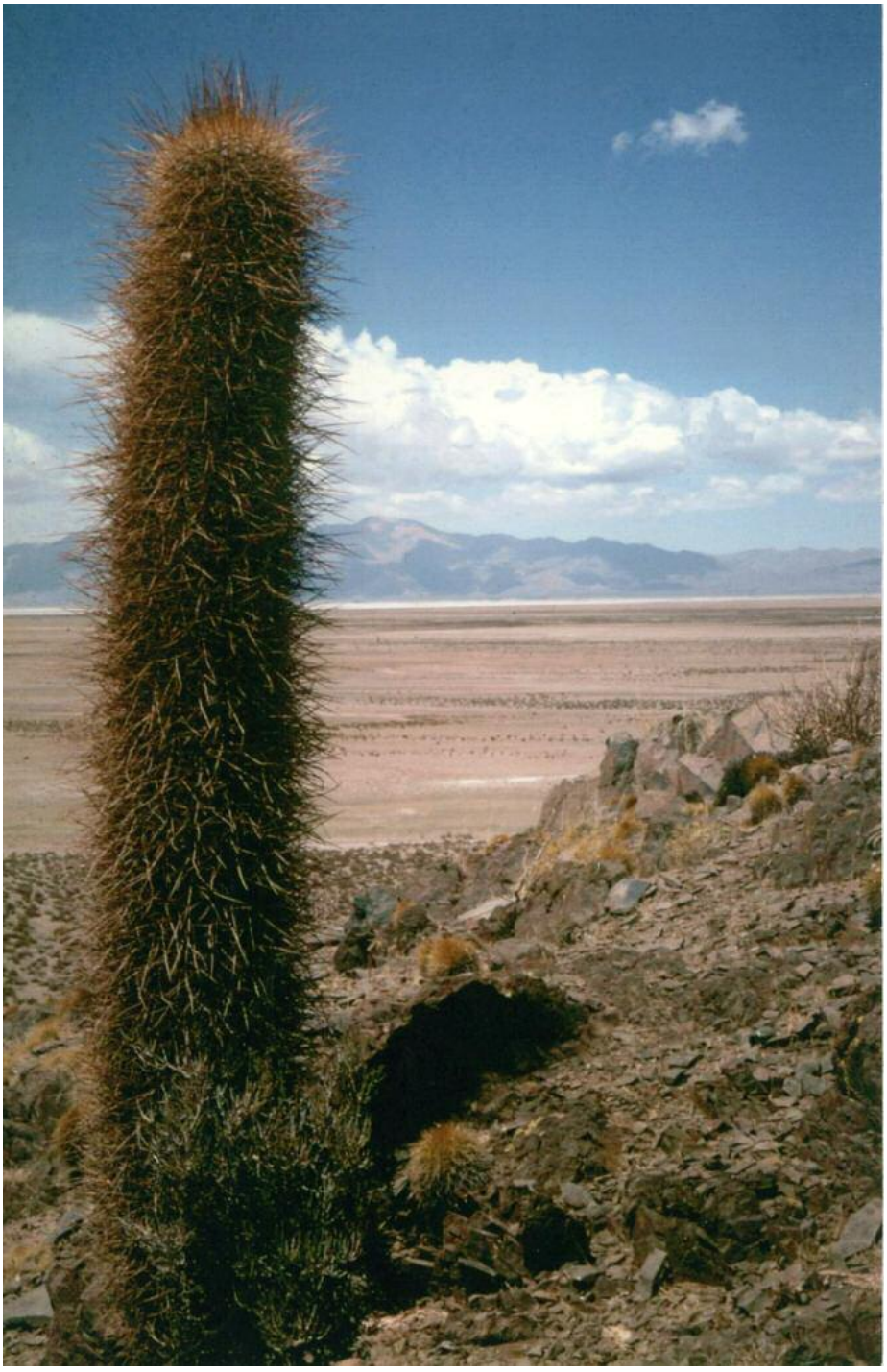
THE CHILEANS 2006

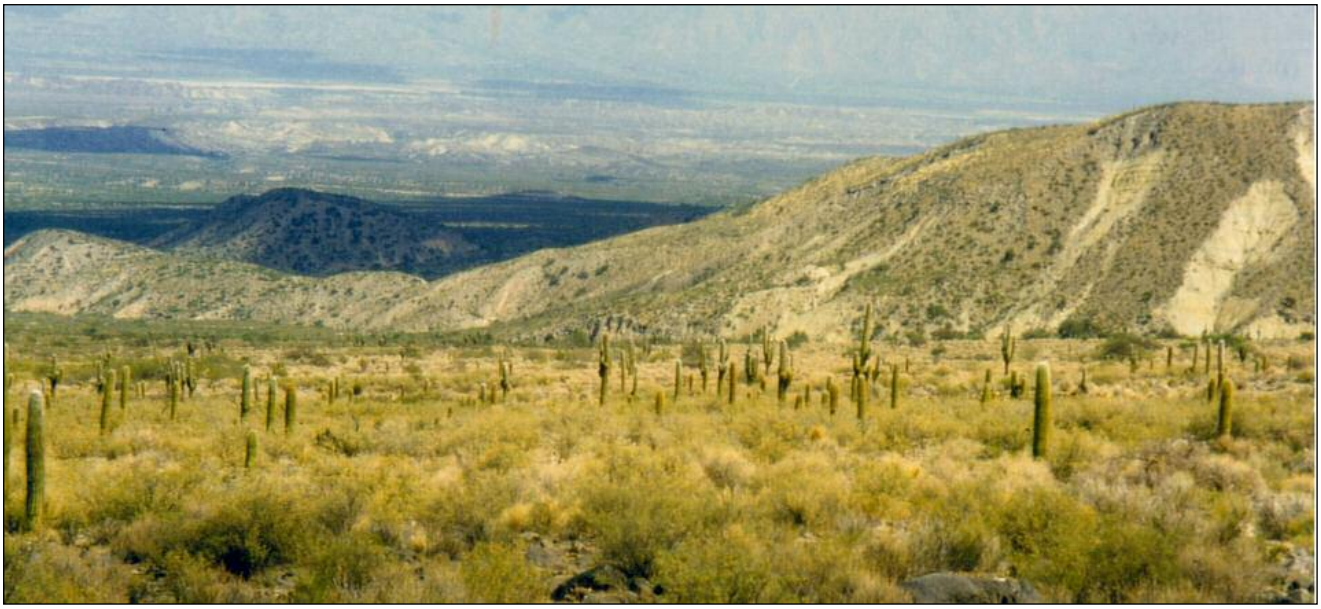
VOLUME 20 NUMBER 64



Trichocereus pasacana

near Salinas Grandes, Jujuy, Argentina

Photo: - R. M. Ferryman



Trichocereus pasacana

Amaicha
del Valle

Photos:
F. Kasinger

Trichocereus pasacana

near Jujuy

Photo:
R.Kiesling

TRICHOCEREUS ATACAMENSIS From A.W.Craig

We came across Trichocereus atacamensis at several places both to the north and to the south of San Pedro de Atacama. The air is so clear up in the mountains that distances become very deceptive. These tall Trichocereus always turn out to be further away and taller than they appear to be when seen from a distance. They may look as though they are about five minutes walk away and possibly 5 to 7 feet tall, but one walks and walks without them coming much nearer until after almost half an hour they are finally close and prove to be a good twenty feet or more in height. They were seen not just at one or two spots, but at several places in this area. They were never seen in vast numbers stretching considerable distances over the hillside, for in some places there would be only about half a dozen scattered columns, at other places a dozen or more. To find some thirty to forty plants spread over one locality was uncommon, but much more often there would be no great number at one place.

We saw these plants growing near Baños de Puritama, and they were also to be seen from the road going south from there, in patches. At one spot they would be growing, then none were to be seen, then they re-appeared. As we continued to travel south towards San Pedro de Atacama we could see patches of these plants down to an altitude of 2600m just before the road descended fairly sharply down into the plain of the Salar.

From San Pedro de Atacama we drove south to Socaire, venturing on to the Salar for part of the way to look at one of the small Lagunas. We were probably too far from the mountain slopes rising to the east of the Salar to be able to see any of these columnar plants which might have been growing there. Not until we were approaching Socaire did we see Trichocereus atacamensis once again, at about 2800m. We went further east from Socaire and found more of these plants on the valley sides at 3250m altitude. When we were about 7-10 km to the east of Socaire we looked further to the east and from that point we could not see any more T.atacamensis; the altitude may possibly have been too high for them.

We did gain the impression that these plants tended to be on north facing slopes and that the flowers also tended to point towards the north. The flowers had an upward inclination so that it was quite impossible to obtain any sort of vantage point which enabled the camera to be pointed into the flower. We did try throwing a stone up at flowers and fruit but were rapidly discouraged by the effort required at this altitude and the ineffectiveness of this attempt compared with the robust nature of the flower or fruit.

.....from F.Kasinger

Our journey began from Tucuman, heading off westwards in the direction of Tafi del Valle. Up to here the terrain had been furnished with a rather luxuriant tropical vegetation, but now the trees soon disappeared and out of the jungle emerged a rocky landscape. From Tafi del Valle the road ascends further up to the pass of Abra del Infiernillo, a pass which lies at 3000m elevation and which as a result is frequently shrouded in mist. On the other side of the pass lay a landscape which until now we knew of only from photographs. The rocky slopes were initially covered with tufted grasses and small shrubbery, but this vegetation did not remain in view for long. Soon the first columns of Trichocereus pasacana were spotted. As the narrow valley starts to widen, a vista opens up towards Amaicha del Valle and the Calchaquies valley beyond.

The road and the river now took separate courses and before us lay a gently sloping terrain completely covered with a wide expanse of ‘Los Cardones’. The large number of columns of Trichocereus pasacana almost took our breath away. It was altogether a very impressive picture to take in. We continued only a little further and soon the first huts and houses of Amaicha del Valle began to appear. Surprised by the rapid onset of dusk, we were obliged to make an overnight camp here.

.....from J.Lambert

When you leave Purmamarca by the road to Abra de Pives, there are quite important populations of Trichocereus pasacana to be seen at first, but these become progressively less abundant as the altitude increases. Above 3000m one only observes some scattered, isolated specimens, which remain short, like dwarf forms; whilst above 3500m the species vanishes altogether. The same sequence is to be observed when ascending the Cachipampa, coming from Payogasta.

.....from H.Middleditch

And were there any tall columnar Trichocereus to be seen near the border with Bolivia, en route from La Quiaca westwards via Tafna and Cieneguillas to Santa Catalina, or elsewhere in the north-west corner of Argentina?

.....from J.Lambert.

No, because here again the altitude is too great for these plants.

.....from H.Middleditch

But in the account of the 1905 trip undertaken by Fries to the altiplano in the north-west of Argentina, there is an illustration (Plate IV.1) of tall columnar Trichocereus near Cochinoca at c.4,000m altitude. However, these plants are growing on a very steep hillside, so steep that ascending it on foot would be decidedly difficult. Perhaps it is the lack of such suitable environments, rather than the altitude, which brings about the absence of these plants in the very north-west of Argentina?

.....from G.Hole

After we had been to San Pedro de Atacama and the surrounding area, we took the main road from there to the east. We passed the foothills of a very high volcanic peak and then went through many miles of monotonous countryside with numerous flattish areas with salt pans, of greater or lesser extent, separated by hills and ridges, with no obvious sign of any interesting vegetation. Over the border, into Argentina, it was more of the same, but with the flattish areas more extensive. For most of this journey the road ran pretty well straight with occasional easy curves. About ten or twenty km beyond Susques we climbed over the Sierra del Cobre and here the road had to ascend by sharp curves and twists. On this climb we saw some columnar

Trichocereus growing on the mountainsides.
.....from H.Middleditch

As far as I am aware this is the very first report of Trichocereus being found in this particular area of the Altiplano in north-western Argentina. Susques lies somewhat closer to Sierra Aguilar - where we now know that T.poco grows - than it does to San Pedro do Atacama, where T.atacamensis grows. Were the flowers pink or white on the Trichocereus near Susques?
.....from G.Hole

We saw white flowers on many of these plants, which were to be seen over quite some distance on the slopes above and below our route.
.....from H.Middleditch

According to my 1;500,000 map of northern Argentina, Susques is at 3675m altitude, so presumably these particular white flowering, columnar Trichocereus were growing at around, or somewhat higher than, 3700m altitude.
.....from R.Ferryman

When we made a return visit to Argentina in 1995 we travelled up the length of the Quebrada del Toro. For many km along the central part of this valley we were seldom out of sight of columns of Trichocereus pasacana. But in the upper section of the valley, probably above about 3250m altitude, we rarely, if ever, saw one of these plants. It was the same after we crossed the pass and went on to San Antonio de los Cobres, over almost plateau like terrain. Going north from San Antonio de los Cobres the road left behind some quite easy gradients until it was crossing over almost dead level ground which carried almost nothing at all in the way of vegetation.

