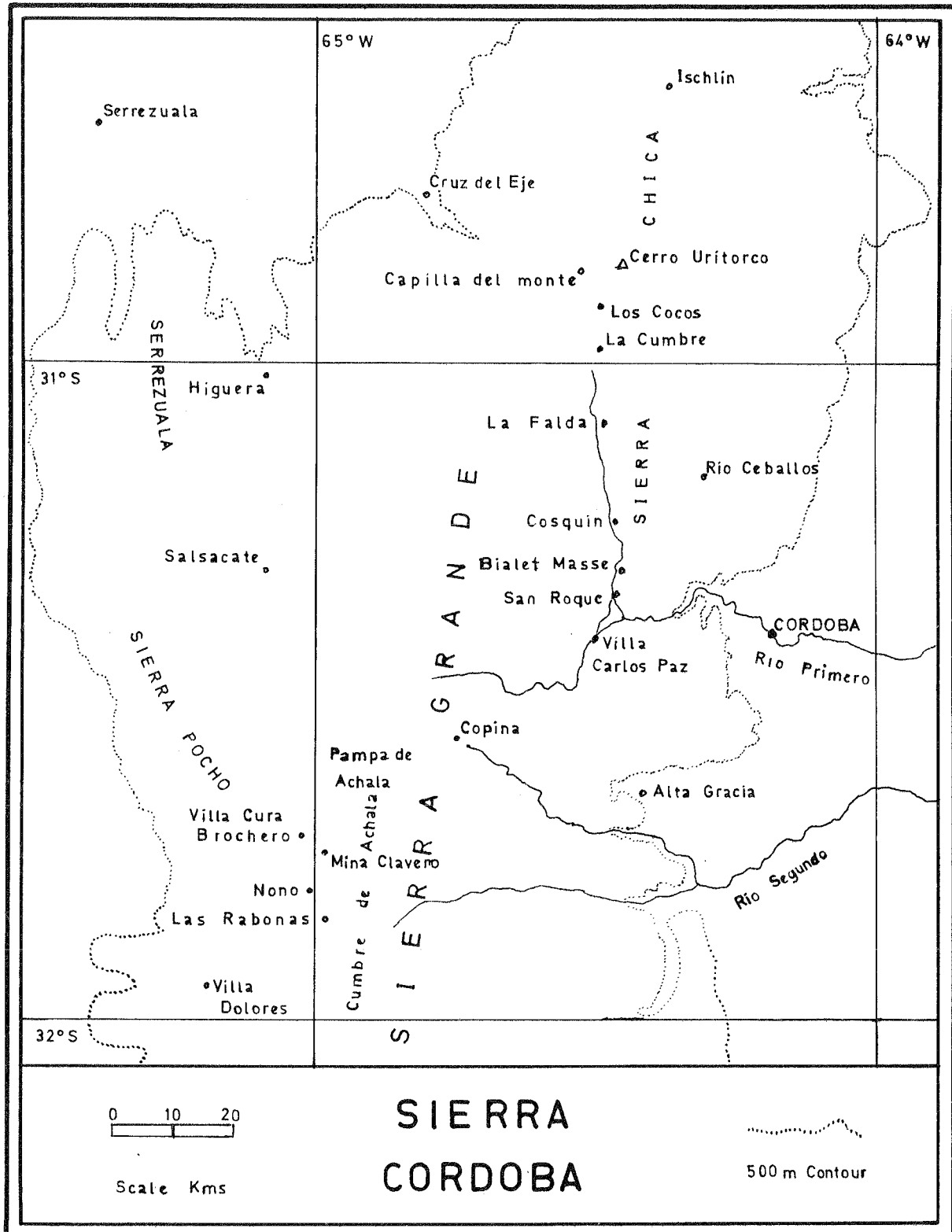


# THE CHILEANS '76

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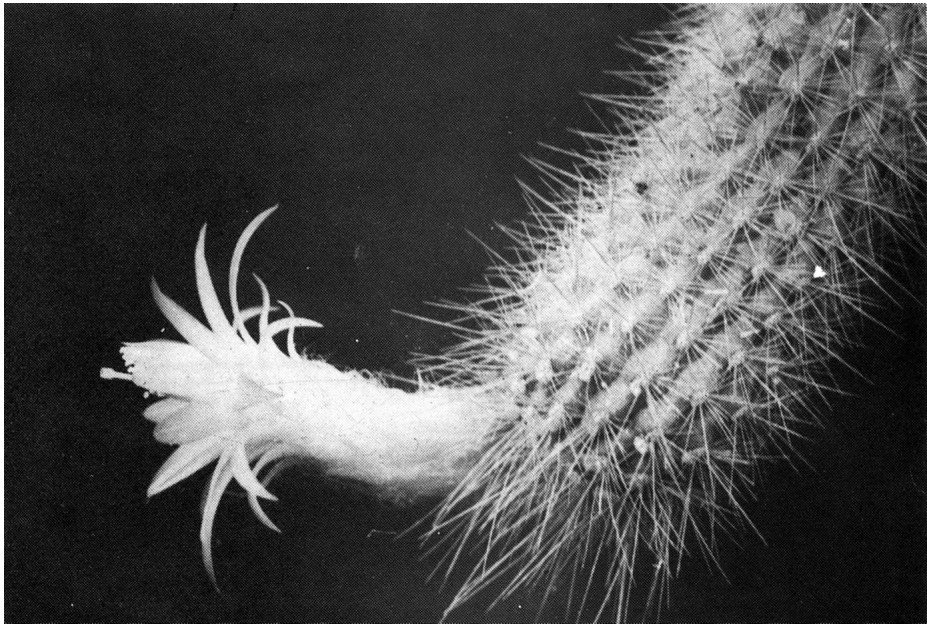


Photo & Collection — Mrs. E. GRAYDON



COLLECTION — J. D. DONALD

**MATUCANA FRUTICOSA**

My plant of *Matucana fruticosa* is grafted on to a *Cereus* stock and I have wondered whether this would cause it to elongate. I have quite a few other species of *Matucana* that are on their own roots and have grown about three times their diameter in height and are now top heavy in their pots, but this plant has a body only about 1½" in diameter and so long that I would not have put it with the *Matucanas* at all. It does not grow upright but adopts a pendant form. The spines are mostly about an inch long with a few longer ones at the growing end but these seem to have no connection with flowering.

Since October the plant has had fourteen flowers, the last one in very late autumn at the beginning of May. Almost every areole at the tip of the plant must have had a flower. It is quite possible that there might be more yet as the plant has flowered in the winter in other years, despite being kept in an open sided shelter with no artificial warmth, and we are now having frosts. I must say that it seems to thrive on neglect, but I have been debating whether to decapitate it and try growing a better looking one on its own roots.

I am enclosing a slide of this plant in flower — there were two flowers, but to get them at eye level I had the plant perched on the top of the step ladder and in manipulating it for the camera I knocked off one of the flowers. (Slide now in the slide library — A.W.C.). When the flower is half open the zygomorphic shape is quite pronounced, but this disappears over the course of the few days that the flower is open. There were one or two fine black hairs on a couple of the flowers but I would not have noticed them if they had not been mentioned in the letter from H. Middleditch.

I brushed the last flower with pollen from a *Chileorebutia glabrescens* — the only other blossom in the glasshouse. A most improbable cross but it evidently gave the *Matucana* such a fright it formed a berry which is hard and firm and just might contain seed. It is 1 cm across and about 0.75 cm high, dark green, ridged, and has groups of minute light green hairs. The dead flower remains firmly attached.

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Comments

. . . . from J.D. Donald

My three plants of *M. fruticosa* were raised from original Ritter seed (FR 1307) received from Frau Winter some years ago. I raised about 20 seedlings and kept back the three most distinct forms for myself. All three are growing on their own roots. None of them are prostrate in habit but form clumps of short cereoid stems. The longest at the moment is about 30 cm tall, and has some eight stems from 10-30 cm in length. The three forms retained differ in epidermal colour — light green to dark green, in colour of spine from pale yellow to deep brown, and in branching habit. Two are similar and branch only at the base of the plant, while the third branches near the top of the stem, almost always into three, each individual stem growing about 10 cm before branching. The latter plant will obviously develop into a dense bush, it is also the lightest in spine colour and unlike the other two has yet to flower. For the other two plants the dark epidermis goes with the darker coloured spines but the flower colours are identical. The areoles are round. Both plants conform well with the original Ritter description.

Neither plant has ever produced a strongly zygomorphic flower, even during the development stage of the bud right up to full anthesis. The flowers are comparatively small for a *Matucana* and never longer than 50 mm whereas Ritter gives 70-90 mm for the type; but the internal structure is as Ritter describes with a large nectarium virtually completely closed by a diaphragm (a type of staminoidal hair ring) at about 3 mm above the base of the receptacle. The tube is bright yellow in colour with greenish pointed scales, the axils of which produce white wool flock and a number of long silky black hairs. The perianth is yellow to orange with carmine margins: the tube is only slightly zygomorphic, about 30 mm long and 10-12 mm thick. The flowers are quite prone to producing sterile fruits. These are hard brownish berries up to 10mm in diameter with the floral remains persisting but they contain no seed. The true fruit is larger and greener, softer and more fleshy, about 20 mm long and 15mm across and narrowed at the apex, resembling in some respect the fruit of *Akersia roseiflora*.

The seeds are neither very similar to those of *Submatucana* nor of *Matucana*, but more of the *Borzicactus* line. They differ also from *Akersia* and *Hildewinteria* and are probably closest to *Seticereus*. However, *M. fruticosa* does not produce additional hair or bristles at the flowering areoles, unlike *Seticereus* or *Akersia*, nevertheless I believe that *M. fruticosa* has a closer affinity with *Akersia* than any other of the segregates of *Borzicactinae* apart from *Seticereus*; certainly it is not close to the globular or short cylindrical forms.

Alfred Lau was not able to find this plant on his Peruvian expeditions. The growing place of San Juan quoted by Ritter, is rather vague as there are several villages of this name in northern Peru.

All my other Borzicactinae (except Oroya) flower like mad around September-October, but *M. fruticosa* seems to prefer to flower in November. The buds appear and develop very quickly, but I find the November sunlight is not very good for photography.

Apart from the body, the rest of the plant fits the description of the mysterious *E. myriacanthus* Vaupel.

. . . . . from Mrs. L.E. MacIntosh

I do have *Matucana fruticosa*, if it is correctly named! A most uninteresting plant at 5 years old from seed, it is 8" tall and nearly 2" in diameter, a bright green body with yellowish spines. It certainly is a *Borzicactus* of some kind, but not like a *Matucana* as I think of them. It seems to mark badly and it has not flowered for me so far. There are pups just starting to grow at soil level.

. . . . . from G.E. Sharpe

I have had a long thin columnar plant for some years, that did not seem to want to stand up straight. I brought it back from one of the Continental Cactus Tours and although it had a *Matucana* label I was always doubtful about the name, because it looks nothing like I expect a *Matucana* to be.

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

I have two plants of this *Matucana*, grown from Winter's seed (probably collected) under FR 1307, sown in the spring of 1966. One plant is now 30 cm high and 3.5 cm in diameter, and has four side shoots; the other plant is 26 cm high and 3.5 cm diameter, with twenty side shoots. Both have 14 ribs with buff areoles at 14 mm apart, with about 6 centrals and 12 radial spines. The taller plant is a mid green, the other is a darker green. Neither plant has flowered, but they may be under-potted; *Matucanas* appear to have a root system which, I think, should be allowed to spread.

. . . . . from P. Cowgill

I do have a plant of this name, grown from FR 1307 seed from Frau Winter in 1965; it has seven branches, one being 6 cm long. The form of growth is procumbent. One could be suspicious of the name but the spine form seems to follow the *Matucana* pattern. No flowers yet!

. . . . . from Mrs. R. Howard

Somewhere about nine or ten years ago I bought a seedling plant of *Matucana fruticosa* from a collector who had imported a small amount of seed and ended up with the odd plant of *M. fruticosa* and *M. elongata*. He knew that I was very keen on these and sold me one of each. For a start I always imagined that the names were mixed, as *M. fruticosa* elongated quickly while *M. elongata* stayed squat. But over the years *M. elongata* has grown to about 9" high, sort of fat compared with *M. fruticosa* and apparently the names were correct.

It does branch from the base — the main stem, about 9" long, droops over the side of the pot and so far it has seven offsets of varying lengths. The stems are a bright shiny green and rather the thickness of a *Bolivocereus*. The flowers are mainly near the crown but not quite as definitely so as in other *Matucanas*. The flowers stay open for three to four days.

The flower tube is almost two inches long, it is very slightly ridged and the mouth of the flower is slightly zygomorphic. The base of the tube starts off pale green then lemon, darkening to yellow as it meets up with the flower. The scales on the tube are fairly sparse and the tips of the scales are green. I would describe the flower as a true burnt orange — not a pale orange like *M. aurantiaca* but a really rich vibrant colour. The bases of the petals are orange, the outer petals have a large tip of dark orange; the inner petals are a darker shade which when just open is reddish orange. The stamens only just project over the petals and the pale green stigma is exerted beyond the stamens. All the scale axils on the tube have a tuft of almost black fine hair which is really wispy and quite surprisingly long, although the buds are not thick with wool. I have sliced open a flower and it has a lot of nectar at the base of the stamens.

This plant has set fruit very freely before; there are a couple of small green-ridged pods on it now which are less than ½" long. I think that they stay green but I have not noticed whether they split in more than one place or not.

. . . . . from H. Middleditch

I used to have a grafted specimen of *Matucana fruticosa*; I cut off the top half of the stem on two separate occasions to try and establish a plant on its own roots. Both attempts ended in failure. I am not at all clear why this plant

should be given the specific name "fruticosa". It sounds like some author's flight of fancy. There are no other Matucanas, as far as I am aware, with the slender stems and branching habit of this particular species. One might have expected the plant to be given a name which referred to this particular mode of growth.

. . . . from G.J. Swales

If you care to have a look in the pages of Marshall & Woods' "Glossary of Succulent Plant Terms" I think you will find that fruticosa is defined as "resembling a shrub". Now botanically speaking a shrub, as opposed to a herb or a tree, is a bush-like plant with branching growth, so that the name of this species does indeed record its rather unusual form of growth for a Matucana.

#### **MATUCANA FRUTICOSA Ritter**

Translated from Succulenta 45:8. 1966

Viridis, basi valde proliferans, fruticosa; caules 10-50 cm longi, plerumque 3 — 6 cm crassi; costae 10 — 27, 5 — 7 mm altae, crenatae; areolae 2 — 3 mm longae, albae, 5 — 10 mm inter se remotae spinae aciculares, rectae, nitidae, flavae vel brunneae vel ferrugineae; radiales 13 — 22, plerumque 5-20 mm longae; centrales 5-10, longae 0.7 — 6 cm, breviores inferne; flores 7-9 cm longi, actinomorphi vel paulum zygomorphi; ovarium viride, paucis parvis squamis instructum, flocci lanae parvi, interdum carentes; camera nectarifera globosa, 3-5 mm diameter, clausa per diaphragma transversum, cum anulo filamentorum terminans; tubus floralis 4-9 mm amplus, inferne amplius quam superne, squamis parvis et floccis albis vel nigris instructus; filamenta alba, sursum aurea, fines miniata; stylus 6.5 — 8.5 cm longus, prominens; stigmata viridia; mixtura aurea et carminea tinctae; petala interiora erecta, exteriora explanata; fructus ca. 15 mm diameter, superne angustus; semina atra, 2 mm longa et lata, tuberculata-costata, hilo magno, obliquo.

Green, sprouting readily from the base, forming clumps (up to 1 m diameter), stems 10-50 cm long, mostly 3-6 cm diameter; ribs 10-21 (mostly 13-15), 5-7 mm high, notched.

Areoles 2-3 mm long, white, 5-10 mm apart; spines needle-like straight, gleaming yellow, brown, or rust-brown; radial spines 13-22, mostly 5-20 mm long; central spines 5-10, 7-60 mm long, the lowermost shorter.

Flowers 7-9 cm long, symmetrical all round or slightly zygomorphic; ovary green, furnished with some small scales and a few white to black wool-hairs which are sometimes missing; nectar chamber spherical 3-5 mm diameter, closed with a horizontal diaphragm; flower tube 4-9 mm broad, broader below than above, clad with small scales and white to black wool-hairs; filaments white, golden yellow towards the top, vermilion red at the top; style 65 to 85 mm long, exerted, with green stigma lobes; floral leaves (petals) 22-30 mm long, 5-7 mm broad, golden yellow, tinged with red towards the tip; innermost petals erect, the outermost bent outwards.

Fruit about 15 mm diameter, narrowing towards the top; seed black, 2 mm long and broad, with wart-like projections arranged in rows and with a large oblique hilum.

Habitat. San Juan, Peru. Collection number FR 1307

#### **A GRINGO LOOKING FOR CACTI** By Wilhelm Knoll

Translated by F. Fuschillo from G.O.K. Bulletin August, 1974.

Towards the end of May I was thinking about another collecting tour and I decided on the Province of Cordoba. I knew from reading the cactus literature that there are a great number of species in this province, especially of the genus *Gymnocalycium*. Once again I must make the journey by bus; the hiring of a jeep has become impossible because of a drastic rise in the price of petrol. I set off on a Friday evening on a modern route-bus of a private firm from Resistancia; before midday Saturday I was in Cordoba. The modern buildings of the bus station, serving the town of 2 million inhabitants impressed me. I looked for the correct ticket office and took a ticket for La Falda in the Valle Punilla, which gives its name to *Gymno. lafaldense* (= *bruchii*).

By the time I had taken a room in a cheap hotel it was too late to make a trip into the mountains so I made a reconnaissance into the surrounding foothills. I soon found a beautiful example of *Notocactus pampeanus* (WO 51) with a diameter of up to 20 cm. Nearby occurred a large-growing example of *Pseudolobivia* (*Echinopsis*) *aurea* (WO 50). Here it was short spined, the centrals hardly longer than the radials, all of which remained black tipped.

Somewhat higher in the Sierra Chica, on the eastern slopes of the mountain range there were some giant examples of *Gymnocalycium multiflorum* (WO 53) with magnificent long thick yellow spines; most of them grew where the soil had a good humus content and was also fairly moist.

Standing on the rocky slopes were large groups of *Trichocereus* species (WO 49), up to 1 m long and 25 cm diameter, sometimes hanging down pipelike from the small cliffs.

It was already dusk as I returned to the hotel and I could hardly wait for the morning when I could begin collecting again. With the first rays of the morning sun I was out into the street and on my way towards Rio Ceballos. After a good hour of hard walking, and a welcome refreshment at the Malanthon de la Laga Vide (The fountain of long life), which bubbled out from the slopes above the road, I left the road and started to climb up into the mountains. I soon sighted a single example of *Gymno. multiflorum*. I already had a few small plants and a couple of large ones in my rucksack, but I had hoped by now to have had a nice large, rare, cristate safely wrapped up in newspaper. As I reached the higher slopes I was becoming disappointed for I had not seen very much. By now I was crossing over to the north side of the range and my zeal was at last rewarded by the sight of many small plants of *Notocactus pampeanus* growing very deep in the ground, irregularly spined, the epidermis burnt red-brown by the sun.

Again the search was for suitable material. With nose to the ground I was able to see better; sometimes I did not see the plants until I had walked on them; I crawled along like a red indian following a trail and in this way success came in the form of the next discovery. Between some grass clumps I saw a small group of cacti with dense white spines, the individual heads barely more than 3 cm in diameter. It was a *Gymnocalycium lafaldense* (= *bruchii*) that flowers pale violet, as I was to be informed when back in Vienna. Now that I could see the plants that I had been looking for, naturally I found more plants at the spot, and in the delight of collecting, the whole day sped swiftly. The digging up of the *Gymno lafaldense* was rather difficult because of the long turnip-like roots.

At 4 p.m. I made my way back to the hotel, my rucksack full of beautiful plants. A midday meal? Naturally it had been forgotten! After a bath and a change of clothing I went to the lounge for some refreshments, when I heard that a newly married couple were staying nearby. Later in conversation with them I learned that the lady had a part in a great folklore festival which took place annually in the town of Cosquin, which is only a few kilometres from here; this festival attracted people from all over the world. I only heard the lady sing for a short while, yet her voice impressed me so much I shall never forget it.

I stayed there for two long days collecting plants of known species. I also found nearby another *Gymnocalycium* species which in its habit somewhat recalled *G. saglionis*, but nevertheless exhibited marked differences. Certainly this species was very rare. It bears my collecting number WO 52.

My next station was Capilla del Monte which is the most northerly place in the Valle Punilla, celebrated because of a large rock in the shape of a shoe; this stands as one immense block of rock in natural uncultivated countryside and provides a popular target for excursions. In the neighbourhood of El Zapato (the shoe) I found *Gymnocalycium valnicekianum* (WO 55), a very beautiful light-grey spined species, the spination of which is very variable.

Here I took one of my few photographs. On one of the largest examples of this *Gymno* species sat a praying mantis, an insect which sits with its fore legs in a praying position and it is said that after mating the female bits off the head of the male.

The next day I climbed the Cerro Uritorco, the highest point in the Sierra Chica, at about 2,000 m. In the woodlands at the foot of the mountains there were beautiful isolated plants of *Gymno. quehlianum* v. *rolfianum*, mostly solitary, but sometimes in groups of up to five plants. The body colour varied from earthy-green to lightest brown.

Somewhere amongst the peaks I found yet another *Gymno.* species: growing on a large sandy flat area, there was an abundance of large groups of *Gymno. capillaense* (WO 57) with long turnip-like roots. The cushion-like clumps were hardly raised above the ground. There was one singularly beautiful undamaged example which I obtained. In the same area but almost hidden under bushes and small trees occurred another *Gymno* species which was peculiarly humped, with a diameter of 8-10 cm. I did not know this species, and my friend in Vienna is still puzzled today.

I spent two days there to collect more specimens of known species. I sent them all to Resistancia, then started on my return journey. From Cactus literature I knew of a place on the Sierra Grande named Copina, yet I could not get enough information about it as to whether there was a place to make a customary overnight stay. I decided to take a chance and go. In Carlos Paz I missed the bus so I had to wait 10 hours for the next. I eventually arrived in Copina at midnight, and (luckily) found myself a cheap hotel. To pass the night in the open would be nearly impossible for the cold at 1,400 m is unbearable. I curled up in bed covered by five woollen blankets and, with chattering teeth, went to sleep.

