *Weingartia* for that of a *Gymnocalycium*. The seeds of all the *Weingartia* species which I have seen to date are quite readily distinguishable from the seeds of any *Gymnocalycium* species. However, judged on the basis of the seed alone, it would not be difficult to incorporate *Weingartia* into the genus *Gymnocalycium* for there is no greater difference between the seed of *Weingartia* and various *Gymnocalycium* seeds than there is between the seeds of the major groups (or sub-genera) within the genus *Gymnocalycium* itself.

"On the other hand the seeds of *Neowerdermannia* bear not the slightest resemblance to the seeds of either *Gymnocalycium* or *Weingartia* and I cannot see how *Neowerdermannia* can possibly be considered as a member of either of these two genera."

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#### THE CORRECT NAME OF *ECHINOCACTUS CUMINGII* by Dr B.K.Boom

(Translated by H. Middleditch from *Succulenta* No.9: 1962)

The naming of the plant which is commonly known in cultivation as *Weingartia cumingii* is a first-class example of the carelessness and inexperience with which many practitioners of cactus study make free with the Rules for botanic nomenclature.

Of recent years there has already been much written about this species (as *Weingartia cumingii* etc.) and moreover a so-called final name was laid down every time. As for the most recent publication (Hutchison 1959) an incorrect name was yet again designated as the correct one.

The reason why I write now on this subject is not in the first place to get the correct name established again (which indeed naturally happens), but to show how mixed-up names can come into the world and how persistently an error, once made, holds its ground.

The plant in question was described for the first time by Salm-Dyck (1850) which he named *Echinocactus cumingii* after Mr. Cuming who had found the plant in the wild in Bolivia. Salm was evidently not aware of the fact that in 1843 Hopffer had already described another cactus as *Echinocactus cumingii*, so that the name given by Salm was thereby invalid (a so-called earlier homonym). For years, however, it has been thought that the same plant was intended by both names, so that the older author's name was always used, viz. Hopffer.

Later Kreuzinger (1935) discovered that the plants of Hopffer and Salm were not identical and that is very important for us, for should he be right, then it would be necessary for our plant (i.e. *E. cumingii* Salm) to receive another name. I have again read over the original description for I have the impression that the diagnosis of Hopffer (published in an almost inaccessible Journal) is not always well studied. But in spite of the fact that there is a good deal of agreement in both diagnoses, they really turn out to be two quite different plants. Hopffer's plant has vertically disposed tubercles, 9-11 spines, rather large flowers and, what is of the most importance, scales with white-woolly hairs; Salm's plant has tubercles disposed spirally, more than 18 spines, quite small flowers and naked ovary scales; Hopffer's plant comes from Peru, that of Salm from Bolivia, but both were found by Cuming.

Which plant Hopffer intended is no longer ascertainable; this appears to have been lost and never to be found again. Salm however has described our plant accurately, so that it is quite certain that his name is indelibly attached to our plant.



With the splitting up of the genus *Echinocactus*, Britton & Rose (1922) were the first who placed our plant in another genus - into *Lobivia* indeed, a genus which is itself an anagram of, and named after, Bolivia. They named this species *Lobivia cumingii* (Hopff) Br. & R. Yet their grounds were not all that sound; they based their name solely on the statement by Salm that the plant was most closely related to *Echinocactus cinnabarinus* (which now belongs to *Lobivia*); thus they did not know the plant.

By this time the nomenclature problem had begun, for Britton & Rose described the plant of Salm, but referred in the name (through the so-called bracket-author) to the plant of Hopffer, so that their name acquired an ambiguous character. The International Rules now prescribe that in such a case, reference to a former name always has precedence over the description, and so the name *Lobivia cumingii* belongs to *Echinocactus cumingii* Hopff and the description to *E. cumingii* Salm. Hence it follows that the plant would have to have another name, at least for *Lobivia*.

The first person who found out that the plants were not alike was Kreuzinger, who in 1935 named it *Oroya cumingii* (Salm) Kreuz., a name which in spite of referring to an illegitimate name, is still valid, because this illegitimate name is accompanied by a Latin diagnosis (Art.36).

Meanwhile the species undertook a detour, as it were. Backeberg (1934) placed it in *Bridgesia*, but this name is not valid because the generic name was never described; in 1935 Backeberg moved the species into *Spegazzinia* and named it *Sp. cumingii* (Hopff) Back., but Werdermann discovered in 1937 that the name *Spegazzinia* already existed for a genus of fungus and therefore he renamed the genus as *Weingartia*; however, he neglected to place the species *cumingii* into it, which Van Osten did do in 1939 - although still under the mistaken impression that Werdermann had already made the combination. In 1957 the genus was once more re-named by Ito, who now designated it *Gymnantha*. This name is quite illegitimate, because it is a superfluous name. Ito wrote: *Gymnantha cumingii* (Hopff) Ito.

All these authors however thereby made the same mistake as Britton and Rose did: they based the name on *Echinocactus cumingii* Hopff., which our plant is not, with the result that none of the aforementioned names can be employed for our species (with the exception of *Oroya cumingii* (Salm) Kreuz.).

In 1950 Backeberg made an end to this state of affairs by naming the plant *Weingartia neocumingii*, additionally quoting the Latin diagnosis of Salm as the starting point.

Even with this the problems were not yet exhausted, for in 1957 Hutchison reclassified the *Weingartias* under the genus *Gymnocalycium* and named our species *G. neocumingii* (Back.) Hutch. This is perfectly correct, but in 1959 Hutchison evidently regretted his publication; he found that he was rather premature and had made a mistake. He now published the name *Lobivia cumingii* Br. & R. as a new name, in addition referring to Article 72 of the Code. However, he overlooked that the heading of this article is only concerned with illegitimate basonyms. Hutchison would have been right if Br. & R. had based their name on *Echinocactus* Salm; this is inevitably an illegitimate name on account of the fact that Hopffer 7 years earlier published the self-same name for another species.

So therefore the specific name "neocumingii" is the correct one, at least in connection with the generic name *Weingartia* and *Gymnocalycium*. Which of these two generic names one ought to select, is a matter for personal judgment and taste; if one seeks out the features differing considerably between one genus and the other, then one will be inclined to retain the two genera in close relationship; if one pays attention to the different characteristics of trifling significance, then one will be able to consider *Weingartia* as a subgenus of *Gymnocalycium*.

The name *Weingartia neocumingii* Back. and *Gymnocalycium neocumingii* (Back.) Hutch. are thus both correct.

It appears to me that the differing characteristics have sufficient systematic worth to retain both genera; it is not only in the vegetative organs that the genera differ; the fruit of *Weingartia* is a remarkably small and thin-walled and contains but few small seeds; the flowers are yellow to

orange, a colour which is not to be met with in *Gymnocalycium*, and the withered flower remains stay attached to the growing fruit for a long time. It is therefore sound to contend that in future we should call this plant *Weingartia neocumingii* Back.

Donald (*Nat. Cact. & Succ. J.* 13, 54-56 (1958); 14, 66-67 (1959); 15, 38 (1959); 16, 7-8 (1961) has written in detail about this genus; he comes to the conclusion that *Weingartia* is a subgenus of *Gymnocalycium*, but most remarkably he does not do this in his name and there he retains the genus *Weingartia*; furthermore he himself makes a new combination viz:- *Weingartia westii* (Hutch.) Donald.

So here we have shown where inexperience in the application of the international Rules for botanic nomenclature can lead; it is absolutely necessary that anyone who is involved with cactus taxonomy (and naturally with all other plants also) keeps themselves thoroughly familiar with the way in which these rules are intended to be used.

There follows now a synopsis of the synonyms, from which it must be noted that with ambiguous names (names having an incorrect diagnosis) it is stated to what the name refers. This is indicated by the word "quoad" which means "in so far as the name is concerned".

*Echinocactus cumingii* Salm Cat. Hort. Dyck. 1849, non Hopffer, Allg. Gartenz. 11, 1843

*Lobivia cumingii* (Hopff.) Br. & R., *The Cact.*, 5, 1922. quoad descr.

*Oroya cumingii* Kreuz., *Syst.*, 1935

*Spegazzinia cumingii* (Hopff.) Back., *Kakt. ABC*, 1935, quoad descr.

*Weingartia cumingii* (Hopff.) Werd. ex van Oosten in *Succ.* 21, 1939, quoad descr.

*Weingartia neocumingii* Back. in *Kakt. u.a. Sukk.*, 1, 1950.

*Gymnantha cumingii* (Hopff.) Ito, *Expl. Diagr.* 53, 1957, quoad descr.

*Gymnocalycium neocumingii* (Back.) Hutch. in *Cact. & Succ. J. (U.S.)*, 29, 1957

*Gymnocalycium cumingii* (Br. & R.) Hutch. in *Nat. Cact. & Succ. J.*, 14, 1959.

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#### Comments on *Echinocactus cumingii*

..... from H. Middleditch

"We are told in this article that both Hopffer's and Salm's original plant of *Echinocactus cumingii* were found by Cuming, and further that Hopffer's plant came from Peru and that of Salm from Bolivia. I feel that neither of these statements can be accepted at face value, in the light of available evidence.

"It would appear to be generally accepted that the plant described by Salm is that corresponding to what we now regard as *Weingartia neocumingii*, which must mean that the original plant obtained by Salm was collected at - or near - Pulquina. This place is about 400 miles from the Pacific coastline. We know that Cuming's principal interest was in the collection of shells, which led him to cruise the length of the Pacific coast of South America, dredging off-shore and collecting on the coast. He also collected and dried plants, but it would seem that this was in response to the demand from Europe for sets of dried plants - the current craze at that time - and also to provide financial support for his cruise. One cannot imagine him travelling inland far away from the shoreline, from his yacht, and from the precious collection of shells which it contained. Furthermore, we know that Cuming acted as agent for the plants which Bridges collected during his trip to Bolivia. It is therefore quite probably that Salm received his plant via Cuming, but much more likely that it was collected by Thomas Bridges; it is perhaps worthy

of note that Britton & Rose state that their "*Lobivia cumingii*" was collected by Thomas Bridges.

"Until 1883 the territory which now forms the northernmost part of Chile - that is, from the Atacama desert northwards - was divided between Peru & Bolivia and did not belong to Chile at all. Prior to that date, Bolivia had an outlet to the sea via the port of Cobija, which is not far to the north of Antofagasta. This was the typical point of entry for a traveller visiting Bolivia and so it was that Thomas Bridges landed at Cobija on his two visits to Bolivia. It is therefore unlikely that Bridges collected Hopffer's *Echinocactus cumingii* in present day Peru.

"This brings us to *Echinocactus cumingii* Hopffer, which most authors seem to have abandoned to the "lost and unidentifiable" category. Perhaps the available evidence does not justify such a conclusion? This particular plant reached Hopffer before Bridges started to collect in Bolivia, so it is possible to accept the statements that it was collected by Cuming. If we bear in mind Cuming's basic interest in shells, it would seem that we are dealing with a plant originating not far from the shoreline; what do we have on the shoreline of present day Peru and northern Chile (the Peru of 1843) which comes anywhere near Hopffer's description? We are looking for a globular plant with yellow flowers; a yellow-flowered *Lobivia* is too far inland, but on the coast we have our choice of an *Islaya*, a *Copiapoa*, or a *Neochilenia*.

"Now we are told that Hopffer described his *E. cumingii* as having "rather large flowers" which would hardly suit an *Islaya*. This would leave a choice between *Copiapoa* or *Neochilenia*. Since Hopffer's description also includes "scales with white woolly hairs" we may conclude that it was a *Neochilenia*, unless we are to assume that it was a *Copiapoa ferox* (syn. *Pilocopiapoa solaris* Ritt.) and also accept that Hopffer paid as much attention as Ritter did much later to the sparse hairs on the tube which occur on no other *Copiapoa*. Could it have been what we now call *Neochilenia iquiquensis*? Or *Neochilenia aricensis*?

"But this brings us to another problem: the plant described by Regel and Klein in 1860 is associated by its authors with *Echinocactus cinerascens* - which we would now describe as *Copiapoa cinerascens*. However, it may be as well to bear in mind the nature of the comparison being made. At that time there would be a very limited selection of South American plants known in Europe - with a choice of *Cereus*, *Opuntia*, *Echinopsis* or *Echinocactus*. Thus when Salm stated (as quoted by Britton and Rose in the article above) that his *E. cumingii* was near to his *E. cinnabarina*, he would mean that it was nearer *E. cinnabarina* than it was to anything else which had come out of South America up to that time; likewise, the *E. cumingii* of Regel and Klein was nearer to *E. cinerascens* than any other South American cacti then known - so given the very limited selection then available it would not have been too much to suggest that a *Neochilenia* was nearer to a *Copiapoa* than (say) to a *Cereus*.

"Thus it would appear quite probable that we have:

*Echinocactus cumingii* Hopff. = *Neochilenia* sp.

*Echinocactus cumingii* Regel & Klein = *Neochilenia* sp.

*Echinocactus cumingii* Salm = *Weingartia* sp.

Since there is no earlier homonym for *cumingii* in the genus *Weingartia*, can we call this plant *Weingartia cumingii* after all?"

..... from G.J. Swales

"I see in Labouret's publication that he places *E. cumingii* Hopff. and *E. cumingii* Otto as synonymous with *Echinocactus jussieui* - a plant which we would now describe as *Neochilenia jussieui*. Are we to presume from this that Labouret would place *E. cumingii* amongst the *Neochilenia*, too?"

..... K. Schumann (Gesamtb. Der Kakteen 1903)

"Ech. cumingii Salm grows in Bolivia and was already cultivated in 1840 by Andry in Chaillot.

Note: Ech. cumingii has been described twice, once by Hopffer in the Allg. Gartenz. 1843 and then by Regel & Klein in the seed catalogue of the Petersb. Gard. for 1860. This latter is completely different from our species, but since it can no longer be determined with certainty, I have only referred to it in passing for the sake of completeness".

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ECHINOCACTUS CUMMINGII Salm Dyck by Prince Joseph Maria Franz Anton Hubert Ignaz zu Salm-Reifferscheid-Dyck

(Translated by G.J. Swales from Salm-Dyck: Cactae in horto Dyckensi cultae anno 1849)

E. caule subgloboso depresso laete-viridi tuberculato, tuberculis distinctis, validis spiraliter dispositis erecto-adpressis, inferne latis subapplanatis, superne convexis subpulvillo gibbose productis, pulvillis sursum paulum elongatis mox nudis, aculeis exterioribus numerosis (circiter 20) gracilibus radiater assurgentibus, infimis brevioribus superioribus sensim longioribus centralibusque 6-8 crassioribus, omnibus mediocribus rectis stramineo-fulvidis, apice fulvo-sphacelatis.

An echinocactus with almost spherical plant body, flattened from above, bright green, tuberculate; with distinct tubercles, robust, spirally arranged, inclined upwards, wide at the base, slightly expanded horizontally, convex above, drawn out into a hump beneath the areole; areoles slightly elongated vertically, soon becoming bare; outer spines numerous (about 20) slender, radiating outwards and upwards, the lowest ones shorter, the upper ones becoming longer, the 6-8 central ones thicker; all moderately straight and of somewhat tawny-straw colour with tawny speckled tip (definition of tawny: "dull yellow with a mixture of grey and brown (Stearn) - G.J.S.)

(This is the end of the official diagnosis and it would seem that the author then elaborates):

Plant body 3-4 inches in diameter, strongly flattened from above, tubercles somewhat broadened, arranged decussately, almost levelled (flattened? - G.J.S.) at the base, convex above and humped below the apex. Spines 2-6 lines long, slender, centrals a little stronger, conspicuously rising upwards, dirty straw coloured, with somewhat tawny-brown tip. Flowers rather small outer perianth segments quite glabrous (lacking hair - G.J.S.), obtuse lanceolate, erect, apices somewhat recurved. Petals bluntly spatulate, curved backwards horizontally, all of the same colour, ochre yellow - pale yellow. Stamens gradually longer (of various lengths? - G.J.S) converging together towards the centre, filaments golden yellow and anthers crocus yellow (deeper shade - G.J.S.). Style columnar, with 8 thread-like stigma lobes pressed close together, vertically.

This plant grows, together with Ech. cinnabarina Hooker, in Bolivia and was sent to our garden through the kindness of Mr. Cumming.

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Comments on E. cumingii S-D

..... from G.J. Swales

"From the description of the flower having the "stigma lobes pressed close together, vertically," I wonder if the observation was made upon an immature flower? Regarding the spine length quoted in units of 'lines', one French line equals 2.3 mm.

"The original description is entirely in Latin and the phrase 'simul ac Ech. cinnabarina Hook. in Bolivia crescunt' may perhaps be rendered either as "growing near Ech. cinnabarina..." or as

"growing with . . . . ."; the latter would involve both plants growing virtually side by side, whereas the alternative rendering would not involve such intimate closeness.

"In this description, I notice that both the name of the plant and that of the person after whom it was named, are spelt with two "m's". Is this the correct spelling? I seem to think that I am more used to seeing it written with only one "m". If the correct spelling was Mr. Cuming with one "m", are we still obliged to accept the name of the plant spelt with two "m's" on the grounds that this is the spelling in the original description?"

. . . . . from H. Middleditch

"It was indeed Cuming with one "m". So will *Ech. cumingii* S-D also be considered an error, thus allowing us to write *Weingartia cumingii* (S-D) H.M. & G.J.S.?"

"The alternative modes of rendering the phrase in the final sentence of Salm-Dyck's description, throw a most revealing light on Britton & Rose's observation "In Salm Dyck's description he makes the significant remark that it is similar to *Ech. cinnabarinus* . . . . .", for they evidently translate Salm-Dyck's "simul ac" as "similar to" - presumably in appearance. If that rendering is to be considered, the shell-back shaped tubercles with the areole at the top might well be considered "similar" on *Lob. cinnabarina* and *Weingartia cumingii*. It appears that a closer familiarity with Latin might not be without its advantages in clarifying phrases such as this; perhaps it is unfortunate that I parted company with my Latin grammar at such an early age.

"There have been occasions in previous issues where comment has been made regarding differences between the Latin and the vulgar diagnosis; this is the first occasion on which we have been able to include a translation of the Latin diagnosis; perhaps a continuation of that arrangement could be of advantage."