Shortly before we actually reached the margin of the Salinas Grandes we stopped, left the car, and walked about a km over this perfectly flat ground to a mountain spur. The ground we crossed was sandy or gritty with little if any signs of stones and certainly nothing remotely resembling any rocks. Arrived at the mountain spur, we found it was formed largely of a rocky outcrop with the surface partially covered with broken stones and grit. And yet on climbing to the top we found a few Trichocereus pasacana growing here and there, where their roots were more likely to have some inches of grit covering the rock, rather than some feet of grit. They were not dwarf plants, either, several having grown tall enough to put out three or four branches.
.....from G.Hole

When we had our lengthy stop near Abra de Pives I had more than ample time on my hands so that I was able to take a close look at the Trichocereus atacamensis growing there. The younger and shorter plants had long gingery orange brown spines, but there were no flowers to be seen on any of these young plants. The spines on these young plants would be up to about 4 or 4.5 inches long in that locality, the uppermost ones curving over like you can see on Echinopsis leucantha. The older and taller plants had whitish spines which were finer and shorter and seemingly more numerous than the spines on the early growth. There were flowers to be seen on some plants, but only on this older growth with the rather hairy spination. I had the clear impression that this mature short, whitish, spination was even shorter still on the later growth after the plant became old enough to flower. We saw similar plants displaying both juvenile spination below and mature spination on the upper part of the stem, a short distance to the east of Susques where the road passes through a mountain chain. There were similar plants growing almost side by side near Lipan. The difference in the appearance of the younger and older stems is just like the difference that can be seen on young and older growth on stems of Browningia.

The Trichocereus atacamensis we saw in Chile, in the mountains around San Pedro de Atacama, were rather smaller versions of what we saw in Argentina, probably because of the greater harshness of the climate there.
.....from G.Charles

Travelling up the Quebrada del Toro, once the damper woodland part is left behind, then the Trichocereus pasacana can be seen in dense stands on the slopes for a considerable distance. Further up, when the Pyrrhocactus appear, then the T.pasacana are at the side of the road, on the less steep slopes, where we also found other cacti. These plants displayed the typical long, dark spines on the lower section of the stem. We saw many Trichocereus atacamensis to the north of San Pedro de Atacama where the top of the old plants seemed to be much more densely spined with fine hairy spines than we had seen on Trichocereus pasacana. But in my opinion these plants are still one and the same species.

It is my impression that all of the Trichocereus atacamensis which we saw in northern Chile have added spines at each of the older areoles over the course of many years - or even decades - so that they eventually display a dense coat of spines on the lower part of the trunk. It is a very hard environment in this habitat and I expect that the dense coat of spines is developed to give the plant some added protection.
.....from H.Middleditch

It is really quite surprising how many of my taller plants of Trichocereus produce a nice clean tuft of new wool at the top of old areoles, together with a couple of brand new spines. Not at all areoles every year, by any means, usually just the odd one or two. On the tallest plants there may be as many as half the areoles in the lowest section of the trunk which have produced more areole wool and some new spines. If this can happen on Trichocereus not much over a foot in height in cultivation then it can surely occur in habitat on tall columnar T.atacamensis.
.....from H.Blossfield, C.&S.S. G.B. Journal, December 1935

On our expeditions through the remote valleys in the extreme north of the province of Jujuy and south Bolivia we photographed several gigantic cristates of Cereus pasacana. These monsters with snow-white hair stand on the slopes of the mountains like a hand with outspread fingers on a mighty arm. But despite so many

hundred snow-white giant columns, we sought in vain for small plants, less than 2 m high and yet with typical white bristles. All the young plants had close, long, brown spines. The reputed species Cereus cephalopasacana or pascana alba owes its existence to the desire to add one more species to the catalogue. The seedlings of these two forms show no difference either in their native place or in cultivation in europe, which would justify the setting up of a variety. In its native place one can be certain that in the high mountains and plateaux, Cereus pasacana, as soon as it has reached a given age, will form white bristles, instead of the long, stout, brown spines of the young form. At lower levels and on the plains the formation of white bristles is entirely suppressed and the plant remains brown-spined even in old age.

.....from C.Norton

On a visit to various nurseries in Germany this year we found in one of the nurseries a huge plant of T.pasacana. It must have been all of twelve feet high. The first six to seven feet as strongly spined and from that point upwards the plant was very finely spined.

.....from H.Middleditch

It is now many years since Buining remarked on the appreciable variation in spination to be seen on T.pasacana as he travelled through Argentina. But it is open to question whether the Cereus which were seen by Blossfeld “at the lower levels and on the plains” would now be regarded as falling within the ambit of T.pasacana

It is nearly as many years ago that a picture postcard was received from R.Kiesling, posted in Jujuy, with a picture of what has every appearance of being a Trichocereus pasacana which must not be of any great height since it is furnished solely with the long, stoutish, dark spines of the younger plants of this species. Nevertheless, it has produced two open flowers from among these “juvenile” spines, right at the crown of the plant. This might suggest that the plant flowers first and then changes its spination, rather than visa versa.

.....from M.Lowry

When travelling in the Quebrada Humahuaca in 1999 we came across one shortish plant of Trichocereus pasacana which had not yet changed its spination to the white, bristly form, but it was nevertheless carrying a flower or two right at the crown, among the strong brown spines. Near the end of that trip, we were not far from Capillitas en route to Andalgala, when we came across another similar plant, still with the juvenile spination, but with flowers in the crown. At this point we were very fortunate to be able to take a photograph of the flowers, with the camera at about the same height as the top of the plant.

.....from G.Charles

One of the Trichocereus pasacana we met with at Km 75 along the Quebrada del Toro, shortly before reaching Puerta Tastil, was under a metre tall and carried only the long spines typical of the younger plants of this species. Nevertheless it was in flower, (rather like the plant on the picture postcard from R. Kiesling), showing that they do flower before producing the short white spines.

.....from R.Ferryman

During the course of several visits which we made to northwest Argentina, we have come across Trichocereus pasacana at various places - they appear to be fairly widespread. Usually their first branches are from about 2m above the ground, with two or three branches, or on older specimens even up to half a dozen branches from that level. On older and taller plants they are often followed by more branches at 1 or 2m further up the main stem, which always grows more or less vertically. But solitary columnar plants several metres high are not uncommon. In the Cardones National Park, en route to Cachi, there were thousands of T.pasacana to be seen, stretching as far as the eye could see over the very slightly sloping ground, accompanied only by scattered dwarf vegetation. These Trichocereus stood mostly some yards apart from one another and many were short solitary specimens suggestive of good regeneration.

On several occasions we came across these tall Trichocereus growing near to ruined properties, which gave the impression that they had originally been planted in order to be farmed for their fruit and for their timber. The Quebrada Humahuaca is a site of internationally recognised importance and a book has been produced to detail its features, which does make reference to this very situation of the T.pasacana (“the Cardones”) being farmed. It was used for such as window frames, doors, and floors in churches. At a number of places we certainly came across these plants of which only the base remained, as they had evidently been cut down, leaving only a stump which could be barely three feet tall. But such a stump did often carry flowers from the areoles at the edge of the cut-off, even as many as a dozen flowers.

In the Quebrada del Toro these tall Trichocereus were to be seen amid the ruins of Santa Theresa and in the Quebrada Humahuaca they grew all around and amongst the ruins of Tilcara. From the town of Humahuaca we took the road climbing round the lower slopes of the Cerro Negro to Coctaca, where again these Trichocereus were growing among the low walls that were all that remained of this village. These were the last of the T.pasacana that we saw in the environs of the Quebrada Humahuaca.

We have made field trips to northwestern Argentina during the months of November, December, and into January, during which we have always seen the Trichocereus pasacana in flower. Probably not all the mature plants in any one population would be in flower, but quite a lot of them would be in flower. Most mature plants would be carrying a considerable number of buds and there could be anything from one open flower to a dozen of them on an individual plant. From these sightings we have come to the conclusion that their flowering season extends over several of the summer months -the southern hemisphere summer of course. Near Coctaca we found one or two T.pasacana with red flowers and a T.tarijensis with white flowers, doubtless the result of hybridisation resulting from birds or insects visiting flowers of both these sorts of Trichocereus.

It was during a field trip made in the month of February that we finally found these T.pasacana in fruit at quite a few places, but still with some late flowers as well on the same plants. When it is ripe, the fruit is naked, blackish green in colour, ovoid, not quite as large as a golf ball and often with the stigma still attached.

I can confidently say that we saw fruit which had split but was still attached to the plants, but there was also similar ripe fruit to be seen lying on the ground around those plants. It is not clear if the fruit falls off the plant of its own volition, or whether some visiting bird or other agency causes it to detach and fall to the ground. There were almost always ants to be seen crawling over the split fruit and at one or two spots we actually saw rodents eating the fruit on the ground. The fruit is filled with a sticky, stiff white pulp in which the seeds are embedded.

The seedlings grown from the collected seed are now about 4 feet tall. My Trichocereus atacamensis which was about 8 feet tall when it was moved from Stonham Aspal to Littlehampton, came from Roanoke about thirty five years ago. It was said to have been grown from habitat collected seed, which is very probably correct bearing in mind that there would hardly be any other possible source of seed for this particular plant. It was kept in a pot for some time and then moved into a free root run, which resulted in reaching 8 feet in height. Even though it had to be put back into a pot in preparation for the move, it has attained its present height of about twelve feet tall. It has produced flowers for the last ten years. The flower buds have appeared from some 12 to 18 inches down from the crown, accompanied by the long, stiff, brown spines in a similar manner to the photograph from R.Kiesling.

.....from R.Kiesling, Darwiniana 1978

Trichocereus pasacana Plants tending to be tree-like, of up to 15m in height, with a central trunk and branches of the first order parallel and close to the trunk; presenting the appearance of a candelabra.

Lateral branches arising at between 1.5m and 3m up the trunk. Spines straight, brownish-yellow, on young plants (up to 1.5 m high) they are robust, subulate, long, and rigid - up to 13 cm long and 3 mm in diameter; on older specimens they are acicular or bristle-like, slender, flexible, very numerous, with no distinction between radials and centrals. Young plants have some 13 slender radial spines, flexible, yellowish, of 1.4 to 4 cm long and some 8 subulate central spines, of which the most central one reaches some 15 cm long, the upper one a little less and the other 6 are of roughly 5 cm in length, disposed in pairs. On the mature trunk the areoles are deciduous and only new spines grow on the scar. The flowers arise from the upper third of the main trunk and the branches.

.....from G.Charles

I find it difficult to understand the comment made by Kiesling, about new spines growing from the scar where the areoles have become detached from the lower section of the trunk. If the areoles are the "growing point" how can new spines grow from the scar if the "growing point" has fallen off?

.....from H.Middleditch

Strictly speaking the growing point exists at the tip of the vascular bundle which normally lies at a depth of a few layers of cells below the exterior of the epidermis. Once the spines have ceased to grow longer, they become woody and the then existing areole has then ceased to grow. But the vascular bundle below the areole will push out fresh areolar growth at the uppermost part of an existing areole even if the woody "dead" areole becomes detached, so that the vascular bundle can still regenerate a new areole where the old one stood.

.....from F.Vandenbroeck

Your mention of the flowering of Trichocereus atacamensis urged me to look at my own slides of these plants. Near San Pedro de Atacama we only saw flowers near the top of the plants. In the Quebrada del Toro there were not only flowers from near the top of the stems but also flowers from down the side of the stem for a distance of up to several metres below the crown. On the Isla Pescadores in the Salar Uyuni, Bolivia, flowering was similar to those in Argentina.

.....from F.Kasinger

The Trichocereus pasacana which we saw in the Valle de Cardons on the descent from Abra de Infiernillo to Amaicha del Valle, certainly carried flowers for some distance down the side of the stems.