In the morning I went out very early in search of cacti but found nothing new, only already named species. It was here that a small area should have yielded *Gymnocalycium vatteri*, but where was it? A search of the mountain fissures produced nothing.

I then took the bus going towards Villa Mercedes; as we crossed the Sierra Grande we passed the well-known places like Pampa de Achala, Cura Brochero, Minas Clavero, and then we arrived in Nono. Again I took a single room in an unfashionable hotel. In the early morning of the next day I set out for Cumbre de Achala, a long winding cliff to the west. After two hours I was already high up on the cliff and had also found many cacti. *Acanthocalycium violaceum* (WO 61), *Gymnocalycium calochlorum* (WO 62) and beautiful examples of *Notocactus submammulosus* (WO 63), very widely scattered.

The long yellow spines of the *Acanthocalycium violaceum*, of which I had a lovely specimen packed away in my rucksack, gave me a special pleasure. In a very limited area grew a very peculiar kind of *Gymnocalycium multiflorum* with one upstanding or slightly curved central spine and with the radial spines curved and twisted. I gave this form the number WO 64.

The next day I went eastwards into the hills of Nono, and here I found *Gymno. calochlorum* and a *Cylindropuntia* whose body was light red in parts. I collected all day and when I had obtained sufficient plants I returned to my hotel resolving to search further on the morrow. The species that I had hoped to find, namely *Gymno-calycium vatteri* and *G. proliferum*, did not cross my path, however.

My next destination was Salsacate, a small village in the centre of Cordoba, approximately 100 Km north of Nono. *Gymnocalycium horridispinum* should be found in this neighbourhood. It is an unruly spined *Gymnocalycium*, as its name suggests. As I came into Salsacate it was clear to me that I would need more than a little luck to find this species. This was another species that I never found. However, another nice present was bestowed upon me. Near the village in an almost pure loam soil I found a wonderful species of *Gymno*. It was similar to *G. bayrianum* yet noticeably different. They were definitely not numerous, and I was highly delighted as I took a few of the smaller plants of this new found species. In my note book they appear under WO 66.

I was delayed a short time in Salsacate, for I ran into a few difficulties with the Argentine Police. I didn't book into an hotel as soon as I arrived, but wandered about full of confidence. By chance I strolled up to a policeman and asked him the way to some accomodation. Probably because of my appearance and rucksack he took me for a tramp and demanded a thorough search of my luggage. This procedure naturally brought nothing to light and when I showed my papers to the local Chief of Police, all became immediately friendly. I had to laugh to myself, for when I was first detained by the Police they were stern and serious, but afterwards friendly and helpful. The hotel in which I had taken a room belonged to the strict policeman who had wanted to arrest me!

After my searching around Salsacate, I had to make up my mind where I should go to next. I didn't have enough money left to go further north but enough to make one more short trip. I thought of taking a bus to Carlos Paz and La Falda where I had seen a few cacti just off the road, but they might not still be there by the time I got back. So I took the bus to Bialett Masse where again I quartered myself in an hotel.

A short walk in the evening confirmed what I had been hoping for; I soon found some *Gymno. quehlianum* which were abnormally large, up to 15 cm in diameter. Under the areoles were strong chinlike protuberances and the colour of the body was always grey-brown. This species bears my collecting number WO 70.

Not far away I found yet another location, where *G. mostii* occurred, of which I identified two forms, WO 68 & 69 respectively. One had three straight radial spines and the other 5-7 radials, curved and longer. For almost a week I stayed in Bialett Masse and by that time I had enough plants of the species I had found, so I started on my homeward journey.

A minor misfortune now befell me, for I missed the route bus to Resistancia by only a few minutes. As a result I had to make the journey home with the interruptions of changing and waiting for buses. The journey lasted a whole day. Dog tired, I arrived home in Resistancia, but as I proudly took stock of my collected cacti, all the misfortunes were forgotten.

Continuation translated by E.W. Bentley from G.O.K. Bulletin for October, 1974

My great wish was to continue on my last collecting trip where I had left off in North Cordoba on my third journey. In September 1973 then, it came about that I travelled again by bus to Cordoba and from there on to Capilla del Monte. Again I put up at the same Inn, this time however for only two days since I only wanted to collect a few plants there. Above all, I lacked plants of WO 58 *Gymno. quehlianum* var. *rolfianum* and of WO 59, a *Gymno*

species of which I had only found a few on my first sojourn.

And so I collected the desired species at the sites already known to me. Before journeying further, I bought in a shop some "sand roses" — also known as "desert roses" — since, as an enthusiastic collector of minerals, I had always dreamed about these particular formations.

My next station was called Serrezuala, a small village near the Salinas Grandes, the Argentinian salt-desert on the border with La Rioja. The neighbourhood already bore a desert-like character; grass was largely no longer to be seen — only earth, sand, and low, straggly thorn bushes. As soon as I had taken a room in a hotel I marched with rucksack and pick into the bush. At first I saw nothing that particularly interested me, except a giant group of a naked *Tephrocactus* sp. that offered a fine sight. Then my eyes became accustomed to the ground features. Over large areas that had a few lichens growing on them were many specimens of a *Gymno.* sp. which particularly attracted me through its fine spination. The spines were straight, close-standing and, on the upper side, as if tipped with red velvet. It received my collection number WO 93.

A little further on I made my next interesting find. Always hidden under bushes, there grew in fine sandy soil flat cacti similar to *Gymno. bodenbenderianum* but much longer — and more thickly spined, and also growing larger. Probably it was a form of *Gymno. hybopleurum*. The search for this species actually took up two whole days since the plants only grew thinly and specimens of suitable size were rarely undamaged. Nevertheless I got together sufficient of this species with the collector's number WO 92 and was able to travel on.

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#### Comments

. . . . from H. Middleditch

This article was accompanied by a list of the plants collected by W. Knoll, a number of which were available for sale. Being unaware at that time of the quality and value of the plants, I sent for about half a dozen specimens and was very pleased with what I received. Shortly afterwards I received from W. Knoll a very comprehensive list of his field numbers which also gave, against each number, the precise longitude and latitude of the collection point, the altitude at which the plant was growing there, together with a brief indication of the nature of the soil and vegetation at that location. This information not only provided a clear and definite geographical location for each specimen, but also afforded an appreciation of the topography and vegetation of the surroundings. All this is in marked contrast to the absolute dearth of relevant information that surrounds most imported plants and greatly reduces their value to the serious collector. Once I had appreciated the great value of the imported plants which I had obtained, I wrote to enquire if any more were still available — but of course by that time I was too late: they had all gone.

In his account W. Knoll refers to the *G. multiflorum* found on the eastern slopes of the Sierra Chica, which possessed "magnificent long thick yellow spines . . . WO 53". My own plant of WO 53 was received as a 2" diam. specimen with flattened yellow spines about 2 cm long, reddish at the base; the new spines which have grown this season are almost 3 cm long. But these are approximately the length of spine that I would normally expect to see on *G. multiflorum* so I wonder why Knoll emphasised the length of the spines — did he come across other examples of *G. multiflorum* with shorter spines?

From this account one imagines that cacti must be found no great distance from the town of La Falda, where Knoll took a walk in the late afternoon. He could hardly have travelled far from the hotel since he was back there by dusk, which would be about 6.00 p.m. in that latitude.

Backeberg's *Die Cactaceae* records *G. saglionis* from Salta, Tucuman, and Catamarca. I do not appear to be able to find any other reference to this plant emanating from Cordoba. Does WO 52 grow as large as *G. saglionis*? What is the nature of the differences between this plant and *G. saglionis*?

Plants of *G. quehlianum* v. *rolfianum* are to be found, according to Knoll, in "woodlands". Does this mean a woodland like an English copse, with the tree-tops forming a canopy and the ground beneath almost completely shaded? Or would the trees be spaced well apart so that most of the ground is exposed to the sunlight; and if so, is there any other vegetation like shrubs or bushes? Or are there grass tussocks to shade ground-hugging cacti? Does *G. quehlianum* grow here in the sun or shade?

It is not clear how Knoll came to associate the vicinity of Copina with *G. vatteri*. The original description by Buining places this species in the vicinity of Nono, on the opposite slope of the Sierra Grande.

In his account Knoll states that he "set out for the Cumbres de Achala . . . to the west . . . of Nono".



According to my map, this cliff lies to the east of Nono.

Near the village of Salsacate, Knoll found a *Gymnocalycium* which he describes as "similar to *G. Bayrianum*". It would indeed be rather surprising if this particular plant was closely related to *G. bayrianum*, which emanates from Tucuman province and is normally taken as the southernmost representative of the *G. cardenasianum* – *spgazzinii* – *bayrianum* group of *Gymnos*.

Among the imported plants which I did obtain from Knoll was a plant of *Gymnocalycium* WO 92, which was nicely rooted on receipt and grew on well in cultivation. When looking at this particular plant, Geoff Swales moistened the greyish coloured spines and they immediately turned into a dark teapot brown colour, just like *G. moserianum*. Now it was from the vicinity of Serrezuela that plants were first collected as *Gymno* sp. Serr. which were later described as *G. moserianum*. Thus it would seem that this particular plant might possibly be labelled *G. moserianum*.

..... from W. Knoll

I collected *G. multiflorum* (WO 53 & WO 64) near La Falda, Capilla del Monte, Copina, Nono, and near the route from Salsacate to Tanti. The plants from La Falda have 5-9 long yellow spines, always closed to the body, up to 3 cm long – as do the plants from Capilla del Monte, Copina, and from the route to Tanti. Near Nono (of course, the Cumbre de Achala is to the east of Nono, in my account I made a mistake) I found a lot of forms of *G. multiflorum*. One had 5-7 spines, straight; another form had 5-7 spines, closed to the body, but in some areoles I observed a central spine, longer than the other spines and more straight. The last form I collected near Nono had 5-9 spines, but arranged in a pattern I cannot explain – see my drawing. This last form (4) now in my collection is growing with spines like form (2). I am sure that all these forms are the same species, but are growing in localities with differences in the climate (microclimate).

Now for your question about the differences between *Gymno saglionis* and WO 52:–

<i>G. saglionis</i>	<i>G. WO 52</i>
Body diam. up to 6 cm	Body diam. up to 20 cm
Ribs wavy	Ribs straight
No chins	Chins over each areole
Spines curved back towards the body	Spines more straight
Central spines 1-4 curved upwards, thin.	Central spine 1, straight, longer than the other spines, thick.
Flower small	Flower large, like <i>G. mostii</i>

I have made a sketch to show these differences

The woodlands at the foot of the Cerro Uritorco are not like our European wood, with closed tops. The trees there have very little (small? – H.M.) leaves, the sun can pass easily, but the cacti on the ground get more shadow than the plants from Cafayate or from La Falda. On the ground there are few other plants, because the ground is sandy.

Now I must tell you that it is very difficult to identify many of the species of *Gymnocalycium*, because there are many forms, and often the form of one species looks like the form of another. I observed in Cordoba a lot of different forms, great differences between plants of the same species, and so on. I hope that this summer all my plants will flower, when I will be able to observe the differences.

..... from G.J. Swales

The root of *G. lafaldense* is described by W. Knoll as turnip-shaped. I would have called it a thickened tap root rather than a shape like a turnip, which implies a swollen root which narrows appreciably at ground level – a feature which I have never observed on this species. From the account in which Knoll describes how he collected this species, it would appear that it occurs near the crest of an outlying peak in the chain the Sierra Chica.

It would be of interest to have a location for the Cerro Uritorco, and equally to know the altitude at which *G. capillaense* was found, which may perhaps be between 1500 & 2000 m.

Reference is made to *G. proliferum*; the plants in cultivation under this name are just varieties of *Gymno. calochlorum*.

I am very interested to learn that plants of *G. multiflorum* have been found in habitat with a central spine at some areoles. Among the plants in my collection is a B21 (which indicates by this number that it originated as a plant

collected by Frau Muhr) which has a body quite close to the colour and shape of *G. multiflorum* but with spines which are rather similar to those on *G. horridispinum*. In addition I have another plant which came to me without any name, which also has the yellowish-green body colour and the chin shape of *G. multiflorum*, with shortish, stout, dark-coloured spines including a central spine, again rather like a "ferocious" version of the spines on *G. horridispinum*.

Now that I have obtained an imported plant of *G. achirasense* B 21 from S.P.I., I find it resembles the other two plants which I have under this number, in possessing a *G. multiflorum*-like body coupled with *horridispinum*-like spines. Whereabouts does this species come from — from a site between the habitat location of *G. multiflorum* and that of *G. horridispinum*, perhaps?

..... further from H. Middleditch

If we are to take the name of *G. achirasense* as a reference to the place-name Achiras and furthermore if we assume that Achiras is where the B 21 is to be found, this location is right at the southern end of the Sierra Cordoba. It lies far to the south of the habitat range of *G. multiflorum*, whereas *G. horridispinum* lies not far to the north at the northern end of the Sierra Cordoba.

..... from H. Ewald

I have two large plants of *G. multiflorum*, one of which I grew from seed and the other is an imported plant which I selected from among those on the staging when I paid a visit to De Herdt. These come into bud at almost the same time; the buds on the seedling grown plant have the green sepals tightly overlapping and each sepal is red at the tip. The imported plant has a much darker green body and when the buds are pea size, the outer scales are not adpressed but stand out just clear of the bud. The buds are so richly suffused with red as to appear purple overall.

Both plants are over 5" in diameter and have borne flowers for many years, but they usually manage to bloom at different times, so I seldom have any opportunity of cross pollinating them to try and set seed. They both have the pectinate spination typical of *G. multiflorum*, with a dark red base to the spines. The new spines growing out of the areoles very close to the growing point, are a very pale glassy green and stand upright in a bunch close together, rather like a broom. Even as the areole is growing out of the depression in the crown, the outermost spine starts to bend towards the body. By the time it is over the shoulder of the plant it has become the lowermost spine, pointing downwards.

..... from G. Charles

I have a plant of *G. multiflorum* which is 2½" across and it recently flowered for the first time at an age of 5 or 6 years. The flowers are very pale pink. The areoles carry not only the usual radials but also a central spine.

..... from J. Klavins

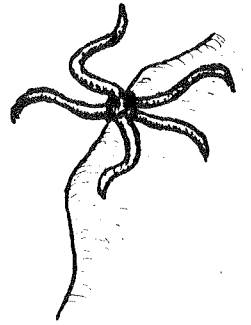
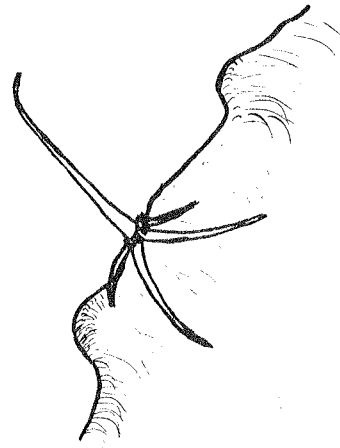
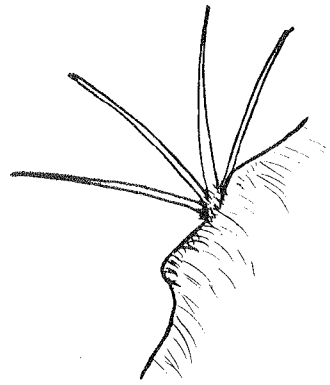
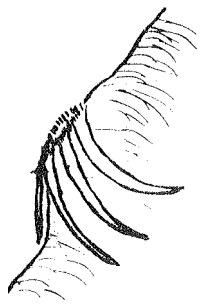
Many years ago I won a plant of *Gymno. multiflorum* in a raffle, when it was only 4 inches across — now it has grown to nearly 7" across. I have won many prizes and cups with it because the spines are very nice; the longer spines are over 1½" long and the tips of the spines are almost an inch away from the body. It has eight radial spines arranged in pectinate fashion on an elongated areole, with one slender central spine growing from the centre of each areole and a second, much stronger and slightly longer central spine growing from the lower part of the areole.

..... from H. Mays

I obtained a plant which I believe to be *G. multiflorum* in 1972 as part of a neglected collection the owner of which had died. He was an old man and had been collecting cacti for many years. I also got a small booklet listing his plants. This showed that he bought a *Gymno multiflorum* for three shillings. It is possible that the plant was bought in the early 1950's but this is not certain. I took the plant to the 1973 Chileans annual gathering and views as to what it actually was, differed rather!

This plant is now 14 cm high and 10 cm in diameter and has 15 ribs. Radial spines 9-11, the lowermost pointing downward, 2 cm long, then four or five at each side of the areole, the top two 1.5 cm long, those pointing sideways between 3.0 and 3.2 cm long. There is one central spine on almost every areole, again between 3.0 and 3.2 cm long. A small number of areoles have no centrals and one or two areoles towards the base of the plant have two central spines, but these could be displaced radials due to the tubercles becoming very cramped with shrinkage at the base. Spine colour I would describe as yellow to pale straw with the base light red-brown.

There are now too small offsets at the base; one has no centrals and the other has one straight central at one

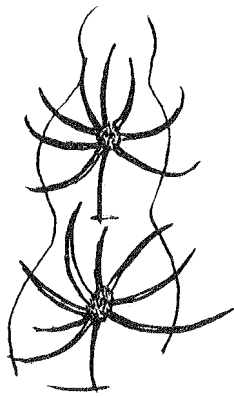


FORM FROM LA FALDA  
& CAPILLA DEL MONTE

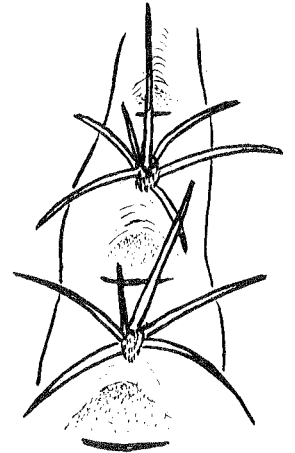
WO 53

FORMS FROM NONO WO 64

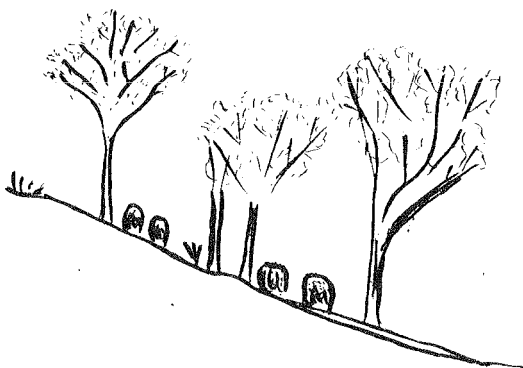
*Gymnocalycium multiflorum*



*Gymno. saglionis*



*Gymnocalycium* W.O. 52



CERRO URITORCO

Trees and few other plants  
on ground.



LA FALDA

Some trees, no bushes,  
much grass on ground.

areole only. On the main body of the plant, not all the central spines are hooked. On the new growth at the present time there are no hooked centrals. On the older growth below the shoulders about 40% of the centrals are hooked. The plant had been grown hard by its previous owner, by me it is being given much easier conditions — shade, water and frequent repotting. Can it be that these different conditions affect the centrals? I would not have thought so.

. . . . . postscript from G.J. Swales

I see on re-examining this article that there are two place names given as Serrezuala and Bialett Masse, whereas my map gives me Serrezuela and Bialet Masse. It also occurs to me that WO numbers must be regarded with some caution if he places plants collected from La Falda, Capilla del Monte, Copina, Nono and the route between Salsacate and Tanti all under two numbers.

. . . . . response from H. Middleditch

I find that the spelling of place names not only varies between map and writer, here and elsewhere in South America, but it varies from one writer to another and even from one map to another. In some cases this may be due to a phonetic rendering of a basically indian name. Perhaps Knoll used the same spelling that he found the local natives using?

Now I am not so sure that I would raise an objection to the same two field numbers being used for two distinct forms of a species when they appear over a fairly wide patch of ground. After all, *Notocactus mammulosus* is found in Uruguay, Sierra Cordoba, and Sierra Ventana — a very much wider spread. It might also be considered preferable to the situation with Uruguayan *Notocacti* where the European collectors seem to dream up a new species name every time they take ten paces forward.

## THE SIERRA CORDOBA

The Sierra Cordoba is an extensive mountain chain extending some 250 miles north to south and about 50 miles wide at the broadest point — covering an area about half the size of the British Isles. They form a fairly well wooded island amidst the surrounding arid lowlands. At the foot of their eastern flanks lies the town of Cordoba, on the banks of the largest of the rivers which flow westwards from the Sierras.

From the earliest days of the Spanish conquest, Cordoba has been an important staging post on the pack horse and caravan trail from Buenos Aires to Tucuman which went thence north to Salta and, eventually, via the Inca trails to Lima. Cordoba is not the only watering place on this ancient route between Buenos Aires and Tucuman, but in this particular section it is certainly the best.

For about 300 years the whole of Patagonia together with the southern part of the Pampas were rendered dangerous for travellers on account of the continual and pitiless running warfare between the native indians and the European settlers. In consequence of this, all overland communication between Buenos Aires on the La Plata and Santiago in Chile passed via Cordoba and Mendoza until about the 1880's, when the Argentine army wiped out the remaining native population. From the city of Cordoba, this traditional route to the west lay over the Sierras thence on to Mendoza. From Cordoba a further, easier, route leads northwards up the Valle Punilla via La Falda and Cruz del Eje and so through the Sierra Grande, for La Rioja, Famatima, or Catamarca. Cordoba is thus placed at a focal point where traditional trade routes meet.

Apart from a short line running into the cultivated Pampa from Buenos Aires, the first major railway undertaking in Argentina ran along the old traditional caravan route from Buenos Aires as far as Cordoba. At that time, Cordoba was still one of the few inland settlements which were quite free from guerilla attacks by the native indians. It is the nearest hill country to Buenos Aires, in a landscape with tree covered slopes, a pleasant change from the flat treeless Pampa which surrounds Buenos Aires for hundreds of miles. Not surprisingly, Cordoba and its hilly backdrop attracted visitors and it is from these very hills behind Cordoba that some of the earliest *Gymnocalycium*s found their way to Europe. Of these, *Echinocactus multiflorus* was one of the first.