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#### A. NEW ECHINOCACTUS from Carl Hopffer

(Translated from *Allgemeine Gartenzeitung* 29. July: 1843 by H. Middleditch)

##### *Echinocactus cumingii* Hopff.

*Ech. deplanato-hemisphericus, viridis, vertice umbilicato, lanifero; costis 18 sub-verticalibus, tuberculatis, ad arcolas valde inflatis, tuberculis oblongis, quasi pentaedris, facie superiore depressa aculeorum fasciculos gerentibus, infra areolam gibbosis, gibbis subacutato-prominentibus, inferne in angulum ad fossam transversam tuberculis intermediam decurrentum, productis, areolis immersis, ovato-oblongis, ultra fasciculum productis, nascentibus lana abundante floccosa, flavescenti-albida, mox tomentosa, cinerascenti obtectis; aculeis 9-11 subulatis, ad basin corneis, apice fuscis, tandem unicoloribus cinerascentibus, exterioribus 7-9 inaequalibus rectis erecto-radiantibus, (imixtis duobus minimis interdum deficientibus), centralibus 2 longioribus, altero erecto, altero ad imum dejecto, subrecurso.*

Flattened-half globular, green, crown umbilicate (depressed - H.M.), woolly; ribs 18, more or less vertical, strongly humped at the nodes, formed into oblong tubercles, which present virtually five distinct faces, of which the upper slope carries the spine-cushion, and the lower half exhibits a rather pointed hump, which runs downwards with a projecting angle as far as the cross-furrow, by which a tubercle is separated from the subsequent one; nodes sunken, oval to oblong, extending above the spine cushion, 2½ lines long, 1 line broad, initially furnished with copious, yellowish-white fluffy wool, which later makes way for a dirty white felt; spines 9-11 in number, awl-like, horn coloured at the base, grey-brown at the tip, later completely grey; of these 7-9 are radials, of unequal length, straight, raised-radiating, of which: 1 uppermost vertical, then 2 sloping outwards sideways, then two horizontal (all 5 of equal size, 3 lines long), below the latter 2 set sloping downwards of 2 lines in length and, finally, right at the bottom 1-2 small



1-1½ lines long which are occasionally absent; 2 central spines of which one is directed upwards, straight, 6 lines long, the second depressed downwards, somewhat curved, 7 lines long.

Buds appearing from the elongated areoles, dark crimson, surrounded with copious snow-white wool.

The 2 inch long, funneliform flower, 2 inch in diameter when unfolded, has a six line long tube, with scales lying tile-like one upon the other, lanceolate, green, furnished with crimson tip and trimmed with snow-white, fluffy wool; then follows two lines of sepals, of which the outer are linear-lanceolate, crimson with pale membranous margin, the inner lanceolate drawn out to a point, are greenish-yellow with crimson middle stripe.

Petals cream, oblanceolate, acute, in the upper wider part dentate, and terminating in a tiny point. Filaments greenish, significantly shorter than the style, anthers sulphur-yellow, oblong-globular, attached to the filament by a thin thread standing out horizontally from it. The projecting style has a pale red stigma and 11 uniformly pale red cylindrical lobes.

The magnificent original plant described above, of 2½ inches diameter and 1¼ inches high, which is related to *Ech. centeterius* Lehm. but is very distinct therefrom, was collected by Mr Bridges from the mountain chain of the Peruvian Andes, and was imported here last year from Mr Cumming in those honour it is named.

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#### Comments

..... from H. Middleditch

"The above article tells us that this plant was imported into Germany in 1842; it should have taken but a week or two to reach the Berlin Gardens from Cumming in England and upwards of twenty weeks to travel to England from Chile. Bridges came back to England in 1842, so he may have brought this plant (and others) with him, on the same boat. Prior to his return, Bridges made a collecting trip into the north of Chile; in the month of June, 1841, he sailed to the mouth of the R. Copiapo, then botanised up that valley past Copiapo before travelling down the coast via Totoral to the Huasco valley. His travels took him up that valley and also the valley of the R. Elqui. By November he was in Coquimbo and from there he returned via Illapel to Valparaiso. The plants collected on this expedition bear his field numbers 1279-1424 and the original catalogue of these plants is in the British Museum of Natural History.

"It is very probable that *Echinocactus cumingii* Hopff. was collected by Bridges on this particular trip; Bridges was never in Peru prior to the publication of the above diagnosis in 1843, so that the habitat quoted therein of "the Peruvian Andes" for that plant would almost certainly seem to be incorrect. It is just possible that the aforementioned catalogue in the British Museum of Natural History may include a reference to this plant.

"Between Copiapo and Illapel we have the choice of various Copiapoa & Neochilenia; but Copiapoa have yellow flowers (not cream petals) and naked tubes. Amongst the Neochilenia, however, there is no difficulty in finding one or two with cream coloured flowers. Having just walked down to the greenhouse carrying the handwritten translation of the diagnosis on which the ink is hardly dry, I find two different Neochilenias in flower with cream coloured petals - but both have creamy white stigmas. There are another two with pale red stigmas - but one has a broad scarlet midstripe on the inner petals and the other has Chileorebutia-length spines. But there are nearly another two dozen plants still in bud and Backeberg's Lexikon includes several species with "pale yellow" flowers and reddish stigmas. It might show up even yet!"

..... from J.D. Donald (Given only a precis of the diagnosis and "western South America" as origin, without specific name, author, or vintage of the diagnosis).

"I've had only a brief opportunity to browse in the greenhouse to try and match a plant to the description. Nothing matches 100% - I can get near 90% with two plants from Chile but there are some very puzzling parts to the diagnosis. The terms used are misleading and perhaps unintentionally used. What does the author mean by "node"? Is this a reference to the areolar groove? What are sepals and petals in cactus flowers? Does he mean anthers or pollen sacs? Sulphur yellow is probably the colour of the pollen - the sac is usually the same colour as the filament. "Tile-like" tube scales - I wonder if they are really tile-like as found in *Gymnocalycium*, a few *Sulcorebutias* and some North American species? Tile-like scales with fluffy wool, of course, rules out both those genera.

"Crimson buds from copious snow-white wool sounds like *Copiapoa* - but no *Copiapoa* (as far as I am aware) has 2" long flowers with tile-like scales.

"The only real contenders in my opinion are sections *Nichelia*, *Thelocephala*, *Islaya* and *Pyrrhocactus* of the *Neoporteria* complex sensu Row. & Don. But none of these have tile-like scales, nor are the buds generally crimson.

"My 90% matches are *Pyrrhocactus* sp. N. 12 Santiago, and *Pyrrhocactus* sp. *Pichindangui*. Of course they are not really *Pyrrhocacti* in the strictest sense but are nearer *Nichelia* than any other section. They differ somewhat in body form - neither is particularly flattened globular. N.12 is decidedly globular and sp. *Pichindangui* is almost cylindrical, taller than wide. Spines yellow or greyish white, 8-12, up  $\frac{1}{2}$ " long.

"Both produce deep pink rather than crimson buds - out of copious white or yellow white wool. The innermost tepals are certainly cream coloured and the outer tepals greenish yellow with crimson or deep pink midstripe. Scale axils bear copious white or yellow white wool but are hardly tile-like. The style is pink and so is the 8-lobed stigma which projects beyond the uppermost anther ring. My plants are respectively N 12 -  $2\frac{1}{2}$ " x 3" and *Pichindangui*  $2\frac{1}{2}$ " x 4" both grafted so this may make the body habit different from a plant on its own roots.

"A less good match is *Neoporteria* A.W.III which lacks the copious white wool and the inner tepals are more pale rose than cream."

..... from Mrs A. Lavender (Given only a precis of Hopffer's diagnosis over the 'phone)

"Looking round the greenhouse at the plants we have out in flower, it is only amongst the *Neochilenia* that I can find anything which seems to match this description reasonably well. But I thought it was supposed to be a *Weingartia*?"

..... from G.J. Swales

"The term 'lines' in Hopffer's diagnosis may be connected with a standard of botanical measurement that is now obsolete but was probably in use at that time. A continental line is 2.3 mm long or about one tenth of an inch."

(During the 1973 Brooksby weekend we should have an opportunity to project the *Neochilenia* in our Slide Library and ascertain which of them bears the closest resemblance to *Ech. cumingii*. Hopff. Any other slides of *Neochilenia* will be welcome for projection on that occasion, either to suggest what it is not likely to be, or what it may be).

## SOUTH AMERICAN EXPLORERS - 3

After Humboldt and Bonpland returned to Europe from their successful trip to South America - or more precisely to those north-western parts of the continent which they traversed - the accounts of their voyage and of their discoveries in the field of Natural History provided a vast store of wealth compared with previous paucity of scientific information about this continent. This inspired many other scientists to follow in their footsteps; the ending of the Napoleonic wars in Europe freed men of learning for such pursuits and the rapid loosening of the bonds between Spain and her American territories afforded an access to the continent which had previously been denied by the tightness of Spanish control.

Although eastern South America had been under Spanish control for almost three hundred years, it was still virtually an unknown continent to the natural historians of Europe. So we find, amongst the explorers following in Humboldt's footsteps across the Ocean, men such as Darwin, Cuming, Bridges and D'Orbigny drawn by diverse interests to this continent.

Alcides Dessaline D'Orbigny was born in France and as a very young man moved to a small town on the Biscay coast. There, he assisted in the studies upon small shellfish which were undertaken by his father; as his father's eyesight deteriorated, it fell more and more to Alcide D'Orbigny to undertake the examination and sketching of the collected samples. His interest expanded steadily into other fields of Natural Sciences, especially paleontology.

An English company was formed in 1825 to fit out an expedition for the exploitation of the mines at Potosi, in Bolivia; the Paris Academie des Sciences appointed Alcide D'Orbigny as naturalist to this expedition. Alexandre Humboldt assisted D'Orbigny to obtain some meteorological instruments required for the work of the expedition and also posed some specific enquiries deserving of investigation during D'Orbigny's travels. In company with another naturalist, Trion, D'Orbigny sailed for South America in 1826, calling first at Rio de Janeiro and then at Montevideo - where they arrived in the middle of an insurrection. Together with his companion, D'Orbigny suffered temporary imprisonment there. He subsequently travelled through Patagonia and boated up the Parana river, he also undertook considerable exploration in Bolivia - sufficient to enable him to produce both a geographical and geological map of that country, and he examined the remains of extinct civilisations in Peru. He was unable to travel in Paraguay owing to the hostile attitude of the then dictator of that country towards foreigners; Humboldt's travelling companion Bonpland who returned to south America and travelled into Paraguay was imprisoned there for over six years.

D'Orbigny sailed from the Pacific coast back home to France in 1833, loaded with a varied and extensive collection which included fishes, shellfish, reptiles, mammals, birds, plants and insects.

Hugh Cuming was a Devonshire man who was apprenticed to a sailmaker. He emigrated to Chile in 1819, setting himself up in business in Valparaiso. He must have prospered for he was able to give up his business in 1826 and build himself a yacht which was fitted out specifically for seeking out and accommodating objects of Natural History. He cruised for over a year among the islands of the south Pacific, spending most of his time dredging for shells or collecting them on shore. His next cruise lasted even longer and extended along almost the whole western coastline of South America. As he had by now gained a reputation for his collecting activities, he was provided with letters of introduction to the authorities of the various States he visited; this enabled him to make some trips inland in search of flora and fauna, in addition to his shell collecting activities at sea and on shore.

He returned to England in 1831 with all his accumulated specimens, most of which were of great interest to the newly-founded Zoological Society. At that time the President of the Zoological Society was the Earl of Derby who was instrumental in obtaining permission for Cuming to collect in and around the Phillipine Islands, as jealously guarded by the Spaniards at that time

as the continent of South America had been during the preceding two centuries. Cuming departed thence in 1835 and spent about four years collecting not only shells, but also birds, insects and plants. He returned home with some 130,000 specimens of dried plants and by that time his collection of shells contained upwards of some 30,000 different sorts. His remaining lifetime was largely absorbed by a study of his collected natural history material.

It appears that Cuming knew Thomas Bridges when both were resident in Chile and that, when in England, Cuming became English agent for Bridge's collected plants.

Thomas Bridges was a Norfolk man who emigrated to Valparaiso, Chile, in 1828. Initially he set himself up in business as a brewer, but engaged in part-time collecting; subsequently he devoted himself to full-time collecting, interspersed with periods of employment and an occasional visit to England. His collecting was done in various parts of central Chile but in 1841 he spent some months collecting in northern Chile, as far as Capiapo. Three years later he visited the then Bolivian littoral, through the port of Cobija, travelling inland about as far as the present border of Chile. Later on in the year 1844 he made another visit to Bolivia, again landing at Cobija and travelling via Potosi to Sucre, where he obtained permission to travel in the interior of Bolivia. After a month spent at Sucre he went on to Cochabamba where he stopped for three months for more collecting work. This was followed by over a year's travels in the adjacent part of the Amazon basin, apparently as far as Trinidad, whence he returned to Santa Cruz. Thence he returned to England for a brief spell, during which time he married the niece of Hugh Cuming.

Later collecting trips took him to Central America and to California. He died at sea and was buried in Lone Mount cemetery in San Francisco.

Although we have no record of Darwin collecting any cacti during his various shore trips on his voyage round South America, yet we cannot overlook the magnitude of his later influence on the outlook of other naturalists.

Charles Darwin graduated from Oxford in 1831 and seemed destined for a career in the Church, but his interest in Natural History led to his appointment as Naturalist with H.M.S. Beagle during her surveying voyage round the world. It was intended to make several calls upon the continent of South America and so it is not really surprising that amongst Darwin's requirements for his voyage was Humbolt's account of his own journey to that continent.

After leaving England, the first port of call was San Salvador in Bahia Province, Brazil; this gave Darwin his first opportunity to become familiar with tropical lands. Shortly afterwards he was able to spend three months ashore at Rio de Janeiro, whilst the ship was engaged in a survey of the coast. During this time he made a journey of about 100 miles inland and en route had his first encounter with a marching column of army ants which devoured every living thing in their path. The next anchorage for the ship was at Montevideo; during their brief stay an abortive revolution occurred.

The next port of call was Bahia Blanca, at the southern edge of the Pampas, giving Darwin six weeks ashore; during this time he collected fossil skeletons of several types of prehistoric mammals previously quite unknown to science. He noted that several of the fossil specimens were not greatly unlike the live animals he could observe on the plains of Argentina.

After a run down to Tierra del Fuego, the ship returned to the La Plata roads for more surveying, giving Darwin three months to botanise around Maldonado, in Uruguay. Afterwards he sailed down to the mouth of the Rio Negro and, with a small band of gauchos, rode overland to Buenos Aires. This was towards the end of the winter and Darwin records experiencing a very cold night in the Sierra de la Ventana and later a hailstorm during the night. From Buenos Aires he made a trip upriver to Santa Fe, again observing and collecting as he travelled. Then back once more to Buenos Aires, just in time to meet with another revolution under way.

Returning to Montevideo, he despatched specimens and notes back home, whilst on board ship he stowed finds of material virtually unknown until then in Britain: his fossils, bottled specimens

of animals, insects and birds, and native weapons such as the bola - two weights at ends of a rope, swung round the head by gauchos on horseback and hurled to drop a fleeing animal. In Patagonia, he joined a party which battled upriver in the ship's boats, attempting unsuccessfully to reach the Andes, turning back only when rations ran low. Then followed a difficult passage through the Straits round Tierra del Fuego to a safe anchorage at Valparaiso, Chile.

Whilst in Chile, Darwin spent six weeks on an excursion going high up into the Andes, where he found strata rich in marine shells. A few months later he was ashore further south when an earthquake took place; immediately afterwards he noticed that the land on the shore there at Talcahuano was a few feet higher than it had been before the earthquake occurred. His final trip in Chile was a ride from Valparaiso for 500 miles northwards, via Illapel, Coquimbo, and Huasco to Copiapo, where he was picked up again by H.M.S. Beagle. Crossing the desert-like plains he observed that at times cacti were to be seen every few yards underfoot.

It was nearly five years after his departure that Darwin returned once more to English shores, never to leave them again during his lifetime. His first ten years back at home were spent largely in writing up the accounts of his voyage and the detailed descriptions of all he had seen, noted, and collected. His subsequent years were devoted to studying and writing about the implications of the pattern of change which was to be read from the marine shells at high altitude in the Andes, the lift of the coast during the earthquake, the similarities and differences between the fossil creatures which he had dug out of the Argentinian cliffs and the living creatures on land, and all the other facets of nature which had been impressed upon him during his long journey.

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#### Comments

..... from I.M. Johnston (Contr. Gray Herb. Harv. LXXXI.1928)

"Thomas Bridges was one of the botanical collectors of the early half of the last century who provided contemporary systematists with material from Chile and Bolivia. His collections are important through the study given them, and the species and records based upon them, by such botanists as Hooker, Lindley, Bentham and Miers in Great Britain and by De Candolle and Turczaninow on the Continent. Many of Bridge's plants being critical ones it is an unfortunate fact that the geographical data accompanying them are very meagre and frequently misleading if not actually incorrect.

"A study has been made of the letters from Bridges, H. Cuming and A. Caldcleugh in the Hooker correspondence at Kew, of Bridge's plants lists at Kew and at the British Museum of Natural History. A determined search for unpublished data on Bridges was made in London, letters and other manuscripts being sought at the Linnean Society, Royal Society, Royal Geographical Society, Horticultural Society and the British Museum at Bloomsbury. Cuming was a friend of Bridges - were it possible to locate Cuming's correspondence and manuscripts much information concerning Bridges might be found. Another possible source of information is the correspondence of Arnott, Lindley and De Candolle since Bridges sent them plants and doubtless wrote to them as well."

..... from H. Middleditch

"In the account of Thomas Bridge's collecting activities, written by I.M. Johnston, reference is made to Bridges leaving Potosi and going "northward to Chuquisaca - about 60 km west of Sucre - where he remained for a month." This directional location lies in very barren territory indeed, in addition to which no place name of Chuquisaca appears thereabouts on any maps in my possession. However, at the time of Bridge's visit, the principal city of Chuquisaca Province was named Chuquisaca; previously it had been called Charcas and was then the capital city of the Spanish Audiencia of Charcas, or upper Peru, within the Viceroyalty of La Plata. Later in the 19th Century Chuquisaca city was renamed Sucre after the General of that name who

distinguished himself during the country's struggle for independence.

"From this, it would appear that I.M. Johnston has misinterpreted the original account of Bridge's trip to Bolivia.

"The original plant of *Lobivia cinnabarina* is acknowledged as one collected by Bridges - probably during his stay in Cochabamba. The original *Weingartia cumingii* is attributed by Salm Dyck to Cuming, but it seems probable that the latter only handled it as agent for Bridges. As the traditional route from Santa Cruz to Cochabamba passes across the valley of the Rio Pulquina, one can readily imagine Bridges collecting *Weingartia cumingii* along this route. Now Johnston states that "The first set of Bridge's South American collections, at least, appear to have been invariably sent to Sir William Hooker and, consequently, are now to be found in the herbarium at Kew. At Kew with the Bridges plants from the Hooker herbarium are those received from Bentham"; and quite specifically "the first and best set of Bridge's collections were sent to Hooker. The specimens were un-numbered and were apparently unprovided with definite geographical data." If the set of plants at Kew is a complete representation of Bridge's discoveries in Bolivia, then presumably there should be a *Weingartia cumingii* (Salm) amongst them".