.....from K.Gilmer

Travelling in the north of Argentina we came across Trichocereus pasacana at various places in and around Quebrada Humahuaca, Quebrada del Toro, and the upper Calchaquies valley. There were flowers to be seen on many of these plants, not just in a bunch at the top of the stems, but here and there down the sides of the stem for at least one metre from the top. Although we certainly did see some of these plants with flowers appearing from down only the one side of the stems, on other plants the flowers came from both sides of the stem. Near Molinos we saw plants with perhaps only two or three wide open flowers, and then going up the valley to Brealitos we found plants with literally dozens of open flowers. Near Molinos in the broad Valle Calchaquie we saw these plants growing on gently sloping ground, but in the valley to Brealitos, at no great different altitude, there were T.pasacana growing on slopes that were too steep to climb.

.....from H.Middleditch

The first description of Pilocereus pasacana Web appeared in Förster-Rümpler's 1886 publication, without any real information on habitat location, as was common in those days.

.....from Förster-Rümpler, Handbuch der Cacteenkunde 1886

Pilosocereus pascanus Web.

In habitat the stems reach a height of 10 or even of 20m, with few branches, the lower part being furnished with spines, the upper with hairs. To this species belong both the dead stems which were displayed among the products of the Argentine Republic at the 1878 Paris Exhibition.

.....from Monatsschrift für Kakteenkunde, 1893

From our highly respected friend, pre-eminent in his knowledge of cacti, Major-General Dr. Weber, the Berlin Botanic Garden has received a quite extraordinarily valuable collection of cacti, the greater part original examples of species which he has named. In the accompanying letter to us are a very considerable number of interesting and important observations which we must not withhold from our friends. Today will be the report

of Cereus pascana Web. It is the giant of its family from the high valleys of the Cordillera of Catamarca and Salta, both provinces in the north-west of Argentina. Its height attains 6-8-10 m, occasionally it reaches as much as 15-20 m tall. The plants propagated in our collections originate from seeds which were collected near Yacutala, District Belen, Catamarca state. This species produces very large flowers of whitish colour, similar in form to those of Echinopsis.

.....from H.Middleditch

Did the writer of these lines mean that the flowers were similar in form to Echinopsis leucantha, known from Argentina for several decades previous to 1893? i.e. with rotate flowers. Presumably he did not mean similar in form to the flowers on the Echinopsis known since the early 19th century from Uruguay and Rio Grande do Sul, in which the general body of stamens, as well as the style and stigma, droop down to the lower part of the flower opening. The impression gained of the form of the flowers on T.pasacana, in particular from the picture postcard received from R.Kiesling, is of a rotate flower, basically similar to that on Trichocereus poco/tarijensis.

Over many years various writers have elected to place these plants in other than Trichocereus e.g. Backeberg into Helianthocereus, Rausch placed the Trichocereus poco/tarijenis into Lobivia whilst ignoring the T.pasacana whose flowers differ mainly by their colour rather than by their overall form. In this instance the traditional designation of Trichocereus adopted by Kiesling would appear to be logical. The use of the name Echinopsis for these plants does nothing to help lucid discussion and merely causes unnecesary complications.

It now appears to be generally accepted that no real distinction can be drawn between Trichocereus pasacana and T.atacamensis. It would be re-assuring to have more positive details of the flowers in order to make a comparison.

.....from G.Charles

Because of the height at which the flowers appear on the stems of these plants we were not able to obtain a view looking straight into any of the flowers.

.....from K.Gilmer

Although we did see a very considerable number of T.pascana in flower at many places in northern Argentina, all these flowers were well above head height from the ground, mostly twice that distance, so we were not able to take a picture looking straight into the mouth of a flower.

.....from B.Burke

During the course of our visit to Chile, we came across hillsides carrying very many Trichocereus atacamensis to the north of San pedro de Atacama. Some of these plants were growing on a quite steep bit of the hillside so it was possible to climb up above them in order to get a better look at the flowers. But we only found one single flower facing the camera, which looked as if it would probably open that night, but not a single open flower that we could look into.

.....from C.Sherrah

We were able to take a photograph looking directly into the flower of a Trichocereus atacamensis at just over 3000m altitude on the road running north out of San Pedro de Atacama.

THE CERRO URITORCO By M.Winberg
Translated by H.Middleditch from Gymnos 5.1988

After two unforgettable days in the awful heat and drought of Cruz del Eje, I felt as if I was in a Paradise as I reached Capilla del Monte. This small town in the northern part of the Province Cordoba lies at an altitude of 914m and it is famous for its mineral waters, the rocks, and the extensive views. Near Cruz del Eje the land was flat, but here, on the eastern side of Capilla del Monte, there arose an impressive mountain, the Cerro Uritorco. Now I had two days before I had to return to Buenos Aires. After six exhausting weeks of mountaineering in the provinces of Salta and Jujuy, mainly on the search for species of Lobivia, I was looking forward to one or two days of relaxation, since at least it was my holiday.

I shouldered my rucksack and started along the street. An old man directed me to the Hotel “La Roma”, from where i set off on a walk through the town. It was still early in the day and the sun had not yet reached its highest point. After going up and down the streets, thick with Argentinian tourists, eventually I reached some barren spots to explore, a few km to the west of the town.

Here the grass was very high, mostly two feet, so that at first sight it seemed to be unlikely that any cacti would grow there. But already after a couple of steps I saw my first cactus. In the moss, in slits and pockets in the rocks, grew fine specimens of Gymnocalycium valnicekianum. I found hundreds of them and none was like another! They had strong, thin, curved, straight, long or short spines, varying from brownish to grey and the spines near the crown were mostly reddish brown. I found a number of really fine clumping plants with five or six heads, which I had to photograph. Whilst I was doing this, I suddenly discovered a smaller, strongly spined plant in the moss close to the Gymnocalycium. My first thought was that it could be a Lobivia aurea, but as I looked at it more closely, I realised that it was a Notocactus submammulosus. It was so difficult to find in the moss that I trod on many of these plants and the rustle of crushing spines could be heard under my boots. With their greenish-brown bodies and flat, grey-coloured spines, they blended into the surrounding vegetation, the dry grass and the moss. These Notocacti were full of ripe fruit and I collected thousands of their seeds. The Gymnocalycium valnicekianum did not have so many fruits, for I could find only five or six of them. Could there be any more species here? I began to search the ground closely. Soon my glance fell upon a small Gymnocalycium, which grew level with the surface of the ground. It must be G.capillaense. The body

was greyish-green and on the flat, broad ribs were adpressed grey coloured radial spines. A fine sight, indeed! Initially I only found one solitary plant, but after a short while I was able to count a dozen of mostly clumping plants, some of them carrying fruit.

It had become really hot and I was obliged to go back to the town where I could obtain something to eat. After a night's sleep, I set off at 7.30 a.m. and took my breakfast with me. The roads were still wet from the rains of the previous night; the clouds had still not passed away, so it was quite likely that I had to reckon on there being still more rain. Now, what do I care? This high mountain to the east of the town looked to be beckoning to me.

Twenty minutes later I was at the foot of some impressive hills, but it was still not the Cerro Uritorco, which lay some km further to the north-east. First of all I had to find my way through these lush-covered hills, which was not a simple matter. Everywhere fences were to be seen and I was not keen on climbing over them. But as I found a way around the fences, straight away I came across some small plants between the gravel. under low growing bushes, In still damp ground, there grew fresh green bodies with straight, sharp ribs and mostly with a short spination. It was Lobivia aurea, a species which was widely distributed in the area. Some of these plants were carrying fruit and I was pleased to be able to collect it under my number MN 76. The central spine was often very short or even absent, but some plants had longer ones up to 3cm long. Close to this population I again found Gymnocalycium capillaense, now in company with G.quehlianum. The latter grew quite level with the surface of the ground, sometimes difficult to find on account of their brown colour and the grey coloured spines. I could observe these three species at regular intervals at the foot of the hills. As I came higher up the slope they disappeared and because of the thicker vegetation there were no further cacti to be found. I was only at about 1100m altitude and the three feet high grass made climbing difficult. At 1150m I saw some open places between the vegetation. Would there be any cacti to be found here?

Yes, between the grass and the gaps I found large Gymnocalycium mostii. Their spines were grey, thick, and very robust. With up to 15cm diameter impressively fine bodies and some with a height of 20cm, I was able to observe the species with different forms of spination - some very robust, others weaker. From 1150m to 1400m altitude I collected some fruit which still had not been blown away by an ever stronger and stronger wind. The clouds were darker and already I could feel the first drops of rain on my cheeks. I huddled under a small tree and waited.

As soon as it brightened up, I stumbled into the bush again. The Cerro Uritorco was now only about 500m away from me and I hurried down the hill which I had just climbed. On the way down I trod on mostly flat Gymnocalycium quehlianum. The crown was depressed, the ribs broad and flat and the generally five spines had a reddish base. These corresponded with Schickendantz's description of the variety rolfianum. But it is at best only a form of a variable and widely distributed species. I collected some seeds (MN78) and it will be interesting to see whether this form is consistent or not. I also found a large clumping Trichocereus (MN79) with fairly short yellowish spination and long red buds. Later I found a population of these plants in flower at the other side of Capilla del Monte. The flowers were white, with red sepals, and attained about 10cm in diameter. A very fine picture - and scented! It is probably Trichocereus candicans.

As I was going down the last 100m to the little stream at the foot of the Cerro Uritorco, I almost trod on a wasps' nest. It was built in a shrub and as large as a football. One step more and I could have been attacked by a thousand wasps. I crossed over the flexing suspension bridge. On the other side of the stream there was a fine large house, surrounded by trees and rocks. I enquired from an old lady for permission to climb the mountain and whether she could point out a good route to me. She nodded, went into the house and came out again with a small admission ticket. I paid and began to go along the stony path. Soon I understood why I had to pay for using this path. For km after km the path had been laid with stones - what a laborious task! Now it was hot. The winding path led me higher and higher. Here and there stood Gymnocalycium quehlianum and Lobivia aurea and at a height of 1100m I found a Gymnocalycium mostii in flower. The flowers were unfortunately closed, but as a I opened them, I could see the white petals and the pale pink throat. These plants had thinner spines than those which I had found earlier on the other hills.

I climbed higher and higher. It now became colder again. The wind blew stronger and stronger and I began to freeze. The slopes were clothed with grass and small, low growing bushes and I could find nothing of interest. Should I turn back? Some km in front of me there rose up bare, mostly perpendicular rocks. No, I thought, I must keep going The altimeter told me that I was now at 1500m. I struggled on. leaning against the wind. Was it worth the dripping nose, the cold fingers and ears? Then suddenly I saw a large spiny plant amongst the dry grass. For a moment I forgot the inhospitable climate. A fine, yellowish spined Gymnocalycium multiflorum with a diameter of 20cm! The pale green, broad and fairly flattened body had 17 ribs with narrow grooves, whitish, elongate areoles, and curved, more or less adpressed, yellow radial spines. I looked for fruit, but it seemed that it had already been blown away by the wind. It was unfortunate that I was unable to collect any material of this fine species.

My fingers were red and stiff. Shivering, I crawled further around the windswept slopes on all fours for some minutes. As I thought about going back to Capilla del Monte, my eye was suddenly caught. Once more I forgot the constant wind and stared at the small plants in front of me. Yes, here they were, growing deep in the ground, between the bunches of grass. Elegant bodies, no more than 15-20mm across with short, appressed spines - Gymnocalycium bruchii! I had to be careful not to tread on them. They were quite difficult to locate as only some 10 to 20mm of the body was visible above the surface of the ground and below that was hidden a 3 to 5cm long tap root. What a picture, if only it had had red flowers on its elegant body! I searched for fruit, but could not find any. Lying in the grass, with trembling hands I took a picture with my camera.

I looked up at the Cerro Uritorco. There were still some km to go, but I was frozen through to the bone, thirsty, and above all I needed to get back down whilst it was still daylight. In the dark, to stumble down the

narrow track would be perillous. Finally I got back to my hotel in the centre of Capilla del Monte, after ten hours of climbing. Soon it would be time to go back to Buenos Aires and fly home.