It would appear that the somewhat less conspicuous *Gymnocalycium*s did not receive any attention from collectors for a considerable time, for it was not until 1899 that *G. quehlianum* was described, followed shortly afterwards by *G. mostii* and *G. kurtzianum*, all from the slopes of the Valle Punilla. In the early 1920's *G. capillaense*, *sutterianum*, and *sigelianum* came to Europe from this same part of the Sierra, then later *G. lafaldense*. It was not until after the second world war that plants growing on the western side of the Sierra came to Europe — *G. vatteri* from near Nono and later still *G. moserianum* from near Serrezuela.

Knoll tells us that it was this same little patch of the Sierras behind Cordoba that first engaged his attention when he came to this part of Argentina. If we refer to the opening paragraph of Buining's account of his visit to this Sierra (Chileans No. 23) it would appear that his first outing from Cordoba was also to this very same patch of the Sierras. Despite the countless visitors who must have passed through this locality, there is a dearth of information about the countryside and landscape.

The map on the front cover extends over this northern part of the Sierra Cordoba which has been fairly thoroughly searched for cacti.

H.M.

**ECHINOCACTUS MULTIFLORUS** By W. Hooker

Curtis's Botanical Magazine No. 71 Plate 4181 — 1845

*Echinocactus (Tuberculati) multiflorus; depresso-globosus viridis subglaucus tuberculatus vix costatus, tuberculis magnis verticaliter oblongis hemisphaerice prominentibus mammaeformibus demum confluentibus superne in series subverticales irregulares dispositis, areolis ovalibus tomentosis, aculeis 5 validis reflexo-patentibus recurvatis subappressis subaequalibus, floribus numerosis (pro plantae retione) magnis albidis.*

From the rich collection of cactuses in the possession of Mr. Palmer, of Stockwell, near London, who obligingly sent a specimen (the one here figured), to Kew, on the eve of its blossoming. Of its native country we are ignorant, and it does not appear to be described; but on this subject it behoves us to speak with caution, for no plants are so difficult to define by words as the individuals of this now extensive family; figures alone can render the distinguishing characters of them intelligible. The species is remarkable for the large tubercles, strong spreading recurved and almost appressed spines, and for the copious pale, almost white, flowers, tinged with greenish-brown.

Descr. Our only specimen is of the size here represented, globose, depressed at the top, green, slightly glaucous. Tubercles large, irregularly placed, upper ones only in an imperfect vertical series, and those oblong or oval, very prominent, obscurely angled. Areolae oval, woolly; bearing five nearly equal spines, about an inch long, diverging, but not on all sides, two opposite pairs laterally and the lower ones toward the base of the plant; all are so much spread and decurved that they may almost be said to be appressed, strong, of a yellowish colour, purple at the base. Flowers large (for the size of plant), numerous, several opening at one time, so as to cover and conceal the upper surface of the plant. Calyx scales green, gradually enlarging and becoming petaloid, till at length they pass into the spreading, obovate, almost white petals. Stamens numerous. Anthers small orange. Rays of the stigma white, or nearly so.

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Comments

..... from H. Middleditch

Although this short description contains no indication of where this plant was found in the wild, information now available to us would suggest that it is likely to have been collected in the northern parts of the Sierra Cordoba. For practical purposes, this area is the only known habitat of this species. The City of Cordoba, lying very close to this growing area, was a staging post on the very old trade route between Buenos Aires and Tucuman long before the 19th century. At the Sierra Cordoba the trail to Mendoza and beyond — over the Andes into Chile and Santiago — branched off the more ancient route to the north. This was the most likely route taken by John Gillies when he travelled from Buenos Aires to Chile in 1821; it was also the route followed by J. Miers on his own plant collecting grips between La Plata and Chile, later in the same decade. Of the various *Gymnos* now known to occur in this area it is not very surprising that the one most readily catching the eye with its long, pale spines should have been the first to be uprooted and brought to Europe.

Among the species of *Gymnocalycium* to be found in the Sierra Cordoba, *G. multiflorum* has an unusual feature in its flower — the stigma lobes both spread out and stand above the anthers. It is remarkable that this important difference has been depicted so clearly in the original illustration in Curtis's Botanical Magazine, which is reproduced in this issue.

..... from G.J. Swales

In addition to *G. multiflorum*, there is also *G. lafaldense* which emanates from the Sierra Cordoba and opens its stigma lobes out wide.

Translated by K. Wood-Allum from Friciana No. 16 : 1963

### Section Multiflora

#### *G. multiflorum* (Hook) Br. & R.

This species was described in 1845 and therefore belongs among the earliest known species of this genus. It is well represented in collections and is generally very well known. But it was not always so. Before 1900 the nomenclature committee of the D.K.G. was very much concerned with the question of what *G. multiflorum* really was. The problem was solved at the time and it was established that *G. ourselianum*, (also *urselianum*) was identical with *G. multiflorum*. According to all descriptions, *G. multiflorum* has 7-10 radial spines, which are a beautiful amber colour, up to 3 cm long. There are two white-spines varieties: *V. albispinum* and *V. parisiense*. In the former the spines are pure white, in the latter they are red basally. In collections nowadays *G. multiflorum* occurs with one central spine, rarely with two or three. These are descendants of imports sent straight from Argentina to Brno in 1930. *G. multiflorum* has white to pink flowers. The name *multiflorum* does not fit our plants for we know many *Gymnos* which flower more willingly and profusely. Its habitat is Cordoba to the north of San Luis province.

#### *G. monvillei* (Lem) Br. & R.

This species was described in 1838 and was frequently grown in past years. In all the old publications we can read of fine large plants which were amongst the finest examples in past collections. It is not known where they were discovered but they were apparently imported from Paraguay. Prof. Werdermann, who had the extensive Dahlem archives at his disposal, wrote in 1936 that he could not establish whether the species had ever again been imported.

In the Dahlem Botanical Gardens large and very old examples grew which must have flowered regularly. The writer did not say whether seed was obtained but he did state that the largest plant produced offsets from time to time. According to Werdermann, *G. monvillei* was only to be found in old collections. In *Die Cactaceae*, Backeberg writes that *monvillei* was earlier grown under the name *multiflorum*. I believe that in this he is mistaken and that Dr. Werdermann is right. I doubt whether there are true *monvillei* in our collections unless they are authentic offsets from Dahlem.

For obvious reasons I had no true seed at my disposal. It is also doubtful whether the species belongs in the *microsemineae* group. It would be the only representative of the *Cordillera Gymnos* to be found in Paraguay. I would expect it to more nearly resemble the *macrosemineae* group.

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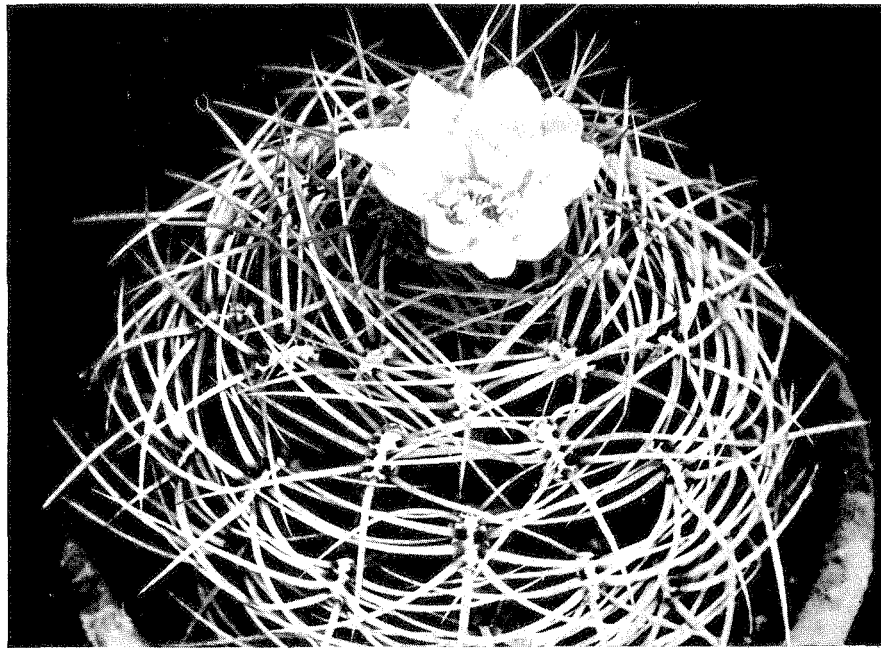
#### Comments on *Gymnos* of the *multiflorum* group

..... from C. Webb

Among the *Gymnos* in my collection I have six plants which are all labelled *G. multiflorum*, but I am rather doubtful whether the name is right on every one of these plants. Somewhere or other I have read a comment that *G. multiflorum* is reluctant to flower profusely, but my plants under this name flower fairly well. As all six of them flowered in one season, and set fruit, I collected some seed from each plant and gave them to Geoff Swales. I didn't tell him exactly what plants they came from but just identified each sample by a number and he had a look at them under the microscope and made a hand sketch of a typical seed from each sample.

Some time later I took the plants themselves along so that we could compare them in turn with the parentage suggested by the examination of the seed. The first seed sample was of a *Macrosemineae* shape and size but with the character of a *Microsemineae* seed. We then took the No. 1 plant out of the box and lo! and behold the plant had a body habit rather more like a *G. denudatum* than the other *G. multiflorum*s in the box. The next seed was more like an *Ovatisemineae* in shape and size than the other five and from this it was suggested that the plant concerned would look more like *G. gibbosum* than the others. On lifting the plant concerned from the box it was immediately clear that the evidence from the seed was repeated in the habit of the plant.

This eliminated in my mind any doubts about the ability to relate seed form to plant groups in the genus *Gymnocalycium*; it also demonstrated that hybridisation could occur between *Gymnos* from two different seed groups.



GYMNOCALYCIUM MULTIFLORUM

var. parisiensis

SUCCULENTA - March 1957



GYMNOCALYCIUM MULTIFLORUM

CURTIS'S BOTANICAL MAGAZINE 71.1845

. . . . from H. Middleditch

Among the slides of *Gymnocalycium* received on loan from the Austrian Cactus Society was one of an imported plant of *G. multiflorum* in flower, a plant from Alta Gracia. (This place name will be found on the map on the front cover). It gave the impression of having a double flower, probably on account of the two fairly distinct rows of petals the inner petals being somewhat shorter than the outer ones. The stamens appeared to be inserted in two series, one close around the style and the upper series upstanding with the anthers leaning slightly inwards. The stigma was exserted above the stamens with fairly lengthy lobes.

Considering how readily this species is reputed to flower, it seems most remarkable how little information can be obtained on the characteristic form of the flower. Could this be because we are so used to seeing this species in flower among the *Gymnos* that we don't bother to give it a second glance?

I wonder where my own imported plant of *G. multiflorum* ex Uhlig was collected?

. . . . .from K. Uhlig

The *G. multiflorum* was collected near Salta, Argentina.

. . . . from Mrs. L.E. MacIntosh

I have been trying to sort out my *G. multiflorum* "complex" for years, *G. multiflorum*, *monvillei*, *ourselianum*, *parisiense*, *megalothelos* and *brachyantha*. At least I can clear one point – they all have funnel form flowers with a short tube and large wide open stigma. All the flowers open flat over here. With the exception of my own original plant of *multiflorum* the rest are offsets from plants grown from Winter's seed.

My *G. multiflorum* is one of my oldest plants and fills a pot with its many heads: I assume that this too would be from Winter's seed as that was our only source in the early days. I have always felt that it was correctly named although I have not seen another exactly like it – body light dull green, taller than wide, 11 straight ribs, chins small but sharp, areoles slightly oval, 1 cm long, 2.5 cm apart, yellowish wool in the youngest areoles, 5 spines, straw colour, greyish at base, no central; the lower three spines the longest – 3.5 cm – standing out from the body and curve outward. The two upper spines are thinner and shorter – 2 cm – and curve over the body. Flowers are cream and large, opening wide. This is the only plant in the collection which sets seed without any help from me: the seed are very large and black.

. . . . reflection from H. Middleditch

If the seed from *G. "multiflorum"* is large and black I would expect that the plant is of mixed parentage – possibly a *G. multiflorum*-*denudatum* cross, for the seed of *G. multiflorum* should be of the small *Microsemineae* type.

. . . . from G.J. Swales

In his article, Dr. Schutz observes that the spines of *G. multiflorum* are "a beautiful amber colour". Assuming that this is a fair translation of the original text, I am surprised to see this particular colour quoted for the spines. In his original description Hooker gives the spines as "yellow" and I have seen many plants which conform to this description. Dr. Schutz also notes that the variety *parisiense* has spines which are red basally, thereby implying that the type plant does not have basally red spines. But again this contradicts the original description by Hooker.

Dr. Schutz observes that the "name *G. multiflorum* does not fit our plants"; I would have been inclined to agree with him until a few years ago when one or two of my older plants had reached a fairly large size and now they produce a complete ring of flowers. Perhaps they do need to be fairly large before they show this particular characteristic. Indeed, Hooker's original illustration shows a plant with several flowers and buds and is possibly rather more floriferous than I might have expected for a plant of that size.

It is of interest to see that Dr. Schutz states that he would expect the seeds of *G. monvillei* to resemble those of the *Macrosemineae* group. I wonder just what he had in mind when he made that comment?

It is quite some time ago that I had a look at the seeds from Chris Webb's plants of *G. "multiflorum"* and I had almost forgotten this fairly early evidence of crossing between different *Gymno* seed groups. At that time I was not aware of Dr. Schutz's observation on the seed type for *G. monvillei* and this now raises all sorts of interesting questions. The large black seeds from the white-flowered plant grown by Mrs. MacIntosh adds further fuel to this problem. Indeed, it raises the very question whether we are entirely justified in believing that all of Chris Webb's *G. "multiflora"* are indeed hybrids; is it possible that one or the other of them could be a species in its own right?



. . . . . reflection from H. Middleditch

Apropos that last question, could they be from Entre Rios, Corrientes, or south-eastern Paraguay and not from the Sierra Cordoba?

**ABSTRACTS FROM SOUTH AMERICAN EXCURSION** By E. Young 1939

While I was in Buenos Aires the advertisements of the many tourist agencies and of the Central Argentine Railway were always urging me to visit Cordoba and the Sierras, the latter a mountainous region said to be of considerable beauty and great geological interest.

Cordoba, by rail, is distant only 432 miles from Buenos Aires. I was advised to go by night as "there is nothing to see", but I went by day because everywhere there is always something to be seen. When we leave Buenos Aires we at once enter a part of the pampa region. The word "pampa" is an old Quechuan Indian word meaning a generally level surface. Much of the country is truly nearly horizontal, but it slopes gradually up to the west and is broken in places by distant hilly regions, like the Sierras of Cordoba, for which we are now bound

When we had left Rosario behind we crossed a number of rivers — or rather dry river beds — Rio Primero, Segunda, Tercero, and so on. Then came a coppice of dark green foliage, a cutting, a bend round the shoulder of a hill and — in front — Cordoba.

Cordoba was founded in 1573, on the right bank of the river Primero by a group of adventurers under Don Geronimo Luis de Cabrera. They had come from the north-west, from Tucuman and Santiago del Estero. From that humble start Cordoba has grown to be a city with a population of nearly a quarter of a million.

To the tourist, Cordoba is the door to the sierras, the point from which radiate all the communications into the hills. All the many tourist agents advertise half-day, day and other excursions. It is as easy to visit the Sierras from Cordoba as it is to visit, say, North Wales from Llandudno.

The Sierra Chica, up to certain heights, is well covered with a vegetative formation known as monte, which consists of large trees, such as the coco (nothing to do with either cocoa or coco-nuts), the molle, its almost inseparable companion, and the algarrobo and a scrub of thorny plants of lower stature whose tangled thickets are almost impenetrable. The monte consists of drought-resisting trees and shrubs with little leaf, tough bark and abundant thorns. Between the stems the ground is often completely bare and baked hard and firm for considerable distances. In places the ground has been cleared, ploughed and sown, either by natives or foreigners. Amongst the birds that I recognised were the noisy parrots, and delicately plumed humming birds, the gaudy kingfisher and the eagle.

My first excursion took me to Alta Gracia by train; with the heather and the gorse, the poultry and the pigs, one was reminded of England, except for the clouds of dust and a flight of locusts that battered against the train window like a shower of hail. Alta Gracia is at the foot of one of the eastern slopes of the Sierra, not actually in the mountains, and its height above sea level is only 1,800 feet. The rain was falling in torrents as I took the bus to the Calamuchita valley. I packed myself into a crowded conveyance where a number of passengers were eating an early lunch (or late breakfast).

We soon left the cottages and farmhouses of Alta Gracia behind and began to cross the Sierra by a course full of curves and angles that twists its way steeply up and down the little foothills. We were still in a region of low scrub and small trees amongst which the cattle sought for food. We turned south into the Calamuchita valley; the bus stopped at the dam holding back the Mar Azul, an artificial lake. The rain was still pelting.

I climbed up the rough, sloppy road and eventually found a corrugated iron shed where I might obtain food and shelter. The shed was a doleful place. The rain made a deafening roar on the iron roof. When I had finished eating, I went to look round the hatcheries and then I strolled about, growing ever wetter and wetter. I returned to the "hotel" and asked what time the bus would return. I was told that if the rain continued the road would become impassable and the bus would not run. I went back to the dyke and took refuge in a disused kiosk for two hours. Fortunately a car appeared with a friendly driver who drove me to the terminus of the branch line to Cordoba.

My next excursion took me to the more northern parts of the Sierra Chica. I left Cordoba by car with my friend Guy Keene for a visit to his estancia on the Portrero de Loza. We followed, in a cold wet mist, the road that runs along the eastern edge of the sierras. At Rio Ceballos we left the main road and began the climb that, at a height of 4,000 feet, reached Keene's house.

The country looked very much like Wales with differences; there was plenty of granite, but there were bamboos in the garden and humming birds among them. The fields, as in Wales, were divided from each other by stone walls. There were grass, willows and poplars, but there were also flowering cacti with delicate waxen petals. In this part of the sierras there is, as in Wales, plenty of water in springs that break out everywhere to gather themselves into little streams that murmur in the valleys or cascade down the sides of hills.

It was good to be on the portrero. I would walk up to the top of a hill, sit on a boss of granite and stare at the valley at my feet. There were no forests, only very small and scattered patches of trees. The big clouds rolled overhead in creamy splendour, shadows swept across the hillside, yellow here with the crocus, scarlet there with the verbena.

When I left the Portrero de Loza I motored back to that same road that skirts the eastern edge of the Sierra Chica, went as far as Salsipuedes and then turned left to cross the mountains to La Falda in the Punilla valley. The Punilla valley lies between the Sierra Chica and the northern extension of the Sierra Grande. It is traversed throughout almost its entire length by a railway that starts at Cordoba and comes to meet us at La Falda. Thence it runs fairly parallel to the road and the river to the northern end of the valley at Cruz del Eje. Along the route are many villas, shady villages and small townships that form holiday resorts for people from Buenos Aires and Cordoba. In almost any one of them the tourist will find a decent hotel and such things as swimming pools and golf courses. Yet a mile away lies an unpeopled wilderness.

The culminating point on the road from La Falda northward is La Cumbre (the summit). The monastery is now a hotel but the magnificent walnut trees planted by the Jesuits remain. Beyond La Cumbre the road descends to the village of Cruz Chica and two miles further to the following village of Cruz Grande. There is a small river at Cruz Grande, that looks harmless enough, whose behaviour may be taken as typical of the sierra watercourses. Usually it is a thin stream of water, but in days when heavy rain falls on the granite summits of the range, it swells into a dangerous torrent. Its waters roar like a bull and boulders are hurled against each other with terrific impact. At such times the passage of cars and horsemen is impeded and the traveller can do nothing else but wait till the flood has subsided.

Following the wide road, I arrived at Los Cocos, which takes its name from the thick woods of coco-trees that abound in the locality, and there I called a halt. The days I spent at Los Cocos were full of interest. I motored along rough roads, splashing through unbridged streams, ascending and descending hills whose sides, though sparsely covered with vegetation, were rarely bare except at the summits. I crossed down-like pampas where scissor-birds sat on wire fences staring at sheep and goats, picnicked in little gorges and by the side of streams whose tumbled rocks made seats and the molle-trees gave shade from the terrific sun. I climbed on foot through thickets of shrubs with thorns two inches long and ascended a local height whose lower slopes are covered with a green and spiny tangle but whose head is rugged and barren.

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#### Comments

..... from H. Middleditch

Although the writer of this extract makes no pretence of being other than a tourist, I find that his account of his journey through South America conveys a clear picture of the topography and vegetation of the parts which he visits. Indeed, in many respects it probably provides an even clearer and more detailed picture of the landscape than that obtainable from the great majority of articles written by cactus collectors which I have read to date.

Young describes his drive from Cordoba to Rio Ceballos during which he encountered a ground mist — this is only the second time that I have come across any mention of a mist occurring in the Sierra Cordoba; the other record is from the accompanying extract written by the cactus collector Bort. Would these two occasions represent exceptional circumstances, or are mists fairly of common occurrence in the Sierra Cordoba? If they are a supplementary source of moisture to the normal rainfall, it might suggest that the *Gymnocalycium*s from these parts would appreciate an occasional spraying to see them through the winter and avoid undue shrinkage.

Even the description of the rainfall in the hills above Alta Gracia proves of value, for it tells us that it is long and steady, suggesting that it originates from an inflow of maritime air and not from a thunderstorm; sudden, sharp rainstorms accompanied by thunder seem to be the more usual source of rainfall in the high Andes.

Another account of collecting in the Sierra Chica appears in the Chileans No. 19 p. 189, where mention is made of collecting *G. hybopleurum* alongside the road from Villa Carlos Paz to Capilla del Monte. But no mention is made of this species being found by W. Knoll. The illustrations on page 565 of Backeberg's *Kakteenlexikon* depict the tremendous variation in habit that occurs in this species.

## BORT in ARGENTINA

Translated by K. Wood-Allum from G.O.K. Bulletin for December 1973

On my one-man expedition to South America this year, I went first to San Luis. After collecting there I had to have some repairs carried out to my vehicle and when it was ready I drove north across the Pampa de Achala and the Sierra Grande in the direction of Cordoba. I never thought I would need a fog lamp in Argentina. I had intended to take it off last year but I was glad I had left it on because in this washhouse atmosphere progress without one would have been impossible.