..... from R. Strong

"I have had a look at the Herbarium sheets in Kew of *Lobivia cumingii* which consists of a fruit and spine formation and two photo's of prints; I did not see any mention of Bridges' name. I am not sure whether this herbarium sheet is part of the Hooker-Bentham collection or if this is elsewhere.

"One thing that comes to mind is that Bridges would have to have found the plant in 1842 for it to reach Europe by 1843, so what were his movements about this time."

..... further from H. Middleditch

"But for *Ech. cumingii* (Salm) to have been published in 1850 it could have been collected during Bridges' 1844/45 trip to Bolivia."

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INTELLIGENCE from Mr. BRIDGES in BOLIVIA

(From Hooker's London Journal of Botany Vol. IV 1845 Cochabamba, April 3rd 1845)

Sir William,

Since my arrival in Bolivia, now six months ago, I have not had the pleasure of receiving a letter from you. Previous to my departure from Valparaiso, I wrote to you after I had the honour to receive the letter from his Lordship, the Earl of Aberdeen, destined for H.B.M. Consul in Bolivia, Charles Masterton, Esq. On reaching Chuquisaca, the Capital of Bolivia, I immediately presented his Lordship's letter, and I am happy to inform you that Mr. Masterton made known to his Excellency, the President, General Ballivian, the object of my journey to Bolivia. A few days afterwards, I had the honour of an interview with his Excellency, who must generously promised to provide me with letters to all Governors of the various Departments of the Republic, which I received prior to my departure from Chuquisaca.

I shall now attempt to give you a brief idea of what I have done in this singular and in some parts, interesting country. On the 13th September, I landed in Cobija, the only commercial port which the Republic possesses. Having procured mules in Cobija for myself and two Chilian servants we took the road to Potosi and in three days we reached the little town of Calama, situated in the desert of Atacama. From Calama, by regular stages, I arrived in Potosi. I remained only a few days in Potosi, and from thence directed my way to Chuquisaca. After leaving Potosi, with a few leagues of gradual descent, and I had the pleasure to find a fine species of berberis,



*B. virigata* ? of Ruiz and Pavon; also a very elegant species of *Lycium*, with long dark blue flowers. Before we arrived at Chuquisaca, we crossed what may be termed the head-waters of the river Pilcomayo. On the mountains on either side of the river there is a very interesting vegetation. Here I found a most beautiful tree belonging to the Bignoniaceae which grows to the height of 20 ft., completely covered with panicles of splendid dark blue flowers, the size and shape of *Gloxinia speciosa*. I verily believe, on many trees, there were at least 10,000 flowers. I have preserved numerous specimens of this fine plant, accompanied with the seed-vessels; therefore you will, when you receive them, soon find the genus to which it belongs. On the banks of the river under the shade of trees, I met with a few plants of a *Gesnera* new to me, having a large tuberous root and pale red flowers.

The commonest tree in the neighbourhood of Chuquisaca is the *Schinus Molle*, which grows to a large size, and is highly ornamental, when its long racemes of pink fruits are ripe. On the large trees we saw parasitical species of *Tillandsia*, and a few species of *Orchidaceae*, but not in flower. The *Cacteae* are very numerous in this part of the country, and I collected about twelve species of *Cereus* and *Echinocactus*, many with very fine flowers, and all different from those of Chile. I have forwarded plants to Valparaiso, and by the time you receive this, I hope they may have arrived in England. From the nature of some of them, I am apprehensive they will not endure the long voyage to Europe.

After a month's residence in Chuquisaca and its environs, I came on to Cochabamba, through the warm and unhealthy valleys of Moxotoro, Rio Grande and Misque, where I found a variety of plants, birds, etc., and I arrived here on the 24th of December. I have now spent three months in this place, which is the most delightful climate I ever experienced, the thermometer ranging from 68° to 74° in the shade.

During my residence here, I have examined the mountains in the vicinity, and have made a considerable collection of dried plants, too numerous to mention. Among them are four species of *Calceolaria*, distinct from those of Chile, several *Salvias* and many genera new to me. One of the handsomest plants I have seen here, is a species of *Begonia*, with a large tuberous root and a fine red flower, 3" in diameter. I have sent tubers of this to Chile with directions for England. The leaves are large and shining, and the plant attains about 2 feet; it grows in a rich decomposed vegetable soil, on the shelves of precipices in shady places on the mountains to the N.E. of Cochabamba.

I consider my next remittance of dried plants from this country will afford you more pleasure and interest than any you have received from me, both as to extent and variety, and it may also prove more novel, from the few travellers that have yet entered this remote country. I have devoted the greater part of the time I have spent here to ornithology and entomology. Of birds, I possess at least 100 species; many of them were made known to Europe, only by the labours of that eminent traveller D'Orbigny. In entomology, I have been no less fortunate; but hitherto I have directed my attention almost alone to *Coleoptera*, and have captured several species of *Nyctalius* and *Phancus*, also a considerable number of species belonging to other genera.

In three days from this date, I intend to leave Cochabamba and proceed to the eastward into the Provinces of Moxos, and Santa Cruz, crossing an enormous ridge of mountains to the N.E. of this place, and afterwards fall into the tropical forests. In about eight days journey, I shall reach the river Mamore, and on that river I purpose going to Trinidad, the capital of the province of Moxos, where I may station myself for two or three months. After I leave Moxos, I shall ascend the River Piray, and land within a few leagues of Santa Cruz de la Sierra, and thence return again to Cochabamba. Should I only have health during this journey, I shall, without doubt, form an extensive collection of Natural History, which may tend to make known the Bolivian flora in England; better, at least, than it is understood at the present day. It is not possible for you to form any conception of the expense and difficulty of conveying things after being collected, in this country, without roads and means of transportation. Soon after my arrival in Trinidad, I will do myself the pleasure of writing to you again, and am,

Sir William,

Your obliged and obedient servant,

Thomas Bridges.

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#### Comments

..... from H. Middleditch

"It is of particular interest to read Bridge's own record of collecting *Echinocactus* in the vicinity of Chuquisaca. If it indeed was at this part of his journey that he collected "*Echinocactus cinnabarina*", it would be in that part of Bolivia where we now find *Lobivia draxleriana* - a *Lobivia* with a long-tubed flower.

"It is not entirely clear why Bridges refers to the Rio Grande and Mizque valleys as "warm and unhealthy". Perhaps it may have been his familiarity with the moderate climate of central Chile, with its absence of pestilent insects, which led to this remark? The lack of mesophytic vegetation in the drier parts of northern Chile - also visited by Bridges - would render these parts also without pestilent insects; likewise the higher parts of Bolivia around Potosi, Sucre and Cochabamba possess a climate free of tropical insects. Presumably his traverse of these two river valleys with their sub-tropical climates was Bridges' first acquaintance with these sort of conditions - a combination of damp heat and numerous pestilent insects."

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VOYAGE from MOXOS to COCHABAMBA by Alcide D'Orbigny

(Abstracted from "South America; the green world of the Naturalists" Ed. Von Hagen)

From the confluence of the rivers Chapare and Mamore, I left to ascend the course of the Chapare. There were no longer any of the sandbanks and inlets so common on the Mamore. As I travelled further up the river, the forest along the banks became taller and taller. In the evening a solitary cloud in the sky suddenly opened up and we were drenched. The rain continued for several days and bothered us a great deal. The next day I caught sight for the first time of the peaks of a mountain range in the distance. The trees grew taller and taller, the vegetation more varied; I had arrived in a region where it rains regularly all year round. Only once in a while could one catch a glimpse of the sun through curtains of clouds which hid it almost constantly. Everywhere vines hang like garlands from the trees, the tops of which are lost in the clouds.

The farther I travelled up the river, the more I admired the richness of the district. The bends of the Chapare were adorned with reeds or lilies whose white foliage contrasted with the dark green of the forests or the elegant tufts of the palm trees. In the evening we sighted on the beach the first stones which we had seen since we left Fuerte de Biera. Upon seeing them the Indians went into a rapture of happiness because, since the Province of Moxos does not show a single stone in any part, it was for them a discovery and at the same time a means of making fire with a steel. They all joyfully began to gather small stones as if they were gathering gems.

The beaches widened, the mountains drew nearer and nearer, the shores were covered with many palm trees, sometimes with vines having yellow or violet flowers, or perfumed vanilla, sometimes even with those mysterious trees the top of which appearing as though they were aflame, are bare of leaves and are made up only of the most beautiful red flowers. At the confluence of the rivers San Mateo and Coni, which joined to form the River Chapare, the currents are swift and carry along heavy stones. The San Mateo runs with a roar in a rocky bed in the midst of

admirable forests. I left it in order to ascend the River Coni, much less important and above all much shallower. I navigated this river with difficulty, struggling against a strong current, sometimes ascending rapids which ran over pebbles; finally, after fourteen days of navigation from Moxos, I stopped on the left bank. I had covered the first stage of my journey.

I travelled through the most beautiful forest and arrived at a village of the Yuracares Indians, in the midst of the forest. In these foothills of the mountain range, I was delighted by the four different levels of this magnificent vegetation. Trees of eighty to one hundred meters in height formed an arch of perpetual greenery, adorned from time to time by flaming red flowers completely covering certain trees, or flowery vines sometimes reaching to the ground to form bowers. It is here that the numerous species of fig trees, white mulberry trees and walnut trees are mixed with an immense number of other trees having solid leaves, each one of which is so covered with parasitic plants that it represents a veritable botanic garden.

Below this upper level, there grow to a height of twenty or thirty meters the straight and graceful trunks of the palm trees; still lower down, from three to four meters above the ground, there grow other palm trees much more slender than the others; the winds can shake nothing but the tops of the giants of the forest which barely allow a few rays of sun to reach the ground. But even the ground is adorned with a mixture of elegant ferns with notched leaves, of little palms with solid leaves and above all with lycopodiums.

At times I gathered plants or made drawings of the various species of palm trees, at others I pursued the brilliant flocks of insects which fluttered round the flowers of the palm trees, the screeching toucans so prized by the Indians, or the numerous Cacique birds.

I resolved to open a new route across the mountains to the city of Cochabamba by way of the River Securi. For this purpose I went to the ancient village of Asuncion de Isibolo in order to be able to engage the first train of mules coming down the mountain. The day after my arrival there, a muleteer came down from the mountain; I resolved to use the authority conferred on me by the Bolivian Government so I summoned the muleteer and asked him for his mules.

On leaving Asuncion, I entered the forest in a westerly direction, through broken terrain covered with fragments of rock or decomposed sandstone. Never had I had to overcome so many difficulties as on this tortuous trail, where nothing had been done to improve the road. Finally I arrived at the ruins of the ancient mission of San Francisco. Very near that place, I found the River San Mateo, which ran with a great din, foaming over a bed of boulders. After a league through the forest, I went along the beach, where I enjoyed the most beautiful view. Ahead of me, to the west, rises the end of the famous Yanacaca range which extends into the distance, showing its abrupt declivities covered with trees, and at the foot the San Mateo. Everywhere I saw impetuous torrents, white with foam, separated by wooded mountains which rise gradually showing their pointed peaks.

Further on I crossed the San Mateo where the current permitted, climbed a gentle slope for about six kilometers and arrived at the ruins of the old settlement of San Antonio, where I decided to pass the night. Many times I have heard of the great migrations of ants which force the inhabitants of houses to desert them, and I had considered this to be a myth. Near San Antonio I ran into one of these travelling colonies. Giant ants, going forward in myriads, in the same direction, covered an area of about twenty meters in width by about ten in depth. As soon as my guides caught sight of them they shouted at me to keep away. These swarms move slowly, devouring every animal substance they find in their path. Unlucky is the insect, the serpent, or even the small mammal that they encounter!

Next day I left very early and travelled through the frightening trails which ran through the forest, parallel to the course of the San Mateo, struggling incessantly against all manner of obstacles. After two hours I arrived at the confluence of the rivers San Mateo and Iririzu. All the rivers are now impetuous torrents obstructed by enormous masses of rock between which the water leaps noisily. Leaving there, the difficulties of the road were increased. Sometimes we

had to walk among loose and shifting rocks, sometimes along the shores covered with thick vegetation, constantly rising and descending between frightful precipices. The showers, which fall every afternoon, obliged us to camp at a place called Itira Pampa, where I found a great many quinine trees, which have not yet been exploited in these mountains.

Next day I had to undergo one of the worst stages of the journey. As the San Mateo runs between steep cliffs, I could not follow its course. The road climbs little by little on a winding path over a very rocky hill. The only path that could be taken down the other side was frightening. In a sort of ditch excavated by rains my mule slid sometimes eight or ten meters on the clayey ground. On one of these involuntary slips, I was caught round the neck by some vines while the animal continued to the bottom and I had great difficulty in getting myself loose. Finally I arrived exhausted at one of the farms in a little valley at Yunga de la Palma, where the rain forced me to remain.

The next day I left in spite of the rain and walked along the left shore of the San Mateo. Further on I clambered up the sides of the mountain and walked along a precipice. It is a natural cornice, without a parapet, above walls cut so steeply that at times I seemed to be suspended two or three hundred meters above the torrent of the San Mateo. My travelling companions got off their mules, for fear of falling into the abyss that opened beneath them, and followed on foot for about a kilometer along this path which was scarcely one meter wide. A little further on I descended to the San Mateo which I had to cross, by two heavy tree trunks which served as a bridge for travellers. The muleteers carried the baggage on their shoulders from one bank to the other, without paying any attention to the clamour of the waters. In the distance one could discern the snowy summits where this torrent received its initial waters. We lowered the mules little by little to a place on the shore which was less rugged; the muleteers assisted by my men tied them head to tail with a long rope and after pushing them into the torrent, much against their will, then pulled them to the other side by means of the rope. The poor beasts, violently shaken by the waters, set foot on shore still trembling.

When we had again loaded the mules, we began to climb the completely cloud-covered mountain. We climbed slowly in a long zig-zag line over the rugged skirts of the steep slope, having always on one hand the almost perpendicular wall-like cliffs and on the other the terrifying precipice. We climbed in this manner the rest of the day, admiring as we went the magnificent ferns and a few palm trees native to this wild region. At the top of La Aguaga a few meters of level ground permitted the construction of a barracks where travellers may find shelter. Our camp was so covered by clouds that we could hardly see ten meters away. The temperature had already fallen considerably and we already felt unpleasantly cold.

In the morning the sky brightened and we got under way over the rugged slopes of the mountain range in the midst of precipices. We climbed laboriously all day long over slippery boulders or through scattered stones. The nature of the vegetation had changed. Only stunted trees were now seen; among them a few quinine trees with violet leaves and ferns. The ground was covered with moss. We stayed momentarily on one of the first crests; I was fortunate enough to kill a new type of humming bird, without doubt the last representative at this altitude of these delicate birds, so common in the warmer regions. As usual, the clouds surrounded us and about three or four hours later a freezing rain began to fall which drenched us throughout the night.

As we climbed higher and higher we saw less and less vegetation and very soon, in the district called "The brow of the Mountain" there remained no trees at all, but only creeping plants, ferns, and moss. On one side I could make out the deep valley of the San Mateo and on the other side that of the Chilliguar and, still further away, high mountains on which could be distinguished, by their different colourings, the various horizontal strata of vegetation. The trees of the lower zone appeared as bluish or dark green colour, which faded gradually to yellow as the zone of ferns and moss was reached. Still higher up among the rocks one could see the green of alpine grasses, and the entire scene was dominated by snow covered peaks.

Soon I arrived at the zone of the grassy plants growing close to the ground, similar to that turf native to the high regions of the Alps. Although the weather was fairly pleasant at the start, we were surrounded by clouds as we began climbing a rugged peak. A violent wind almost blew us down and we were beaten by flurries of snow and hail from time to time. As the weather kept getting worse, we were obliged to halt in a little valley on the western slope of the crest, in the district of San Miguel, about four kilometers from the peak. There, without shelter of any kind and without a fire, we resigned ourselves to passing the night in a heavy snowstorm.

Never had I experienced such a quick transition from extreme heat to penetrating cold. I had seen in a period of three days how rapidly nature changes with altitude. Little by little the giant trees, the elegant palm trees, and the spreading ferns with elegant foliage had disappeared. The trees had been replaced by stunted bushes and these in turn by grassy plants.

Guided by the sound of the bells, the muleteers set out before dawn to find their mules which had descended the slope to find some food on a ledge above a bottomless precipice. At daybreak we were already on our way on footpaths partly covered with snow. Passing through deep ravines both to the east and west of the crest covered with eternal snows, I arrived at the highest point of the mountain range where, at an altitude of almost five thousand meters above sea level, I found to my amazement a great quantity of fossil sea shells. I could see loose rocks and some rare plants such as geraniums, violets, malvaceas, saxifrage plants and valerian which grew to a height of only a few centimeters above the ground. I passed near a frozen lake between the two ravines. Urged on by the muleteers, we crossed the ridge past the summit and we would now be quickly descending to the plateaux of the southwestern slope of the mountain range.

Since dawn we had not stopped a single instant. Even at nightfall the muleteers did not want to stop. We descended quickly down gentle slopes. At about 8.00 o'clock, after fifteen hours of forced march, without having tasted food during all the day's journey, we arrived at the settlement of Cotani, inhabited only by Quichua shepherds. The weather was cold and dry, quite different from the humid cold on the other side of the mountain range. To the north it rains constantly whilst to the south there are nine months in the year during which not a single cloud is seen. Only one day apart, these two regions are completely different.

On these high plateaux, the cold is too intense to try any kind of cultivation; for this reason all the inhabitants are shepherds, except those who descend to the lower valleys to plant a few potatoes which, together with dried mutton, constitute their only food. Scattered here and there in the most sheltered spots, their huts, almost always circular and covered with earth like those of the original Incas, are gathered in small groups, each housing a single family. One hut is for the home itself, and another smaller one is used to store provisions.

In the morning I resumed my journey. I crossed a hillock and entered the valley of Colomi with a village of that name. Far to the east I made out the village of Tiraque. I soon descended to the valley of Sacava and decided to camp there. Early on the following morning I arrived at the city of Cochabamba. Everything astonished me, even bread which I had not tasted since leaving Santa Cruz de la Sierra.