..... by H.Burmeister. Travels through the northern provinces of the La Plata states. Neumann's Zeitschrift fur Allgemeine Erdkunde Vol. IX 1860

I was in Cordoba for ten days, from 21 June to 1 July. On the latter days, I made a short excursion along the longitudinal valley which runs between the the two chains of the Sierra Cordoba, the so-called Punillo [Valley of the Rio Cosquin]. At this time of year the mornings and evenings were so cold that I had to make use of my European winter coat against the cold. Mist covered the early morning sun and violent winds blew most uncomfortably. I found the average temperature during these ten days to be 6° at 8.00 a.m., 11° at 1.00 p.m., 5.5° at 9.00 p.m. [centigrade?], also a low degree of warmth. Half a month later it snowed even in the daytime and there was ice all morning on the water barrels in the yards.

The climate of Cordoba belongs in general to the less acceptable of the La Plata states. It is, as befits its continental location, hot in summer, cold in winter; it has to endure mainly very strong winds and is visited in summer by violent downpours of rain, which always approach from the south, with frequent thunder storms. Just as unpleasant are the torrid north winds in high summer. They bring only drought and completely dry up the loamy earth. When it blows incessantly, as towards the end of summer, the ground becomes as hard as stone. Hence the vegetation in Cordoba is very poor and the fruit seen here is only of average size. Oranges are brought from La Rioja and Santiago [del Estero?], wine likewise. Beef and maize forms the principal diet for the population.

GYMNOCALYCIUM VALNICEKIANUM. From J.Piltz
Translated by H.Middleditch from K.u.a.S. 3.30.1979

Whilst the species Gymnocalycium valnicekianum is to be found in many of the European cactus collections, to my knowledge there exists in the German literature neither a photograph of plants in habitat nor any publication of precise habitat observations. In order to round off the impression which we already have, about the variability of this species, and to complete the knowledge about it, there will be presented here some observations and the results of investigations undertaken on plants in the field at various locations and in cultivation.

In November 1918 the young Castellanos visited the habitat location for this species near Capilla del Monte for the first time, but on his second visit to this area in the summer of 1922 he collected for the first time a valuable selection of plant material and sent it to Buenos Aires. From whatever cause, the plants were lost, without him being able to identify them. In January of 1939, Castellanos & Lelong were once again at the habitat location, in order to recollect the unidentified and forgotten Gymnocalycium. In the same year they also described the plants as Gymnocalycium immemoratum, without having regard to the fact that, five years previously, Jajo had already described the same plant as Gymnocalycium valnicekianum. In the meantime the species had of course been imported into Europe. Hosseus had first sent plants to Berlin, where they were described as Echinocactus cententerius and they were also offered under the same name by the Haage nursery. So Jajo's description at least created agreement on the genus.

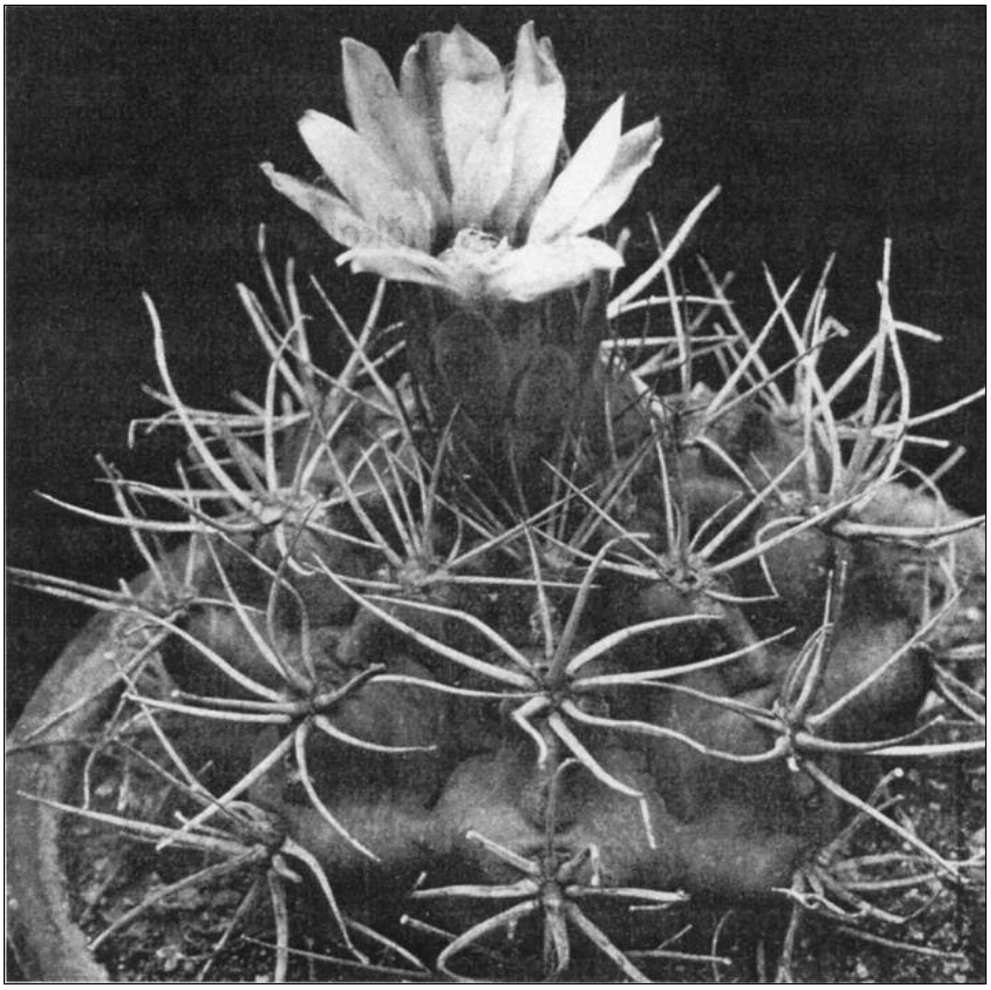
Unfortunately Jajo provided the typical "European" description, e.g. it included almost nothing about the full variability of the plants which they display to the observer in habitat. In addition, the selected Holotype is unfortunately with only one central spine, which is however not in accord with the most commonly occurring form at the individual habitat locations, which mostly have more than one central spine. In comparison, the invalid description by Castellanos and Lelong is much more thorough and it outlines almost the full variability of the species in habitat. Whilst this was a good piece of work, embracing what was based upon observations in habitat, that of Schutz ten years later as Gymnocalycium valnickekianum v.polycentralis was superfluous.

This variety should also differentiate itself from the Type on account of the presence of 4-6 central spines. Perhaps that is entirely correct, if one considers only the diagnosis by Jajo. On the other hand, Castellanos & Lelong mention already in their diagnosis of 1939, 4 central spines (nonnumquam 4 centralibus) and in a footnote to the Spanish description they observe that the plants they examined had a very variable appearance, so that some areoles with a large number of spines displayed several central spines, whilst others were much more sparsely spined. An invalid description is not always the poorest.

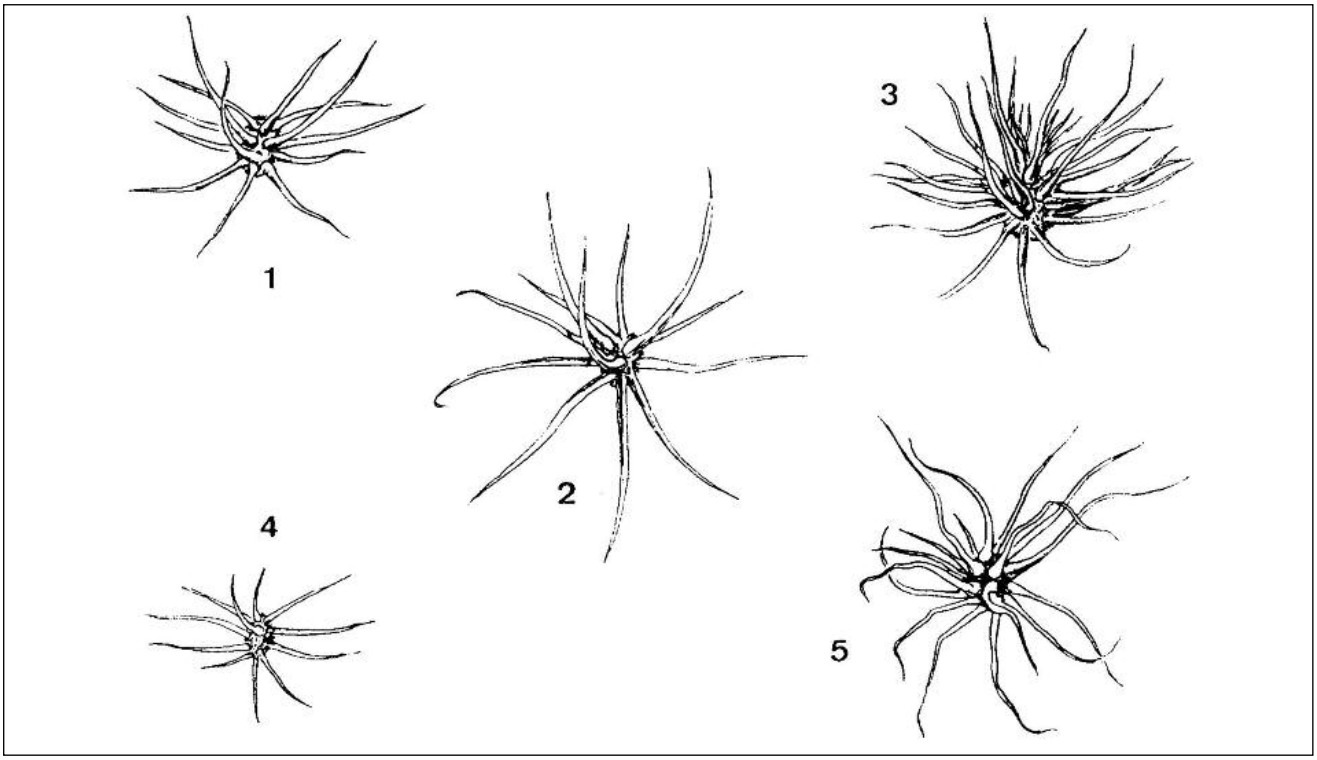
In the year 1954, there followed a further superfluous description of the species Gymnocalycium tobuschianum Schick. Looking at that, in which most important characteristics were repeated, there followed a diagnosis lacking any data on the flower or fruit. The horn-coloured radial spines alone still did not warrant the setting up of a new species, particularly since sporadic examples with darker radial spines were met with at the location near to Los Mogotes in the vicinity of Capilla del Monte.

Castellanos & Lelong give as the habitat location the isolated rock "El Zapato" near Capilla del Monte, Jajo the somewhat grandiose "Argentina" and in brackets with a question mark "Uruguay", whilst Schick again goes back to Capilla del Monte. Castellanos' description being authentic, one must regard "El Zapato" as the Type location, Jajo's opinions in this respect being useless.

Moreover, we still found the species near Los Mogotes, west of Capilla del Monte and ca. 7km north of the town. All habitat locations are more or less comparable. Soil had accumulated in the hollows between the smoothly rounded granite rocks, in which the cacti - solitary or mostly clumping in age - grew in grass. The thin fibrous roots are set shallow under the surface of the ground and spread out up to 50cm long. The largest plants attain a diameter of 20cm maximum in the typical depressed globular growth form, but generally remain



Gymnocalycium valnicekianum Jajo
Kaktusar 5. 1934



Gymnocalycium valnicekianum
Fig.1 & 2: P 83 Figs. 3, 4 & 5: P83a J. Piltz K.u.a.S. 1979

At Capilla
del Monte

Photo:
F. Vandenbroeck

Gymnocalycium valnicekianum

Photos: L. Bercht

LB 1116 from
Capilla del Monte

var. polycentralis

low, about 7cm. In cultivation with us, they tend of course to taller growth. Only quite rarely does one find such an example in habitat, that has attained a height of 12 cm or more. At a diameter of 9cm., occasionally already at 5cm., many plants begin to offset, so that after some years they form clumps, as Castellanos indicated and demonstrated with a photograph.