Last year, in the region of Las Rabonas I found *Gymno vatteri* and in fact, not as described in the literature – three different plants in three different places but all three together in one place near Las Rabonas.

The Sierras of Cordoba, the Sierra Grande and the Sierra Chica, the big and the small, and the other Sierras of the Cordoba, Catamarca, San Luis, San Juan and La Rioja provinces exhibit the typical vegetation patterns of Patagonia and Bolivia. The characteristic tree in the lower zone is the algarrobo, a tree with a somewhat twisted trunk whose branches start just one meter above the ground. Somewhat higher up the mountains, at about 1600 m the algarrobo peters out and brushwood begins. This whole Patagonia/Bolivia formation is a sparse dry wood or brush vegetation and here the Espinillo bush is common, in which the *Cereus* stands often grow. The twisted wood of the Espinillo and also the wood of the columnar cacti is made into charcoal by the natives. They also make various things from cactus wood, for example weaving stools, door panels, tables, benches, chests, tourist souvenirs, trays, picture frames, all sorts of things, mostly from the wood of the pasacanas.

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### Comments

. . . . from H. Middleditch

In his account of collecting in this vicinity, W. Knoll records that he searched unsuccessfully for *G. vatteri* in the vicinity of Copina, which lies on the eastfacing slope of the Sierra Grande; later he walked into the hills to the east of Nono (on the west facing slopes of the Sierra Grande) and was again not successful in discovering a growing place of *G. vatteri*.

La Rabonas, where Bort was able to note that three sorts of *G. vatteri* grow in company, is barely three miles to the south of Nono. In his description of his collecting trip through Cordoba, Buining refers (Chileans No. 23 p.91) to the restricted growing area of *G. vatteri* near Nono.

I find the record of the "wash-house atmosphere" most valuable – could this be low-lying cloud coming down to ground level in places, or alternatively a ground mist? Presumably there would be some condensation at ground level in any case – but how often does this occur, one wonders? Is it a rarity? I can find no other reference by any writers to the occurrence of this source of moisture. Even Bort's article affords little help in deciding at what time of year he met this mist. At latitude 32° South I would have expected a ground mist to be more likely in winter (June) than in summer. This is the dry season in western Argentina and the occasional ground mist could be an important source of moisture to tide the cacti over the dry season. Might this explain why *Gymnos* in cultivation don't like being left bone dry over winter? Would they be better off with an occasional spraying?

. . . . from G.J. Swales

Does not Bort tell us when he commenced his visit to Argentina and whereabouts he went before he came to the Sierra Grande? Would not this help us to determine approximately the time of year at which he reached the Sierra Grande and found himself in his "wash-house atmosphere"?

. . . . from H. Middleditch

Going back to a preceding section of this account I do indeed find that Bort tells us that he started off from Buenos Aires on March 5th., whence he visited San Rafael and San Luis. The text might suggest that this occupied about a month of his time. He then had a five week interruption to his trip which he then re-started at San Luis. This would have taken him up to about the end of May, so indicating that he was in the Sierra Grande some time during the month of June, which would be early winter. This brings us back to the question whether this mist is a regular climatic feature in the Sierra Cordoba.

..... from R. Keisling, La Plata

Cordoba is a very beautiful province in the centre of Argentina, and I have taken my holiday there in summer for many years. In that place many dams have been built which have formed lakes, and now in these spots it is much more humid than formerly – hence more mist. This is common in the Valle Punilla (Cosquin to La Cumbre), Valle Calamuchita, etc. I think that this mist is more frequent in summer, but it also occurs in winter.

..... from A.F.H. Buining

When my wife and I were in the Sierra de Cordoba for about one month, we never had any fog – but we were there from November 18th for a month and that in full summer. It may be that during wintertime in May, June and July there is some fog, but we had no weather of that kind.

..... reflection from H. Middleditch

To judge by other parts of Young's account it appears that he was in the Sierra Cordoba at the end of October or the beginning of November when he encountered the mist on the Sierra Chica.

### **SULCOREBUTIAS in CULTIVATION**

..... from E.W. Barnes

I have a few collected Sulcorebutias and find some most interesting root systems amongst them. Most Sulcorebutias seem to have large to very large tuberous roots and offsets which are still attached to the parent plant develop tuberous roots of their own to a lesser degree, eventually forming a tangled mass of thick fleshy roots. It is also interesting to note that a root "tuber" will produce another plant body if the original one is removed.

I have also noted that Sulcorebutias develop the thickened fleshy root as young seedlings, whereas cuttings take about 18 months or so to do the same; but their roots are then untypical as they are a number of thickened roots, instead of one much thicker one.

..... from Mrs. L. Teare

The Sulcorebutia are indeed difficult to raise from seed. However I can be very persistent and in the last three years I have grown a good number. The difficulty is as you say, all the seeds are not viable and this means sowing a large number to obtain a few plants – sometimes just two or three. Some are easy from seed such as *S. lepida*, *polymorphia*, *candiae*, *menesesii*.

Out of about 30 seeds I may raise three seedlings or perhaps four – in the case of *S. flavissima* only one. Last November I pricked out 160 seedlings. Some species I have already but I wanted a second plant in order to obtain my own seeds. Once I have the seedling up I find that they flower 2 years later. I raise all my seedlings in my small 8' x 6' glasshouse in very shaded conditions, but the Sulcos do better when moved to full light when they are 1" high. In shade they fare badly – the same with *Oroyas* and *Islayas*.

..... from C. Webb

I seem to have been bitten by the "numbers" bug. I noticed your request for information on *S. flavissima* and went to look at my imported plant from D. Sargent, received August '71. Clearly named and numbered Lau 337 – but I see from the Chileans Year Book that Lau 337 is not *S. flavissima* but an un-named species from Cruce, Mizque – so I wonder what I have got? Anyway it is a lovely little plant, bright fresh green with lots of golden yellow spines and growing well, now 5 cm dia. by 3 cm high, depressed centre. It had one offset from below ground which has rooted away on its own.

Another oddity is a plant labelled Sulcorebutia FR 779 from Clive Innes in March '70. It is a grafted plant and I am quite sure that it is a Sulco – but FR 779 is listed as *Pseudolobivia orozasana*!! My plant is bronze reddish-green with pale creamy spines and has flowered well from sides and bottom – don't know what colour it was as I was at sea at the time.

I have other Sulcos from De Herdt mostly, the one I like the best is *S. rauschii* which I got this year from Jim Bolton. It is a grafted plant that pups profusely and I have already rooted several very easily. All my Sulcos flower readily and set seed without any help from me.

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

I have had flowers on several *Sulcorebutias*, including several which I have managed to get on to their own roots. Incidentally I think the characters who say that they are easy to root should be made to give a public demonstration. *Sulco. glomeriseta* is, I am fairly sure, a *Rebutia* without prefix, in appearance and in ease of rooting.

..... from R. Moreton

Regarding *Sulcorebutias*, the only collected plant that I have is a *S. kruegeri*. This started off as a single head but has since formed four new heads.

..... from J.R. Gooch

As to *Sulcorebutias*, I have been fortunate enough to receive several varieties as imports already clumping. *S. candiae*, *canigueralii* and *zavaletae* consisted of one main head with two to four offsets. *S. crispata* arrived a twin header, while *S. tarabucoensis* and *S. verticillacantha* both arrived as groups of about 6-7 small variable sized heads.

Other species have quickly formed offsets after getting established with only three or four exceptions; in this latter group *S. krahonii*, *cylindrica*, and *flavissima* spring to mind.

..... from A.W. Craig

I have degrafted quite a number of *Sulcorebutia* to get them established on their own roots, and almost invariably the first thing that happens once they have begun to grow is the appearance of a ring of pups. At least I can take offsets and root them separately or set them on grafting stock, when this happens. I am interested in obtaining *Sulcorebutias* of certain species and would be pleased to offer other *Sulcorebutias* or various other spare plants, including one or two imported north American species, in exchange.

## A COLLECTING TRIP in BOLIVIA

A report of a G.O.K. Branch Meeting

Translated by F. Fuschillo from the G.O.K. Bulletin May 1974

Herr Zecher began his talk with his new collection of transparencies from his last collecting trip. This time it was Bolivia and it was made in the company of Herr Vasques, whose collection should not be missed. Herr Vasques lives in Cochabamba, and he is not exactly poor, as one can see by the very generous scale of his collection. In the centre of the inner garden of the house, which is rather like a small palace, there is arranged a collection of mainly Bolivian cereiform cacti, in a soil bed allowing them a free root run.

The average annual temperature in Cochabamba is 20° C while in winter only now and again do they have a frost during the night; one knows beforehand how plants will succeed and what fine specimens will develop. For example *Cleistocactus straussii*, and *C. tupizensis* from the very light spined to the very dark spined sorts; plants of the rarely seen *Vatricania guentheri*, followed by *Bolivocereus samaipatanus*, with their readiness to bloom and the pleasure they give us. Now we have a beautiful new discovery, a small strongly growing, group-forming cereus, *Trichocereus vasquesii*. The heads are 25-20 cm high. After that a collected example of *Cylindropuntia*. Once more a rarity; a natural hybrid between *Oreocereus celsianus* and *Cleistocactus tupizensis*.

What we were to see next was to make most of our mouths water. On the house wall which is lightly shaded is the main collection (and also the favourites) of Herr Vasques. Firstly *Sulcorebutia*, with 20 headed plants among them, the rarely seen *Sulco. caineana*, the true *Sulco. menesesii* and the newer *Sulco. muchii*. Then came the *Lobivia*, likewise mostly in groups, and for the most part rich with blooms; for example, *L. cinnabarina*, *L. pugionacantha*, also the new wonders like *L. aguilarii* and *L. lae* which are not often seen in European collections, which with their dark red flowers are a decoration for any collection.

Now follows a different form of *L. arachnacantha*, which is the new var. *sulphurea* which is as beautiful as the name suggests, with sulphur-yellow flowers. Then there is the beautiful var. *densiseta* and the newer var. *vallegrandensis*, with fewer but larger heads than the Type plant.

A series of *Parodia* followed, with the yellow flowered *P. ocampo* and its red flowered var. *compressa*.

Also in Cochabamba there is a cactus Society, without club evenings but otherwise united; every two weeks

the 10 or 12 members hire lorries and go on a cactus collecting trip. On such a trip our representative Herr Zecher, took part. The assistant of Prof. Cardenas, Senora Kreuger, was also in the party. Now followed habitat shots of many well known plants. Much too quickly, we thought, Herr Zecher came to the end of his series of pictures.

## SULCOREBUTIA

Translated by K. Wood-Allum from the G.O.K. Bulletin for December 1972

Reported by Kurt Svimmersky

At the North-Austrian group meeting we were treated to a new slide lecture on *Sulcorebutia*, written and presented by our Chairman, Dr. Steif. First we saw some maps of the distribution area of the genus which until recently was considered to be monotypic containing only *S. steinbachii*. Only through the new discoveries by Cardenas, (who, by the way, attributed them to *Rebutia*), and more recently by Rausch, has this genus grown to about 30 species, to which can also be added a number of varieties and forms. We were shown an alphabetical series of all the known species, together with varieties. We saw habitat photographs by Zecher of the new *S. alba*. *Sulcorebutia canigueralii* Rausch No. 281 was seen to be very variable in flower colour, from violet through pure red to orange. *Sulcorebutia frankiana* had a splendid flower, red with a yellow throat. *S. krahnii* is very variable in spination, which had been introduced earlier as *S. weingartiana*. *S. lepida* is similarly very variable in spination.

The flowers of *S. mizquensis* R. 194 I found particularly striking — they were bright lilac. I was also very taken with the wine red flowers of *S. oenantha*. *Sulcorebutia polymorpha* is more like a *Lobivia* in body construction. Our attention was particularly drawn to the different body colours of *S. rauschii*. *Sulcorebutia minima* R. 196 is richly flowered in gentle pink.

The floriferousness of this genus in comparison with its body size must delight every collector, especially those with limited space. *S. vasqueziana* R 284 has narrow magenta petals whilst *S. verticillacantha* v. *aureiflora* R 479 flowers a beautiful yellow with a brownish red edge. The last slide was of a plant said to be *Weingartia totorensis* but which from its appearance should be included in *Sulcorebutia*.

## NEW DISCOVERIES from WALTER RAUSCH

A slide lecture by W. Rausch, reported by Walter Bilek.

Translated by K. Wood-Allum from the G.O.K. Bulletin for February 1972.

This lecture was delivered to our Branch meeting, to which we were able to welcome Dr. Stieff, numerous members and guests, in particular Herr Zecher, who accompanied Herr Rausch on his trips.

First of all we saw some wild animals — unfamiliar to us — with which the speaker had made acquaintance on his trips to Argentina, Bolivia, Peru and Uruguay; a quaint sloth, a hand-size spider covered with shaggy hair, dangerous looking rattlesnakes and coral snakes, a puma, and a condor which attains a wingspan of up to 3.5 m and lives high up in the mountains at between 3,000 and as far as 4,000 m altitude. At such heights (as previously indicated) an intense cold prevails and the air here is quite rarified. We could also admire a lake situated at 4,800 m altitude with 6,000 m high mountains perpetually snow-covered. The highest Bolivian peak, Illimani, reaches up to a height of almost 7,000 m.

Upon the high plateaux lying at 4,000 m in these mountains, the llamas live — and now we also see the first cacti; giant cushions of *Tephrocacti* which look from a distance just like llamas lying in the grass. There are the large, compact, rigid cushions of *T. malyanus* and the looser cushions of *T. floccosus* and *lagopus*. These high plateaux are completely deserted. One may often walk around all day without coming across another single person. Only now and again does one bump into Indians in a more or less lower lying valley, or one may be met out on horseback.

We then saw large numbers of indifferent *Lobivias*, *Parodias*, *Rebutias* and *Sulcorebutias*, discovered and collected by Rausch. These were mainly new discoveries, some still un-named.

First came *Lobivias*. *Lobivia sicuaniensis*, similar to *maximiliana* but whose bodies are not green but grey and the spines are grey too. The next *Lobivia* — No. 422 — has long yellow or also red petals. *Lobivia zecheri* is characterised by a red pistil and stigma. *L. oligotricha*, already described by Cardenas, flowers red with a rosy throat, but it can have magenta flowers, too. *L. draxleriana* is related to *L. cinnabarina*. Its flowers are dark red with a bluish sheen. It does not vary like all the other species. Whilst *L. cinnabarina* has yellow anthers those on *L. draxleriana* are red. The

new *L. cardenasiana* is almost identical with *Echinopsis ayopayana*, a floriferous plant with large violet flowers. A plant difficult to find is *L. oxalapestra* because it shrinks greatly in the dry season and disappears almost completely into the ground. *L. mizquensis* looks like *Pseudolobivia obrepanda* and *L. lateritia* (similar *L. cintiensis*, *L. catamarcensis* and *L. scopulina*) is named after the brick red flower colour which is really not apt since most plants flower pink or yellow.

*L. pugionacantha* flowers yellow and has dagger like spines. Rausch also found pink flowering plants. Related to this species was *L. cornuta*, whose ribs have horizontal furrows in the middle. *L. amblayensis*, known since 1962 has reddish spines in the crown and red or yellow flowers. The outer petals are always somewhat darker, the pistil can be red or green. *L. markusii* is relatively large with close yellow spination, whilst *L. pusilla* (according to Ritter) has very variable flower size and shape. The plant bodies are small and thickly spined. We also saw a variety with pink flowers. *L. tiegeliana* has very variable shapes to its violet petals. A newly discovered variety flowers red and will in all likelihood be named *L. ruberina*. *L. quiabayensis* has yellow and red shaded flowers. The last *Lobivia* we saw was *L. laeae* which Cardenas has already described.

Now came some glorious landscape views with magnificent *Oreocerei* and some huge *Browningia candelaris*, in whose meagre shade a weary collector reposed.

This time it was the turn of the *Sulcorebutias*. The first one, un-named, which flowers characteristically a dirty dull red will probably be named *S. tarijensis*. The flowers of *S. oenantha* are equally dirty red. *S. flavissima* has yellow spines, violet-pink flowers with a whitish throat and different petal shapes. Then followed *S. vizcarrae* (Cardenas), *S. krahnii*, *S. markusii* with large pink flowers, *S. frankiana* with green body and reddish brown spines and very variable flower colours, *S. hoffmanniana* with bicoloured yellow and red flowers, *S. vasquesiana* which remains very small with a diameter of only 1 cm and a still unnamed species with the number 477 collected at de Ravelo. In addition we saw *S. crispata*, *S. mizquensis*, *S. minima* and yet another undescribed species with a copper brown body, on account of which it will probably be named *S. cuprea*; then *S. alba* and *S. rauschii*, which is very variable in spination and body colour (bright green to dark violet).

The last group we saw consisted of *Aylostera padcayensis*, *Rebutia eos*, *R. spinosissima*, *R. margarethae*, an *Aylostera* which will presumably be christened *A. buiningiana* and *A. heliosa* which is amongst the most beautiful of the discoveries. It has closely adpressed spines and very long pediceled sensitive flowers which break off easily in the wind.

The closing shots of magnificent landscapes with huge groups of *Oreocereus trollii* and *celsianus*, with numerous *Trichocereus*, *Espositoa* and *Cleistocacti* growing abundantly in broad valleys, were crowned in the background by a strange moon-like mountain range.

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## Comments

. . . . from J. Hopkins

This commentary, although dealing briefly with the various species, raises a few interesting points in connection with the *Lobivias*. The first of these concerns *L. sicuaniensis* and *L. maximiliana*. The bodies and the flower colour (bi- or tri- coloured) may be similar but the flower size and the seed separate the two. The flower of *L. sicuaniensis* is about 4 cm long and wide whereas that of *L. maximiliana* is only 3 cm long and 2 cm wide. The seed of *L. sicuaniensis* related it to the *L. incaica* group and it may be that this species is an intermediate form of one of the southerly members of this group and *L. maximiliana* which occurs further south. The seed of *L. maximiliana* belongs to the widespread *L. pentlandii* complex in which one seed form covers several sub groups of plants within the complex.

The red anthers of *L. draxleriana* (Lau 352 is probably the species) are quite distinctive and this feature is also shared by *L. prestoana* Lau 388. The flowers are very similar in other respects to *L. cinnabarina* except that the petals, particularly of Lau 388 are much broader, and that the flower tube is slightly longer.

Rausch published his *L. cardenasiana* as a *Lobivia* whereas I suspect that Cardenas would have put it in *Echinopsis* and Backeberg in *Pseudolobivia*. Rausch has put all his red flowered "pseudolobivia" in *Lobivia* which I think is a sensible move and *P. rojasii*, *calorubra*, etc. would probably also be better there. The white flowered *Pseudolobivias* which open their flowers in the evening are closer to *Echinopsis* which do the same. The "Everything in *Echinopsis*" viewholders would no doubt object to this, but I doubt if any classification can cope with all the problems we have here. The *Lobivia* situation is complex enough without adding that of *Echinopsis* to it. I prefer to see a classification that is convenient for me to use rather than one that looks nice on paper.

Returning to the above article, I suspect that *L. catamarcensis* should read *camataquiensis* which is a member of the *cinnabarina* group, quite different from *L. cintiensis* and *L. scopulina* which are probably an offshoot of the *L. densispina* group further to the south. *L. amblayensis* belongs to the latter group of plants. The small stems (2 – 3 cm high) produce the most enormous flowers for their size! The flowers are red-orange some 6-8 cm long and 6 cm diameter and open abruptly bell-shaped from a narrow, almost parallel-sided tube some 2 cm long. The *L. densispina* flower, although equally large, is much more funnel-shaped with a tapered tube. Other recent discoveries make this group rather unsatisfactory as a whole, looked at from the aspect of flower morphology.

..... from J.R. Gooch

I think we now know that *Lobivia zecheri*, while typically having a red stigma, can also exhibit all shades from green through pink to purple. I certainly have most variations represented on the flowers on my plants. The plants themselves are rather variable too, especially in spine development. Those distributed from Ayocucho have dense strong brown spines almost obscuring the plant bodies (KK442) to KK787 having pale, rather weak, pectinate spines. All flower very freely throughout the summer and if a collector was only able to have one *Lobivia*, this would be the one I would recommend. The flowers often have a very attractive "bluish" cast which I have yet to secure satisfactorily on a slide. This colour is to be found in some *L. cinnabarina* forms, also.

The *Lobivia catamarcensis* queried by John Hopkins might well be *Acanthocalycium catamarcense* rather than *L. camataquiensis*. This group of plants is lumped into *Lobivia* by some authors. It also comes from Argentina where forms of *Lobivia lateritia/cintiensis* are to be found. The flowers would be yellow and not brick red, however. (There is no flower colour quoted for *Acanthocalycium catamarcense* in Backeberg's *Kakteenlexikon* – H.M.).

I have a crimson red flowered *L. tiegeliana* that was distributed as a *L. aracanacantha* form, Lau 406. I now feel that it may well be *L. tiegeliana* form *ruberrima*. Plants of *L. quiababyensis* from Lau (Lau 1004) all seem to have clear yellow flowers, but plants raised from seed with Rausch's number 205 flower an orange-red colour shading to a yellow throat.

**"NEW" SULCOREBUTIAS** From Dr. Leo Kladiwa

Translated by K. Wood-Allum from K.u.a.S. for September 1970

In K.u.a.S. 6/1970 pp102-105, W. Rausch attempts to establish new species of the genus *Sulcorebutia*. One must assume that all these "species novae" such as *S. vasqueziana*, *mizquensis*, *crispata*, *markusii*, *krahnii*, *frankiana* and *flavissima* are nothing more than *nomina nuda*.

Not once has the author kept phytographically to the international rules of nomenclature and does not even correspond formally to them in his descriptions. The international rules require the description of all parts of the plant, including the flower and the fruit which latter the author has failed to do. Even the Latin diagnoses, which should give some semblance of legality, cannot help here. This sort of fragmentary, and in the German translation, incorrect diagnosis, does not even come up to first descriptions of more than a hundred years ago.