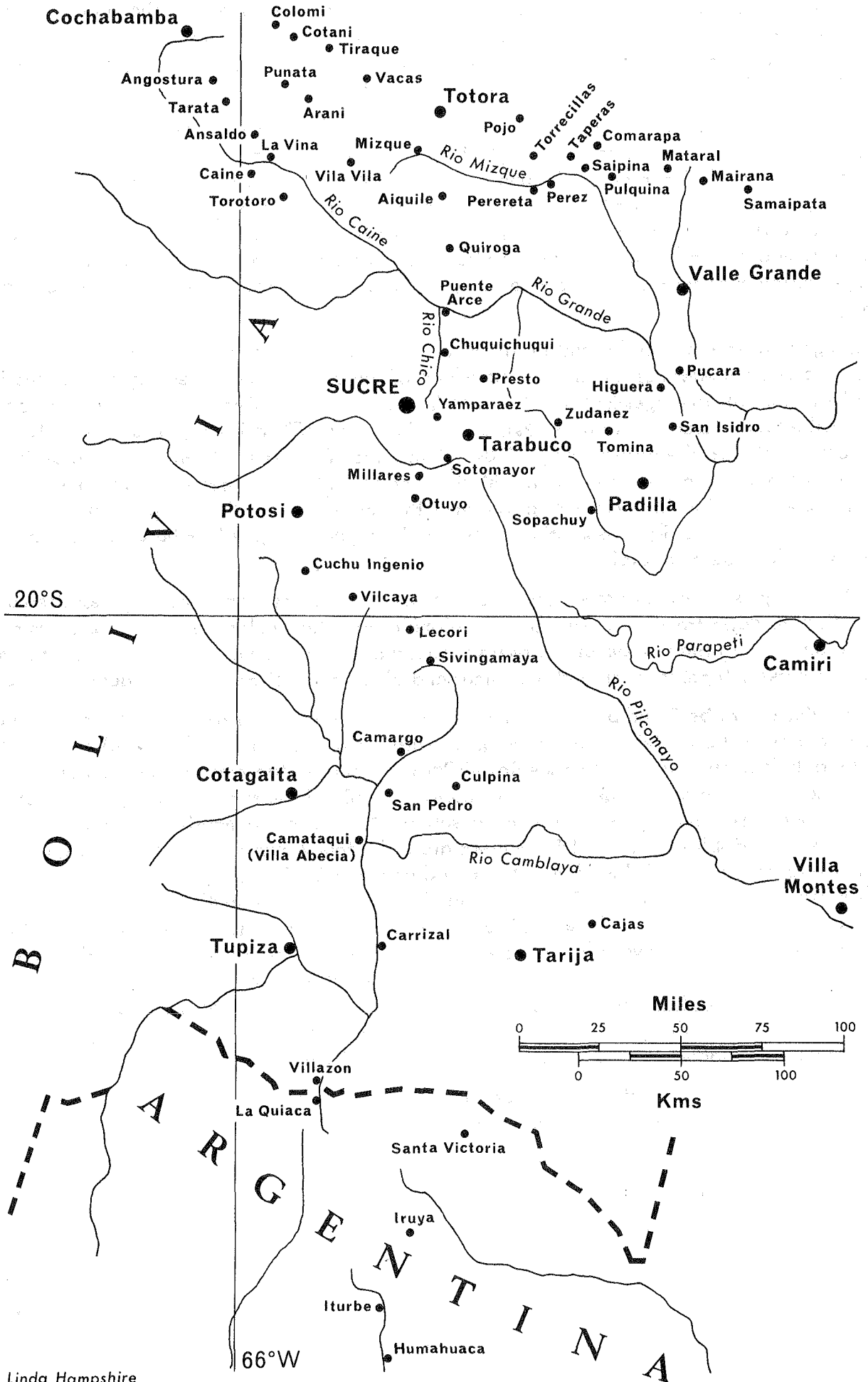
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## SOUTHERN BOLIVIA

The accompanying map covers the eastern half of the high Andes of southern Bolivia. Only the north-eastern and eastern margins of the map represent the fringe of lowland Bolivia.

The high peaks of the Andean chain run fairly close to Colomi, Tiraque, Totorá, Pojo and Comarapa to Samaipata. The northern side of this chain of peaks plunges steeply down to the adjacent lowlands. The ascent of this flank is graphically described by D'Orbigny in another article in this issue.

# Southern Bolivia



Linda Hampshire



The elevated inter-Andean plateau or altiplano is to be found on the western edge of the map, having an average altitude of between 12,000 and 15,00 feet. Between the altiplano to the west and the lowland to the east, the larger part of the country shown on the map is formed of mountain blocks and ranges - the ranges running mostly in a north-south direction. The highest peaks, approaching 20,000 feet altitude, lie close to the altiplano, the peaks becoming progressively lower towards the eastern flanks of the Andes.

Superimposed on this mountain system is a network of rivers which have cut out deep, steep-sided or broad valleys. But as the map itself shows, only three major rivers cut through the eastern flank of the Andes to debouch upon the plains below. Two of these, the R. Grande and R. Pilcomayo, collect between them almost all the upland drainage of southern Bolivia. Large expanses of flattish or gently sloping ground remain between the dissecting valleys. Travel is relatively easy over the elevated ground, rather less so along the valley floor, but any trail crossing a valley must follow a tortuous route up and down the valley walls and makes for very slow progress.

Orographic rainfall on the eastern flanks of the Andes supports a thick montane forest on the northern and eastern edges of the map. The whole of the upland area appearing on the map is much drier. Rainfall averages 22" per annum at La Paz and 18" at Cochabamba (both stations in the lee of the high eastern chain of peaks), 27" at Sucre and 15" at Tarija, these two stations being more exposed to the rain-bearing winds. Both pairs of stations exhibit the decrease in rainfall which occurs from north to south. Most of the rainfall occurs between the months of October and April. For the remainder of the year the rainfall is less than 1" per month. As a result of this pronounced dry season, the vegetation is largely xerophytic - hardwood scrub, grasses, Bromeliaceae and cacti.

At the highest altitudes grow dwarf cacti, a few tough grasses and some low resiniferous bushes. Further down from the snow line grow globular and short columnar cacti, some grasses, herbs and bushes. In the valleys of the rivers Camblayana, Pilcomayo and Grande grow thorn bushes and grasses, together with both columnar and globular cacti and also slender-limbed cacti.

Lobivias are to be found both over much of the map and also off to the north and south of the map; plants of the *Lobivia cinnabarina* group (discussed elsewhere in this issue) are found in the northern half of the map. A few species of *Parodia* occur to the north of the map and many *Parodias* (mainly *Microspermae* group) to the south. *Parodia* of the *schwebsiana* group occur in the Rio Grande basin and adjacent parts to the south; *Parodia* of the *maasii* group are to be found in the Rio Camblaya basin. *Trichocereus* are to be found over much of the area on the map, likewise *Helianthocereus*. *Sulcorebutia* are spread between Cochabamba and Zudanez in the Rio Grande basin. *Weingartia* stretch from Quebrada Humahuaca at the southern extremity of the map to Pulquina in the north. *Cleistocacti* grow mainly in the thorn tree vegetation in the lower parts of the major river valleys, also in the eastern lowlands and in other Andean valleys both to the north and to the south of the map coverage. The Bolivian relatives of *G. saglionis* grow in the hills adjacent to the Chaco lowlands. Columnar *Neocardenasia* occupy the middle reaches of the valleys; *Corryocactus* are found from Tarija northwards into Peru. It will be seen that this area supports a very wide and varied range of cactus flora.

Reference to a number of place names appearing on this map will be found in the articles dealing with *Weingartia* and *Lobivia* appearing elsewhere in this issue.

NEW and OLD in FLOWER in the BOTANIC GARDEN by Herr Schatzl, Linz Botanic Garden.

(Translated by E.W. Bentley from the G.O.K. Bulletin for January 1971).

Herr Schatzl's lecture was a very informative and interesting flashback to the 1970 flowering season of the Type Collection of the Linz Botanic Garden. Understandably not all the species that flowered in 1970 could be shown, time being too short for that. But even the modest number of 86 species expertly commented upon permitted a good picture of the high standard of culture of the Type Collection of our Botanic Garden.

Beginning with the well-known *Acanthocalycium violaceum* Backbg. from Cordoba, Argentina, Herr Schatzl showed old cultivated plants and imports sent by Frau Muhr from Argentina. Right away the onlooker saw that there were scarcely any differences between the cultivated plants and the imports, which was also made clear over and over again in the course of the lecture. This showed once more that here at home too, with expert cultivation, plants can be grown with the typical appearance of imports.

There followed the invariably yellow flowering *Ac. griseum* Backbg. collected by Fechsner but without habitat details, *Ac. glaucum* Ritter from Catamarca north of Belen, *Ac. thionanthum* Backbg. from Salta and - also coming from Salta - *Ac. brevispinum* Ritt., this latter perhaps only a form of *Ac. thionanthum*. Finally the splendid orange flowering *Ac. catamarcense* collected by Ritter.

Of the *Weingartias*, all domiciled without exception in Bolivia, *W. cintiensis* was shown first, a Rausch import found near Cinti. Then *W. platygona* Card. from Potosi, 2,400 m high. This species could be the next following *W. neocummingii* var. *corroana* Backbg.

The widely known *Echinopsis tubiflora* (Pfeiff.) Zucc. was shown by Herr Schatzl as an import from North Argentina. It has been found again in the Provinces of Tucuman, Salta, and Catamarca. In this species too it was vividly demonstrated that correctly grown plants in cultivation scarcely differ from imports, although they may have been kept for many generations during the past more than a hundred years (it was first described in 1846).

The round of *Lobivias* shown began with *Lobivia shaferi* Br. & R. from Andalgala, Catamarca - according to Rausch a variety of *L. aurea* Backbg. There followed *L. saltensis* Br. & R. with very variable spination and striking red flowers. *L. rebutioides* Backbg., big and shining red in flower. This gives rise to the varieties *chlorogona*, *sublimiflora*, and *krausiana*, the latter with giant, flat, old gold to orange coloured flowers. The true *Lobivia famatimensis*, found again by Ritter and by Rausch, needs positively a light and very cool wintering location according to Herr Schatzl. Whether *L. spinosissima* is a good species demands further careful examination. *L. muhriae* Backbg., yellow to orange-yellow flowering from El Aguilar, Prov. Catamarca. Magnificent, reminding one of the bird's nest, the long spined *L. quiabayensis* described by Rausch in 1968 from La Paz (3,500 m), Bolivia. Then on to *L. miniatiflora* Ritt., *L. jajoiana* Backbg., *L. sanguiniflora* Backbg., and *L. allegraiana* Backbg., the latter with a small body and forming big clumps, flowering freely in blood-red. *Lobivia pseudocinnabarina* Backbg. from Bolivia near Coloni, Dept. Chapare, with a columnar body and numerous small red flowers. One can scarcely recognise any difference between *L. oligotricha* Card. and *L. acanthophlegma* Backbg. The *Lobivias* concluded with a splendid pale-lilac flowering *L. backebergii* (Werd) Backbg. found near La Paz at 3,500 m.

*Parodia sanguiniflora* Fric ex. Backbg and *P. rubriflora* Backbg. now led on to the *Parodias*, followed by *P. tuberculata* Card. from Yamparaz, Dept. Chuquisaca; *P. ocampo* Card. from Puenta Arce, Cochabamba; *P. tarabucina* Card. from Oropeza and *P. taratensis* Card., collected again by Rausch on the Rio Caine. All the *Parodias* described by Cardenas grow in Bolivia and are probably more or less related to each other. Here sprung to mind especially the great similarity between *P. tuberculata* and *P. tarabucina*, which both occur near Oropeza. Finally

was shown one of the *Parodias* sent by Frau Muhr under the description B 53.

Next a show of gems brought to the screen the small-sized remaining genera, *Sulcorebutia*, *Aylosteria*, *Mediolobivia*, *Rebutia* and *Blossfeldia*. Magnificently photographed and admirably commented upon. Beginning with the old *Sulcorebutia steinbachii* Backbg., with which in 1951 was set up a monotypic genus characterised by a tap-root, clump formation and a furrow (sulcus) leading from one areole to the axilla lying next above. There followed *S. arenacea* v. *candiae*, *S. tunariensis*, *S. canigueralii*, *S. verticillacantha* with the var. *sucrensis* and *mizquensis*, *S. lepida*, *S. kruegeri* var. *glomerispina* and the especially attractive *S. markusii*.

After some *Mediolobivas* and *Aylosteria* we came to the *Gymnocalycium*. Among these special mention should be made of a *G. megalothelos* (Sente) Br. & R. from the estate of our Herr Director Bayr in which were united all the characters in the description. Herr Bayr had worked in the last years before his death on the clarification of this species, so extremely rarely found pure in collections. He gathered together sceptically the various publications referring to this species and opined that their authors in their works mostly confused *G. paraguayense* with *G. megalothelos*. Now followed transparencies of some plants sent by Frau Muhr which, at present, are not yet quite identified, and finally as a special tit-bit one of the Zurich City Succulent Collection's *G. denudatum* v. *delatetii*. This species recombined by Dr. Schutz in "Friciana Rada" as *G. megalothelos* v. *delatetii* was called in doubt by various authors or even completely rejected, an opinion that is incomprehensible to those familiar with the material.

After the *Gymnocalyciums* followed a series of mostly new *Notocacti*, each finer than the previous one, beginning with *N. herteri*, which for a long time was our only genuinely red-blooming *Notocactus*. Then *N. horstii*, *N. purpureus*, *N. rauschii*, *N. vanvlietii*, *N. werdermannianus* and *N. minimus*, as well as the longstanding *N. concinnus* and *N. apricus*.

Reported by Hans Till

#### Comments

..... from H. Middleditch

"The brief observations in this article upon *Weingartia*, appear to have overlooked the species *W. neumanniana* from Argentina. On this account, the genus cannot be said to be domiciled "without exception" in Bolivia.

"A scrutiny of available maps has not yielded any place name of El Aguilar in Prov. Catamarca, quoted as habitat for *Lobivia muhriae*. There is the well-known El Aguilar in the peaks to the west of Humahuaca, in Prov. Jujuy. On consulting Backeberg's *Kakteenlexikon*, one finds El Aguilar Prov. Jujuy quoted as habitat for this plant. It would seem likely that the source given in this present article is not correct.

"*Lobivia pseudocinnabarina* is assigned a "columnar body" whereas the *Kakteenlexikon* quotes 6.5 cm diam., 5 cm high for this species. This plant group is discussed further elsewhere in this issue.

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#### BOLIVIAN LOBIVIAS - THE CINNABARINA GROUP by John Hopkins

A preliminary review of the genus *Lobivia* with divisions into apparently related seed groups, was put forward in *The Chileans* No. 23 p.76. Since that time, many more samples of seed have been examined and the species coverage is now much wider, but there are some species yet to be studied which could alter the scheme of things. Some notable omissions are *L. chrysochete*, *L. hastifera*, *L. charcasina*, *L. draxleriana*, *L. polycephala* and a few other species discussed below. Several species are still represented by only one seed sample or a number of samples

which are traceable back to the same source. Other samples, probably due to incorrectly identified plants or wrongly labelled seed, appear to belong to two groups and for the time being these cannot be satisfactorily placed until new material becomes available for study.

Rather than merely give an updated version of the previous review, it would seem more appropriate to discuss separate groups in more detail and include comparisons of other characteristics of the species involved, along with their geographical distribution, to see if the relationships deduced from examination of the seed are indeed sensible.

Of the five groups presented in the introductory article, the fifth would appear to be the least satisfactory. Examination of new material within this group indicates that a subdivision is desirable and this results in the following:

Group 5A Seed with testa dull to moderately shiny, black, cellular, more or less prominently tuberculate. Traces of arillus layer on fresh seed, but this is easily rubbed off. Hilum large, circular to oval, more or less thickened at the margin, sometimes turned outwards giving a waist, flat to moderately depressed, at least half the width of the seed (sometimes the full width), whitish to reddish cream. Seed 1.1 - 1.6 mm high and wide, 0.8 - 1.2 mm thick with a prominent dorsal keel.

*Lobivia* *cinnabarina* (Hook.) Br. & R. R 62  
*cinnabarina* v. *grandiflora* Rausch n.n. R 265  
*mizquensis* Rausch R 463  
*mizquensis* v. *titora* Rausch n.n. R 463a  
*prestoana* Card. Lau 388  
*pseudocinnabarina* Backbg.  
*rossii* v. *walterspielii* (Boed) Backbg.  
*yamparaezii* n.n. (=Lau 378?)  
*cardenasiana* Rausch R 498

Group 5B Similar to group 5A in general form of seed. Testa dull, slightly rough (matt) to slightly tuberculate (much less prominently than in group 5A), black. Arillus light brown, thin to very prominent. Hilum moderately large, (circular to) oval, thickened at the margin, not turned outwards, one to two thirds of the width of the seed, creamy (to almost black in one case). Seed 1.1 - 1.8 mm high, 1.1 - 1.6 mm wide, 0.8 - 1.2 mm thick. Dorsal keel more or less prominent.

*Lobivia* *acanthoplegma violacea* n.n. Rausch R 457  
*larae* Card. R 264  
*oxyalabastra* Card. & Rausch R 200  
*taratensis* Card.  
*oligotricha* Card. R 54

In his comments following the introductory article, J.D. Donald referred to the desirability of including several other genera in this study, including *Pseudolobivia* and *Echinopsis*. These two genera are indeed being examined and although *Echinopsis* consists of several seed forms, *Pseudolobivia* is so far represented by one one seed form, which in many respect is very similar to the group 5A type of seed. It seems appropriate therefore to introduce the *Pseudolobivia* at this stage as:

Group 6 Seed almost identical to group 5A except that the dorsal ridge does not extend quite so far around the seed and that the seeds are generally slightly less wide, giving a more elongated appearance tapering to a slightly narrower hilum, one third to one half (to two thirds) the seed width.

*Pseudolobivia* *ancistrophora* (Speg.) Backbg. R 237  
*callichroma* (Card.) Backbg. R 461  
*calorubra* (Card.) Backbg. R 181  
*hamatacantha* (Backbg.) Backbg.

kratochvilliana (Backbg.) Backbg. R 2  
obrepanda (Salm-Dyck) Backbg. R 175  
rojasii (Card.) Backbg. R 181a  
torolapana (Card.) Backbg. R 256  
sp. comarapana R 271  
sp. Pojo R 272

The similarity of the seeds of Groups 5A and 6 has added a further degree of confusion as it seems quite possible that *L. cardenasiana* could be included in group 6 and indeed the rather long flower, 9-10 cms, of this species tends to support this idea as do the straight ribs and spination which are typical of *Pseudolobivia*. The very variable shape of the group 5A seeds (within the dimensions given) makes this move a little uncertain at present.