The grey to (in habitat more frequently) blackish, dense woolly areoles bear veritable bundles of spines of pale grey or sometimes horn-coloured spines, One can often count up to 8 central spines which are then difficult to distinguish from the remaining 18 to 20 radial spines. In reality one finds not quite so often the plant described by Jajo with one central spine, so that unfortunately the Type is not typical. The epidermis which is a dark green in habitat becomes paler with us in cultivation. Flowers and fruit were not observed in habitat. Occasionally one also finds Notocactus submammulosus and, hidden in the grass and in the moss, Gymnocalycium capillaense. [Fully detailed description follows]

The observed material was collected on 21 August 1976 and 6 August 1978 under the numbers P83 and P83a at various habitat locations near Capilla del Monte. Gymnocalycium valnicekianum is very closely related to G.mostii and to its var.kurtzianum which are to be found at higher altitudes, the latter growing at the same altitude as the species reviewed here, only spatially separated. Another closely related species, G.bicolor Schutz, grows further to the north near Cruz del Eje.

.....from H.Middleditch

It is rather puzzling to find that Piltz observes “the Holotype with only one central spine” when the illustration which accompanied the original description of this species by Jajo plainly displays more than one central spine at several areoles.

.....from J.Piltz

Yes, it is my impression that some of the areoles on the plant in the Jajo picture do display more than one central spine, although on some of them it is difficult to separate the centrals from the radials.

.....from H.Middleditch

What precisely were the observations were made by Schutz concerning G.valnicekianum v.polycentralis which Piltz regards as “superfluous”?

.....from B.Schutz, Friciana 16.1963. Gymnocalycium valnicekianum. Translated by K.Wood-Allum

Described in 1934 in “Kaktusar”. According to Jajo this plant is grey green, matt, flat to spherical with 7-9 radial spines and one central. The radial spins were fragile, slightly incurved, the central spine awl shaped and strong. The photograph also shows a plant with one central spine. I know the holotype. It came from a large number of imports owned by Bohumil Chrone and I bought one from him. Plants corresponding to the Type are seldom to be encountered in our collections today. Different forms of the plant arrived later. They were light green and had more secondary spines and, most important, more central spines which were thin. Their whole appearance was significantly different and I therefore considered it desirable to describe them as a variety of - G.valnicekianum v.polycentralis. The description and photograph were published in 1949 in Kaktusarake Listy, p.41. Backeberg, in my opinion wrongly, would not recognise this variety. My variety polycentralis differs from the Type much more strikingly than many of Backeberg’s varieties e.g. weissianum, mazanense etc. where transitional forms occur. It would clearly be detrimental to our subject if the dark green type with the one central spine were not separated from the light green variety with 4 or 6 or sometimes even more central spines. From ignorance of the original description, our plant has been described by Castellanos & Lelongas G.immemoratum and by Schick as G.tobuschianum. Through the kindness of Herr Bozsing I have an offset of Schick’s original plant. It corresponds to the description of G.valnicekianum. In Czech collections there are many forms of this fine plant, of which some have fairly strong and firm spines and others weak and thin spines. All G.valnicekianum offset, so that they are easily increased. Old plants are columnar.

.....from H.Middleditch

Do all dark green G.valnicekianum have only one central spine and all the light green G.valnicekianum have four or more thinner central spines?

.....from L.Bercht

In my collection I have some 30 plants of G.valnicekianum, mostly of P or LB numbers, whose spination displays a wide range of variation in number and appearance. I have plants of the G.mostii complex which have bodies of dark green, green, and light green, but the colour of the epidermis is always a very tricky matter. In nature as well as in cultivation it can depend upon the minerals in the soil. Body colour can be influenced by cultivation - for example, in cultivation I find that my G.valnicekianum tend to develop a more bluish green epidermis, which may be the effect of using a fertiliser. But allowing for this, neither among these plants, nor those seen in habitat, could I separate them into light green bodies with numerous spines and darker green bodies with fewer spines.

.....from H.Middleditch.

It would appear that Schutz had a decidedly limited range of variation in the plants at his disposal when he described his variety polycentralis.

.....from L.Bercht.

My very first visit to Argentina was made in the month of December in 1989, when I spent several weeks travelling through the provinces of San Luis, Cordoba, La Rioja and Catamarca. In Cordoba province we visited many parts of the Sierra Chica and the northern section of the Sierra Grande. The very first plants of Gymnocalycium mostii v.mostii which we found (LB 795), were along the road from Alta Gracia to Bosque Alegre, near the side road to the observatory. This was a hilly, rocky landscape with grasses, herbs, and small shrubs. This is the most southerly G.mostii that I saw, growing at an altitude of 880m. Going northwards from there, we made many more findings of G.mostii, as far as near to Capilla del Monte and Asconchinga. Within this distribution area I have seen a lot of G.mostii and collected some material. All the plants looked well but it

was not the right time to see flowers or fruit on these plants. During our drive through many of the northern parts of the Sierra Cordoba, we stopped at about a hundred places. At many of these spots we found both G.mostii and G.monvillei, but these two sorts would be growing in separate populations at no great distance from one another, but we never found these two species growing intermingled with one another.

For example, close to Todos los Santos on the eastern flank of the Sierra Chica, we found both these species occupying their own patches, in an area of stony ground with a scattering of low growing shrubs. Also growing here was Lobivia aurea, but they were not as numerous as the Gymnocalycium. On this hill slope at an altitude of 880m we also found Notocactus submammulosus and another Gymnocalycium which is now under discussion for its relationship to G.amerhauseri or G.erinaceum. Then at about 12km to the north of Ongamira we had crossed a ridge, running close to the Cerro Negro, and on a fairly level, stony area, with some large granite rocks and a scattering of small shrubs, we again found both G.mostii and G.monvillei, but again not in close company with one another. Then nearly at the highest point on the road between Asconchinga to La Cumbre, we saw some cacti growing on an open, level area close to the road, a spot similar in appearance to other places where we had found these two species. But now we also found G.bruchii which were less easy to see as they grew only a few cm above the surface of the ground. Because of their size and stature, they did not appear to be as numerous as the G.mostii. We also observed Notocactus submammulosus growing here.

In general terms, the landscape in which G.mostii and G.monvillei were to be found growing is hilly, with grasses, herbs, and small shrubs, these two species growing in a stony soil without any form of shading. The G.mostii may be found growing between the altitudes of 800 to 1400m, whereas G.monvillei is usually found at places between 660m and 2080m in altitude. In habitat, G.mostii is normally single headed, although in cultivation it may occasionally offset. The G.monvillei in habitat are also mostly solitary plants, but sometimes offsetting plants may be found. There was no difficulty in being able to distinguish these two species in habitat. The G.mostii had grey spines whilst the G.monvillei had yellow spines which were brownish near the base. Also the G.monvillei tended to have an epidermis of a rather lighter green colour than the G.mostii. Some of the G.monvillei which we saw in the Sierra Cordoba were in flower, but we did not find any of these plants carrying fruit

.....from R.Hillman.

Travelling in the province of Cordoba, we came across Gymnocalycium mostii at about a dozen places in the Sierra Chica, as well as near Ischilin, on the Sierra Ischilin. At only three or four places did we find G.mostii growing close to G.monvillei and even then they were not really growing side by side. The roads which cross the Sierra Chica have to wind round the hillsides and in many places the higher ground at one side of the road has had to be cut away to improve the width of the road, often into solid rock. At such places, for example near the pass going from Salsipuedes to La Falda, and also near Santa Rosa de Sierra (Salsipuedes to La Cumbre), there were G.mostii to be seen which were growing on the steep face of the exposed rock right next to the roadside - a patch of ground roughly only some 2m high and some 10m in length - together with some tufts of grass, whilst the G.monvillei were growing above them, on the undisturbed hillside, in company with small bushes.

It was not difficult to distinguish G.mostii from G.monvillei in habitat - the G.mostii had very rounded ribs and no chins, whilst on the G.monvillei, chins under the areoles are common.

.....from J.Piltz

During the course of our various travels in Cordoba, we have never come across G.mostii and G.monvillei growing side by side.

.....from M.Lowry

Flying off to Argentina at the end of November, we spent our first day in company with Omar Ferrari at his home in La Plata. Early the following morning we set out westwards across the Pampa, reaching the Rio Segundo. Next morning we set off from here along the road leading to Alta Gracia, through countryside given over almost entirely to agriculture. Reaching Alta Gracia, we then turned north into the foothills of the Sierra Chica and began to climb slowly, leaving behind most of the fields. There were now more bushes and trees on the gently rolling hills. After 30 minutes or so, being eager to see the cacti again in habitat, we made our first stop where we saw low rocky areas rising from the scrub. Here we discovered Gymnocalycium monvillei, G.bruchii, and Echinopsis aurea. Being relatively old “shield” rocks, most of the peaks of the Sierra Chica are quite rounded with gentle slopes allowing the roads to wind easily along them, giving expansive views across the surrounding plain. Once beyond the pass over the Sierra Chica, we could see the Observatory on a hilltop some way off to the north side of our road. We continued for a short way past the turn off which led to the Observatory and then stopped to climb up the easy slopes of a gently rounded hill lying to the south side of the road.

There were only a few real bushes or shrubs on this hill, or on any of the other hills at either side of this part of the road. It was an easy walk through the low growing grasses which did not quite cover the whole of the ground, with very few low growing bushes and quite a lot of rocks, large and small. Walking round, we came across some plants of Gymnocalycium monvillei, scattered here and there in no great numbers, mostly several paces apart from one another. Some of these plants were quite large, 15-20cm across, but most were significantly smaller, only 7-12cm across. I do not recall seeing any flowers or fruit.

We were probably on the east side of the hill here, so whilst the other members of the party continued to extend their search on that side, I walked through some rocks, round to the NW side of the hill. From here, the crowns of the Sierra Grande could be seen on the horizon. On this side of the hill, I found Gymnocalycium mostii, but no G.monvillei. They were growing among the rocks, many in flower. Other than possibly being more individual large rocks and boulders, there was no real difference in the amount of shade, compared with

the other side of the hill. But the orientation may have exposed these G.mostii to the sun only in the afternoon, whilst the G.monvillei on the other side of the hill were probably exposed to the sun for the whole day. Along with them, I found several Notocactus submammulosus and Echinopsis aurea, both with flowers and fruit.

Meanwhile, on the other side of the hill, C.Pugh had come across some G.bruchii. Now we went from here directly north as far as La Falda, with the high ridge of the Sierra Chica to our right, all the way. From La Falda we took the road going to the east, climbing up the Sierra Chica by many twists and turns. Close to the pass we stopped and found both Gymnocalycium mostii and G.monvillei growing at one and the same place, not immediately next to one another, but one sort here, the other sort a few paces away, and so on. Again they were growing in a grassy area with scattered rocks in places, but here the grass did not carpet the ground as there were bare patches between the bunches of grass. Again we found Notocactus submammulosus, Echinopsis aurea, and Gymnocalycium bruchii here.

There was no possibility of confusing the G.mostii with the G.monvillei either at the Observatory or above La Falda. The G.monvillei were more globular, or occasionally even slightly elongate, with a bright green body having a depressed crown and yellow spines. The G.mostii were a darker, matt green with an applanate body and grey spines which appeared to be stiffer than those on G.monvillei

.....from L.Bercht

It is interesting to note that the taxa closely related to G.mostii i.e. G.bicolor and G.valnicekianum, were never found growing together with G.monvillei. The reason seems to be that the altitude of their habitats is too low for G.monvillei.

.....from H.Middleditch

Is it possible to make a comparison between the original description of G.valnicekianum provided by Jajo and any plants of this species which have been seen by cactus travellers in habitat. Or with provenanced plants of this name which are in cultivation today?

.....from R.Mottram

The original description of G.valnicekianum by Jajo which appeared in Kaktusar 5 of 1934, is accompanied by a fairly good picture of one of these plants. The spination is a bit unusual, many spines being curved in various directions, alongside, towards, or away from the body, whilst quite a few are curved first one way and then the other in a sort of “S” shape. Other spines are bent quite sharply part way along their length, one or two are even hooked at the tip and there are some straight spines, in no sort of regular pattern.

.....from G.R.Allcock.

In my own collection I have two seed grown specimens of G.valnicekianum P.83, which I grew from seed supplied by Piltz. One plant has 1-3 centrals, mostly curving upwards, and up to 10 radials, variously curvaceous but mostly curved away from the body. The second plant has one central only, strong and springy, of a length up to 4cm., mostly somewhat curving upwards. A careful examination of this second plant reveals one central spine kinked downwards, several short kinky radials - kinky in various ways, one radial bent into a fish hook and another with a very sharp 45° kink. There is also one spine with an 80° kink - an abrupt change of direction. There is no weakness or breakage at the kink. The spine is properly lignified along the whole of its length. The rest are variously curved. On the first-mentioned plant of P83 there are no spines with these peculiar kinks.