The author has published without research into the plants and without sound indices for the species categorisation. He uses the dimensions of the body, length of spines and colour of spines, length and colour of flower as indices for the establishment of species which, according to research results with this genus to date, is just not possible. Precisely these organs and parts of the plant are set out as external factors in a specially formulated biotype and cannot be validated as indices for taxonomy. Numerous examples have proved that.

Some of these allegedly "good species" as for example *vasqueziana* have in their flower description only a few words like "..... flower c. 25 mm magenta or red and yellow inside". This kind of description of a species must be an annoyance to every serious cactus researcher.

It would be desirable and urgently advisable so far as the author is concerned to study the research of previous authors of this genus and its species before writing a first description. Very important and morphological facts based on the genus have been researched (see Werdermann!) on *Sulcorebutia* which permit a means of comparison for the establishment of new species. From the published pieces before me it can only be a matter of, at best, varieties without any categoric value. Until thorough research proves otherwise, these plant names must remain as "Nomina Nuda".



## Comments

..... from H. Middleditch

I must admit that if one compares Rausch's descriptions of the new *Sulcorebutia* (to which Dr. Kladiwa refers) with some of the more recent descriptions from Buining or Ritter, or even with Hopffer's original description of *Echinocactus cumingii*, then the criticism made by Dr. Kladiwa does seem to be justified. However, it does give me the impression of being a bit stiff, as if the writer had allowed his wrath to run away with him somewhat.

..... from G.J. Swales

First of all I must disclaim any pretence to comment on any species of *Sulcorebutia* as to its validity – I just do not know the group at all well. Secondly, I am sorry to say that I do not know – except in the broadest outline – the regulations laid down by the Botanical Congress for plant descriptions.

However, having said this much, I would agree entirely with the evidently irate Doctor regarding the lack of detailed information in some of the new descriptions. I think that the recent descriptions by Buining are pretty good (whether some of his newer *Melocacti* are justifiable species is another matter on which again I am unable to comment!) especially as they are accompanied by excellent drawings by Brederoo. I don't know what the regulations are but I would insist that accurate drawings of seed, fruit, flower sections, areole structure etc., are essential parts of the description and also colour photographs of the plant in habitat. None of these items on their own do I consider sufficient. It would make a rather nice party game "Guess the cactus". Issue the contestants with ten original descriptions of common plants such as *Echinopsis multiplex*, *Mamillaria hahniana*, etc., and I am willing to bet a Gymno to a Dandelion that nobody would score over five – most very much lower!

I fail to see why the practice has arisen, of giving a few lines of Latin as a "diagnosis" and then going on in one's native tongue adding further vital features and repeating the remainder. I have spent hours and hours lately joining up into one diagnosis, the two separate parts e.g. Latin/German, Latin/English, etc. As the worthy Doctor points out, not infrequently the Latin diagnosis and the vernacular version do not entirely agree!!

As regards the comparison with much earlier descriptions, I think some of some of the early writes were as much to blame as some of the present day ones. Many of the early books lacked any illustration at all, which to me seems incredible. For example, A.H. Haworth in his *Synopsis Plantarum Succulentarum* 1812 included no illustration at all and I seem to remember reading somewhere that none of his books was ever illustrated! Can you identify this plant from his description (an original!) "Subrotundus, profunde sub-sex-decim angularis; apice depresso, inermi; angulis gibbero notabili sub singulo fasciculo spinarum; spinis nigris." Needless to say it is a Gymno or as he knew it, an *Echinocactus*. To be fair, he did not have the problem of trying to separate the plant from 90 odd other Gymno species as an author would today, but I still think it is a pretty poor effort (based incidentally on one specimen seen in a friend's greenhouse!).

To take another example, Spegazzini at the turn of the century was producing quite detailed descriptions and somewhere even laments on the fact that other authoris did not bother to describe flower structure. However, he too, did not seem to think drawings were important and I don't think I can recall seeing any Gymnos illustrated by him, although latterly he photographed his plants.

While not wishing to tread on any sensitive toes, especially amongst our Chilean members or correspondents, I do feel that original descriptions should be dealt with by competent professional Botanists who could see fair play as it were (decline to describe new species based on one plant for example) and who would conform to a standard pattern as agreed by a Botanical Congress. It might also be laid down that authors' names were replaced by possibly a University name and number (the University of the professional Botanist). This would put an end to folks who attempt to get their name remembered by having it appended to a plant as the author of the name. It would also prevent such possible horrors as *Gymnocalycium swalesii* spec. nov. Middleditch followed by *Gymno. middleditchii* spec. nov. Swales in the subsequent edition of a Journal! I think there is too much of this sort of thing. A specific name ought to be as far as possible descriptive of the plant e.g. *curvispinum*, or *lanata*, or indicative of its origin e.g. *culpinensis*, *boliviensis*, etc. Although this is perhaps away from the main point at issue, I think that it is still relevant.

I must also agree with the Doctor's statement regarding the doubtful validity of body size, length of spines, colour of spines, length and colour of flower it determining new species. These seem to be some of the least reliable features, although in conjunction with a number of others, can be of use on occasion. *Sulcorebutia crispata*, for example, differs (if my translation is correct) from *verticillacantha* only in the fine curved bristle-like spines. I would like to see masses of habitat plants all showing this feature uniformly and no intermediate forms between it and *S. verticillacantha* before I would be happy about accepting this. Unless of course there are other differences which have not been pointed

out in the scrappy descriptions!!

I don't know anything about Werdermann's work on *sulcorebutias*, but if it is the same man who described *Gymno. sanguiniflorum* as the first ever red *Gymno* without having done his homework and read up about Spegazzini's *G. baldianum* many year's before, then I would treat his work with a certain amount of caution!

I would agree with your comment that the criticism made by Dr. Kladiwa is "a bit stiff". I cannot see how a plant description can just be ignored, however imperfect, and the name still described as a *nomen nudum*. The general tone of the letter is reminiscent of Buxbaum's tirade against poor Dr. Schutz and his *Gymno.* classification — the apparently rather overbearing attitude of a supposed expert whose wrath has been raised. On the other hand, as I have said above, I would agree with at least some of the sentiments expressed.

..... from Gordon Rowley

Dr. Kladiwa rightly draws attention to the over-hasty and inept publication of new names by certain writers on succulents, but he overstates the case and in so doing introduces new confusion and shows himself equally ignorant of the International Code of Botanical Nomenclature. Thus, it contains no guide or definition relating to what should or should not be included in a new description, and to dismiss names as "nomina nuda" because certain characters are omitted is just nonsense.

As a matter of fact, if we look at the diagnoses of Rausch in *Kakt.u.a.Sukk.XXI: 102-105* we find that, apart from lack of floral criteria, they give quite a good idea of what each species looks like. I am not concerned here with taxonomic issues on whether or not these are good species — the is for *Sulcorebutia* experts to say — only with the accusation that the new names transgress the Code. They do not. Type specimens are cited for each species, and in addition to descriptions in Latin and German there are excellent photographs. Now, it could be that Mr. Rausch considers that the flowers and fruits are all so much alike that they offer no diagnostic features beyond those common to all the genus. How does Dr. Kladiwa know that vegetative features are less important than floral in differentiating species of *Sulcorebutia*? We have only his word for it, and other botanists are entitled to disagree.

The whole point at issue is that, in order merely to validate a new name, it is sufficient to indicate how your new taxon differs from all others. It is up to the describing botanist to decide whether or not he also treats us to a full description with colour plates, line drawings and so forth. For example, if I discovered a new species of *Leuchtenbergia* with pink flowers and hooked centrals it would be perfectly adequate to describe it (in Latin) as: "Differs from *L. principis* in having pink flowers and hooked centrals". Everybody knows what *L. principis* looks like, it has been described and figured many times, so the new taxon is immediately recognisable, and the name validated, provided the other provisions of the Code (Articles 29 to 50 are complied with.

Of course, a good botanist will usually want to do a lot more than the bare minimum, and usually adds references to previously published relevant works, illustrations and proper descriptions. But the Code does not demand it. I recently had occasion while collecting data for the English translation of Jacobsen's "Sukkulentlexikon" to consult the original description of *Euphorbia abdelkuri* Balf. as cited in "Index Kewensis". It consists of an 11-line summary of a paper on cuticular structures read at a meeting and says nothing whatever about the *Euphorbia* except that it comes from a small island in the vicinity of Socotra and has a quite unique epidermis of crust-like prismatic cells. Yet there is only one possible species to which these facts apply, and its identity is unmistakable!

It is hardly necessary to add that potted diagnoses such as this are not to be encouraged, and merely leave more work for later botanists to do. Dr. Kladiwa is therefore right to castigate the offenders, but I find his comments based more on personal animosity than factual observation.

..... from REPORT of the BRITISH ASSOCIATION for the ADVANCEMENT of SCIENCE

Year 1901, page 851

Paper "Cuticular structure of *Euphorbia Abdelkuri*"

By Professor I. Bayley Balfour F.R.S.

*Euphorbia Abdelkuri* is an interesting succulent plant which has been brought home from a small island in the vicinity of Sokotra by the Ogilvie-Forbes Expedition. The outer surface of the plant in the fresh condition appears to be covered with a crust which readily cracks off, and on examination this is found to consist of a number of prisms. At first sight these may be taken for some form of mineral incrustation, but they are not of this nature, but are formed by

the cuticle of the epidermal cells. This does not form an uninterrupted layer over the epidermis, but the cuticle of each cell is separable from that of the adjacent ones, and the prisms are merely blocks of cuticle, each one belonging to a single cell. This is a construction different from that which is ordinarily met with in plants with thick cuticular layer.

(This is the original description of this species of succulent plant, cited above by Gordon Rowley as an example of an adequate description).

. . . . from J.D. Donald

I am very glad indeed to have an opportunity to comment on Dr. Kladiwa's very misguided article. At the time it appeared, I had some misgivings about the spate of new descriptions published. However, despite the deficiencies of these new descriptions they were nevertheless strictly according to the code of Botanical Nomenclature and hence Dr. Kladiwa's prop falls down. Gordon Rowley's comments echo my own views so far be it for me to prolong the argument on justification or lack of it in the quoted article. Except to say that to anyone who knows the *Sulcorebutia* genus, the Rausch descriptions are perfectly adequate and allow facile identification of the plants, and one can contradict Kladiwa straight away in his claim that the most important features of the genus are its flowers. The dominant separating characters of the species of *Sulcorebutia* are associated with the podaria, areoles, and spines and of course geographic distribution. The flowers are remarkably uniform in appearance, differing only in size and colour. It is another matter as to whether the genus is justified or not — although as things seem to be turning out, *Sulcorebutia* as a genus might become the resting place for a large number of *Weingartias* in which the majority of species do not seem to correspond to the type species of *W. fidaiana*!

Whilst having every sympathy with Geoff Swales in his hunt through the Latin diagnoses and the lingua barbara descriptions, the two are not obliged to agree in their entirety. The Latin diagnosis is of the type plant — a single entity — the lingua barbara description is often much broader and attempts to describe (or ought to) the species population, of which the type is but a single member.

Heaven forbid that we should have authorised committees to describe plants! Have you no soul Geoff? What has happened to the spirit of academic freedom in the north-east?

I accept that on the face of it, that on paper, it might appear the *S. crispata* and *S. verticillacantha* differ only in the fine curved bristly spines of the former, but in actual fact side by side the plants are instantly recognisable and easily separated. You wonder about the intermediate forms — do they even exist? I have seen masses of habitat plants collected both by Rausch and Lau, and again with little difficulty one can see that these are either *crispata* or *verticillacantha* forms and this with no arbitrary selection.

There is however a big "but" — and this concerns not only *Sulcorebutia* species, but most of the popular South American genera as well — what constitutes a species? Maybe things are a little lax in the readiness to describe new species rather than new varieties and forms. Are all these new species of *Lobivia*, *Rebutia*, *Parodia*, and *Frailea*, really true species? But that's another story.

There are enormous pressures on the discoverers of new taxa to get them described as quickly as possible — otherwise botanical pirates will seize them and describe them as their own. There are rivals in the field collecting the same plants — the original discoverer if he is tardy or too particular in his studies, very often loses out. There lies the rub!

I should add that whilst the Rules of the I.C.B.N. may contain no guidance, the recommendations do — however only the Rules are binding!

. . . . from R. Ginns

I don't think that there is any point in my adding anything to Gordon's or John's comments on taxonomy. But I would like to support everything that Geoff Swales writes.

I notice that no-one has responded to the query about how Werdermann came into the study of *Sulcorebutia*, so perhaps I can help over that. It was Werdermann who described and named *S. steinbachii* but he called it a *Rebutia*. In 1951 (I believe) Backeberg erected the genus *Sulcorebutia* taking *R. steinbachii* as the type species so that it became *Sulcorebutia steinbachii* (Werd.) Backbg. So there seems little purpose in dragging Werdermann into the argument.

..... from P.G. Waterman

I was most interested to read the somewhat vitriolic letter by Kladiwa on Rausch's description of several new *Sulcorebutia* species and the comments thereon. Unfortunately (for him, that is) the grounds on which Kladiwa chose to make his attack are so without basis that he has achieved nothing except to make himself look rather foolish. His accusation that Rausch has failed to comply with the requirement of the I.C.B.N. for the publication of new species has already been adequately refuted by Gordon Rowley but perhaps a little more detailed explanation of what Rausch had to do to comply is in order for those not familiar with the Code.

Conditions required to be fulfilled for valid publication are laid down in Article 32 from which I quote:—

“In order to be validly published, a name of a taxon must

- (1) be effectively published (see Art. 29);
- (2) have a form which complies with the provisions of Arts 16-27 (these are concerned with the nomenclatural aspects of naming taxa — P.G.W.);
- (3) be accompanied by a description or diagnosis of the taxon or by a reference (direct or indirect) to a previously and effectively published description or diagnosis of it . . . . .
- (4) comply with the special provisions of Arts. 33-45”

To take these points in order, Rausch complies

- (1) by publishing in *K.u.a.S.*, a journal available to the general public.
- (2) by adopting specific epithets that are in accord with Art. 23.
- (3) by accompanying each new name with a description or diagnosis considered by him to be adequate. N.B. The I.C.B.N. defines a diagnosis as — “a statement of that which in the opinion of its author distinguishes the taxon from others”.
- (4) by complying with relevant instructions in Arts. 33-45 which include: Art. 35 citation of rank intended (e.g. *sp. nov.*), Art. 36 description or diagnosis in Latin, Art. 37 designation of a type specimen, and Art. 43 using a genus that is itself legitimate.

..... from G.J. Swales

I would like to take issue with John Donald over one of his statements — having taken Gordon Rowley's advice and obtained my own copy of the International Botanical Congress Rules for Nomenclature. Referring to Article 32 section 3 of those rules as quoted by Peter Waterman above, which is taken from page 37 of the ICBN, the description or diagnosis must be of a taxon, which I understand to be a taxonomic unit. John Donald apparently insists that the diagnosis is only concerned with the type plant itself, which is quite a different interpretation.

On page 38 of the ICBN, five recommendations appear but none of these are relevant to the problem and cannot justify John Donald's view. I would maintain that the Latin diagnosis should agree with the further description (if you must have two separate ones) but far better to make a detailed Latin diagnosis of the whole plant. Brevity may be the soul of wit, but in Taxonomy, although it may be legal (like Gordon Rowley's marvellous example of *Euphorbia abdelkuri*), is not something to be encouraged.

..... from R.B. Ivimey-Cook

There are quite a lot of points raised in Dr. Kladiwa's note and the subsequent comments. In the first place, as Gordon Rowley and John Donald have pointed out, Rausch's species are valid under the I.C.B.N. There is no question, then, of “*nomina nuda*”, which is a name without any description.

From the moral or ethical standpoint, however, I am quite sympathetic to Kladiwa's comments. My knowledge of *Sulcorebutia* is confined to very general aspects and I have not seen the original of Rausch's paper in *K.u.a.S.*, but I would be very surprised if anyone who can describe new species, based apparently on vegetative and colour characteristics, has a proper appreciation of variation in this or any other genus; this certainly in the absence of a thorough discussion of interspecific relationships and the value of the various characters.

The question is raised as to whether a new species diagnosis applies to the holotype only or to the species collectively. I have just been looking through Charles Jeffrey's new book on Biological Nomenclature (Arnold, 1973), which

seeks to explain the workings of both the Botanical and Zoological Codes. The answer to the question is not immediately clear. However, the Latin diagnosis of a new taxon has only to be sufficient to distinguish it from other taxa in the same rank. I think "taxon" here means species, but only rarely is sufficient information available on ranges of characters, and in practice this boils down to one, or a few, individuals. If one met, in a diagnosis, the statement "spines 18-30", in the absence of contrary evidence, I would assume this to be variation on the type, or at least the syntypes – or other specimens collected simultaneously. The very useful convention that has grown up whereby a diagnosis is followed by a description of the plant, in the language of the author, often amplifying the diagnosis and commenting on the nature of variation, is to be welcomed.

Returning to Kladiwa's last paragraph, if he feels so strongly that these are only varieties (of what?), why not publish them as such? It would have been much more telling to have written a short paper reducing these species to appropriate categories rather than to put his name to an argumentative note.

. . . . from H. Middleditch

Dr. Ivimey-Cook questions whether Rausch has a proper appreciation of the variation in this genus *Sulcorebutia*, or any other genus. We may glean an idea of the extent of Rausch's travels in South America from the account in *The Chileans* No. 19, p.24; No. 20 p.26; and No. 21 p.66. In describing a previous collecting trip to the Andes in *Chileans* No. 17 p.107, Rausch speaks of the cacti in the Rimac valley in Peru, as follows: "You will find very few species of cacti there. On the other hand one could describe 20 or more "species" because almost every plant looks different to the other". In the *Chileans* No. 18 p.150 J. Donald observes that "W. Rausch believes that *Sulco. verticillicantha* and *S. steinbachii* are the two dominant species and that many current species may be reduced to a varietal status of these two". In *Chileans* No. 16 p.38, W. Rausch describes his various trips to the Andes and observes "I have done over 4,000 Km mostly on foot in roadless areas. I have been to over forty *Sulcorebutia* localities, and so I have been able to get a good look at the forms. It may seem paradoxical both that this or that name can be identified as a synonym and also that one makes new names oneself." Then in *Chileans* No. 19 p.217, W. Krahn observes that "W. Rausch . . . . has a profound knowledge of *Sulcorebutia*".

It would perhaps be rather surprising if he was not fairly well acquainted with these plants after all his perambulations. As he does seem to recognise that the variation within a population can give rise to new "species", perhaps one could suggest that he does have the "appreciation of variation in this or any other genus" which Dr. Ivimey-Cook questions. Whether he has made a fair appreciation of what is new and what is synonymous is something else altogether; and how can we challenge Rausch's conclusions with the limited knowledge at our disposal – the cultivated specimens and the information published by Rausch and others? It would seem to me that we are not very well placed to discount Rausch's new species, nor his reduction to varietal status of a number of earlier specific names.

If I were to set up in competition with Gordon Rowley and discover a new species of *Leuchtenbergia* with black wool in the areoles and a green stigma, it would presumably be "perfectly adequate" to describe it (in Latin) as: "Differs from *L. principis* in having black areole wool and a green stigma". The new taxon is immediately recognisable and valid under the ICBN Rules, but to avoid anyone suffering any anguish over whether it is synonymous with *Leuchtenbergia* sp. nov. Rowley, I would add a description in English to make clear whether or not it has hooked centrals and pink flowers. Understandably R.B. Ivimey-Cook welcomes the practice of supplementing the diagnosis by a description which provides amplifying and explanatory information, otherwise I could leave a trail of confusion over possible synonyms.

I suppose that this merely goes to show that the ICBN Rules are only concerned with the proper manipulation of nomenclatural practices and do not concern themselves with how thoroughly or otherwise a plant is described. There would appear to be only "good practice" which can be quoted in this respect, such as the recent new descriptions by Buining and Brederoo to which G.J. Swales makes reference, whilst Gordon Rowley would discourage the rather less satisfactory mini-descriptions.

Coming now to Geoff Swales' question of whether the diagnosis is intended to describe the species or the plant, I see in Charles Jeffrey's "An introduction to plant taxonomy" a statement that ". . . a name must be accompanied by a description of the plant to which it is applied". Note particularly the words "the plant", that is, a single specimen, not a selection or series of specimens. This observation is confirmed by Jeffrey's example "thus the type of the species named *Kalanchoe densiflora* Rolfe is the specimen collected by Snowden in Kenya on which the original description . . . was based". Here again we find the words "the specimen" which refer to the single plant covered by the diagnosis. To add weight to this, Jeffrey then goes on to quote two further examples in the same vein. Thus it would seem that the Latin diagnosis applies to the type plant only, not to the species collectively.

Now on several occasions, Geoff Swales has pointed out to me in the course of conversation, the degree of variation which can be found in the literature between the description of a species given by one author to that given by other authors. These descriptions could vary yet again from the original diagnosis. It would appear that we are obliged to accept this situation if any author is entitled to describe (in his own language) the species as he knows it, amplifying or extending any previous descriptions, for this remains in conformity with the ICBN Rules since they do not cover the scope of the description in the author's own tongue. I could imagine that I would be able to adjust a few well-established descriptions myself on the basis of some of my own plants.

. . . . . postscript from R.B. Ivimey-Cook

I don't know whether you are proposing to publish these comments in the *Chilensis*; if you do, I hope you will consider that you are, in effect, bringing to people's notice work which is, perhaps, better left buried in its original journal. Anyone who is proposing to monograph *Sulcorebutia* will find it anyway — should it be publicised to those who are not?

. . . . . p.p.s. from G.J. Swales

Further to my comments above, reference to p.5 of "The Principles of Angiosperm Taxonomy" by Davis & Heywood, 1967, reveals the following definitions:

1. "A diagnosis is a short comparative description, stating only those characters which differentiate the taxon from its closest allies in the same rank . . . . ."
2. "A taxon is any taxonomic group of any rank . . . . ."

Surely it is reasonable to argue that one single plant does not constitute the whole taxonomic group i.e. in this instance, a species, as John Donald would have us believe.

## THE LINZ BOTANIC GARDENS

Translated by E.W. Bentley from G.O.K. Bulletin July 1972

The function of this collection as a type collection, which was established by a resolution of the I.O.S. on the occasion of the Congress held in Vienna in the year 1962, has in recent times been questioned by some specialists. This fact led its curator Stefan Schatzl to inform the members of our Branch, and thereby all others interested, about the aims of this institution. It is true that the Linz Garden, with few exceptions (e.g. *Gymno bayrianum* Till) possesses no so-called holotypes. However, one can meet up here with a large number of habitat plants (neotypes and isotypes) in good health.