Turning now to take a more detailed look at Group 5. Basically there is still some serious shortage of material for study purposes, with no seed samples of *neocinnabarina* and only unauthenticated samples of *L. rossii* v. *walterspielii* and *L. pseudocinnabarina*. Neither is there any seed of *L. draxleriana*, a close relative of *cinnabarina* (the seed of *draxleriana* is said by Rausch to be larger than that of *L. cinnabarina*). It will also be noticed that *L. claeysiana*, *L. backebergii* and *L. aracanacantha* are now omitted from this group and these species are discussed in more detail below.

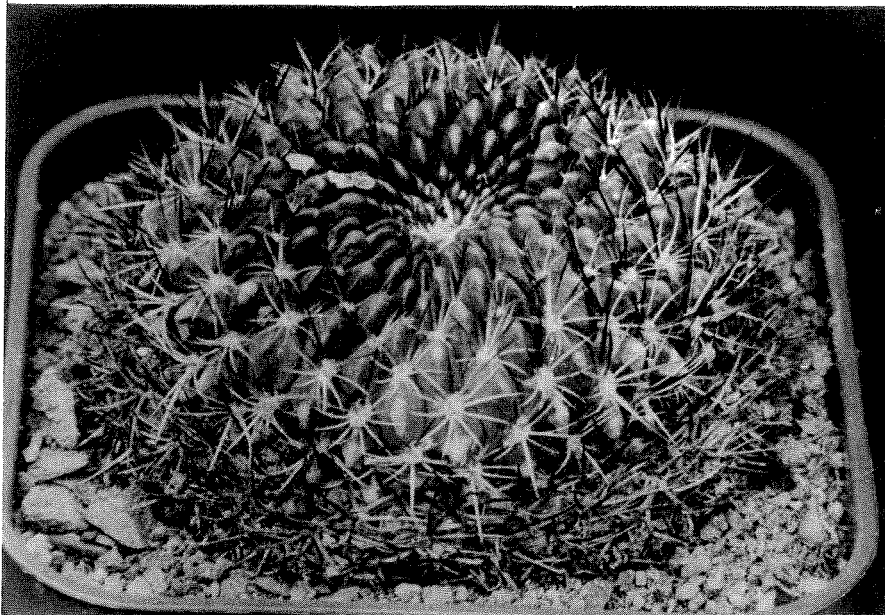
Before proceeding further it might be useful to endeavour to disperse the aura of mystery and confusion which seems to surround *L. cinnabarina*. Reference to the brief original description by Hooker in 1847 reveals that this large bodied (up to 15 cm diam.) plant possesses large carmine flowers some 8 cm diameter (length not given). A reproduction of the original illustration appears in Backeberg's *Lexikon* as Abb. 191. He also discusses the plant at some length, pointing out that the Britton and Rose diagnosis does not stem from the original and that Cardenas' concept of this species is also incorrect, being in fact Backeberg's small-flowered *L. neocinnabarina*. The illustration in Britton and Rose's monograph Vol III Plate IV appears to resemble *L. acanthoplegma* or *L. taratensis* in spination and the flower size of 4 cm diameter quoted by the authors supports this view.

Cardenas, after his own description of *L. oligotricha* comments on its affinities with *L. cinnabarina*. The flower of *L. oligotricha* is again small, being only 2.5 cm in diameter. In view of this confusion, it is to be hoped that Lau and Rausch have identified *L. cinnabarina* correctly.

The seed diagnoses of groups 5A and 5B indicate that *L. cinnabarina* is not directly associated with the smaller flowered plants mentioned above and in addition the distribution areas of the two groups are seemingly separate. Plants of group 5B are found in the Tarata-Cochabamba region and of 5A are found to the south and south east of that region - extending southwards to Tarija and south-eastwards to Valle Grande. If *L. pseudo-cinnabarina* really does belong to group 5A then it is found in the group 5B distribution zone - which is very compact compared to the area covered by group 5A plants.

As indicated above, it would now seem profitable to examine the body and flower morphology of these and other species to see if the groupings are realistic and also to see what might be expected when the seed of other species becomes available.

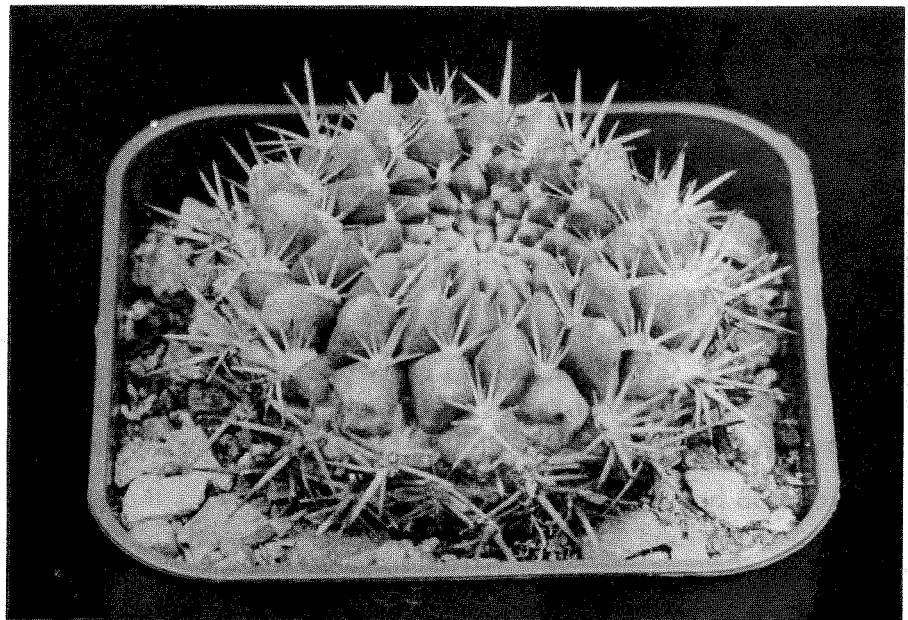
*Lobivia cinnabarina* has a large flattened body with ribs scarcely describable as such, for they are deeply divided into large - almost conical - tubercles. The somewhat elongated areoles sit obliquely in the notches between the tubercles and extend out slightly into the upper tubercle surface. The remainder of group 5A have similar tuberculate ribs with the exception of *L. mizquensis* and *L. cardenasiana*, both of which are much less deeply cleft, giving more of a hatchet-shaped tubercle. *Lau 372* and *L. draxleriana* are like *L. cinnabarina* in this respect, as also are *L. pseudocinnabarina* and *L. neocinnabarina*, although the tubercles are smaller in the latter two species. There are however, some differences in areole situation: *L. draxleriana* is again



LOBIVIA

LAU 352

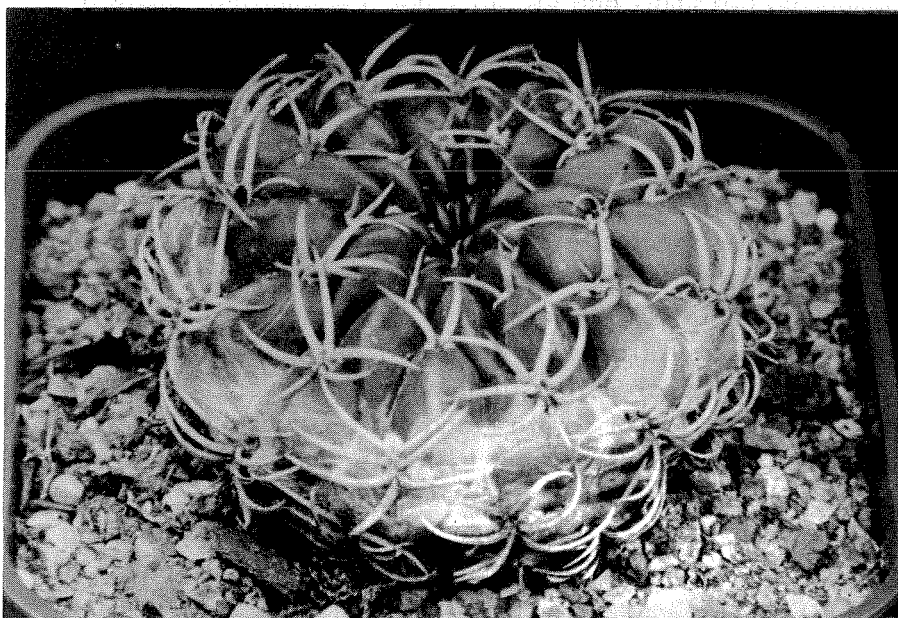
5" Pot



LOBIVIA

LAU 332

4" Pot



LOBIVIA

LAU 388

4" Pot



like *L. cinnabarina* - and possibly only a form of it. In *L. prestoana* and *L. pseudocinnabarina*, the areole is completely out of the notch, is much elongated, and sits straight on the upper surface of the tubercle. This is also true of *L. Lau 332*. There are also some spination differences: *L. cinnabarina* and *L. draxleriana* have more or less radiating spines - as does *Lau 332* but in this case they are more pectinate. *Lobivia prestoana* also has pectinate and somewhat adpressed spines. This leads into group 5B where all the species have pectinate spines arising from elongated areoles situated on the upper face of the tubercles, characteristics common to *Sulcorebutia*. The tubercles in the 5B group are in some species somewhat elongated but such elongation is not general, as morphological characteristics of this sort can easily be affected by the conditions in which the plants grow i.e. in the open, or shaded - and hence is hardly a point of major importance.

The bodies of *L. acanthoplegma*, *L. taratensis*, etc., can be equally as large as that of *L. cinnabarina* viz: some 15 cm in diameter; most of the others are somewhat smaller but all have the flattened appearance except *L. neocinnabarina*, *L. pseudocinnabarina* and *L. oligotricha*: all of these, while being flattish to start with can become rather more short cylindrical with age, but both of the first two species cited can exceed the dimensions given by Backeberg and *L. pseudocinnabarina* is known to offset - as are *L. taratensis* and *L. oxyalabastra*. The latter is in fact freely caespitose and has somewhat smaller bodies than the rest; another characteristic of this species is the tendency for the flower to appear from the lower half of the stem - rather than the upper half, which applies in the remaining species.

The large flower of *L. cinnabarina* is matched by the equally large flower of *L. draxleriana*, which is perhaps a deeper carmine colour and possesses a dark violet throat (attributable to the lower stamens) and very unusual almost golden-brown anthers. *Lobivia Lau 352* from the Pucara - Valle Grande pass fits the *L. draxleriana* description very well, but is some way from the type locality between Mizque and Aiguile. The *L. draxleriana* variety R 65 from the Sucre region indicates how widespread is the species. The numerous varieties of *L. cinnabarina* assigned primarily by Rausch e.g. *rossii* R 70, *walterspielii* R 73, *zudanensis* R 626, possess somewhat smaller flowers than *L. cinnabarina* (typically about 6 cm long) as does *L. prestoana Lau 388*. *Lobivia R 265* was originally listed as *L. cinnabarina* v. *prestoana*, but has now been published as v. *grandiflora*; its distribution area around Padilla puts it with the other species in group 5B.

The group 5B has in general somewhat smaller flowers than those in group 5A, *L. laeae* having the largest at 5-6 cm long and diameter. Perhaps the most significant feature of their flowers is the variability in the quantity of axillary hairs at the tube and ovary scales. The *L. cinnabarina* group all possess a small to moderate amount of hair at the scale axils, as does *L. laeae* and *Lobivia acanthoplegma*, whereas *L. taratensis* has a very hairy tube indeed. The flowers of *L. neo-cinnabarina* and *pseudocinnabarina* are small and virtually hairless and their distribution is associated with group 5B around Colomi. From this, it may be seen that there is no clear cut division of large and small flowers, more a tendency to be on the large or small side of an arbitrary 5 cm length.

From the above comments on the group 5 species, it can be seen that it is very difficult to draw any firm conclusions at this stage as to the overall relationships, which are evidently quite involved. Acquisition of the seed of the other species referred to above may well help to formulate a better scheme, but there is little doubt that the number of specific names could be reduced, as witness comments in the literature. For example, Lau observes that *L. taratensis* is synonymous with *L. acanthoplegma*, despite the differences in flower hairiness. If this is so, then *L. laeae* must also be synonymous, as the only real difference is the slightly longer flower tube. It is significant that all these species grow in the region of Tarata - and yet Lau found *L. taratensis* and not *L. laeae*, and Rausch vice versa. Cardenas states that *L. taratensis* is very variable, yet asserts that his variety *leucosuphus* is sound, on account of its fewer spines and yellow flower throat. It would almost seem to be a case of finding a variable population of plants, picking out the most distinctive ones, and describing them as species without studying the whole population

thoroughly. If the plants in the author's collection of Lau 332, 352, 378, *prestoana*, *larae*, *pseudocinnabarina*, and *taratensis* (Lau 312) flower and set seed this year, it should help considerably towards an understanding of the relationships between these species. Lau 378 - which is probably *L. charcasina* - is of particular interest as it closely resembles *L. taratensis* in body form and spination, yet it is found in the Sucre area i.e. in the *L. cinnabarina* distribution area.

As noted above, the species *L. claeysiana* and *L. backebergii* have been omitted from the seed groups 5A and 5B as both are represented by two distinct sorts of seeds. *Lobivia claeysiana* is a rare, yellow-flowered plant somewhat similar in body morphology to group 5. It is found in S. Bolivia and apparently also in S. Peru. This seems very strange under any circumstances. If the species has once been widespread it might be understandable, but there is no evidence for this. That the same species has evolved in two entirely separate areas is hardly believable.

*Lobivia backebergii* appears to be a case of non-rediscovery of the species until recent times - R 456. Several seed samples were such that they fitted reasonably well into the original group 5 until a reputed sample of R 456 arrived, which was clearly of group 4. The original description of *L. backebergii* leaves a great deal to be desired (and to the imagination) and the only published photograph discovered so far is in Marshall and Bock's *Cactaceae*. This shows a very strange plant with slightly spiralling ribs, broken into roundish humps, on top of which sit the rather elongated areoles. The smallish, naked tubed, flowers arise from the upper parts of the stem. The overall impression is most un-*Lobivia* like and does not fit either group 4 or 5 satisfactorily. There is a considerable difference between this illustration and the plants found in collections under this name. Presumably the first samples of seed came from these latter plants - but does this mean that they are all a single mass produced hybrid?

*Lobivia aracnacantha* and its forms do not fit happily into group 5 now that more seed samples have been seen, and it is possible that a separate group or sub-group will be necessary to take them. Certainly the small, freely offsetting bodies together with the narrow tubed flowers, do not show much resemblance to the group 5 species. The ribs are continuous, only slightly humped, but the areoles are elongated, bearing pectinate spines. In all respects except flowers, they could well be taken as *Sulcorebutia*, the flowers of which do not have the two separate stamen insertions (as in *Lobivia*) and the tube scales are devoid of hairs.

The variable *L. aracnacantha* v. *torrecillacensis* from the Comarapa area is found quite some way from the main distribution area of *L. aracnacantha*, around Valle Grande. Is the variation in flower size to be found in this variety due to hybridisation with *L. pojoensis*, itself having variable sized flowers? Comarapa is roughly midway between Pojo and Valle Grande; in addition, *L. pojoensis* is red flowered as is the *aracnacantha* variety.

*Lobivia pojoensis* itself is another species which could well be of interest in the group 5 seed category. From the description of this species, it would seem to be rather like *L. mizquensis*, a variety of which is found at Totorá, midway between Pojo and the habitat of *L. mizquensis*, between Vila Vila and Rio Mizque. The variety R 463 a is already allocated to group 5A. On the other hand, Rausch at first thought that *L. pojoensis* resembled a small *Pseudolobivia obrepanda*, and when seed of the species becomes available it may be a problem to determine whether it belongs to group 5A or 6 - as with *L. cardenasiana*. Cardenas's *Echinopsis calorubra* from Comarapa would appear to be merely a longer flowered *L. pojoensis*.

To further the seed study, the author would welcome any samples of seed, or - even more valuable - fruits from imported *Lobivias*. Details of the field collection number or habitat, and of the pollen donor plant would be of immense value. It would also be of much interest to be able to see more slides of plants in flower at our Brooksby weekend, and to see sectioned and pressed flowers - particularly of imported plants.

## Comments on *Lobivia cinnabarina* group

..... from J. Arrowsmith

"Of my collection of *Lobivia* & *Pseudolobivia*, many are small seedlings and about 20 are imports with Lau numbers which were obtained from Sargent, together with others from Uhlig. I think that the group 5B plants are the most interesting to me as I have imported plants of *L. tarantensis*, *acanthoplegma* and *larae*. At the end of May, only the *acanthoplegma* was showing sign of bud. I wonder if the plants in group 5B flower later than the *Lobivia* in other groups, or is it that being imported plants they have had a set-back? They all seem to be growing very well.

"Another interesting import I have is *L. claeysiana*, which is in bud (end of May); if they are yellow flowers it will tend to sort the plant out. I must admit that the body morphology is very similar to group 5, just as J. Hopkins remarks.

"It is suggested that all *Lobivia* in group 5B have pectinate spines - maybe my *L. acanthoplegma* is an exception; the areoles are oval, rather than elongated, about 3 mm wide, 6 mm long, and the spines appear to be radiating, not pectinate."

..... from H. Middleditch

"Two years ago I received two imported plants from Uhlig - a *L. larae* and a *L. claeysiana*. Without the labels, it was difficult to tell them apart; they both have the pectinate areoles of the *cinnabarina* group. Might some confusion have occurred with labels? At this time (June) the *L. claeysiana* is in bud - the buds are daisy shape i.e. flattened globular, the sepals being quite a bright green colour. It is not what I would have regarded as a typical *Lobivia* bud.

"Perhaps I can look forward to receiving some good advice concerning the naming of these two plants at our forthcoming Brooksby gathering?"

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## ECHINOCACTUS CINNABARINUS

(Abstracted from Curtis's Botanical Magazine No. 73, 1847)

*Atro-viridis* globoso-depressus centro umbilicatus, tuberculis spiraliter dispositis basi tetragonis dorso verticaliter profunde carinatis, areolis parvis tomentosus ad summum apicem tuberculi sitis, aculeis rigidis mediocribus gracili-subulatis exterioribus radiantis sub uniformibus, centrali erecta dimidio longiore, floribus solitariis sparsis, calycis viridis tubo lanato sepalis inferioribus minutis acutis superioribus spathulatis, petalis numerosis cinnabarinis.

A neat species in regard to the form and arrangement of its tubercles, and very striking when in flower, from the numerous rich cinnabar-coloured petals, which spread to a diameter of three inches. The species is among the many rare ones from Bolivia, purchased for the Royal Gardens from Mr. Bridges. It flowers in a cool greenhouse in July.