In the 1934 Jajo description of G.valnicekianum the spines are described as easily broken, or fragile. However, on my own P83 plants, the spines are flexible, but resistant to breaking - indeed there are no broken spines on either of my plants. In regard to the tendency to produce a few very curved or irregularly curved spines, this can be seen in the photo of his MN 73 as grown by M.Winberg. Initially I was rather surprised by the Jajo photo of his G.valnicekianum, with the peculiar kinky spines. At first I thought that the spines must have suffered some damage, some sort of collision or impact, while still soft and deformable at the centre of the plant. But now, I am fully satisfied that my own two plants of P.83, and also the plant of MN 73 from Capilla del Monte, as well as the plant in the Jajo picture, are conspecific. I can see no reason to think otherwise.

The 1934 description by Jajo certainly says “central spines 1”, but neither on the Jajo picture nor on my own plants would it be true to characterise the plants by saying “central spines 1”. On several of the areoles on the plant in his picture a plurality of central spines are quite evident.

.....from G.Slack

In my own collection I have two provenanced plants of G.valnicekianum, both of which have dark green bodies. One of them, came to me under a “B” number in 1979 and is now 13cm in diameter and 18cm tall. This has spine clusters with upwards of a score of spines, including some areoles with several central spines. The other plant is a P83a, now 12cm diameter by 8cm tall, which has not only less spines per areole but also about half as many central spines as the “B” plant. The sketches by Piltz of spine clusters with spines bending, curving, forming “S” shapes and so on, are typical of the spines on my own plants. These sketches also mirror the basic appearance of the spination displayed by the Jajo plant. Although the Jajo plant carries spines that are rather more robust and longer than those on my own plants, the overall impression is of a basically similar sort of spination.

.....from J.Piltz

The plant in the Jajo picture certainly has some curved spines, some curved first one way and then another, as well as some spines that are very sharply bent part-way along their length. I would agree that my own sketches of spine clusters seen on plants in habitat (published in K.u.a.S. 3.30.1979) do include spines of these various sorts.

.....from M.Winberg

The Piltz sketches of spine clusters on G.valnicekianum are just like those which I saw on the plants near

Capilla del Monte, with the spines having irregular curves or bends. My own young plants grown from seed collected there (MN 73) have similar spines of that same irregular form.

.....from J.Lambert

The plants of G.valnicekianum which I saw in Cordoba were not really difficult to spot amongst the grasses. As for the spination, it was rather less twisted than may be seen in the Jajo picture and the Piltz sketches. I noted that the radial spines were "curved to slightly bent back" and the centrals "more or less curved towards their extremity". The number of central spines varies from 1 to 4. From the photograph which I took of a plant in habitat, an occasional twisted spine may be seen on some areoles, but not many indeed. Perhaps comparable to those on the Mats Winberg picture of his MN 73.

.....from L.Bercht,

Looking at my own plants of G.valnicekianum - LB 1116 from near Capilla del Monte and LB 1120 from El Zapato - the spine clusters do include spines which curve in various directions, even odd spines which curve in more than one direction! as well as spines which are bent part way along their length or near the tip. So they compare well with the spine clusters on the original Jajo picture. Better than comparing these plants with the Piltz' spine cluster sketches is comparing them with the several specimens of P.83 and P.83a in my own collection and again the spine clusters on those plants compare well with the Jajo picture.

.....from A.Finney

My own plant of G.valnicekianum is one of those with just the single central spine. All the spines are fairly slender and are of a reddish brown colour, although they fade to a pale off-white from about half way down the plant. On a recent visit to various continental nurseries, quite a number of plants of G.valnicekianum were seen, which mostly seemed to have more than one central spine. These plants were mainly pale spined. Some plants had so many spines to an areole that it would have been very difficult to decide which were centrals, which radials, and which were in-betweens.

.....from H.Middleditch

The picture of G.valnicekianum P.83 which Piltz includes in his 1979 K.u.a.S. article, displays curving spines but very few bent or twisted spines like those shown in his spine cluster sketches. The MN 73 grown by M.Winberg does have a few curved and twisted spines, but not quite to the extent of the Piltz spine cluster sketches. Which would suggest that G.valnicekianum can display a fairly wide range of spine form, from almost all curved spines through to having many bent and twisted spines.

.....from L.Bercht

In a well-documented article in the Austrian Gymnocalycium Journal nos.1 and 2 for 2002, Till & Amerhauser highlighted the history of G.mostii and its relatives, made a revision of the complex and restated the names. They divided the complex into two species, G.mostii and G.valnicekianum, with G.mostii ssp.mostii v mostii and G.mostii ssp. mostii v.immemoratum, this latter including the synonym G.valnicekianum v.pluricentralis. They maintain that Gymnocalycium valnicekianum was already a valid description but it was given to the wrong plants and that the name valnicekianum applies to the plants which have been recently named G.genseri n.n.

.....from R.Mottram

The Till & Amerhauser name of G.mostii v.immemoratum contravenes the ICBN and is illegitimate under article 52.1. They have included G.valnicekianum v.polycentralis as a synonym of G.mostii v.immemoratum, so that a name already existed for this plant at the rank of variety, namely polycentralis. So they ought to have made the combination G.mostii v.polycentralis per Article 11.4 "For any taxon below the rank of genus, the correct name is the combination of the earliest legitimate name of the taxon in the same rank, with the correct name of the genus or species to which it is assigned". Within G.mostii, the epithet immemoratum had never previously existed at the rank of variety, only as a species, so cannot be used in the new combination lacking, as it does, priority at the rank of variety.

.....from D.Metzing

In the paper in the Austrian "Gymnocalycium" Journal about G.mostii, Till & Amerhauser published the new name of G.mostii v.immemoratum and included G.valnicekianum v.polycentralis Schutz as a synonym. The name valnicekianum v.polycentralis had already been validly published by Schutz in 1949. In this way, they contravened Article 11 of the International Code for Botanical Nomenclature as they did not use the oldest available name at the same rank - in this case, the varietal name. According to Article 11.4 the correct name for G.mostii var.immemoratum Till & Amerhauser would have been G.mostii v.polycentralis, but they did not publish this name. The combination G.mostii v.immemoratum is legitimate but incorrect.

Unfortunately the Austrians publish a lot of new confusion in their papers. The highlight of this was the publication of several infrageneric names in 2001, many of which were wrong - see the Rep. Pl. Succ. 52 for a list of these. The Austrian "Gymnocalycium" papers are often not so scientific as the authors claim.

.....from J.Lambert

We may sum up the reliable historical data which we have on G.valnicekianum, as follows. In 1934, Jajo publishes his original description of the species. Unfortunately, this is a rather brief account, which does not give any idea about the variation of the species. We may suspect that Jajo based his description on a single specimen, all the more because the holotype bears only a single central spine, which is not the most frequent case in habitat, as noted by Piltz in his 1979 K.u.a.S. article on G.valnicekianum. The origin given by Jajo is also quite vague, as it says: Cordoba to Catamarca, with a possible extension into Paraguay!!!

In 1939, Castellanos & Lelong, who were not aware of Jajo's publication of this species, publish their excellent description of G.immemoratum, giving a full range of variation and a precise type locality: El Zapato, near Capilla del Monte, which is where I collected my own specimen of JL-41. As for the character of the twisted spines, this is indeed undeniable, as confirmed by Jajo's photograph and Piltz's sketches. It is

stated by Piltz that “spines often [not always-JL] irregularly sinuous”. Which is in turn confirmed by my own habitat photographs as well as the one from M.Winberg of his seed-raised MN-73. Why the spines become or remain straight we may only guess. Perhaps this is dependant upon environmental factors - for example, it may be that plants, in the protected environment of cultivation, may adopt a more regular shape of these features. Another interesting possibility is that it might be connected to the age of the plants.

Of course, I am aware of Till & Amerhauser’s extravagances on the Gymnocalycium mostii complex in Gymnocalycium for 2002, in which they claim to apply the name G.valnicekianum to the form previously known as G.genseri, and to consider G.immemoratum no longer as a synonym of G.valnicekianum, but as another form of G.mostii. Without entering into too much detail, the most glaring mistake on which the Austrians base themselves in order to decide that the G.genseri from Ischillin is the real G.valnicekianum is their choice of B-44 to prove this. Indeed, they write themselves (their p.449) that this form has (3)5 to 7 ribs, whilst in Jajo’s original description, the ribs are noted as 10 to 13! The two figures do not even overlap!

But I really would not pay much attention to all this. Indeed, every time the Austrians propose new arrangements or even new species, I am quite careful, not to say suspicious, about their proposals, because experience has taught me that far too often, they are wrong. For one thing, they are frantic splitters, and tend to subdivide species into a muddle of subspecies, varieties, and forms, which does not help one to get a clearer insight of their subject matter, and hence is absolutely useless, even counter-productive. And on the other hand, they seem to give way too often to “wishful thinking” or the temptation of sensationalism or scoops, instead of basing their work on serious scientific arguments. Mind you, I am on friendly terms with them and sometimes I do have a quiet word with them about various matters, on which occasions they are quite willing to admit to some of their mistakes.

.....from L.Bercht.

In my collection, I have two Gymnocalycium collected from near Ischilin, which I named G.genseri and these plants cannot be compared with the plant in the Jajo picture.

.....from R.Coward

I do have a G.mostii v.genseri B 42 and a similar looking mostii P.380. However, my B42 has twelve ribs and the P.380 has eleven ribs, which does not fit the 5-7 ribs quoted for G.genseri.

.....from H.Middleditch

Those cactus travellers who have come across G.valnicekianum Jajo in habitat all appear to agree that the plant in the 1934 Jajo picture falls within the compass of the variation of those plants. Hence it appears to be reasonable to regard the Jajo plant as having originated from the area around Capilla del Monte and so it becomes very difficult to justify the notion put forward by the Austrian “Gymnocalycium” article that the name of valnicekianum was applied to the wrong plant. Perhaps it is very fortunate that the proposals in the Austrian “Gymnocalycium” for changing the application of the name valnicekianum are evidently not in accordance with the ICBN requirements.

FINDING GYMNOCALYCIUM VALNICEKIANUM By F.Vandenbroeck
Translated by H.Middleditch from Succulenta 70.1.1991

In the neighbourhood of the city of Cordoba, capital of the province of the same name in central Argentina, there are two groups of mountains of no great elevation which carry the names of Sierra Grande (the large chain of mountains) and Sierra Chica (the small chain of mountains). Although the mountain formations only reach a moderate altitude - the highest peaks go little over 2000m - for all that they are very outstanding in the otherwise flat stretches of Cordoba province. In fact they can be regarded as very distant outlyers of the much more westerly lying Andes mountains. The Sierra Chica lies to the NW of the city of Cordoba and the Sierra Grande to the west. Both mountain chains are in fact connected by a high plateau.

The mountain zone around the city of Cordoba supports the population of the city and the surrounding countryside offers a certain attraction as a recreational area, especially on account of the presence of an attractive vegetation, mountain streams, and unusual rock formations. Here and there a degree of tourist infrastructure, although of elementary extent, is to be found. The countryside of Cordoba province consists partly of brushwood and partly of areas of farmland, mainly cattle breeding.

The names of both Sierras are to be found regularly in the cactus literature because they form the natural habitat for a series of species of cacti. The accompanying vegetation however is so luxurious that the cacti quite positively do not attract attention; one really does have to search in order to find plants. Larger sorts of cacti are completely absent. In this region, those species which hold an interest for cactophiles almost all belong to the genus Gymnocalycium.

One plant which we have come across during a trip through this region, which has a very typical outward appearance as well as being found in very variable biotypes, is Gymnocalycium valnicekianum. We found these plants when walking on foot in the Sierra Chica, in the vicinity of the town of Capilla del Monte, which lies at 914m. For nature lovers, this is an attractive area to stay in and look around for a while. The vegetation displays a wealth of diversity as various microbiotypes are to be found there, such as moist valleys with willows and aquatic plants, rock formations, open grassy plateaux, areas of bushes or palms, mountain rivers, and so on. Gymnocalycium valnicekianum grows there on rocky ground completely exposed to the sun, often in the company of Bromeliaceae. The fresh green plants attain a diameter of about 15cm and are typical on account of their darker, almost black areoles and the long, upwardly curving, sometimes bristle like spines. It is through this particular spination that G.valnicekianum is immediately recognisable in a collection of different species of Gymnocalycium. This long, dense spination often forms a barrier to the full opening of the

flower which is white with a red throat.