In order to fulfill its function properly as a "Protection and Type Collection", the Linz Botanical Gardens has made it its task to bring together, to grow and where appropriate to increase by propagation, imported cactus plants of endangered species or plants imported only once. (This is done among other ways through seed distribution to the G.O.K. and to other Botanic Gardens).

Because, at the moment, *Sulcorebutia*s are "modern" and plants of this genus have been imported in numbers, they have gone to the trouble in Linz, to obtain as far as possible, a complete collection of this plant genus. This also because one cannot foresee whether, ever again, a collector will make a collecting trip in the area of distribution of this genus.

As a further example may be presented the fact that one can find in Linz today, cacti that were imported long ago and that therefore already possess a scarcity value. I have mentioned previously *Gymnocalycium delaetii* — this plant is so rare that elsewhere a few examples are in the possession only of the Zurich City Succulent collection. Where now can you find *Gymno. hybopleurum ferocior* Pirqu.? In the Linz Garden there are some specimens of this species. A further rarity that one can see here is a *Gymnocalycium* with the designation B 21. This plant, collected by Frau Muhr, exhibits a large elderberry coloured flower and possesses in addition a great resemblance to *G. horridispinum*.

A plant with the collector's number WR 141 collected by Herr Rausch was designated as *G. baldianum* var. *albiflorum* and made out to be a white-flowered form of *G. andrea*. In "Succulenta" it was described as *Gymno. uebelmannianum*; it possesses the tap-root characteristic of the above-named form complex.

In the course of a round tour through the cactus house we then had the opportunity to get acquainted 'face to face' with one or another rarity. *Gymno. kozelskianum*, a Fechsler collected form of *G. ochoterenai* was represented —

as also *Gymno. vatteri*. Most plants of this species have up to 3 centre spines although according to the original description they should possess only one such.

Under the collection number WR 126 we saw a *Gymnocylcium* with the epithet "spec. de Famatima". A fine-looking plant, which with certainty can be ascribed to the *G. mazanense* complex. Less crowned with success has been the growing of *G. damsii* and *mihanovichii* and their associated varieties. This can be explained by the fact that these plants need half-shade, but in the Linz Gardens stand in full sun. I have already explained at the beginning that the plants that served for the original description of *Gymno. bayrianum* — named after our late President — are to be found in the Linz Garden. Director Alfred Bayr was regarded in specialist circles as a *Gymnocylcium* expert. Together with *G. cardenasianum* and *G. spegazzinii*, this species forms a unique species-complex.

With *Copiapoa cinerea*, imported plants from the years 1958/9, Herr Schatzl has been especially successful. After each repotting some plants died. He then decided not to disturb them any more and since then they have done well. A good cross-section of all the new discoveries of recent years, like *Notocactus rauschii*, *vanvlietii*, and *purpureus*, *Eriocactus claviceps*, *Eriocactus magnificus*, *Uebelmannia pectinifera*, *Wigginsia horstii* and many others, are represented in the Protected Collection.

Both the cactus lover and the simple amateur can inform themselves concerning the variability of particular species.

I have already mentioned in previous reports that the Botanic Garden possesses an extensive Orchid collection. The cactus lover may be interested to know that *Oncidium onustum* grows for preference on cacti. *Tillandsias* also grow down from cacti. *Tillandsia cacticola* has thereby got its name.

Speaking of *Tillandsias*, Herr Schatzl has grown one of the most complete collections of *Tillandsias* hanging over the cacti. Conditions for cultivation seem to be optimal, since they develop wonderfully, do not get overgrown with algae as one so often hears happens, and bloom freely. At the time of our visit we were able to marvel at a flowering specimen of *Tillandsia albertina* from Argentina. *Tillandsia xiphioides* in flowering condition was also to be seen. This plant, coming from Argentina, possesses a sword-like inflorescence — hence the name — with white solitary flowers which are fantastically scented. Once a week the plants are sprayed with water; this suffices for good progress.

To my knowledge the "Protected Type Collection" in the Botanic Garden of the town of Linz is the only cactus collection in Austria accessible to everyone. It is therefore to be hoped that it will be maintained at its present size and be built up further.

For visitors it should be remarked that all plants to be seen with numbers belong to the Protected Collection.

Comments

..... from T. Lavender

I must admit that I do not find *Gymno. mihanovichii* the easiest of plants to grow, either. They never seem to get really plumped up, no matter how much you water them. I have seen this species on grafts in various collections and when it is grown that way it has a much healthier appearance.

..... from A.W. Craig

If the writer of the above article would like to know where to see some *Gymno. hybopleurum* var. *ferocior*, I could suggest that he has a look at some of my seedlings, now about a couple of years old. Unfortunately they are not yet large enough to show their mature features.

I would certainly agree that the *G. mihanovichii* and *damsii* are very difficult to grow — they always seem to be terribly shrunken as if they lacked any decent roots. I am thinking about putting them down under the staging where they will get some more shade.

..... from G.J. Swales

I suppose that I must have spent two or three years battling with my *Muscosemineae* — *G. mihanovichii*, *damsii*, etc. — to try to get them to grow well — or for some plants, even to try to get them to grow at all. They have lost their roots, they have shrunk, they have looked unhappy, and finally I have put them underneath the staging where they will get far less sunshine — and what they do receive will mostly be indirect sun.

I have always thought of these plants as growing in the wide open spaces of the Chaco, exposed to the searing sun for most of the year. They should be tough and quite capable of putting up with the vagaries of cultivation without any distress. But clearly, quite the reverse is the case – even with careful cultivation and regular attention they are disinclined to grow. I am beginning to think that they do not grow fully exposed to the tropical sun after all. Perhaps there is not a great deal of vegetation growing along with these plants, but it does not need much in the way of grasses to diffuse the sunlight for the plants growing much closer to soil level. Even the daisies growing in my lawn will not be fully exposed to the sun, for they are two or three inches below the topmost stems of grass.

Looking at the sunny side of my *G. delaetii* I see that it is fairly deeply infused with a red tint, whilst the rest of the plant remains its normal green colour; I am beginning to think that these plants produce the red-brown pigment in (or closely beneath) the skin as a defence against the harsh effects of the strong sun, just as our own skins produce a pigment under similar circumstances. But I suspect that the layer of red pigment not only acts as a sunblind to protect the plant. At the same time, it probably screens the chlorophyll from the incoming sunlight, so that the process of photosynthesis which provides the plant with food and building material for new growth, is interfered with. Hence the plant does not grow; and until the plant loses the sunblind by some means or other, it cannot restart growth. No wonder it is a battle to get them to start growing again! We will see how they fare in their new conditions.

I see from the latest commercial catalogues that Frau Muhr's plant designated B 21 is named *G. achirasense*. My own *G. achirasense* looks very much like *horridispinum*, but it has not had a chance to try and flower as yet. I also have a small seedling of B 21 which has put out central spines at only two or three of its areoles, so far.

..... from H. Ewald

During the winter I keep my greenhouse heated but no water is given to the plants. *Gymno. mihanovichii* and *G. damsii* do without water from November onwards and they are very shrunken by April – but they will expand tremendously when watered at the start of the summer season.

..... from R. Zahra

I find *G. mihanovichii* and *G. damsii* very easy from seed. In 18 months I have plants which have grown to 30 to 35 mm in diameter. Some of them even flower the following Spring from the time when they have been sown. and I collect seeds regularly from the plants which I have in my collection. On the other hand when the plants are about three years' old they grow much slower, and in the winter they tend to shrivel rather too much. My plants are outside all the year round, and although they are sheltered from the rain, and from the very cold north winds, the temperature at night during the winter falls quite often to 45° F. It is at this time that the plants shrivel most, and I think that had they been in a closed greenhouse where the temperature is 50° F or above, it would have been much better.

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

I find both *G. damsii* and *G. mihanovichii* susceptible to grey mould (*Botrytis*, presumably) in winter. I have some top staging where drips possibly fall on the *Gymnos* there and once the mould attacks them it spreads like nobody's business. This year, my plants have had no water from the end of September until April, apart from a light spraying or two in March, but I have not had a lot of plants shrivel unreasonably and I have not had any trouble in getting them moving. But I have lost two *G. mihanovichii* from grey mould. The natural colour of this plant in full sun is definitely reddish.

..... from J. Hopkins

*Gymno. damsii* and *G. mihanovichii* are a real problem. In fact I would go so far as to say that they are a pain in the neck. In particular they always get into trouble when the dead flower is allowed to remain on the plant. When we get a run of several days of damp weather, which occurs quite frequently in these parts, it seems to set the flower remains away going mouldy and this in turn must affect the plants themselves.

..... from R. Moreton

I find that *G. damsii* and *G. mihanovichii* grow marvellously for a year or two and then they seem to come to a stop and just look unhappy.



..... from J. Klavins

I have four plants of *Gymno. mihanovichii*; one of them is a pink colour, one pale pink, one green, and the other light metal coloured green. They are not large but they are all nice plump plants and they hardly shrivel up at all in the winter. I keep these and all my other plants dry from the end of October up to the end of February. I water them whenever they need water – if it is very hot they will get two or three waterings in a week.

..... from I. Le Page

I do not have many *Gymnos* as they are not particularly good growers for me. I know that from time to time various commentators have said that these plants are sensitive to the pH value of the soil. Our local soil has a fairly high pH value and it is this that I feel is responsible for their poor showing. The *Muscosemineae* group plants seem particularly vulnerable. This season I intend trying a mix based on pine needles of pH 4.2, sand & loam, fortified with trace elements in the form of superphosphate, sulphate of potash, etc, to try to improve growth. Do you know of a commercial mix that is suitable?

..... from C. Webb

I must regrettably confirm similar difficulty with some members of the *Muscosemineae*, especially *G. tudae*, *eytanium*, *griseopallidum*, etc. Apart from having a marked tendency to die, they are much beloved by mealybugs, red-spider, and any other horror that lurks around the greenhouse. I got a bag of compost made from ground bark recently and the few plants I've put in it seem to like the stuff. I'm going to try some of the *Muscosemineae* in it come Spring – if they are still with me.

## TEMIK

..... from A.F.H. Buining

This last trip to South America was of six months duration and once again was quite successful. I came back in very good condition. I certainly should like to fly to England for the Chileans Gathering.

(Later). I repotted my cacti this spring (1975) and used in the earth grains of the insecticide "Temik". I did not touch it but took it out with a spoon. But it had an awful bad smell when I opened the bag. After some weeks I had great troubles with talking and walking. While it became worse I went to a specialist doctor and he came to the conclusion that my nerve-points were poisoned by the gas out of this Temik. It would take a long time before this sickness of the nerve-points was over.

While it did not get much better after our vacation in June I went afterwards to a nerve-specialist. He looked at me and after being searched through an electronic instrument it was proved that indeed this temik-gas had poisoned my nerves. Once a week I get concentrated injections with vitamin B. Although my talking goes somewhat better, my health is so that I cannot walk further than a few hundred meters and those few hundred meters are very difficult for me. My doctor told me that the situation of my nerves is not any better yet, so that he says I must not make the long trip to England. So I am writing to you that I regret this very much. I was to have given a lecture also in Hamburg, Germany, in the beginning of October. But I warned the Society there that it is still possible that I can not come.

I had the planning to go once more in the coming years to Brazil, where I found a new friend in the western part of this enormous country; but it looks now that this will be only an illusion. But one never can tell, but on my age of 74 years the chances are much lower than for younger people.

..... from Pesticide Manual, British Crop Protection Council

Aldicarb is the common name for  $C_7H_{14}N_2O_2S$ , the insecticidal properties of which were first described by Weiden, M.H.J. et al in the *J. Econ. Ent.* 1965,58,154. It was introduced, in 1965, by the Union Carbide Corporation under the trade mark "Temik".

It is a systemic insecticide of promise against certain arthropod pests: Davis, J.W. et al in *J. Econ. Ent.* 1966,59,159; Hopkins, A.R. & Taft H.M., *ibid*, 1965,58,746, and for the control of soil nematodes. The sulphur atom of the molecule is easily oxidised to form the sulphoxide which is highly soluble in water (more than 33%).

The acute oral LD50 for rats is 0.93 mg/kg. (This lethal dose is approx. equal to 1/500th of an ounce per

ten stone adult – E.W.B.). Because of handling hazards only granular formations are offered, 10% active ingredient.

... from Ministry of Agriculture, Fisheries & Food.

Aldicarb is included in the Health and Safety (Agriculture) (poisonous substances) Regulations. These Regulations require an operator using the substance in a granular form to wear rubber gauntlet gloves and either an overall or mackintosh with the sleeves worn over the cuffs of the rubber gauntlet gloves when opening a container, or when transferring the contents from one container to another, or when applying the granules by hand or by means of hand operated placement apparatus.

Wash all protective clothing thoroughly after use, especially the inside of gloves. Wash dust from skin or eyes, immediately.

(Mr. Buining died on 9th May, 1976).

## **AN IMPRESSION of the 1975 CHILEANS ANNUAL GATHERING** From P.H. Sherville

We had been looking forward to hearing Mr. Buining talk about one or two of his trips to South America, and looking at his slides of plants in habitat, at our Gathering at Brooksby this year. Unfortunately Mr. Buining fell victim to the effects of some insecticide "Temik" which he used when repotting his plants in his greenhouse in spring. Three weeks before the date of our Gathering, we heard that Mr. Buining's doctor would not allow him to come to England and this rather upset the intended programme for the weekend.

The first talk on the Friday evening was given by Harry Middleditch on close-up photography. We saw first of all a slide taken at about two feet from the subject, then a slide taken rather closer to show a single flower, then closer still by means of twin number 4 extension tubes plus bellows to show the stigma alone, and finally by means of a 300 mm extension tube and bellows a short length of one stigma lobe occupied the screen. The receptive surfaces of the stigma were expected to be seen as feathery papillae, but instead they appeared to be composed of minute globules. After some discussion it became clear that these minute globules – which were about 5 mm across (app. 1/4") on the screen, were actually pollen grains adhering to the stigma. By comparing the actual length of the stigma lobe on the plant with the length of the same stigma which exceeded the width of the screen, it appeared that a magnification in excess of 100 times was being obtained on the screen.

Several problems arose when taking close-up shots at the magnification. To gain an adequate depth of field, a small aperture and long exposure was used – exposures often reaching half a minute. Initial focusing was done at f 2.8 and when stopping down to f 16 the viewfinder literally turned black. Hence if the camera was disturbed by the slightest amount during the process of stopping down there was no indication whatsoever in the viewfinder that the subject was now out of focus or even out of view. It was suggested that a twin cable release and Z ring would overcome this problem.

The second problem was a peculiar one, in the shape of a circle of light round the centre of the slide and an almost white spot of light right at the very centre. Various suggestions were put forward to explain this phenomenon, including diffraction round the iris, interference fringes, reflections from the back of one of the lens elements and re-reflection from the front face of the lens, or simply an out-of focus picture of the aperture in the iris which was about 400 mm from the film when the subject was about 450 mm from the film. It was noticeable that the phenomenon was less conspicuous when a plant body appeared as the background, practically non-existent when a stigma was detached from the flower and laid on a black velvet cloth for photography, and most conspicuous when flower petals formed the background. One possible cause of the light spot at the centre of slide might have been reflections from the petals.

The last of the close-up slides were of vestigial leaves on *Tephrocacti*, *Neochilenia*, *Lobivia* and *Erdisia*. At this point John Hopkins showed a slide taken with a 135 mm lens coupled to extension tubes and bellows, which gave excellent definition and magnification. Geoff Swales then demonstrated the use of a 200 mm lens to the front of which a reversed 50 mm lens had been attached. Two slides were shown of seeds which had been taken with the use of this equipment, the magnification being quite adequate for important features of the seed to be seen on the screen.

The camera equipment used for the various close-up techniques was on display during the discussion.

Saturday morning started with an explanation of the terrible delay suffered at the hands of the printers in getting Journal No. 28 published, which had given rise to much concern amongst members. The tripling of printing costs was also discussed and the need for a supplementary subscription explained. It was even suggested that we purchase a second-hand lithograph printing machine and produce our own Journals, but no volunteers could be found either to house or operate such a machine. There was much pressure to seek an alternative printer to obtain more realistic attention to our needs.

Although next year's guest speaker had offered his services this year at very short notice, his topics would not have matched the plants which members had already arranged to bring with them, and it was accepted that it would indeed be best to look forward to his visit next year. Suggestions were made that a weekend was inadequate to discuss all the plants and slides and subjects that arose and that the occasion be extended to a week. It was evident, however, that very few members were likely to attend for a full week, but the possibility of widening the weekend to cover all day Friday for those wishing to use the opportunity for discussion was well received — a few members being desirous of adding the Monday as well.

As the general discussion abated, Graham Charles took the floor to give a review of the Notocacti. Before him was some 20 feet of tabling covered with Notocacti which had been brought by members. He pointed out that a large number of species were as yet undescribed and proceeded to outline contemporary groupings and run through a few species in each group, drawing attention to the characteristics relating various plants to the group concerned.

The first group thus dealt with was the Mammulosus group, where characteristically the stamens are bunched round the style, as shown on a slide of *N. mueller-melchersii* in flower. It was suggested that *N. roseo-luteus*, described in *Succulenta* in June 1973, could be an intermediary between *N. herteri* and *N. mammulosus*. It was also suggested that *N. allosiphon* which had been looked upon as a member of the Mammulosus group, could be considered as a *Wigginsia* (*Malacocarpus*). There followed a discussion on *N. werdermannianus* which appeared to differ only in spine colouration from *N. vanvlietii*. Breaking for lunch, requests were made for flower sections of *N. herteri*, *roseo-luteus*, and *mammulosus* to confirm the transition sequence.

Next to be discussed were the gymnocalycioid Notocacti in the *Crassigibbus* group, which have sensitive stamens, incurving and later straightening. There is a species *N. militaris* which is related both to this group and also to the *Ottonis* group and is presumed to be a link plant between the two.

The *Setacei* or *Concinus* group generally have a bare growing point, *N. apricus* being more woolly and *N. tabularis* having a darker body and darker spines. A flower section of *N. elegans* (R 341) was requested in order to be able to confirm that it did belong with this group.

The last group to be discussed was that around *N. ottonis*, which includes the stoloniferous section comprising *N. tenuicylindricus*, *N. caespitosus* and *N. minimus*. *Notocactus linkii* v. *buenekeri* displayed a bicoloured stigma, yellow suffusing through a pale pink. Many members of this group were reported to suffer from a black mould, usually around the areoles, which often proves fatal.

Following on from this, Harry Middleditch then discussed the *Eriocacti*; in general these plants grow in the sub-tropical rain forest in the northern part of Rio Grande do Sul, on very steep rock faces, whereas the *Notocacti* generally tend to grow on rolling down-like grasslands. The stigma on *Eriocacti* is raised above the stamens and has characteristic spreading, twisting, lobes. Slides from other members and especially half-section flowers from Paul Sherville, showed this feature clearly.

Between the borders of Uruguay and the habitat of the *Eriocacti* there lies a transition zone between the virtually treeless south and the fairly heavily forested north of Rio Grande do Sul. It is presumed that a change of bird and insect life accompanies this change in vegetation and it is here that we find the *N. horstii*, *muegelianus*, *purpureus* group which have stigma lobes spreading somewhat like those found in the *Eriocacti*. Once again, requests were made for flower sections to be taken next season in support of further discussion next year on this point.

The next lecture was by special request. A number of members had stated that they had difficulty in following some plant descriptions as they were not familiar with the terminology, and this was especially true of seeds. Geoff Swales proceeded to give a very enlightening run down of the structure of seeds with particular reference to the *Cactaceae*. Almost all of the terms used in the pages of the *Chileans* are confined to the external features of the seed and not to its internal structure. Starting with the unfertilised ovule in the ovary, this consists largely of a food supply for the future embryo and is contained within two, or sometimes three, outer coats which are called integuments. On ripening into a seed, the two integuments fuse together to form the outer coating of the seed which is the testa. This appears as the dark surface enclosing the greater part of the seed; the remaining, much paler, surface of the seed is known as the hilum which consists of a porous or spongy layer which possibly assists in water absorption prior to germination. In the ovary, the seed is attached to the wall of the ovary by a slender stalk or funicle through which nourishment is provided for the ripening seed, rather like the umbilical cord in mammals. The hilum of the seed represents the junction between the seed and the funicle and may perhaps be compared with the abscission scar left when a leaf falls off a deciduous tree.

In the Cactaceae, a minute opening described as the micropyle is to be found within the area of the hilum (in many other families of plants it occurs outside the hilum). This is the only point of access into the seed from the outside. The micropyle itself is far too small to be seen with the naked eye. The pale surface of the hilum however can often be distinguished from the dark area of the testa by the naked eye alone. In some species there is an extra thick, corky, absorbent hilum and the area of the hilum in such cases is fairly large, which makes it even easier to see with the naked eye. This extra thick hilum has been called an arillus by some writers; it is particularly evident in the Trichomosemineae group of the Gymnocalycium. In other seeds there is not a clean break between the funicle and the seed; a short length of dried up funicle remains permanently attached to, and forms a part of, the hilum. This is particularly evident in the small seeded Parodias — the microsemineae group — and in Mammillaria pennispinosa, where it is described as a strophiole.

In some seeds a third outer integument does occur and this manifests itself as a thin, membranous tissue covering the whole of the testa or just parts of it. This is usually described as the arillus layer and may be distinguished by a hand lens or low power microscope. The fairly level surface of the arillus layer contrasts with the rough, cellular surface structure of the testa, which is sometimes pitted. Pitting seems to occur where a number of the surface cells are absent or depressed and is a characteristic feature of a number of seeds in the Cactaceae.

Now it was the turn of Roger Moreton to bring to the speaker's table some plants of the newer species of *Parodia* described by Brandt. Some slides were shown of these species and four colour prints of plants in flower were circulated which had been sent to the Chileans by Brandt himself. This brought forth comments regarding their great similarity with species already described and generally well known. The value of many of these and other new species names was questioned and the authority of some authors of newer species names was questioned. It was argued that people publishing new species should have first hand knowledge of field trips and habitat conditions, together with the natural variations normally found in plant populations. Some members present contested this idea and expressed the view that providing research work was carried out with known habitat material, and that the collector had an understanding of habitat conditions, then the work could be equally as valuable as that carried out by someone with actual experience of the habitat.