Our specimens grow solitary and are globose, but depressed and umbilicated in the centre, six to seven inches in diameter and three or four inches in height. The surface is formed of copious dark green mamillae or tubercles, closely packed and arranged in spiral oblique lines; they are four-sided at their base, and dilated at the back into a deep vertical, rather short keel, on the top of which the areole is situated; this areole is small, woolly, and bears a cluster of about twelve, pale brown, narrow, subulate or acicular but rather strong aculei; those of the circumference are nearly equal in length, and form a circle,  $\frac{1}{2} - \frac{3}{4}$  of an inch long; the central one is longer and stronger than the rest, all slightly curved.

Flowers scattered, solitary, large in proportion to the size of the plants. Calyx green;

the tube short, woolly, the folioles - or sepals - of the lower portion, small, short, acute, the superior ones large, spatulate, and resembling the petals except in colour, and seeming gradually to pass into petals. Petals numerous, spatulate, obtuse, spreading, of a rich cinnabar colour. Filaments red. Anthers yellow. Rays of the stigma (in the few flowers I have seen) erect and approximate.

(The colour plate accompanying this original publication has been reproduced as Abb. 191 in Backeberg's "Kakteenlexikon".)

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## ECHINOPSIS CINNABARINA Lab.

(From "Bluhende Kakteen" October 1900)

*Echinopsis cinnabarina* Labouret, Monographie des Cactees 288; Weber in Bois, Dictionnaire d'horticulture 471; K. Schumann, Gesamtbeschreibung 288.

*Echinocactus cinnabarinus*, Hooker in Botanical Magazine. Plate 4326

This beautiful plant was sent to Kew Gardens in 1846 by Bridges, where it bloomed after a short time, and was then described and well illustrated by Hooker in the well-known Botanical Magazine. The author did not place the plant in the genus *Echinopsis*, where it is held today, but in the genus *Echinocactus*. It forms a small natural group at present in the former genus along with the widely cultivated, easily propagated and free-flowering *Echinopsis pentlandii* S.-D. and *E. obrepanda* K. Sch., the latter being better known under the names *E. misleyi* Lab. or *E. cristata* S.-D. It is characterised by the hatchet shaped tubercles comprising the ribs.

If the flowers alone are considered, Hooker's opinion that the species be held in the genus *Echinocactus* is more readily comprehended. The short funneliform shape of the perianth, which it shares with *E. pentlandii* S.-D., is indeed duplicated in many species of *Echinocactus*, so that it might seem to be characteristic of this genus. Nevertheless I have never been of the opinion that it should be returned to *Echinocactus*. The basis for retaining it in *Echinopsis* lies in the shape of the body, which corresponds perfectly with that of *Echinopsis obrepanda* K. Sch., and there can be no doubt that this is a true *Echinopsis* in its flower characteristics. The position of our plant will thus be better decided by whether the characteristics of the flower or those of the body are considered. In *E. cinnabarina* and *E. pentlandii* S.-D. we have before us two species which in my work on the distribution of cacti, I have signified as merging forms. They obviously show connecting links between the genera, by which they could rightfully be classed in either genus.

The name *E. cinnabarina* is not well chosen, since the flower colour to which the species name refers, is by no means cinnabar-red, but carmine.

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## Comments

..... from H. Middleditch

"The colour plate which appears in *Bluhende Kakteen* depicting this species shows a set of tubercles very similar in shape and disposition to those on Schumann's illustration; if anything, they may be a little longer for the same width. Schumann's illustration shows a plant markedly higher than it is broad, *Bluhende Kakteen* a flattened globular plant; could the latter be younger - and smaller, thus explaining the apparently longer tubercle? The flower on Schumann's illustration is wide open and in breadth is equal to nine ribs of the plant; in *Bluhende Kakteen*,

the flower is perhaps partly open and in breadth is equal to but five ribs of the plant. Both illustrations depict an upper row of stamens which must either have longer filaments than all the other stamens, or else there must be a gap between them and the insert of the general body of the stamens. The Fibonacci spiral ratio appears to be 9/18 on Schumann's plant and 15/11 on that in Bluhende Kakteen.

"The illustration on Plate IV of Britton & Rose's Vol III of their monograph "The Cactaceae" is a little confusing at first sight, as the areoles appear to be most peculiarly arranged, without any definite Fibonacci spiral. A close scrutiny of this particular illustration reveals that the apparent areoles are makeshift spines marked on in a hotch-potch fashion by the photographic retoucher, who presumably had never heard of Fibonacci spirals. This has effectively obscured the nature of the tubercles and makes it impracticable to adjudge their nature in comparison with the two foregoing illustrations. However, the flower is clearly quite short, apparently equal in width to about five or six ribs, nearly wide open.

"It may be borne in mind that any red-flowering plant with hatchet shaped tubercles, coming from the Andes of mid-Bolivia in the 1890 to 1910 era would be "cinnabarina", whereas today we have a dozen and one specific names to cover these plants. This may readily explain why we have various sorts of plants going around even nowadays under the label of Lobivia cinnabarina.

"We tend to regard any argument concerning the relative merits of alternative generic names as something which began with Britton & Rose's establishment of numerous new genera and which burst out afresh each time Backeberg published a new genus. The pre-Britton & Rose days tend to be regarded as free of argument about generic names, largely on the grounds that there were so few to chose from. However, as one may see from the above article, this was far from the case and it would seem that, of the plants known at that time which we would now class as Lobivia, there was disagreement over their being named as Echinopsis or as Echinocactus.

"When I look at a red-coloured flower and describe it as a particular shade of red, not uncommonly someone else will describe the same colour by a different shade. Perhaps I can take some comfort from the fact that the writer of the above notes in Bluhende Kakteen found himself at variance with Hooker's description of the flower colour on L. cinnabarina.

"Even in this vintage article one finds phrases like "There can be no doubt that this is the true ...." which seem to crop up in literature even today, just like red spider in the greenhouse."

..... from A.J.S. McMillan

"Arguments about colour can only be resolved by reference to a colour standard, preferably the excellent R.H.S. Colour Charts."

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ECHINOPSIS CINNABARINA Lab. by K. Schumann

(Translated by H. Middleditch from Gesamtbgt. Der Kakteen 1903)

Body solitary, at least in cultivation, rarely spontaneously offsetting, depressed globular, up to 15 cm diameter, usually not quite so high as broad, rounded on top, at the crown deeply umbilicate, at this point entirely unarmoured strewn with only sparse woolly felt, shiny dark green.

Ribs divided into quite narrow chins by a distinct formation of rows arranged in conformity with the 13th and 21st spirals, which exhibit on top a deep depression and below a large, acute angled, chin-like appendage; the latter is up to 1 cm high.

Areoles 10-12 mm apart, circular, 2.0-2.5 mm in diameter, furnished with sparse, whitish, almost grey wool-felt. Radial spines 8-10, spreading out in all directions, the central pair extending the furthest, but rarely exceeding 15 mm. Middle spines 2-3, somewhat larger and stronger; all spines are awl-like slightly curved, pale brown, then darker horn coloured, finally becoming grey and becoming damaged.

Flowers not far off the crown or more at the side; overall length 6-7 cm. Ovary spherical, dark green, furnished with short, triangular, greenish, transparent scales, dark wool projecting from their axils. Perianth short funneliform, largest diameter up to 8 cm. Outer perianth leaves (petals - H.M.) spatulate, truncated, diminutive pointed tip, green, with ascending red midstripe; inner spatulate, blunt, pointed tip, denticular, magnificent scarlet-red, gleaming in the carmine colour. Filaments extend over half the length of the perianth tube. Filaments dark red, anthers chrome yellow. The pistil barely extends above the lowermost stamens, the 8 dark green stigma lobes remain closed up together.

Was sent to Kew from Bolivia by Bridges about 1846; flowers open in summer early in the morning and close up after two days.

Comments on *Lobivia cinnabarina*

..... from H. Middleditch

"It is rather puzzling to know just what Schumann means in his diagnosis by the term "13th and 21st spirals". One might perhaps assume that this refers to the Fibonacci spiral ratio, that is the number of left hand and right hand spirals in which the areoles are arranged. An attempt to count this spiral ratio from Schumann's illustration yields a figure of 9/18 for the spiral ratio, which is not much help at all."

..... from G.E.H. Bailey

"About 7 or 8 years ago I sowed some seed of *Lobivia cinnabarina* which I obtained from Uhlig, and I have retained one of the seedlings. It is a deep green colour, with tubercles just like those on Schumann's illustration; the ribs are disposed in a left-hand spiral and the areoles are a beautiful right-hand spiral. The plant has not flowered yet, although it is about 5" high and about as broad. The crown is very depressed and is completely without spines."

..... further from H. Middleditch

"A spiral count on this particular plant produced a spiral ratio of 13/21, exactly the same as Schumann's figures. Under the circumstances, a neat fitting ball and chain might be a suitable attachment for this plant."

..... from J. Hopkins

"There is no difficulty counting the spiral ratios on many of my imported *Lobivia* in the Group 5 (*cinnabarina* etc.). I have two plants of *L. draxleriana* - which John Donald suggests may possibly be the equivalent of the original *L. cinnabarina*; one of them has a 13/21 spiral ratio and the other plant is 18/11 spiral ratio. However, I do have an imported two-headed *L. taratensis*, both the heads being more or less the same size (about 3" in diameter); one of these two heads has an 18/11 spiral ratio and the other is 16/10. Two different plants of *pseudocinnabarina* also have spiral ratios of 18/11 and 16/10. But is this of any help to us?"



..... from G.E.H. Bailey

"My *L. oligotricha* has a spiral ratio of 16/10; it is seed grown".

..... from H. Ewald

"Last year I obtained a number of imported *Lobivias* from De Herdt; amongst them were three plants of *L. neocinnabarina*. Two of these have a spiral ratio of 7/11 and one has a ratio of 12/8".

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LOBIVIA OLIGOTRICH Card. sp. nov. by Prof. Dr. M. Cardenas

(Translated by H. Middleditch from *Cactus* (France) 18.78: 1963

Simplex globosa vel breviter cylindrica 5-8 cm alta, 7-8 cm lata dilute viridis. Costis plusminusve 18 spiralibus in tubercula securiformia 4 mm alta 7 mm lata solutis. Areolis 8 mm inter se remotis ellipticis 4 mm long, cinereo tomentosus. Aculeis plusminusve 15 acicularibus radiantibus albidis ab basim incrassatus 6-15 mm long. Superne areoli aculeis intricatis fere eorum obtegentes. Floribus numerosis circum apicem umbilici exeuntibus, infundibuliformibus 3 cm long. Ovario 3 mm diam., viridi, paucis squamis 1 mm long. acutis rubidis, paucis pilis albis praedita. Tubus brevis 4 mm long, viridis, squamis paucis rubeis 1 mm long., pilis paucis albis instructus. Phyllis perigoni exterioribus lanceolatis 15 mm long. viridibus, interioribus purpuris. Phyllis interioribus spatulatis 15 mm long. dilute rubeis. Staminibus inferioribus ex fundo tubi usque 5 mm supra, 3-10 mm long; filamentibus inferne viridibus, superne purpureis. Staminibus superioribus 7 mm long., filamentis purpureis. Omnibus antheris flavis. Stylo 12 mm long. dilute viridi, 5 lobis stigmaticis dilute viridibus 2 mm long. coronato.

Patria: Bolivia, Provincia Punata, Departamento Cochabamba, prope Cuchu Punata, 2,568 m.

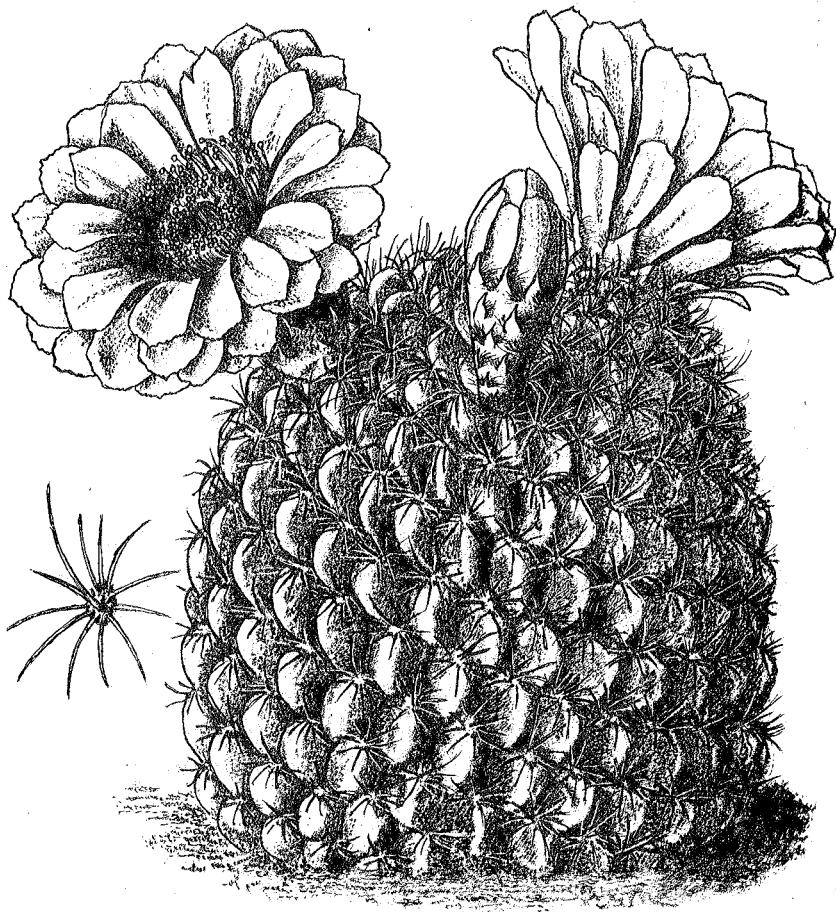
Plant solitary short cylindrical, 5-8 cm in height, 7-8 cm in diameter, light green. Ribs in about 18 spirals divided into tubercles in the shape of a hatchet, at least 4 mm high, 7 mm long. Areoles 8 mm apart, elliptical, 4 mm long grey felted. Spines about 15, acicular and spreading, indistinguishable between radials and centrals, a few very slender, whitish, thickened at the base, 6-15 mm in length. Upper areoles interwoven, entirely hidden at the unarmoured crown.

Numerous flowers, about 15, surrounding the depressed crown, generally in the shape of a funnel, 3 cm in length, the limb of 2.5 cm. Ovary of 3 mm diam., green, with sparse reddish and pointed scales of 1 mm in length furnished with some white hairs. Short green tube, 4 mm long, clothed with some red scales, pointed, furnished with very sparse white hairs. The exterior perianth segments lanceolate, 15 - 3 mm, green on the outside, red on the inside. The interior perianth segments spatulate, pale red, 15 x 4 mm. The lower stamens inserted at the base of the tube and thence up to within 5 mm of the top, 3-10 mm in length, the filaments green below, violet above. The upper stamens 7 mm long, filaments violet. All the anthers are yellow. The style 15 mm in length, pale green. Stigma lobes 5, pale green, 2 mm in length.

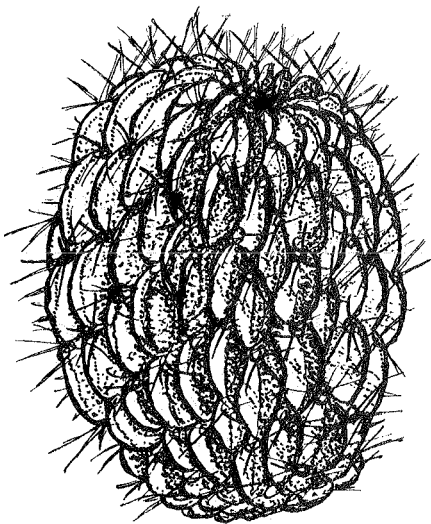
Bolivia, Province of Punata, Department of Cochabamba, Cuchu Punata, 2,568 m. December 1963, M. Cardenas, No. 5,559 (type) in the Herbarium Cardenasianum.

This species has a resemblance in its flower to *Lobivia cinnabarina* (Hook.) Br. & R. but differs from it by its very thin yellow spines which are thicker and acicular in *L. cinnabarina* (Hooker) Br. & R., slightly adpressed to the body and whitish. It also differs from it by its generally funneliform flowers which are quite urn-shaped and whose sepals are of a very much paler green.

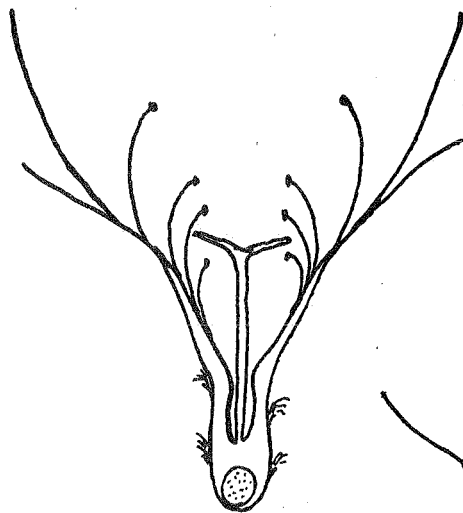
*Lobivia cinnabarina* (Hooker) Br. & R. which was discovered by Bridges in 1846 has been entirely lost. I have rediscovered this plant close to Colomi (Cochabamba, Bolivia) in 1942. It is a very common cactus on the green slopes of the Provinces of Chapare and of Punata in the



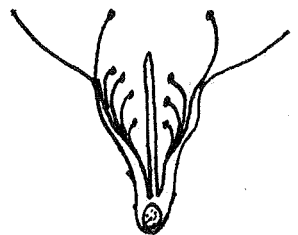
LOBIVIA CINNABARINA - Schumann  
 GESAMBT DER KAKTEEN



LOBIVIA OLIGOTRICHA  
 Collection E.W.Barnes



LOBIVIA LAU 352



LOBIVIA  
 PSEUDOCINNABARINA

2 cm.  
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Flower Sections - x1 - J.Hopkins.

Department of Cochabamba and at an altitude of about 3,400 m.

Comments on *Lobivia oligotricha*

..... from H. Middleditch

"At the time when Schumann's book was published, there had been no great amount of collecting done in Bolivia beyond the regular trade routes; there was the old road from Cochabamba to Santa Cruz along the eastern edge of the Andes, which had been in use since the time of the Spanish conquest; there was also the route from the plains of Moxos to Cochabamba described by D'Orbigny in the accompanying article, both of which appear to pass through the territory in which *L. cinnabarina* and allied species are found. It seems quite probable that any plant from that locality which had a resemblance to *L. cinnabarina* would be given that name, even though some were depressed-globular whilst others were elongated-globular.