These plants grow at places mostly together in small groups of populations. Gymnocalycium valnicekianum is closely related to G.mostii, a species which likewise occurs in the Sierra Chica but more to the south. Another close relative is G.bicolor.

As already indicated, these plants grow in surroundings that display a richly variegated vegetation. Striking are the large groups of grey Tillandsias which are sometimes nestling on perpendicular rock walls. Gymnocalycium valnicekianum forms no real association with other cacti. Other kinds that occur at no great distance away are Trichocereus candicans - a semi-decumbent sort which remains small - a form of Lobivia huascha - probably the variety crassicaulis, and Notocactus submammulosus. These plants grow in less exposed situations on more grassy places and in many instances in the shelter of bushes.

WE RIDE UP TO THE CACHIPAMPA By C.Backeberg
Translated by P.Sherville from Stachlige Wildnis 1951

The moon pales into the dawning morning sky, the sounds of the night are quietened, and the first parrot shrieks ring out over the large Mongoes, which border the rear of the garden of the hacienda. A small watercourse splashes peacefully somewhere between the thick verdure. The air is heavily scented from millions of orange blossoms on the plants which we ride under to the quebrada. Senor Rodriguez has risen early in order to pay his respects on my departure. He had attended to the journey scrupulously, spoke once again to his most trustworthy peon [farmhand] and exhorted him to attend to me well and give me every assistance.

We have a long way before us, riding through this large canyon of Escoipe and over the Cuesta de Obispo towards Tintin on the Cachipampa. This will be no easy undertaking just now, for we can count on no help whatsoever, should we need it, in the mountains. The rains are over, and with them, the horse traffic; the dry period is the time of the lorries. Because there is then little on the roads, the inhabitants take off with their cattle up into the highland pastures; we will therefore see nothing of them. But in the meantime vehicular traffic is also not possible, since this year the road is impassable, for the heavy precipitation has caused the light volcanic earth to slide down the steep slopes. The province once again has no money for the extensive repairs and new building works. So the last stretch of the journey will be very lonely.

My small group of mules stood against the wooden fence at the entrance to the house. The mules let their heads hang peacefully. They are strong long-legged animals, for only such as these can be employed on the stiff climb. I satisfied myself that that everything was stowed away: tent, rucksack, paper, bags, axe, rope, blankets, and the bags with the provisions as far as Escoipe. When I was already in the saddle, the stout senora also came out. Her tired face changed to a friendly smile: “Adios Senor! have a good trip! I have here still another small gift for you” I untied the bag which she handed me. It contained finely cut tobacco, the best that the hacienda produced. This is, for the strong pipe smoker such as I, a welcome gift.

I looked round towards my escort. He nodded discreetly and mounted clumsily, like all cattle herdsmen (who spend the greater part of their lives on horseback) on to his pitch black animal, which pricked up its ears to him. Then he swung his short, handy driver’s whip and in a cheerful, rapid trot we rode through the plants to the river below, in whose half-dry bed the way led upwards. It is a beautiful morning. The mountains, around whose summits a few night clouds still hung, shone in delicate colours. Out of the quebrada came already the first caravans, which are departing early in order to be in Rosario de Lerma in good time for the evening.

Before us, in a glade, were noisy flocks of small green parrots in the old trees, The path weaves a little between the gnarled trunks. Soon the gorge narrows and the yellow water dashes rapidly towards the valley below. The animals dropped to a slower pace. The countryside ascended steadily. I laid the reins on the neck of my horse, put my hands in my coat pockets, and satisfied myself with a pipe. This day is so agreeable to my senses. The delay in the town had already become much too long for me. The mountain attracted me, for I could endure the commotion no longer. It was good fortune that I had learned of the excellent settler who offered me his animals and his peon, with whom I have been able to see, as he expressed it himself, one of the most beautiful regions of all Salta. “You will never forget the way to Tintin” he thought at that moment.

I was already seeing how right he was. Both sides of the route have almost perpendicular rock faces plunging out of thick tropical forest to the river below. Their deep brown glistened in the adornment of the green undergrowth, and small waterfalls bubbled joyously through cracks and crags. Somewhat later a large herd of sheep turned the corner of the gorge. The encounter produced a traffic jam. The leading herdsman carried the leading sheep over the river; they struggled miserably, but must go on, otherwise the crowded frightened animals will not be induced to cross the water. I stepped over a rocky projection and considered the beautiful scene of the precariously balance fleeces against the brilliant back lighting.

Hour after hour elapsed. Occasionally the riverbed becomes wide and free of rocks, and sometimes it goes uphill through mighty boulders. Only a few people met us. It gradually became evening. The forests are disappearing. How mighty lava-flows lay concealed on the furrowed mountains above us, covered with green mats, whose colour changes by delicate shades in the setting sun, until the outlines of the summits are extinguished in the night sky. We rode on in the dark. After a while a dog barked somewhere; in the mountain breeze rustling weeping willows betrayed their presence in the darkness, and behind the trees a doorway flashed open; the settlement at which we wished to spend the night had arrived. Someone showed us to an empty room, the travelling kit was stowed away, the muzzled animals were left in the corral, then we consumed the food we had brought with us and soon Fernando and I were in a deep sleep.

We must prepare breakfast for ourselves; my companion does the cooking. His hearth consisted of an old

gasoline container, whose lid he used as a substitute for bellows. Whilst we were reloading our animals some people offered us some goatskins; twelve pieces for one mark! I made up my mind to establish myself in this region as a pelt dealer, in the event that I should change my profession any time. Fernando explained to me that goats are kept for their meat alone, their hides are hardly sellable. In Patagonia, the opposite is the case; there the mutton has no value, only the wool. When we wished to buy provisions, the Syrian trader offered, apologetically, only sardines in oil. I am, however, no great lover of these. Someone said to us that there was still a trading post up around San Martin, where provisions would be available. We could manage on empty stomachs until there. In any case we filled our saddlebags with beautiful apples which were now being harvested.

The countryside climbed further upward, through a stunted copse, which glinted fiery-red where the trees had been overgrown with the parasite Loranthaceae. We soon remarked at the considerable altitude we had achieved. The wind is so cool that one can hardly hold the reins with one's hands. In this solitude we came across large groups of colossal Trichocereus terscheckii, the dominant colonising feature of the region from southern Salta to northern Tucuman. They displayed hundreds of large white flowers, which were beginning to close in the first light of day. Where there are large Cerei, the spherical cacti are usually not very far away. So we tied up the animals, with the exception of two, which we required for the removal of the plants. In these desolate regions one need have no fear that any of the mules would be stolen; and then we climbed one behind the other over the highlands, which have hardly been affected by the goats.

My luck was once again favourable. Perhaps also the collector with experience and time has also a certain instinct from within. After the first hundred metres of climbing, we find that we have already fallen into a cactus paradise, whose abundance was not suspected from the impression made by the slope below. As we unpacked the harvest in the valley, in order to wrap up these particular plants, I gazed upon the "bag" in detail. It contained a tiny Rebutia, which later revealed itself to be the most valuable of all, because the flowers appeared a quite rare violet-pink. I named this species as Rebutia violaciflorum as a result. In addition we had come across two Lobivias, L.nealeana and L.pseudocachensis, whose flowers are very rich red, and carmine violet, respectively; furthermore some peculiar disc-shaped long-spined Pseudolobivia species, highland Echinopsis, whose flattened bodies form a valid characteristic and constitute a specifically related group of the genus Echinopsis. In order not to haul the whole spiny harvest, we left them in the first good cabin, where we could collect them on our return. "The start has been made" I said to Fernando, to whom cactus collecting had at first appeared to be a somewhat eccentric thing to do; but he had soon come to grips with the collecting industry, so that he will now be a good assistant to me.

Gradually the quebrada came to its end; we were approaching the cuesta [brow]. At the exit to the canyon below lay the small village of San Martin. In the vicinity of this village I found still another bulky Echinopsis which became short cereoid - Echinopsis smrziana - a new plant, which from its first appearance must belong to this genus, although it has never flowered with us. We had left the last settlement behind us now, and the ascent to the pass begins. The ragged mountainsides tower before us. The dark threatening walls offer a magnificent sight. Wide cloudbanks drift along rapidly under the crags, over which they are scattered into a single banner at the summit by the high winds. At one place the sun has broken through the white veil, in whose shadow the rocky peaks stand like blackish pyramids, whilst the last pastures shine at their feet in an almost unnaturally bright green.

From these delights, the route leads ever onward to Cachi over varied landscapes, from below the quebrada over the easy valleys around Escoipe to the wild highlands of the cuesta. The ride is indeed a unique experience; Senor Rodriguez had not exaggerated. Already we recognised a dark point high above us, the solitary trading post of which our Syrian proprietor spoke. Hopefully we would be able to buy our provisions there. We had already become aware of hunger, as I had only had some apples at midday. By comparison, Fernando seemed to manage with his cocao, he did not once touch the fruit. One saw that wide sections of the road had fallen away at the sides; polished rocks interrupted the narrow roadway everywhere. The repairs to the road would cost much money and many months work.

When we arrived at the shop and had been there for a long time we established that it was shut. We looked at each other with surprised faces. We now had to resign ourselves to waiting until tomorrow lunchtime before we would be able to eat. If only just one ridge lay behind us. The twilight gathered in unexpectedly early over the ridge. We bowed our heads over the necks of the mules and approached the mountain. The high winds stormed impulsively above us. Thick fog sank down over the canyon walls and enclosed us in its damp vapours. We began to freeze, and wrapped our ponchos tightly around our bodies. The gallant mule struggled on, groaning against storm and gradient. There was only slow progress onward, for the smooth track ran ever steeper in great zigzags to the pass above. The colossal ascent seems to be without end. Silently, Fernando urged the animals on with his whip. To and fro plunged his fleeting figure through the white waves and disappeared again. Occasionally the path is scarcely recognisable.

I managed to pick up the ghostly music which played in the canyon walls. Hopefully, so far everything had ended well, but what should we do if the mules could go no further? After three hours, nevertheless, we had the cuesta behind us without incident, and also we soon came out of the range of the clouds. Above the plain of Tintin stood a glistening night sky. From the faint light of the rising moon, the pampa spilled in soft undulations before us, bordered by black mountains. The high plains were displayed before us like a martian landscape, one of them extending like the sea between dark islands, whose waves had been magically solidified by the pale silvery light.

Small slit-like rock fissures suddenly appeared. Between them is a real snug, since they only slowly release the sun's warmth. Fernando proposed to let the animals rest here. I am in agreement with this. But before I catch some sleep I still take a look round in the slopes of the boulders, to see if there were any cacti

here. I had hardly taken a few steps when I saw in the light of my flashlamp a whole colony of golden yellow globular bodies, sitting in the crevices in the rock. The Parodia aureicentra, the first of the unknown species from Cachipampa, was discovered. Also I found a specimen of Opuntia nigrispina, further south than that collected by the American Shafer. It formed small, very dark red segments.

The next day broke cool and clear. The mountains above Cachi shone in dark yellowish red shades with a snow covered peak right in the distance. Now we get closer to the broad plain of pasacana forest. At this early hour it offered a still more impressive picture than the columnar groves of Humahuaca. The further we rode into this phantom forest, the fainter became the trail.

As we once again turned off for a halt, we found to our surprise under low bushes and exposed in the hard weathered rocky ground two different globular cacti, a high mountain form of Gymnocalycium spegazzinii with colourful talon-like spines and the new Lobivia drijveriana, whose long root went so far down into the ground, that we dig out a number of specimens only with great difficulty. In cultivation later, these plants displayed the finest of all cactus flowers . They are so non-uniform in colour that one can almost say that not a single one is the same as the next. They show all possible gradations of colour from yellow to red, and likewise the style and throat.