All were agreed though, that field work in habitat was a great asset in any serious research work. Some parties contended that writers in the cactus journals who had been on field trips failed to convey any clear impression of the nature of the habitat in which cacti were to be found. Earlier in the year one of our members had suggested that the Chileans sponsor a field trip to South America and this topic engendered a lively discussion. One of the ideas discussed was to send a Chileans member out to South America, but it was suggested that the return air fare together with food and lodging would be over £750 and we were unlikely to raise that sort of money from our own membership. The second alternative was to offer financial support to a member who already felt inclined to pay for a large slice of such a trip. One of our members, Roy Martin (who was at the weekend) had already made two field trips to collect in Mexico and had expressed a keen interest in a possible visit to Peru. A count of those present who were prepared to subscribe £25 to such a trip came to about a fifth of the number prepared to subscribe an amount of £5.

Another suggestion put forward was for a group to go out for not less than 2-3 months almost on a holiday basis; it was questioned whether this could produce any useful study material or data. It was suggested that such a trip would cost around £1400 per person based on flying out and back, hiring/buying a vehicle and surviving largely by camping out. Some two years might well be involved in organising such a trip beforehand.

A further suggestion, which was agreed to be the most practical, was to sponsor a person already out in the field or someone who has been out into the field before, who is already familiar with some of the ground, and has plans for a further trip. It was eventually deemed that such an arrangement would probably offer the greatest return on our investment. It was agreed that we consider placing such a proposal before our next year's guest speaker, who was coming to talk to us about his trip to South America, on which occasion we could indicate the sort of data we would like to see obtained.

The final outcome of the discussion was that some spade work was to be done by certain members present with a view to preparing proposals for future submission to the membership with a request for financial support. It was asked of those present precisely what they expected to receive in return for the money they invested and generally five collected plants was considered a very acceptable return on a £5 investment. One member however protested most strongly that it would be undesirable for the Chileans to give an impression that they were offering support to plant collection as opposed to conservation and indicated that she would offer financial support for collecting seeds, taking habitat slides for the Chileans slide library, etc., but would not offer financial support if plant collection was to be included in the itinerary. Other members present who had carefully built up collections of imported specimens for study did not appear to be altogether in agreement with this point of view.

Sunday morning saw the speakers' table loaded with an array of Copiapoas, many of them established imported specimens in 6" pots. During the course of the discussion these were rearranged to bring together plants whose general appearance (body morphology) would place them in close relationship to each other. The geographical location of the species concerned were then related to a map of the Chilean coast and hinterland and an excellent degree of conformity was demonstrated between the proximity of the plants on the table and in habitat.

A further examination of Copiapoas involved delving into early publications for original descriptions, *C. marginata* and *C. streptocaulon* being taken as two of the earliest descriptions of this genus. A copy slide of the coloured plate which accompanied the original description of *C. streptocaulon* was put on the screen and an imported specimen of this species taken off the table and held up beside the original, the likeness being most striking, considering the two were about 140 years apart.

It was perfectly clear that far more was left untouched than was covered by this discussion on Copiapoas.

The floor was then taken once again by Geoff Swales to give us an insight into some of the *Gymnocalyciums*. Dealing largely with only one of the seed groups which he had studied, he expanded on the relationships between the various yellow-flowering species. This was followed by discussing some observations made on *G. horstii* and *horstii* v. *buenekeri*, relating this to earlier descriptions of *G. denudatum* and its varieties and to various features of Buining's description of *Gymnocalycium horstii* and its varieties. Anyone having habitat material of *G. denudatum* v. *pentacanthum*, *G. horstii* or its var. *buenekeri* was asked to observe and photograph any flowers and fruit and retain some seed for study.

After lunch, Harry Middleditch discussed various aspects of the pollination activity of bees, thus following on from previous years' discussions on humming bird flowers. Apparently both social and solitary bees are fairly widely distributed throughout tropical and temperate climates, although solitary bees alone are to be found in arid areas — where most cacti are also to be found. Social bees tend to collect pollen or nectar from a very wide range of flowers, whereas solitary bees normally collect from a limited range of flowers, occasionally from one species of plant alone. Social bees therefore have the whole of the flowering season during which they can forage, whereas solitary bees only forage during the flowering season of the plants they visit. This means that social bees are active for about 100 to 105 days in the year whilst solitary bees fly for only 40 to 45 days, or even less.

In some regions there are specific links between individual species of bees and a particular species of plant; these can be brought about and maintained by flower odours registered by the bees' perceptive sense of smell. Some flowers have stripes or patches which reflect ultra violet light and certain bees are especially sensitive to these reflections or even to specific patterns of these u.v. reflections. A further selective plant/pollinator relationship is represented by the matinal and crepuscular bees which sleep in the daytime and fly respectively in mornings and evenings only. The corresponding plant populations which they visit open their flowers, or are only receptive, to coincide with the flying times of the pollinator.

It was suggested that those arid areas which support a growth of cacti lack the type of vegetation required to nourish caterpillar phases of butterflies or moths, and hence solitary bees are likely to be the most common pollinating agent. Perhaps it is for this reason that the great majority of cactus flowers are of similar form, since they are built to encourage and facilitate visits from bees?

To round off the 1975 weekend, we were given a talk by Joan Hobart on flower sections and preserving flowers by embedding them in clear plastic resin. From the purely photographic point of view, there are two options open to those wishing to take a slide of a half-section of a flower. One can cut the flower off the plant and then section it, or the flower can remain on the plant and half of it can be cut away. Both methods have their merits and disadvantages, the latter — which the speaker suggested might be described as Paul Sherville's method — has two points of merit. Firstly the flower is still supplied with sap and hence does not go limp; secondly the flower is much easier to "model" i.e. handle since the whole plant can be moved around to obtain the best pose. The biggest disadvantage occurs with plants with well-spined crowns, as the lower details of the flower are then somewhat obscured and of course it is also rather more hazardous to make the initial section. One point common to either method is to be careful not to cut through the style as it will curl up.

On the main theme of preserving the flower the speaker described early attempts to press the flower between blotting paper, subsequently removing the fluff from the blotting paper left adhering to the flower by the use of surgical spirit. As most cactus flowers are quite fleshy the results obtained by this method were not entirely satisfactory, so attempts were made to embed the complete flower in a clear resin. The flower still needs to be dried and initial attempts suffered from loss of flower shape, loss of colour density, and difficulty in eliminating air bubbles from

the flower receptacle when pouring the resin.

Drying the flower has been achieved satisfactorily by immersion in borax, tamping it down to get the borax in contact with the whole of the flower. A modification of this method is to dilute the borax powder with sand, to support the flower better and help to maintain its correct shape. About a week is required to achieve the desirable degree of desiccation prior to embedding in resin. As an alternative, silica gel may be used as a desiccant but is more expensive and is not significantly better.

The actual resin used has been a "Plasticraft" kit but "Isopon" is now preferred. The resin is mixed and poured a little at a time so building up the mould in shallow layers to prevent overheating and splitting. The mould used must have a very good surface, free of imperfections, as the resin faithfully reproduces the contact surfaces. White or pale coloured flowers tend to appear transparent when embedded, so a primary layer of colour tinted resin is used as a base and when this is set a colourless layer is added and the flower then put in place. After pouring the final layer, the mould should be left for three or four days to cure completely, after which it can be extracted from the mould and polished. Any surface defect can be repaired with fresh resin prior to final polishing.

Many examples of pressed and embedded flowers were tabled by the speaker to demonstrate the results obtained. To assist with the ever-present problem of handling the dried flower, a suggestion was put forward to spray it with hair lacquer before placing it in the mould in order to render it less liable to become mis-shapen.

Although the weekend closed officially with the buffet tea and an expression of thanks to all those who had contributed to the weekend by bringing along plants, slides, or comments, a further discussion continued after tea over slides of miscellaneous topics.

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Comments

..... from K. Halstead

I would like to record my thanks for a very entertaining weekend at Brooksby and I am sure everyone enjoyed themselves. The tabling of many plants in a particular genus does help one to appreciate the difficulties of identification at times.

..... from H. Middleditch

The publishers' announcement of Walter Rausch's three-volume work on *Lobivia* arrived by post just before I left for Brooksby. This was publicised at the weekend and an order written off to the publishers about a week later. Inexplicably this elicited no response and a further letter was despatched in November asking for advice and assistance from the Secretary of the Austrian Society (G.O.K.) in this matter. The publication (English version) arrived in April.

..... from D. Rushforth

I see from the report and accounts which appeared in the *Chileans* No. 28 that a sum of close to £1,000 is carried forward and constitutes a reserve. Why is it necessary to have such a relatively huge reserve? Why are subscriptions increased just to increase this reserve?

..... response from H. Middleditch

The subscription requested to cover the publication of Nos. 28 to 30 inclusive, proved in practice barely adequate to meet the bill for printing No. 28 alone. We are very fortunate in having this reserve since it enables us to pay for the printing of No. 29 and still leave a small working fund. Other people, such as Rolls Royce, Burmah Oil, and British Leyland, have discovered the results of coming to the end of their liquid funds. Provided we retain the support of our membership we shall avoid suffering a similar fate; but if we do run out of funds, we are unlikely to be bailed out like the foregoing.

**A VISIT TO PISAC** From J.C. Hughes

I have belonged to the *Chileans* for several years but only now has the appearance of the article on *Erdisia brachyclada* tempted me to write to you. In particular I noticed the various comments relating to *Kz 354 Bolivicereus pisacensis*.

It was my fortunate pleasure during a visit to Peru to take a holiday in the South of the country, visiting amongst other places Cuzco, Arequipa and Puno. During my stay in Cuzco I followed the well beaten trail round the various Inca ruins near Cuzco. Unlike Dr. Hanna Rydh, in the account of "Argentine to Andes (Chileans No. 29), I was able to travel by camionetta (shooting brake). Leaving in the cool of the morning, we followed a dirt track road skirting the Rio Urubamba, arriving mid-morning at Pisac. The township itself stands at some 2,971 m, about 20 miles from Cuzco. Pisac is very typical of a large Andean village with its orange red roofs glistening under the sun, contrasting against the generally white painted buildings. After a glass of delicious cuzconan beer, we took the path upwards (by car) to feast our eyes on the same terraces shown on the inside front cover of Chileans No. 29.

It is difficult to say how many miles the winding road took us, or exactly the differences in altitude between present-day Pisac and its older ruins. It did however seem more than 1,000 ft above Pisac and this would make the altitude a little lower than that of Cuzco (which lies at 3,326 m). This would suggest that its climate should be similar to Cuzco e.g. July average temperature 47° F. Differences between day and night temperatures are normally more marked than variations between the seasons. The seasons are better classified as Dry and Wet. Of a rainfall of approx. 80 cm (32"), some 56 cm (22") falls in the period from December to March.

On that March morning the effects of the rainy season were clear. The region round Cuzco was not the barren waste I had expected. The grass was as green as the Emerald Isle itself and annuals, which I had never seen before, were in full flush of colour. Leaving the station wagon at a convenient spot, we took a winding way to the ruins. This skirted a few rock promonteries and I was soon struck by plants of a dwarf cereoid form growing in amongst the grass and annuals. It was unlike anything I had previously seen. Some plants were sprawling, others small and upright, and one appeared stoloniferous; with 7-9 ribs and one strong central spine. The real surprise was to find one, and then several, with flowers. All plants that were flowering were red in colour and they reminded me of Lobivia flowers.

I collected two 8" cuttings from the tops of flowering plants and brought them home with me. They seemed to have set fruit, despite the disturbance of transport and potting up here, but the seed pods did not develop properly. I took a slide of these barley a month after our return and you will see that the seed pods are spiny. Since that date, both of the cuttings have rooted. One of the cuttings has continued to grow from the apex of the plant and has added 9" of growth. The other did not grow from the apex but produced a shoot some 8" tall. The old stem, ex Peru, was about 1" thick and the new growth only about half that thickness. Radial spines number up to ten, with one strong central on the Peru growth. On the English growth spination is much weaker but I think it might improve in the coming seasons.

Does this help the discussion on about Kz 354 being a Bolivicereus or an Erdisia, in any way? As a postscript, could you suggest where I may obtain a plant of Lobivia pentlandii, preferably var. maximiliana, which I would like to compare with a collected plant that I obtained in Puno, the flower being red with a yellow throat?

..... from "A trip to South America" by J.M. Chalet, Cactus (Belgium) 7.3.1975

I passed the morning in visiting this ancient capital (Cuzco) of the Incas. La Plaza de Armas needs no further description, with its lines of houses in the Spanish style with carved wooden balconies, its Cathedral and the Convent of Mercy.

Early in the afternoon, I set off in a ramshackle old bus in the direction of Pisac on the river Urubamba in order to visit the remains of an Inca citadel. The descent is giddy. The road cuts a passage in a gorge with very steep walls covered with bromeliads. On the less precipitous slope grow Trichocereus cuzcoensis, Erdisia aureispina, and Tephrocactus. Having reached the village, I pushed along up the climb to the citadel. On the way, I cut off a branch of Erdisia aureispina which grew at the foot of a waterfall. At the approach to the ruins, I discovered numerous examples of a Lobivia with carmine flowers, as well as Austrocylindropuntia subulata. On returning to the village, I was only just in time to see the cloud of dust raised by the last bus going back to Cuzco. With other tourists who had suffered the same misfortune, I climbed into the back of a lorry.

After having visited Machu Picchu, a site of incomparable beauty, on the two following days, I then flew off for Lima, La Pax (7°C) and Asuncion (43°C in the shade). The bus took me by night to the Iguazu waterfall, eighth wonder of the world, thence to Curitiba, Sao Paulo, and finally Rio.

..... from H. Middledtich

The slide of the Erdisia growing near Pisac is quite astonishing, for it seems to be surrounded and almost

overgrown by herbaceous plants, some of which are also in flower. Referring back to Chileans No. 29, I see that Weberbauer places the transition between the herb-poor cactus zone and the "grass steppe with scattered shrubs" at about 3,100/3,000 m altitude. This is about the altitude of the ruins at Pisac. The columnar *Cereus* (*Trichocereus*) *cuzcoensis* is reported by Weberbauer to occur at altitudes up to 3,500 m — did it perhaps appear near Pisac? Were there any *Tillandsias* growing on the ground, on bushes, or on the columnar cacti? Were there any Bromeliads to be seen growing on the rocky slopes? If this vegetation was characteristic of the vicinity of Pisac, then it is more likely that Kz 354 is an *Erdisia*, rather than a *Bolivicereus*. Were the "sprawling" plants seen by J.C. Hughes of similar appearance to the upright growing plants? Were any of these sprawling plants also in flower? Could Knize have collected some of these sprawling plants in the dry season and mistaken them for *Bolivicereus* because of their sprawling habit? But if he collected seed, there should have been a quite evident difference between the spiny fruit of *Erdisia*/*Corryocactus* and the spineless fruit on *Bolivicereus*. Are the fruit on *Bolivicereus* like those on *Matucana* and other *Loxanthocerei*?

..... from J.C. Hughes

Indeed the Plaza de Armas at Cuzco is a very beautiful setting. The Church and Convent of Mercy dates from the foundation in 1536. It was destroyed in 1650 by an earthquake and then rebuilt. At about 15 miles out from Cuzco the road was running along beside the river and I saw there plants of *Trichocereus* sp., possibly *T. cuzcoensis*, growing in the long grass at the side of the road; these plants looked about 10 to 12 feet tall. Growing along with them was an *Opuntia* which to my eyes at least seemed to have affinities with *Opuntia cylindrica*. I did not see any *Erdisias* at this site. The *Erdisias* and *Lobivias* which I saw were at the monument of Pisac itself.

Now regarding the yellow flowers growing in the grass alongside the *Erdisia* — they looked to be bulbous plants — *Trigrida* or *Iris*, perhaps? Also growing wild here were *Calceolarias*; I think the common native name for these plants was *Zapateros*. The vegetation at Pisac was fairly lush — the grass was up to one foot high and there were many annuals growing and flowering (it was March). There were no columnar cacti around the monument — only on the valley floor. The car was left some 400 yards from the ruins and a narrow path ran round boulders to the terraces shown on the illustration in the Chileans (inside cover No. 29). The rocks were clothed with Bromeliads; *Tillandsias* of the Spanish moss type over-ran others of the conventional upright, broader-leaved type. This latter group flowered with pink and blue flowers. *Hechtias* with flower stems taller than a man overhung the trail. From memory there did not appear to be any bushes near the monument. I do remember seeing the Spanish moss growing on the only tree in the town centre in Pisac.

All the flowers on the *Erdisias* appeared similar to me, although I was not looking for minor variations. There was some evidence of plants arching over and re-rooting, rather like blackberries, although I did not attempt to pull any up to check this. The luxuriance of the grass was such that it was rather difficult to make a firm comment on their habit of growth, many of them growing in relatively long grass on the precipitous paths below our trail. Many plants appeared to become decumbent with age. I would have felt it hard to erect any of these plants as varieties and would consider them within the variation one might expect from a species and as such I only collected three specimens. There were no fruits to be seen on any of the *Erdisias* — it was apparently too early for fruits to have formed.

I saw no humming birds, in fact I remember nothing of the insect life at all. It always seemed amazing to me that there were so few insects around, throughout my stay.

#### A CHILEAN FIELD TRIP?

..... from D. Huxtable

I have a long-held aspiration to make a trip out to some South American country like Brazil, to see for myself the cacti as they grow out there. Not just to dash from one spot to another, taking a quick picture here and digging up the off specimen plant there, but to spend some time examining the conditions under which they grow. But unfortunately my Doctor tells me that I would be ill-advised to expose myself to the searching heat of the tropical sun, so my dream of a stay of some length in S. America is unlikely ever to be achieved.

However, I would like to ask if you or The Chileans might present a suitable person willing and eager to make this sort of trip? There must be many "Chileans" willing, as myself, to make a standard contribution in cash. The pursuit of knowledge would make it worthwhile. Is the idea so outrageous?

..... from E.W. Bentley

I certainly think that there is still much to be done in the way of detailed fieldwork on the real Chileans —



the Neoptereria and Copiapoa — to make a visit to Chile very worth-while. But recollecting my experience of Malaya, I think that a solo trip of this nature would be beyond me. From what I have read it would be inadvisable for anyone to go off alone on parts of the Chilean coast — though it would be feasible to hire a guide and work the vicinity of the towns. I suppose a lot depends on what the object of any such field trip would be. I would not mind teaming up with somebody who knew the country and how to cope with it — and had experience of packing up and transporting specimens, seeds, etc. But this would mean financing two collectors.

. . . . . from R. Martin

We have just returned from our second trip to Mexico and our wanderings this time were very extensive indeed — travelling as far north as the State of Sonora, then right across the Sierra Madre and back to Mexico city, which alone took up four weeks. From Cuernavaca we made two local expeditions, the last to Mount Popocatepetl where at an altitude of 13,600 ft. we collected *Echeveria alpina* — well named!

For many years I have had three very serious ambitions that I should like to achieve during this life : firstly to visit Mexico both for the cacti and for the country itself — which I have fortunately been able to do on two occasions now. Secondly, to visit South America, again for reasons of the plants and the countries themselves. And thirdly, the Himalayas. So I should certainly love to visit any area of South America; what had the member in mind who proposed this idea? If it were not for some further trips to Mexico that are in the pipeline for the future, we would have been to South America by now. If support is serious, we should very much think about curtailing another trip to Mexico for a year or two.

I think that the greatest and most important thing about any such trip is compatibility of the party, and then the rest is simple. You certainly need to have contacts out there, of course, so one doesn't feel quite so alone. The ideal size of party in my opinion would be four to six people, any larger and one could run into problems. At the moment the health requirements for South America are for smallpox and cholera vaccinations only; Visas or Tourist cards not being required. But of course in this ever changing world, this could alter in times ahead! It would certainly be an achievement for the Chileans to put a small party into the field; let us hope something will transpire and the idea turn into reality.

. . . . . from H. Middleditch

There are one or two practical questions to which I would require an answer before proffering any financial support to a field trip. I would anticipate that anyone extending such financial support would do so on the same basis that the great majority of such trips have been made over the past century and a half — the subscribers put up some money because they expect a fair return for their outlay in the shape of plants. Would there be any other grounds for requesting financial support that are likely to encourage members to part with their money?

To quote an example, when Sellow went out to Brazil in 1814, he "accepted from Sir Joseph Banks and Dr. Sims an advance against anticipated expences" and then "his first year in Brazil . . his (collected material) sent to Sir Joseph and Dr. Sims cancelled his debt to them".

The second aspect is place and timing; the accounts given in the pages of the Chileans of collecting trips in South America are strewn with references to problems of travelling and collecting in the rainy season; to missing the flowering time in a district and hence finding it nearly impossible to locate plants which are all but completely buried and whose colours blend with their surroundings; or to arriving a week or so too late to collect any seeds. What time of year is the right time to visit the Rio Rimac, Cuzco, Cochabamba, Salta, Asuncion, Cordoba, Uruguay, Minas Gerais, etc.? It may possibly be better to find out well beforehand, rather than affording the subscribers an explanation afterwards as to why one has come back pretty well empty handed, quite apart from personal disappointment at such a result.

Just as a minor consideration, I expect the present return air fare out to South America will be about the £500 mark.

. . . . . further from R. Martin

I have tried to probe for information regarding travel in Peru, but not very successfully so far; but I shall now go through all the travellogues available in the Chileans and digest their contents. The problem would mainly seem to be one of time factor i.e. when it would be the right time to travel about within a country (not impassable owing to rains), it is the wrong time for spotting cacti in flower or even collecting the seed. Again thinking of Peru, I do feel quite

sure that any visit should take place in November for ease of travel weather-wise, and I presume that at this time the cacti are coming into flower.