"There are two very confusing points in this diagnosis. Firstly we have a statement in the diagnosis that the spines are whitish (blanchâtres) and acicular. Then in the notes following the diagnosis we are told that this species differs from *L. cinnabarina* by its yellow (jaunes) spines. There is a quite clear contradiction here in the statements on spine colour. It would be of interest to know of the spine colour on any elongated-globular *cinnabarina*-like plants. Secondly, the spines are thicker "and acicular" in *L. cinnabarina*, this apparently being one of the distinguishing features between *oligotricha* and *cinnabarina* - but the diagnosis for *oligotricha* tells us that the spines are acicular, too.

"In addition, the sentence on "Areoles superieures enchevetrees entierement cachees au sommet du tronc inerme" means literally that the upper entangled areoles (are) completely hidden at the crown of the body. The picture by Cardenas accompanying his article in "Cactus" shows the spines from the upper areoles overlapping - or, if one wishes to so describe it, entangling - and also shows the unarmoured crown with no areoles visible. One wonders whether there has been a transcription error in translating Cardenas's manuscript into French for this publication, since the wording used cannot be made to match the photograph without stretching beyond the bounds of acceptable transliteration.

"The accompanying sketch by E.W. Barnes depicts an elongated form of *L. oligotricha*. It will be of interest to see if we are able to compare the tall and the short forms of this species-complex at our Brooksby Gathering."

..... from J. Hopkins

"The comments by Cardenas and the illustration in the French Journal "Cactus" depicting a plant which he calls *L. cinnabarina* (immediately following the description of *L. oligotricha* reproduced above), adds - I think - to the confusion over *L. cinnabarina* which I have discussed elsewhere in this issue.

"The original Hooker description of *L. cinnabarina* in Curtiss's Botanical Magazine of 1847 gives us no clue as to the area of occurrence of this species, except "Bolivia". Examination of the Cardenas illustration shows a very floriferous plant, and even if the body is a full 6" (15 cm) in diameter, then the flowers are only about 1½-2" (4-5 cm) across, which does not compare very favourably with the description given by Hooker: "Flowers scattered, solitary, large in proportion to the size of the plants, spreading to 3" diameter. But the distribution area around Colomi, cited by Cardenas, is far from the area where Rausch, Lau, etc. found their interpretations of *L. cinnabarina* i.e. around Sucre. Indeed, Colomi is outside the general distribution area of the large flowered *Lobivias* related to *L. cinnabarina* (*L. draxleriana*, etc.) but is in the centre of the distribution area of the small flowered species *L. pseudocinnabarina*, *L. neocinnabarina*, etc. Mature plants of these species are indeed as floriferous as the Cardenas

depicted plant, which to my mind is one of these species - probably the latter, as Backeberg concluded (vide the extract from Das Kakteenlexikon in this issue).

"Considering the comments by H. Middleditch on *L. oligotricha*, there should be no confusion with the genuine *L. cinnabarina*. Short columnar growth habit is also found in *L. pseudocinnabarina* and *L. neocinnabarina*. The Schumann illustration of *L. cinnabarina* is very strange but the tuberculation and spination detail compare very favourably with the illustration accompanying Hooker's description.

"The new spines on *L. oligotricha* are indeed yellow and all are acicular. The radial spines of *L. neocinnabarina* (with which Cardenas is probably comparing it) are also thin acicular, light to dark brown at first and the similarly coloured centrals are stronger and rather more awl shaped.

"The French sentence concerning the entangled upper areoles is probably an error as the Latin refers to the entangled spines. My reading is "The entangled spines from the upper areoles covering the unarmed apex".

..... from G.E.H. Bailey

"My plants of *L. oligotricha* were grown from Uhlig's seed - received as *cinnabarina* var. *oligotricha*. The smaller of the two plants has flowered for several years, the flowers being quite small and scattered, in the usual many of *Lobivia* flowers, not near the crown of the plant. The spines are less in number than Cardenas's description (about 10-12 in all) and they are only slightly lighter than those on my seed-grown *L. cinnabarina*. The areoles on both my plants of *oligotricha* are farther apart than on *L. cinnabarina* and the spines finally become greyish in colour.

"Both plants of *oligotricha* are taller than wide, unlike *cinnabarina*, and the most noteworthy thing about them is that although the ribs on one are right-hand and on the other a left-hand spiral, the areoles on both are arranged with a left-hand spiral.

"I will check on the flowers later on."

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LOBIVIA CINNABARINA (Hook) Br. & R. by C. Backeberg.

(Translated from Das Kakteenlexikon 1965 by E.W. Bentley).

In Hooker's original description in Curtis' Bot. Mag. 73 plate 4326 of 1847 it says, among other things: Body broad-round, up to 15 cm diameter; flower carmine ca. 8 cm diameter; outer spines several, in a circle, 12,  $\frac{1}{2}$ - $\frac{1}{4}$  inch long, light-brown, distinctly acicular; central spine 1, longer, stronger and somewhat curved; petals obtuse-edged, numerous; filaments red, anthers yellow; stigmas upright - Bolivia.

Britton and Rose's diagnosis did not correspond to the original description and perhaps corresponded to the plants distinguished as the above species by Cardenas. In "Cactus" (France) 18, 78: 1963 the latter pictures this species and says of it "Discovered by Bridges in 1846 and completely lost; I discovered it again near Colomi (Cochabamba). It is frequent on the slopes of the Provinces of Chapare and Punata, at about 3,400 metres."

This view was mistaken. What was meant was the plant with smaller flowers now described by me as *L. neocinnabarina*, the habitat of which is also that given by Cardenas. It was Rausch, Vienna, who established that *Lobivia cinnabarina* referred to another plant and who also found it again.

The var. *spinosior* (S.D.) Y. Ito: Salm-Dyck's description only "Body somewhat stronger; spines stiffer, 1.5 to 2 cm long; centre spines always present". It is conjectural whether Salm-Dyck did not understand by this name yet another plant, since he speaks of "1-3 centre spines,

sometimes lacking" corresponding to a description by C. Morren, but says nothing about the strikingly large flower of the original description and also nothing about the spine number in var. spinosior.

Given the confused resemblance of the representatives of the *L. cinnabarina* species-complex and with the width of variation of particular species (unless they flower with a white throat and are therefore easy to recognise, like *L. neocinnabarina*) it is not to be excluded that var. spinosior is identical with a plant found in East Bolivia by Hoffmann, with a shining green body, ribs at first narrow-edged: spines at first few, brownish, soon more, up to 20, stiff and sharp, centre spines and upper outer spines soon blackish and more or less thickened at the base, the centrals up to 4 or even more; flower scarlet-carmine, red-throated, medium-sized; tube very slightly hairy.

For reasons given previously I have not up to now thought fit to describe the Hoffmann plant as a species in its own right.

#### Comments

..... from H. Middleditch

"On referring to the photograph in *Cactus* 18.78:1963 which Cardenas considers to be *L. cinnabarina*, I find that it is not practicable to discern from the photograph a white throat on any of the 12 to 14 open flowers facing the camera. Presumably Backeberg must have had some samples of these plants from Cardenas or obtained more description from Cardenas than just the brief comments appended to the photograph in the French Journal.

"Reference to the description of *L. neocinnabarina* in Backeberg's *Lexikon* yields "Body solitary, globular to elongated later, up to ca. 12 cm high, 6-7 cm in diameter; crown white felted". This body shape appears to be nearer to the sketch of "*Echinopsis cinnabarina*" in Schumann's book than any other possibility examined to date within this species-complex. However, the "white-felted" crown seems to be a little peculiar; there is not the slightest sign of any white felt in the unarmoured crown of the plant depicted by Cardenas in the French Journal, to which Backeberg refers. However, Schumann does make reference to "sparse woolly felt in the crown" in his description. Could the felt in the crown which was described by Backeberg have been observed on a carefully cultivated plant, with neither Andean winds nor a greenhouse hose-pipe to disperse the loose white felt which may perhaps accumulate around the crown as in various *Notocacti* and *Parodia*?"

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LOBIVIA DRAXLERIANA sp. nov. by W. Rausch

(Translated by H. Middleditch from *Succulenta* 50.10:1971)

Simplex, ad 60 mm alta et ad 140 mm diametens, glauca, plerumque radice rapiforme; costis ad 25, in gibberes ca. 15 mm longos dissolutis; areolis ovalibus, 5-7 mm longis, albotomentosis, postea glabrescentibus; aculeis marginalibus 9-12, 8-15 mm longis, divaricatus et ad corpus subarcuatis, albidis brunneo-acuminatis; aculeis centralibus 2-5, 20-30 mm longis, superiore verticem superante et postea paluto, subarcuatis, rubris nigro acuminatis et postea canescentibus; aculeis omnibus subulatis basi incrassatis. Floribus ca. 75 mm longis et 65 mm diametentibus; ovario et receptaculo viridi squamis viridibus et pilis albis ad fuscis tecto; phyllis perigonii exterioribus longe-lanceolatis, viridibus roseomarginatis; phyllis perigonii interioribus spathulatis, rotundis et serratis, rubris subcaeruleo-nitidis; hymene violaceo-roseo, fauce violacea, ca. 15 mm angustissima deinde cyathi modo ampliata; filamentis exterioribus rubris, interioribus violaceis, ca. 12 mm supra ovarium orientibus; antheris subfuscis; stylo brevissimo, ca. 6 mm cum receptaculo connato, viridi; stigmatibus (6-8) viridibus; fructu globoso, ca. 15 mm diametente; sufflavo-viridis; seminibus globoso-doliiformibus, ca. 15 mm longis et 1 mm

diametientibus, testa fusca-nigra verruculosa et hilo basali.

Patria: Bolivia, secundum viam ab Aiquile ad Mizque, 2,500 m. alt.

Typus Rausch 279 in Herbario W.

Plant solitary, up to 60 mm tall and up to 140 mm diameter, blue-grey-green, usually with a tap root.

Ribs up to 25, divided up into about 15 mm long tubercles.

Areoles oval, 5-7 mm long, with white felt, later bald.

Radial spines 9-12, 8-15 mm long, standing outspread and somewhat curved towards the body, whitish with brown tip; central spines 2-5, length 20-30 mm, the uppermost extending over the crown and later outstanding, somewhat curved, red with black tip, later becoming grey, all spines awl-like with thickened base.

Flower about 75 mm long and 65 mm diam., ovary and tube green with green scales and white to brown hairs; outermost petals oblong lanceolate, green with red stripe; innermost petals spatulate, round and toothed margin, red with bluish sheen; hymen violet-pink; throat violet, the lowermost 5 mm very narrow and then widening out chalice-like; the outermost filaments red, the innermost violet, inserted about 12 mm above the ovary; anthers brownish; style very short, about 6 mm united with the tube, green; stigma lobes 6-8, green.

Fruit spherical, about 15 mm diam., green to brown with pink scales and grey-white wool.

Seed spherical to barrel shaped, 1.5 mm long and 1 mm diameter, testa matt brownish-black, with fine crenations and basal hilum.

Finding-place: by Aiquile, Bolivia, at 2,500 m altitude.

Type: Rausch 279 in Vienna Herbarium.

This species is related to *Lobivia cinnabarina* (Hook) Br. & R., but differs from it on account of the bluish epidermis, the red central spines always displayed at the crown, the bluish sheen in the flower colour, the brown-red anthers and the larger seeds.

I name this handsome form-group after the Austrian cactus collector Paul Draxler, who has always given wholehearted support to my exploratory trips and studies.

Comments on *Lobivia draxleriana*.

..... from H. Middleditch

"It is interesting to note that in the Latin diagnosis, Rausch refers to the anthers as "subfuscus" (pale brown, brownish?) and in the vernacular diagnosis as "brunachtig" i.e. brownish. Towards the end of the article above, in noting the specific differences between *L. cinnabarina* and *L. draxleriana*, he quotes the "brown-red" anthers on the latter species. This would appear to provide quite a variation in the diagnosis along and one tends to wonder what the variation will be in the plant itself.

"In his diagnosis of *L. cinnabarina* v. *grandiflora*, Rausch states that the anthers are red in colour; however, in his notes appended to that diagnosis, he does not refer to the anther colour as a distinguishing feature between the type species *cinnabarina* and the variety *grandiflora*. From the absence of any note of a difference in colour, one might have inferred that the anthers on var. *grandiflora* are the same colour as those on the type. But if we refer to the colour illustration in Backeberg's *Kakteenlexikon* reproducing Hooker's original *L. cinnabarina* (Abb. 191) from Curtis's *Botanical Magazine*, we may observe the yellow anthers very clearly displayed - and the photo reproduction was taken by Rausch! From this, one might assume that Rausch was fully aware that *L. cinnabarina* had yellow anthers. Why, then, should he select for a mention

the difference in the anther colours from *L. cinnabarina* when writing about *L. draxleriana*, but omit to refer to any difference when writing about var. *grandiflora*?

"The colour illustration on the front cover of *Succulenta* (which carries the article reproduced above) is of *L. draxleriana* in flower; the anthers may be seen quite clearly and they give every impression of being yellow in colour. Of course, there is always the possibility that the anther sacs are one colour and the pollen is a different colour, but one would have hoped that in such a case, that it would have been observed and noted by Rausch.

"A black and white print in *Succulenta* which accompanies the above article by Rausch, depicts a plant of *L. draxleriana* and one may discern the long upper central spines just forming a wigwam over the crown; this is quite different from the Hooker, Schumann, or Bluhende Kakteen illustrations of *cinnabarina* - which have unarmoured crowns. But the *L. draxleriana* on the cover of *Succulenta* have unarmoured crowns! Whilst that particular photograph has been nicely staged, with a couple of pseudo-Andean lumps of rock as background, one may discern in the photograph a part of the rim of a rectangular asbestos-cement tray in which the plants are presumably being cultivated; these trays were found to be in common use in Austria in our 1964 Cactus Tour and one example which I brought back with me on that occasion is still in use in my greenhouse. On this evidence, might we accept the unarmoured crown as a feature of cultivation, and not of habitat growth?

"In which case, what of the Hooker, Schumann, and Bluhende Kakteen illustrations of *L. cinnabarina*, with unarmoured crowns? We are not told whether these are specimens as imported, or grown on in cultivation. Could this mean that *L. cinnabarina* is just *L. draxleriana* grown on in cultivation?

"Like other species in this complex, *L. draxleriana* may be regarded as having slightly spiralling ribs. But the ribs are not very evident to the eye, owing to the combination of a deep hollow between adjacent tubercles on each rib, the mature areoles set askew to the ribs, and the discontinuous groove between adjacent ribs which bends towards each areole and appears to turn right into the top of some areoles - especially on the shoulder of the plant. To some extent one must use a little imagination to consider that a line of tubercles does indeed form a rib.

"The diagnosis refers to 6 mm of the length of the style growing united with the tube - a feature previously found only in *Aylostera* and some *Rebutia*. One is obviously tempted to enquire if this feature may also perhaps occur in any other species of *Lobivia*, but has not yet been observed and reported."

..... from J. Hopkins

"I too found the apparent fusion of the lower 6 mm of the style with the receptacle to be rather strange. I wonder if Rausch really means connivent - gradually converging? Even this would not seem quite correct as examination of the flower cross-section of *Lobivia Lau 352* - which is probably identical with *L. draxleriana* - shows a definite nectary with no sign of fusion of the style and inner wall. The latter is pinched in slightly about 6 mm above the bottom of the nectary. A sketch of the cross section appears in this issue and I have slightly exaggerated the pinched-in tube for clarity. I have not yet had the opportunity to examine other large flowered plants in this group, but it is not present in the small flowered *L. pseudocinnabarina*.

"A further interesting point concerns the stigma lobes which are widespreading in *L. draxleriana* but according to the original description by Hooker, those of *L. cinnabarina* are erect and almost unspreading (= approximate), but this may possibly have applied to only one plant."

..... from J.D. Donald

"I believe that we have still a very long way to go before we can be absolutely certain of the identification of the true *L. cinnabarina* - my own inclination is that it is *L. draxleriana* or



one of Lau's near relatives in this area. I believe Rausch has been a bit hasty in describing new plants in this group and that he has not studied enough flowers to get the true mean variation within the species. Hence all this business about connate styles - he may not of course mean connate but connivent or something like that, or he may have observed a rogue which can happen. Incidentally this phenomena of fused filament tissue around the base of the style above the nectary to give the appearance of a style connate with the receptacle wall has been observed in many *Lobivia*, *Parodia*, and *Rebutia* species on odd occasions. Sometimes it is there, sometimes it is not. Certainly Lau 352 does not show it, in the flowers I have sectioned."

---

LOBIVIA CINNABARINA var. GRANDIFLORA Rausch sp.nov. by W. Rausch

(Translated by H. Middleditch from K.u.a.S. 23.11:1972)

Simplex, plano-globosa, ad 40 mm alta et 100 mm diametens, atroviridis; costis ad 20, spiraliter tortis, in gibberes 20 mm longos, acutangulos dissolutis; areolis in superiore parte gibberum sitis, ovalibus, 5 mm longis, albo-tomentosis; aculeis marginalibus 8-10, ad 10 mm longis, subulatis, unguiformiter ad corpus arcuatis; aculeo centrali 0-1, ad 20 mm longo, sursum flexo; aculeis omnibus flavo-fuscis ad nigro-griseis. Floribus 80-95 mm longis et 85-100 mm latis; ovario ovali et receptaculo viridi, squamulis parvis, acutis, fuscis laxe tecto et pilis longis, pullis vestito; phyllis perigonii exterioribus lanceolatis, roseis, medio-viridistriatis; phyllis perigonii interioribus spatulate-rotundis, ad 14 mm latis, rubidis, saepe subcaeruleo-micantibus; hymene roseo, fauce 45 mm tantum longa, ima paulum impressa, deinde campanulate ad 35 mm ampliata, coccineo-violacea; filamentis partim 10 mm supra ovarium orientibus, coccineo-violaceis, partim e hymene orientibus, rubris, antheris rubris; stylo brevi, 15-20 mm longo, rubro, basi viridi, stigmatibus 8, viridibus. Fructu globoso, ad 15 mm diametente, epidermite, squamis, pilis subfuscis, per longitudinem dehiscente. Seminibus *Lobiviae cinnabarina* (Hook) typo.

Patria: Bolivia apud Padilla, 2,300 m alt.

Typus Rausch 265 in Herbario W.

Solitary, depressed globular, up to 40 mm high and 100 mm diam., dark green, ribs up to 20, spiralling in 20 mm long, sharp angled, offset humps. Areoles located upon the upper end of the tubercle, oval, 5 mm long, white-felted; radial spines 8-10, up to 10 mm long, awl-like, bent claw-like towards the body, central spines 0-1, up to 20 mm long, bent upwards, all spines yellow-brown to grey-black.

Flower 80-95 mm long and 85-100 mm broad, the oval ovary and the tube are green furnished with small, pointed, brownish-red, loose-fitting scales and long, blackish-brown hairs; outer petals lanceolate, red with green middle stripe, inner petals spatulate-round, up to 14 mm broad, dark red, often with a bluish sheen, hymen pink, throat only 45 mm long, rather narrowed below and then expanding bell-shaped up to 35 mm, carmine-violet, first filaments commencing 10 mm above the ovary, carmine-violet, a second series at the hymen, red; anthers red; style short, only 15-20 mm long, red with green base; stigma lobes 8, green.

Fruit spherical, up to 15 mm diam., coating, scales and hair brownish, dehiscing lengthwise. Seed type like *L. cinnabarina* (Hook).

Habitat: Bolivia close to Padilla at 2,300 m altitude.

Type: Rausch 265 in the Vienna Herbarium.

This species-complex is distinguishable from the type plant on account of its dark green epidermis, its thicker, darker, claw-like spines and on account of the significantly larger, dark red flower.

..... from H. Middleditch

"In the Latin diagnosis the anther colour is given as *rubris* (red) and in the vernacular as "rot" (red). This is a somewhat uncommon colour for anthers. The colour photograph accompanying the original article in *K.u.a.S* showed five flowers fully open, in which the stamens are clearly visible. From that photograph one would have taken the anthers to be more or less yellow in colour.

"In his comments following the diagnosis, Rausch refers to these plants as a "formenkreis" i.e. species complex, to be distinguished from the type species *cinnabarina*. This seems to be a rather unorthodox use of the term species-complex; this term would normally be used in reference to the *L. cinnabarina*/*draxleriana*/*oligotricha*/etc species complex, not to a population of plants which are distinguished only by a new varietal name.

"In his article on *L. draxleriana*, Rausch refers to that species as a "vormengroep" which literally means form-group and is quite possibly the Dutch equivalent to the German word "formenkreis". Again, the term "population" would have appeared to have been more appropriate. This tends to make it rather difficult to understand the author's intentions in utilising this particular terminology, when such terms are used in what appears to be an unorthodox manner."

---

PYRRHOCACTUS CRISPUS Ritter sp. nov. by Frederick Ritter

(Translated by H. Middleditch from *Succulenta* 11:1959)

Simplex, hemisphericus, radice, radice alba rapacea; costis 13-16 atroviridibus, tuberculatis, obtusis; areolis mediocribus subapproximatis; aculeis nigris, apillaceis, crispis, longis subaequalibus, marginalibus 6-10, centralibus 2-4; floribus infundibuliformibus, alborubris; fructibus cavis floccis albis instructis; seminibus nigris, tuberculatis, hilo subventrali.

Plant somewhat flattened to hemispherical, 5-7 cm in diameter, blackish grey-green, with thick white taproot, the neck of the root narrowed but slightly or not at all.

Ribs 13-16, blunt, often somewhat spiralling, about 1 mm high, humped below the areoles, grooved above, bottom of tubercles with chin-like prominence.

Areoles with white felt, all sunken to some degree,  $\frac{1}{2}$ - $\frac{3}{4}$  cm long,  $\frac{1}{3}$  -  $\frac{1}{2}$  cm broad, about 1 cm apart.

Spines black, becoming grey, slender - almost hairlike, curved upwards and twisting, all pretty similar in appearance and projection, not sharp; radial spines 6-10 of 2-5 cm long, central spines 2-4 of 4-8 cm long.

Flower odourless,  $3\frac{1}{2}$  cm long with even wider opening.

Ovary furnished with minute brownish scales and white wool flock in the axils; red interior.

Tube exterior like the ovary,  $1\frac{1}{2}$  cm long, at the margin additional soft white bristles in the axils of the scales, funnel-shaped to somewhat tapering-urn shaped.

Nectar chamber 4 mm broad, 2- $2\frac{1}{2}$  mm long, half open, on account of the lowermost stamens leaning towards the style.

Filaments white, the lowermost  $\frac{3}{4}$  cm, the uppermost  $1\frac{1}{4}$  cm long; anthers pale lemon yellow, reaching about half way up the petals; inserted from above the nectar chamber as far as  $\frac{2}{3}$  of the height of the tube.

Style projecting above the anthers, 2-2½ cm long, 2 mm thick, full of sap, carmine red, with about 10 yellowish carmine red stigma lobes 4 mm long lying towards each other.

Petals 1½ cm long, 4-5 mm broad, short terminal point, the outermost more red, the innermost more white, with narrow reddish midstripe.

Fruit skinlike, hollow, on the outside like the ovary.

Seed about 1 mm long, 2/3 mm broad and ½ mm thick, black, dull, with coarse and somewhat riblike crenulations, somewhat keeled on the back; hilum on the slope with the lower and leaning towards the bulge.

Finding place: Freirina, north Chile. Only known from this discovery spot.

Systematics. Closely related to *Pyrrhocactus atroviridis* sp. nov. (to be published). This species is known under FR 491.

As material evidence I have sent a type-specimen and a seed sample, both from the finding place, to the City Succulent Collection at Zurich, Switzerland.

#### Comments

..... from H. Middleditch

"I see that Donald and Rowley in their proposal for re-uniting *Pyrrhocactus* etc. under *Neoporteria*, briefly question the synonymy of *P. crispus* and *Neochilenia nigriscoparia*, a sketch of this latter species appeared on the cover of *Chileans* No. 12. This particular plant is indeed of a very dark reddish-black colour, with markedly fine spines. On the new growth the tubercle humps are small but very prominent, almost rose-thorn in shape and rather more honey-red in colour. It would be interesting to be able to compare this form of growth with that of *P. crispus*, if indeed there is still a specimen in cultivation.

"When sketching this plant, Eddie Barnes observed that the earth-like colouring over the greater part of the plant might suggest that it was buried as far up as the slight waist not far below the crown. As his collection has now been broken up, one wonders if this particular plant is still in cultivation.

"My own plant of *Neochilenia nigriscoparia* has remained on the same stock upon which it was growing when purchased; it has put on a little new growth in the meantime and flowered in both 1971 and 1972. These flowers appeared from close to the growing point in typical *Neochilenia* fashion.

"During the winter of 1972-73 I decided to try a different system for feeding my plants. As soon as the weather seems to suggest Spring is near, my careful rate of winter watering becomes more generous; when the plants are showing signs of growth, I would start with an occasional weak feed and by about midsummer one or two full-strength feeds would be given. On this occasion, I decided to try some winter feeding, continuing through Spring into Summer. The water for this purpose was taken from the hot tap in the house, diluted about 50-50 with rainwater; the resultant mixture was still very warm. Apart from causing some stubborn plants to start growing, it may also have contributed to the crown of flowers on *N. crispus* this summer, for there are twenty two buds to be seen on the plant.

"The young buds are simply a pointed hump of white wool and are probably about 5 mm high before the brown sepals can be distinguished under the wool. The sharply pointed tip of the bud is retained right up to the time when the flower starts to open - rather more of the brown upper scales becoming visible above the white wool as the bud enlarges. The bud is about 2 cm high before a very dark red colouring can be distinguished under the white wool curling round the scales on the lower half of the bud. The flower will be about 4½ cm broad when fully open and of

nearly the same height. The long, slender, tapering upper scales are very dark red-brown in colour; the lowermost petals (or uppermost scales) are narrow with a very pale cream semi-transparent margin and a broad dark red-brown midrib. The outer petals have a deep mauve midrib and a pale cream semi-transparent margin. The inner petals are of the same pale cream semi-transparent colouring with a narrower pinky-mauve midstripe. The lanceolate petals terminate in a fine point. The filaments appear to have a faint pink sheen but this may be merely a reflection from the petals; the anthers are cream. The style is solid red, the colour of ripe *Neopteris* fruits, very stout indeed - about  $1\frac{1}{2}$  to 2 mm thick. The stigma is carried just above the anthers, initially club like in shape, the lobes of the stigma opening out very slightly from each other later. Each lobe is in the shape of a very finely tapered arrowhead so that the stigma has a crown-like appearance. The velvet-like covering of papillae on the stigma lobes does not cover the middle of the lower half of the exterior of the stigma lobes.

"Like most *Neochilenia*, the flower stays open even if the sun goes behind cloud or overcast, and will also stay open for a few days.

"My second plant of this species - much smaller and on its own roots - must also be suited to the greenhouse climate this season, for it, too, is putting out a couple of buds."

..... from Mrs J. Yorke

"Over the Easter weekend of 1970 we went to the Isle of Wight for a few days' holiday with some fellow-collectors. We had quite a time browsing around Sargant's nursery and amongst the plants we acquired was a *Horridocactus crispus*. It was terribly shrunken, with concertinaed ribs and a flattened body which blended into a thick tapering root. There were just a few very thin, long, spines and the whole of the body seemed to be covered by a pale grey-brown coating. Everyone thought it was just about dead, but Sargant said it would recover. There was only one of these plants left and I have never seen another plant remotely like it.

"Now that we have been growing the plant for three years, it has plumped up nicely and it will be about three inches broad. New growth fills almost the whole of the crown by now - it is very dark indeed, more or less greeny black in colour. The new spines are black and very slender indeed, about 4 cm long and almost as thin as bristles. The original ribs are almost flat, they have plumped out so much that between each of the brown-coated ribs you can see the very dark green body colour. The original body surface is still covered by the pale grey-brown coating, which has cracked apart in several places, exposing a sound green epidermis below. You get the feeling that you could almost peel off this grey-brown coating.

"The areoles on the habitat part of the body are hardly distinguishable in colour from the general grey-brown body coating, but the newer areoles are filled with dirty white felt, barely 1 mm wide but 5 to 7 mm long. They must be slightly sunken at their upper end because the felt is about level with the body, but the lower end of the areole is visibly sunken - perhaps about 1 mm down into the tubercle. These areoles must be situated on the top half of the tubercle, as they face upwards as much as outwards.

"The slide of *Neochilenia nigriscoparia* shown to our Branch by H. Middleditch, looked to be quite close to *H. crispus* both in body colour and spination - I thought it was the same species when the slide came up on the screen."

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#### ERRATA NO. 24

P.128 line 6, for *Haageocereus salmonoides* read "*salmonoideus*".

P.157 line 22 should read "..... and any ....."

p.159 should read:

"Pentlandii group - long flower but rather narrower than the foregoing

Section acanthoplegma ("breviflora") - Bolivia, area round Rio Caine & Rio Mizque.

Section incaica: .....

p.176 The notice regarding the Seed list had been intended for the previous issue - No. 23 - which was accompanied by the Seed List.

### SLIDES

The slide librarian would like to obtain any Agfa slide frames of the current "thin" type which are surplus to member's requirements; if you are going to throw away a slide you think is poor, and it is mounted in one of these frames, please send it to the slide librarian instead!

### FORTHCOMING TOPICS

We should be pleased to hear from any members who believe they may have the original *Echinocactus cumingii* among their *Neochilenia*; or grow *Cleistocactus wendlandiorum*, *brookii*, or *vulpis-caudae*; or have set fruit on *Lobivia westii*; or grow *Matucana hystrix* or *M. breviflora*.

Any suggestions for a plant to fit the diagnosis of *Echinocactus cumingii* Hopff. would be welcome; also any observations regarding any *Lobivia* species within the *cinnabarina* group.

### ANNUAL REPORT AND ACCOUNTS 1.4.72 to 31.3.73

<u>Income</u>		<u>Expenditure</u>	
Subscriptions	£410.00	Printing	£599.62
Subscriptions in advance 1973 - 74	£ 10.12	Postage, Stationery, etc.	£203.95
Subscriptions in arrears 1971/72	£ 52.63	Plant purchases	£126.53
Sales of Back Numbers	£191.46	Invoice outstanding	
Sale of Year Books	£139.85	£151.42	
Sale of Index	£ 10.84	Nett Balance c/F	
Sale of plants and seeds	£176.92	£379.69	
Bank interest	£ 15.89	Balance c/f	£531.11
Sundry income	£ 65.33		
Balance brought forward from previous year	£388.17		
	<hr/>		<hr/>
	£1,461.21		£1,461.21
	<hr/>		<hr/>

Despite the increased subscription rate for 1972/73 it will be observed from the accounts, above, that there has been a fall in our nett balance carried forward.

Each Volume of Back numbers, now being sold at £1.55, is currently costing nearly £3.00 to reprint; it thus appears unlikely that complete sets of back numbers can be made available much longer.

Appreciation of seed donated is expressed from the Seed Pool, together with a request for any members who may not have done so in the past, to collect their seed for use in the seed pod. A single fruit is perfectly acceptable and useful.

The sale of plants has been much reduced this season, owing to our plant custodian receiving his new greenhouse both incomplete and late in delivery, when moving house.

The slide librarian is once again able to express appreciation for slides donated to the library; to maintain quality, very few slides were copied. Income and expenditure were in balance on the slide library.

The work of various members in undertaking translations continues to enable us to republish articles from foreign journals - especially difficult passages often requiring a disproportionate amount of time to ensure a correct rendering of the author's meaning. Research through older literature is now receiving more prominence in these pages, in order to provide a more comprehensive review of the subject matter. However, this appreciably increases preparation time for an issue (the present number has been in preparation for well over six months) and it may prove impracticable to continue to produce three issues per year. Should this occur, a subsequent renewal subscription would be at a reduced rate.

#### 1973 CHILEANS NATIONAL GATHERING

Our 1973 National Gathering will be held at Brooksby Agricultural College, near Melton Mowbray, over the weekend September 14th - 16th.

Our programme will include a talk on *Sulcorebutias* from A.W. Craig, a talk on *Lobivia* from J. Hopkins, a review of some *Neochilenia* and *Neoporteria*, talks by Mrs Hobart on close-up photography of flowers and further discussion of flower morphology, a talk by J. Forrest on *Frailea*, a discussion on *The Original Weingartia?* from H. Middleditch, and some further thoughts on plant name changes, this time from P.G. Waterman. There will also be a showing of slides newly received into the library.

We hear from Mrs Hobart that she has already mounted some flower specimens in resin, which we shall be looking forward to seeing. Other members are trying their hand at pressing flowers this season and we hope to be seeing some of their results, too.

It is anticipated that rather more time should be available on this occasion for discussion following the formal talks, but there will again be opportunities for informal discussion over specific genera, on photographing cacti, and other matters. As before, any plants or slides which can be brought along to support the discussions will be most welcome.

Vacancies are still available - details and booking from Mrs J. Hobart, 39 Woodside, Darras Hall, Ponteland, Northumberland.

## SEEDS

Many of you will now have ripening fruit on plants in your collection and you may well intend to sow some of the seeds or pass some to friends. If you do have any seed surplus to your needs, please send it to our seed exchange organiser, J. Hopkins, 25 Crossefield Road, Cheadle Hulme, Cheadle, Cheshire SK5 8PD.

You may perhaps feel that the contents of an odd fruit, particularly one containing a fairly limited number of seeds, would be of questionable use to the Seed Pool. In fact we are able to make good use of small amounts of seed, such as the contents of one fruit. This is because we have a relatively small membership in comparison with most Cactus Societies (who may well find seed in smaller quantities to be an embarrassment).

We endeavour to provide seed from the Seed Pool at a cost which compares favourably with commercial sources. However, the income from the Seed Pool does provide a substantial contribution to our funds, without which we would be obliged to adopt a higher annual subscription than the current figure.

In recent years many species of *Gymnocalycium*, *Parodia* and *Notocactus* etc. have become available more readily, or for the first time. Seeds of these species would naturally form a welcome addition to our list. Overseas members especially may be able to help with seed from plants which seldom flower or fruit in the U.K, such as *Cleistocactus*, *Haageocereus*, *Leocereus*, *Corryocactus*, *Arequipa*, *Mila*, *Austrocactus*, etc. Here again, if you have an outlet for your seed but feel able to spare the contents of one fruit for the Chileans, it will be a valuable addition to our list and welcomed by our members desirous of raising from seed species new to them.

## SLIDES

We have received a number of donations of very interesting slides during the year and the opportunity will be taken during the Brooksby weekend to screen a selection of these.

Although we now have an extensive library of slides covering a wide range of species, it is remarkable how many supposedly more common species are not represented. With continual use, occasional slides also have to be withdrawn from time to time, leaving an unfilled gap.

Donations of slides to the slide library continue to be most welcome.

## BUXBAUM'S "CACTUS CULTURE"

We have available for sale a copy of Dr.F.Buxbaum's "Cactus Culture based on Biology". Original dust cover torn in places, slight soiling of edges. Offers over £3 to H. Middleditch; proceeds will go to funds.



## STUDY GROUPS / ROUND ROBINS

Cleistocacti	T. Lavender, 62 Finchale Avenue, Billingham, Teesside TS23 2EB.
Copiapoa	D.J.Lewis, 80 Pencisley Road, Llandaff, Cardiff CF5 1DQ.
Epiphytes	A.J.S.McMillan, 5 Oakfield Road, Bristol BS8 2AJ.
Frailea	J. Forrest, Beechfield House, Meikle Earnock Road, Hamilton, Scotland.
Gymnocalycium	G.J. Swales, 5 Hillcrest, Middle Herrington, Sunderland, Co. Durham.
Lobivia	J. Hopkins, 25 Crossefield Road, Cheadle Hulme, Cheadle, Cheshire SK8 5PD.
Matucana/Borzicactinae	W.W. Atkinson, 12 Court Road, Tunbridge Wells, Kent.
Mediolobivia	J.R. Chapman, 5 The Crescent, Raunceby Hospital, Sleaford, Lincs.
Melocactus/Discocactus	Mrs L.Teare, 7 Birkinshaw Avenue, Tranmere, Adelaide, South Australia 5073, Australia.
Neoperterianae	D. Rushforth, 8 Broadfield Road, Knowle, Bristol 4.
Notocactinae	K.H.Halstead, Little Firtrees, Wellington Close, Dibden Purlieu, Southampton.
Parodia	A.Johnston, 11 Malvern Road, Scunthorpe, Lincs.
Photographing Cacti	A.W.Craig, Davela, Forest Lane, Kirk Levington, Nr.Yarm, Yorks.
Sulcorebutia	W.G.Sykes, 10 Ashley Close, Thornton Cleveleys, Lancs FY5 5EG.
Trichocereus	N.T.Hann, 5 Lake Road, Shirley, Croydon, Surrey CR0 8DS.

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