. . . . reflections from H. Middleditch

Certainly Peru has much to recommend it as a site for a cactus trip. A flight to Lima places one right in cactus country, without incurring the time and expense of further travel. The relative scarcity of pestilent insects must also make it attractive to any European. But as to a suitable time for a visit? In *Chileans* No. 24 p.134 Rauh says that "it is essential to approach the high mountains before the middle of April" but without stating why this is necessary. Harper Goodspeed, in his "Plant Hunters in the Andes" refers to the trail from Cuzco via Abancay, Andahuaylas, and Ayacucho to Huancayo — "The first of these cross country expeditions was made in the dry season, the second in the wet season". The difficulties posed by the mud and fog of the wet season, are graphically described.

Considering the coastal lomas, Charles Darwin anchored in Callao, the port for Lima, in July and complained that "almost every day of our visit there was a thick drizzling mist". Harper Goodspeed refers to a trip along the coast north of Lima in the month of April when "the winter fogs had not yet begun to blanket the coast". Then a few months later, in the lomas of southern Peru, there were plants in flower below the base of the cloud-mist, but actually in the mist itself "buds were just forming and it would be a month or more before the sun would stimulate their development into flowers". Thus "seasonal conditions constitute one of the major problems of the plant hunter. On the semiarid lower slopes, we were too late; at intermediate altitudes the vegetation was in flower, but not very rich in species. Above, where moister conditions prevailed, we were much too early". And should these views be thought inapplicable to the cacti, Rauh refers to flowers on *Loxanthocereus jajoianus* (*Chileans* 26 p.82) probably in March/April time, and to "*Cereus weberbaueri* flowers during the time of the rains, whilst *Corryocactus brevistylus* only flowers during the dry season" (*Chileans* No. 27 p.128).

Perhaps it is hardly surprising that there is a spread of flowering times, otherwise the resident humming birds, Bees, and moths, would fare badly without flowers to visit.

All of which might suggest that there is, perhaps, no "best" season for visiting Peru!

. . . . from P.G. Waterman

I very much doubt if the Chileans could afford to support anyone in the field for a long enough time for it to be worthwhile. To someone not familiar with the flora and ecology of an area I would say that it takes at least 2 to 3 weeks to settle down and begin to understand where you should be looking. This is in accord with my own experience, from my botanising trip to Malaya and Borneo last year. So in the first instance I feel that you have to think in terms of sending someone for an absolute minimum of six weeks. Then there is the problem of where to send him. You have the alternatives of either sending him to one place and therefore to examine the flora of that one area, or to let him travel and perhaps to concentrate on one genus or a group of genera — this would be even more expensive. Either way the lucky tripper should come back with some good pictures but I would think only a very sketchy idea of the subject he went over to study — i.e. I would expect him to come back with more questions than answers.

As regards important points in preparation for such a trip, I would say that preparation is all important; plans should as far as possible be made before leaving U.K. as regards route (if travelling), contacts collecting, etc., etc. Some of it is bound to go wrong but the less you have to worry about once you are there, the better. As regards a specific objective, this is very difficult and I would doubt if six weeks would be long enough for any specific objective to be undertaken, other than that of a most limited scope, e.g. the search for a very rare species.

## A VISIT TO PERU From J. Medway

On this, our second visit to Peru, we had planned to visit some habitat locations of Matucana/Submatucana, in particular places well to the north of Lima. But the Dodge pick-up we expected to use for this terrain had a smashed front suspension and spare parts were simply not available in Lima. So I never went above 2,300 m altitude on this trip and we will have to go back again in a year or two for Oroya and Sub-Matucana. With the Datsun and an old Rambler we were limited to using relatively good dirt roads — relative being the operative word. Some of them were so bad that 15 Kms in an hour was good progress.

In this way we had a day in the Eulalia valley, a visit to the Canta valley to the north-east of Lima, a trip to Churin (northwards from Lima), a 4-day trip to Iquitos in the Amazon basin, and a run up the Rimac valley to Matucana. We had the use of a two-month old Coronet — air conditioned and enormous — in which we mopped up the 1,000 mile round

trip down the Panam Highway to Atico in the south of Peru. I exposed 11 rolls of film and although the meter on my Praktica played up a bit, almost all of the slides are acceptable to good, bar a roll of Orwochrome which has come out underexposed by about two stops, although it is supposed to be 50 A.S.A.

Nevertheless I still haven't achieved a photograph of a humming bird at a cactus flower, but we saw two distinctly different species of humming bird at flowers of *Neoraimondia*, *Trichocereus peruvianus*, *Clistanthocereus* (*Borzicactus*) *tesselatus*, *Espostoa melanostele* and (in Karel Knize's nursery) at Oroya, Matucana, *Thrixanthocereus senilis*, *Espostoa sericata*, *E. melanostele* and *E. baumanii*. Karel Knize finds most of the plants are visited frequently by bees and wasps and (at night) many moths. Additionally I observed ants were very active on the flowers of *Clistanthocereus tessellatus*. We did obtain an introduction to an entomologist at the Javier Prado Museum in Lima; he may be inclined to correspond on the subject of insect life in Peru.

It had been my intention to collect soil samples in as many cactus locations as possible, but in my excitement I quite forgot to sample soil at many places. However, I did get samples from places where I collected Islayas, *Pygmaecereus*, and Matucana and that's about all. On examining the soil samples, I find that they confirm what I found in handling plants in habitat. All plants collected came from habitats where the ground was fine sand — or clay — seeming soil with small to massive rock debris and no humus. The only habitat with any fibrous loam (in the purely physical sense) was at Matucana. Here the *M. haynei* were all lifted from pockets of soil which seem to be composed of decaying grasses and moss and other vegetable matter. A test on the soil might be interesting. Do you know anybody in The Chileans willing to analyse a small quantity? (Has any member suitable facilities? — H.M.)

As to the places we visited, we had been to Eulalia before but this time added a few pictures of *H. seticeps* in flower and of *Espostoa*. We made a 2,000 mile air trip in a small jet to the Amazon, 40 miles from Iquitos. Hot and humid, mosquitoes and noisy at night. Start of the rainy season, a lot of mud. No orchids in flower. Very few other flowers. Photographed natives, river, a few butterflies and the odd Bromeliad: the birds wouldn't stay for a picture, unfortunately.

At Churin were the best stands of *Espostoa melanostele* and *E. nana* I've seen, also saw *Haageocereus acanthus* v. *metachrous*, *Mila* sp., *Matucana variabilis* (one plant, not in flower, photographed and collected), *Melocacti*, *Tephrocactus*, *Armatocereus procerus* and *A. churinensis*, *Clistanthocereus tessellatus* (collected) and *Neobinghamia villigera*.

Atico — Islayas! *Islaya grandiflora*, *paucispina*, *paucispinosa*, and *bicolor* (collected) also *Pygmaecereus bylesianus* and *P. akersii* around Chala. Saw *Corryocactus brachypetalus*, *Neoraimondia aticensis*, *Haageocereus litoralis* and *H. repens*. Oh boy! is it barren on this coast. Night stops in Chala with no breakfast available.

Canta — *Melocactus amstutziaea* (collected) also collected *Loxanthocereus* sp. Karel Knize identified this as *L. faustianus* but I am fairly sure that I've got two distinct species — the other will be *Lox. canaensis* or *L. pullatus*. Also saw *Mila cantaensis* (collected), *Tephrocactus mirus* and *Austrocyllindropuntia* sp. collected as well. Many *Haageocereus* here including *divaricatispinus* and *H. viridiflorus*.

As I did not get to my primary objective, we had a quick run to Matucana for *M. haynei* (Collected) and *Loxanthocereus acanthurus*. Also saw *O. subulata* and *Trichocereus peruvianus* with one flower only. All of the *Mat. haynei* were small as a recent earthquake has covered the habitat. This place must get more rain than the other locations I visited. It was the only place, outside of Amazonia, where I got wet in the whole month although the Garua is pretty depressing around Chala.

I have photographs from my last visit to three *Haageocereus* in bud, but almost all the plants I saw and photographed had seed pods and dead floral remains. I had hopes that November would not be too early for flowers as March had been too late — however, I saw only one red *Haageocereus* flower, a *H. seticeps*, which I photographed. I hadn't the heart to chop down this plant with the only red flower I saw, but I hope to organise some cuts in the spring. I'm not sure whether I've ever seen the correct *Haageocereus chosicensis*. Karel Knize identified the only *Haageocereus* I found in flower on my previous trip as *H. chosicensis*, but that plant had a green-white flower. I have one slide of it. As you will know from your list of red-flowered *Haageocerei*, Backeberg lists *H. chosicensis* as one.

I think some of the habitat photos illustrate the terrain quite well, particularly at the barren areas along the Panam Highway around Chala. I would be delighted to attend the 1976 Chileans weekend and show the slides taken on these trips. However, our duty officer rota is only prepared a month or so in advance and if I happen to be rostered on duty then, I cannot get away. If I can't make the date, somebody else can have the slides for projection.

## CHILEANS CONTENTS — SOME CRITICISM

..... from J. Hopkins

The No. 27 issue of The Chileans caused me some unease and the No. 28 issue some considerable anxiety. Although the humming bird information is relevant to some of the cacti we grow, I thought that the coverage was too deep and I have heard similar views from other members. The fact that nearly one third of No. 28 is filled with data, and quite detailed data at that, on plants of non-cactaceous status gives me cause for concern. In view of the content of the last two Journals and the fact that there has been a year between them, I suspect that many members will think twice about renewing when there is the call for a much increased subscription.

I would therefore urge that more priority is given to proper articles written by our members. I feel that the balance between historical and current data is swinging too far towards the former and the wealth of "snippets" from members in No. 28 makes for relatively uninteresting reading. Maybe I have more cause for complaint than others as it is now over two years since I started the article on the *Lobivia incaica* group and it has been revised once, already.

I had hoped to be able to raise the subject of the Journal content at Brooksby, but a whole session on production difficulties was perhaps a sufficient waste of the time available.

..... from K. Halstead

I do not think that the inclusion of material dealing with the caudiciform type of succulents is a waste of time. After all they are South American plants and I don't consider that the Chileans should adopt a partisan policy restricted only to cacti. It is always interesting to learn what other plants grow with our pet cacti.

On the other hand the elimination of snippets etc. from emmbers has crossed my mind. Some of it is of minimal value and only observations of any significance should be introduced. Perhaps one could be more circumspect and ask for information only from those people whose knowledge is of real value. Of course reports from members could be collated into a precis and thus cut out any un-necessary waffle.

..... from R. Purves

In regards to the complaints that have been made about the contents of No. 28 Chileans, I would tend to agree that we should stick to cacti — caudiciforms never were exciting for me and I tend to bypass any reference to these sorts of plants. However, I do quite like to read the comments from members which we relay — it gives a good cross section of opinion and ideas — as long as it is kept in perspective and doesn't proliferate to the extent that much more important and informative narrative has to be left out. Now I cannot agree that articles on the work of past botanists should be left out — surely this, as the source of valuable habitat details, can hardly be said to be superfluous.

..... from G.J. Charles

As far as criticism of recent Chileans is concerned, I would say that I find articles about climate, vegetation, insects, etc., only of interest insofar as they relate directly with cacti and are kept reasonably short. In regard to those historical articles, these are not of great interest to me unless they relate tales of cactus hunting or describe climate or other plants in association with cacti. My favourite articles are those describing modern finds in the wild by people like Buining, Ritter, Horst, Lau, etc.

Now with regard to comments from members following articles, I think that these are amongst the most valuable part of the Chileans and are a must for inclusion.

..... from R. Ferryman

I feel that a lot of the criticism of recent Chileans Journals is somewhat unfair. The succulent article I paid little attention to so I can understand the "stick-to-cacti" school of thought, but I cannot agree with criticism levelled at other articles. The point about members' comments being too long, I find strange. Surely these are what our Journal is founded upon? If the comment is interesting is it not then worth printing?

However I feel that the non-appearance of the Journal can be as dangerous as printing material which is not of interest to members. Certainly there are rumblings of discontentment in the South, but I would hate us to adopt a publish-on-time attitude evident in other publications just to ensure that Chileans members receive a specific number of issues in a calendar year.

..... from H. Mays

Personally I prefer the Chileans to deal with cacti only. Also, I do not find the background information of much help. They tend to be general travelogues without the illustrations. If they were scientific studies of soils, climate, etc., they would be more useful. The trouble with the comment following articles is that it is not edited. Things are repeated and you get comments on the comments as in conversation. Some lengthy comments are in fact articles and worth recording. The brief comments could be summarised, thus: “. . . . five people said that . . . . but two had found . . . .”

..... from R. Carter

Concerning the substance of the Chileans, this is a difficult one. Personally, I don't like any of the caudiciform succulents. However, I feel that such articles are worth inclusion, if only to give a background. In my opinion it is wise not to devote every last word to cacti, as obviously it has its limitations. I think we must endeavour to cover the whole field of South American succulents — cacti and others — along with some of the more weighty botanical items. Otherwise we fail in the aims of the Chileans which is to bring about a better knowledge both of the plants and also of the South American continent — its climate, topography, etc.

I do feel that some members may tend to regard the Chileans as though it caters only for their interests, and not for the wide range of tastes indicated by the letters and articles which are published.

..... from J.M. Heatlie

There can be few growers now who don't have at least some other succulents. The plants mentioned in No. 28 were quite new to me and I therefore found the notes of interest. Whether I would grow them I shouldn't like to say: I now have a variety of T.C.P.'s which have a fascination of their own. I feel also that the historical background to plants and plant hunters has an interest of its own which we should not lose sight of. Most of the modern books have little to say on this subject and we tend to lose sight of the debt we owe to many of the plant hunters.

I should be very sorry to lose the snippets and comments. There is so often some tip which can be put to good use. They can, however, take up quite a lot of space and perhaps with printing costs as they are, some degree of compression may be worth considering.

..... from A.W. Craig

I have one or two Cycads in the greenhouse which came to me without any leaf or sign of life. It was over a year before the first one eventually put out a leaf. The article and illustrations in No. 28 are the only information I have come across so far which tell me anything at all about these plants.

..... from I. le Page

I for one welcome the inclusion of non-cactaceous material; I believe the Journal should cover as broad a spectrum of plant material as possible. I have found that one of the Chileans main achievements is its ability to cover a topic in depth, in contrast to some Journals with a wider circulation whose appeal is ephemeral. I thoroughly enjoy the background topographical information — to my mind it is essential to furthering the understanding of plants and their habitats.

The comments at the end of the articles are also of interest to me. I don't have much contact with other collectors so these give me much useful information from other members' experiences. All in all I find it difficult to suggest any improvements on the content — please don't attempt to popularise it. This would be to court disaster, and to make it too specialised would probably have the same effect.

..... postscript from H. Middleditch

There seems little doubt that there is common concern among members at the recent undue delay between issues; personally I find it highly frustrating to have four or five issues virtually ready for publication due to delays arising from incessant printing problems not of our making. Doubtless it would be foolish to claim success in the attempts to weave together information relating to cultivation, identification, habitat ecology, species relationships from flower and seed, the biography of the collecting work and the geography of where it was done, but at least it would be the intention to continue to work in that direction.

**LOBIVIA – Part One** By Walter Rausch

From J. Hopkins

I was rather surprised that this book was not hardbacked but pleased to see it in an English version. There are a number of satisfying combinations nova, but I do not agree with all of them. I was delighted to see *L. pampana* as it should be and not with a *westii* type flower as most imports with this name possess. I do not agree with all of the combinations under *L. backebergii* – in particular I think that *L. schieliana* shouldn't be there! *Lobivia oxyalabastra* and *L. simplex* are probably inter-group hybrids. It is nice to see *L. maximilliana* and *L. corbula* sorted out – but is *L. sicuaniensis* in the right place? The *L. sicuaniensis* seed that I possess would suggest that it is a hybrid between *maximilliana* and *incaica* and certainly not synonymous with *L. corbula*. I wouldn't have put *L. quiabayensis* under *L. maximilliana*. The *L. pentlandii* group is O.K. but I know nothing of *L. hardeniana*. *Lobivia laeae* also puzzles me as I have two different seeds for R 252 and *L. laeae* R 264!

In the *Echinopsis obrepanda* group, I would have put *L. aguilari* under *L. cinnabarina*, but as an alternative it is the ideal bridging plant between these two groups. The *L. cinnabarina* combinations upset me most as these are clearly two distinct seed groups. Furthermore I am far from convinced of the synonymy between *acanthoplegma/taratensis* and *oligotricha/pseudocinnabarina*.

Whilst these are my views in brief I nonetheless look forward to the other two volumes.

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

The first part of Rausch's "Lobivias" is an extraordinarily interesting book and well worth the exorbitant cost – at least to a student of Lobivias. He is obviously a great lumpner but there is certain logic in his reasoning and he really throws considerable light on the genus, which is really in an awful mess, otherwise he would not be able to call 14 "species" and 5 varieties just plain *pentlandii*.

..... from H. Middleditch

Apart from being a valuable ready reference to the northern Lobivias, this booklet contains some first-class colour photographs of plants in flower. The distribution maps are quite handy as a quick reference, but further maps are required to locate place names in the text. The flower sketches are drawn to a good standard and would have been even more useful if they had been accompanied by a scale. There is no indication whether the fruit is drawn to the same scale as the flower, or not. The seeds could have been drawn to a larger scale in order to bring out the detailed differences much more clearly; plenty of room is available on the page to do this. Again, it would have been of advantage to have had a scale for the seeds.

There does not appear to be a single reference to the nature of the habitat, topography, or associated vegetation in the places where these plants were found.

**WRINKLING PLANTS** From P.D.R. Allcock

I have noticed that on days of very hot sun, certain plants in my greenhouse wrinkle up on the shoulders and the crown. So far I have noticed that this happens with *Submatucana celendinensis* and *grandiflora* and also with *Oroya peruviana*. These are all imported plants. This wrinkling lasts through the day, but by the next morning the plants are back to normal again.

This has already happened three or four times this year with the *Submatucanas* and once with the *Oroyas*. The plants show no ill effect from this at all and all three continue to grow strongly. Presumably this phenomena is due to an increased rate of transpiration in hot sun and the cells simply plump up again with moisture during the night. I am amazed that no scorching occurred – although when I think about it, I have never yet succeeded in scorching a *Matucana* or a *Submatucana*, though I must have managed it with just about every other genus. *Copiapoa* seem to be one of the most susceptible to this. Why this should be so is totally beyond me. I can't see that it can be a question of transpiration (although our relatively humid climate would inhibit a high rate of transpiration) since the plants could not afford to transpire at any great rate in habitat due to lack of replenishing moisture. Imported *Copiapoas* with their protective "bloom" seem to be just as susceptible to scorch as seedlings, in my greenhouse.

## REPORT & ACCOUNTS for CHILEANS Nos. 28-30 (1.1.75 – 31.7.76)

Income		Expenditure	
Subscriptions (including supplement)	£684.03	Printing — Journals and Reprints	£1414.60
Subscriptions in advance	55.62	Postage, Stationery, etc.	246.24
Sale of Back numbers	277.25	Recoverable expenditure	14.54
Sale of Year Books etc.	90.00	Balance carried forward	650.90
Sale of plants & seeds	50.83		
Bank interest	111.18		
Miscellaneous income	133.21		
Balance brought forward	924.16		
	<u>£2326.28</u>		<u>£2326.28</u>

In the previous Report and Accounts (which appeared in Chileans No. 28) it was intimated that expenditure might exceed income by about £1,000 for Nos. 28-30 and it will be seen from the above that the cost of printing and postage exceeded subscription income by almost this amount; this takes into account the income received from the supplementary subscription for which we were obliged to call. The float is now adequate only to meet the printing and postage cost for one issue, the cost of which must be met whilst subscriptions are still arriving. The new subscription rate reflects current costs of printing, postage and stationery.

Our complaints of delays, difficulties and poor workmanship in printing continued to go unheeded by the printers; to underline our dissatisfaction the printer's bills were not met in full and finally alternative arrangements have been made for printing The Chileans.

In preparation for the anticipated visit by Mr. Buining to our 1975 Annual Gathering, a special effort was made to bring out one issue of The Chileans largely devoted to Brazil, which was probably Mr. Buining's favourite collecting region. In the event, an infection prevented his coming, but this also added to printing delays in postponing the appearance of much other valuable information which had already been received from Members.

We continue to be indebted to our translators for handling foreign articles covering an ever-broadening range of ecology and background information, and to our Hon. Officers for their handling of the administration, especially with the additional problems arising from the printing delays. The value of the slide library has been extended by the donation of further slides and by a number of commentaries written by members. There have been fewer opportunities to obtain seedlings for plant sales and there has been a reduction in the quantity and variety of seeds received from Members for the seed pool.

### FORTHCOMING TOPICS

We should be pleased to hear from members who sow a fairly wide variety of seeds whether they have found any particular genera normally seem to take longer than average to germinate; or have flowered any *Austrocactus* or established an imported specimen; or have noted a scent associated with any particular species of *Copiapoa* or *Gymnocalycium*; or have had any fruit ripen on plants of the *Gymno. megatae/marsoneri/tudae* group, or on any *Weingartia*; or have taken a flower section on *Matucana myriacantha/weberbaueri* and have noted the form of nectar chamber present.

## STUDY GROUPS/ROUND ROBINS

Cleistocacti	T. Lavender, 62 Finchdale Avenue, Billingham, Cleveland, TS23 2EB.
Copiapoa	D.J. Lewis, 80 Pencisley Road, Llandaff, Cardiff, CF5 1DQ.
Frailea	J. Forrest, Beechfield House, Meikle Earnock Road, Hamilton, Scotland.
Gymnocalycium	G.J. Swales, 5 Hillcrest, Middle Herrington, Sunderland, Co. Durham.
Lobivia	J. Hopkins, Primrose Cottage, Monks Lane, Audlem, Cheshire, CW3 0HP.
Matucana/Borzicactinae	P.H. Sherville, 51 Park Road, Enfield, Middlesex, EN3 6SR.
Melocactus/Discocactus	Mrs. L. Teare, 27a Maher Street, Kensington Gardens, Adelaide, South Australia, 5068 Australia.
Neoporteriae	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, Kirklevington, 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.

## THE CHILEANS

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Treasurer	R.L. Purves, 19 Brocks Drive, Fairlands, Guildford, Surrey, GU3 3ND.
Membership Secretary and Back Numbers	Mrs. A. Lavender, 62 Finchdale Avenue, Billingham, Cleveland, TS23 2EB.
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Slide Librarian	A.W. Craig, Davela, Forest Lane, Kirklevington, Nr. Yarm, Yorks.

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