.....from J.Piltz

After climbing the Cuesta del Obispo, we come out on to the plain of Cachi Pampa, which is surrounded on all sides by mountain peaks. After crossing the Cachi Pampa, the road passes through a narrow quebrada which connects the plain of Cachi Pampa to the Campo de Tintin. This was the site of P.172 Parodia aureicentra, where we also came across plants of Lobivia drijveriana and an Airampoa. I do not recollect seeing any of the larger padded Opuntia at this site. In his Stachlige Wildnis, Backeberg describes his trip from Escoipe to Cachi, when they reached the top of the Cuesta Obispo by twilight. From here to the site of P.147 is about 15 km, which would occupy roughly one hour on horseback. Perhaps they crossed the Cachipampa and spent the night in the same little quebrada where we found P.172. On the next day he found his Lobivia drijveriana in the Campo de Tintin, together with Gymnocalycium spegazzinii. There would not be any G.spegazzinii on the plain of Cachipampa, as it is too high. In his Die Cactaceae, under the heading of Tephrocactus nigrispinus, Backeberg mentions that his Abb.201 is a plant in cultivation which he had collected on Cachipampa. I think his picture Abb. 201 is similar to those plants we consider to be T.nigrispinus.

.....from J.Hughes.

In January and February of 2001 I made a trip from Buenos Aires to Bariloche on the edge of Patagonia and after crossing the Andes I worked up the coast of Chile to Antofagasta before returning to Salta in Argentina. From Salta, a one-day excursion was made to the Calchaquies valley via the Quebrada Escoipe. It was the summer season and it had been raining overnight. As we entered the Escoipe valley the sun was breaking through the dark clouds which were still threatening more rain. The bottom of the valley was damp with tropical plants such as begonias. Then as we reached the Cuesta de Obispo at 1750m we saw some Rebutia, possibly R.xanthocarpa, on the rocks above the road. There were some Trichocereus terscheckii growing on the rocks above us here, and more of these plants on the slope down to the river.

The road now wound ever higher into the mountains with plants such as Oxalis and Calceolarias visible. After crossing the top of the ridge the area around 3000m. was shrouded in mist. After crossing the Cachi Pampa we passed through the Parque Nacional de los Cordons with its numerous Trichocereus pasacana whose timber was used for rafters, doors, and window frames in the interior of churches. On our return from the Calchaquies valley we came back over the Cachi Pampa again and before we crossed the ridge above the Cuesta Obispo, we stopped to have a look at a splash of red by the roadside at 2920m, which turned out to be a Rhodophilia. We had decided to make this our last stop because only a few yards in front of us was a blanket of mist. The terrain was gently sloping with mainly sandy-gravelly ground, very largely bare of vegetation. Apart from some scattered dwarf bushes, I have no recollection of seeing any tussocks of grass here. It was here that we found one or two clumps of a Tephrocactus which were some six inches across and hardly three inches high, with globular segments about 2cm thick, which were growing on the bare, open ground, well clear of any other vegetation. No flowers were to be seen. Later, when we back home, the smaller plant was identified as Tephrocactus minutus.

.....from K.Gilmer

It was towards the end of November when our field trip to northwest Argentina took us from the Calchaquies valley across the Pampa de Tintin, on our way towards the Quebrada Escoipe. We had left behind the great numbers of Trichocereus pasacana which grew on the Pampa de Tintin and came to the mountains which formed the western boundary of the Cachi Pampa. This presented us with quite a change of surroundings so we decided to stop at 3,050m and look round the nearby mountain slopes. There was a lot of bare ground here, covered with sand, gravel, and stones which carried some dwarf bushes about 80cm high which were growing perhaps 2 to 4m apart from one another, together with some scattered tussocks of grass. There was a butterfly on a flower on one of the bushes, which I was able to photograph. There was a Parodia sp. growing here, some Tunillas, and also fairly numerous straggling Opuntia sulphurea, all growing close to the bushes, as well as a few hummocks of Tephrocactus bolivianus, the largest about 80cm across which seemed to prefer the open ground.

On the bare ground we also found some Tephrocactus which barely projected one or two segments high above the surface of the ground, forming mats some 10-15cm across. The individual segments were about 2cm long and 1.2cm in diameter, many with spines at one or two of the topmost areoles, These spines tended to lie close to and parallel to the surface of the ground. Some segments had several spines of 2 to 4 cm in length to one or two areoles, but there were also a few spines, one per areole, which must have been about 5cm long, on

only one or two of the areoles of a few of the segments. These plants were not abundant here. There were buds on both of these Tephrocactus which might have opened into flowers within two or three days, but there were no open flowers to be seen.

Travelling across the Cachi Pampa, another stop was made before reaching the junction with the road to Amblayo, on gently undulating ground which was again covered with sand, gravel, and stones. It was even barer of vegetation than at our previous stop. There were bushes to be seen only in the dry stony beds of run-off streams, together with only a few other sparse plants. Again, there were Platyopuntia growing here. On the bare, stony ground, clear of other vegetation, we found some hummocks of a Tephrocactus which were mostly some metres apart from one another, which were up to 30-35cm across and about 10-15cm high, looking like a heap of very small segments. The individual segments were globular, etuberculate, about 1.2cm in diameter, with short tufts of what were probably glochids at each areole, but quite lacking in any spines. None of these plants were in flower or in bud.

Both the low growing small segmented Tephrocactus which we saw here and at our previous stop were logged as forms of Tephrocactus minutus. Before reaching the pass leading out of the Cachi Pampa to the Cuesta de Obispo, we made one more stop where we found only some more hummocks of T.bolivianus as well as some small dense groups of Austrocylindropuntia verschaffeldtii.
.....from H.Middleditch

The two sorts of dwarf Tephrocactus seen by K.Gilmer are rather different in outward appearance and it may be open to question whether the one name is appropriate for both sorts. The plant seen near the western side of the Cachi Pampa. in company with Parodia aureicentra and a Lobivia, would appear not only to be close to where Backeberg stopped overnight when leaving that side of the Cachi Pampa, but the cacti reported from there also appear to be comparable. But Backeberg described his find as T.nigrispinus and there is a passing reference to this in his Die Cactaceae, which is accompanied by a photograph of a plant in cultivation which originated “from the Cachi Pampa”.
.....from K.Gilmer

The cuttings which we brought back with us, taken from the very low growing Tephrocactus which we found at the foot of the mountains on the western entry to the Cachi Pampa, rooted and are in cultivation. The new growth displays the small egg-shaped segments growing hard up against one another, forming a low hummock, typical of the habitat plants. About one in five of these segments carry one or two long spines at the topmost areoles, again just like the plants in habitat. This is nothing like the T.nigrispinus which is illustrated in Abb.201 in Backeberg’s Die Cactaceae.
.....from H.Middleditch.

Evidently both T.nigrispinus and T.minutus can be found growing in the general vicinity of Backeberg’s overnight stop at the exit from Cachi Pampa. Perhaps this long-spined form of T.minuta may be found elsewhere?

MAIHUENIOPSIS MINUTA From J.Lambert

During my visit to the north-west of Argentina I travelled up the Quebrada Humahuaca, going as far to the north as Cuesta de Azul Pampa. Here the ground is mostly bare stony earth with only a scattering of low-growing vegetation, mostly tussock grass. In these kind of surroundings, it is quite easy to locate the bigger hummocks of Maihueniopsis bolivianus, or even M.pentlandii, but not so with Maihueniopsis minuta. These latter do not form clumps which are large enough to be spotted at a distance, but form only small cushions, not exceeding 10 cm across at the most. When they are not in flower, they can very well be overlooked, even when you are within a metre of them!

To unearth one of these plants is quite a job, especially if you want to preserve the complete root in an undamaged condition. The soil is full of stones, between which the roots find a tough anchorage, so that you have to dig quite a hole, removing all the stones one by one from all around the root. I dug up two of these plants, which both had a post-like root of some 20 cm in length and about 3 cm thick. There were no more than about half a dozen segments on each of these plants. The segments are smaller than average for Maihueniopsis, being about 20 mm long by 13 mm in diameter. The spination corresponds much better with Fig. 11d in Kiesling’s paper on Tephrocactus and Maihueniopsis than with his text - “todas arquadas”. Indeed, most spines are pointing upwards whilst a smaller number are bent horizontally. This corresponds to Ritter’s description (under “rossiana”) of his population from Iturbe, where he states that, in this population, spines are “meist gerade”. It is my impression that there are no Maihueniopsis rossiana to be found in this locality. Which raises the question whether Ritter did not mix up both species? As Kiesling writes, Maihueniopsis rossiana seems to be closely related to M.minuta, but the latter is distinguished by its less numerous spines, smaller flowers, and paler stamens.

There was a flower on each of the two plants which I unearthed, which were of a different shade, one with an orange cast and the other with a pinkish cast. I opted for the identification of these plants as M.minuta because of the colour of the inner parts of the flower: filaments yellowish white, with white anthers, as against Ritter’s “golden yellow, carmine or brownish red filaments with lemon yellow anthers” for rossianus.
.....from H.Middleditch

The general habit of this plant described by J.Lambert as Tephrocactus minutus, with fairly lengthy narrow, acicular spines lying parallel with the ground, is identical to a plant near Iturbe seen and photographed by F.Vandenbroeck and described as T.rossianus.
.....from R.Mottram

A small specimen of JL245 Tephrocactus minutus from Cuesta Azul Pampa is in cultivation here. The segments are miniature fir-cone shape, etuberculate, about 10mm tall and 8.5mm in diameter, green, with a few tiny hair-like spines. It produces only one or two new segments each year. Another plant of T.minutus growing here originates from a collection made by Kiesling at Abra de Pives, at 4000m altitude, with segments of a similar shape but 18mm long and 12mm in diameter. At the topmost areoles of the new segments on this plant there are now substantial spines some 17mm long, broad at the base and tapering to a point.

The plant seen by K.Gilmer at the western entrance to the Cachi Pampa appears to be either Opuntia minuta or O.rossiana, but is definitely not nigrispina.

.....from H.Middleditch

It would appear that both T.minutus and T.nigrispinus are to be found growing near the western entrance to the Cachi Pampa. Where else is T.nigrispinus to be found?

.....from K.Schumann. Gesamt. der Kakteen 1903

Opuntia nigrispina - Shrub like, low growing, barely 10cm high. Segments cylindrical or ellipsoid, 2 to 3.5cm long by 1 to 1.5cm in diameter, markedly tuberculate. Spines 2-5 of which 1 - 2 are up to 2.5cm long, round, violet-black. From the Puna of Humahuaca.

.....from Fries. Nova. Acta. Reg. Soc. Scien. Ups. 4.1.1905

Shrubby, low 10 - 20cm high, segments 2-4 cm long by 1-2 cm thick. Spines only on the upper areoles, 3-5, 2.5 to 3 cm long, porrect. From Moreno, prov. Jujuy, 3500m, rare in the stony mountains.

.....from M.Lowry.

Travelling from La Quiaca towards Abra Lizoite, we stopped near Suripujo where many Oreocereus were to be seen spread over the hillsides. On the sandy level ground right next to the road there were T.nigrispinus to be seen, in fairly compact clumps of up to about 20cm tall and a bit wider. They had dark green segments and half-upright spines and displayed dark red flowers. They seemed to be growing only on this level ground and not on the hillsides.

On the road from Abra Pampa across the puna to Coranzuli, we again found some T.nigrispinus between some rocks, but these were were also growing on level ground. Not the fairly soft sandy ground like near Suripujo, but very hard - so hard that it was almost like concrete. These plants consisted of only one or two stems of no great height, formed of more brownish segments.

.....from D.J.Ferguson

We found T.nigrispinus a few km to the south of Abra Pampa where the road that comes north from San Antonio de los Cobres meets the road coming north from Humahuaca. This species is indeed common through the whole area up to and across the Bolivian border. It occurs at a high altitude, probably at above 3000m. It usually grows out in the open, not in grasses nor in bushes, and its habitat is basically desert with a scattering of low deciduous bushes. We did see a few plants growing in bushes or grasses, but not most. The plants vary much in size, probably depending upon age, but 30cm across is typical and 15cm tall would be about average. They resemble the fragile jointed Tunilla type, until you get close to them. Small clumps of joints are common, but these are not mature plants, being either juveniles or propagules. It is a species that breaks joints off easily when they are turgid, so there is a lot of obvious vegetative reproduction, but they also set seed freely. Flowers vary in colour from dark yellow to magenta, with shades of red being most common and yellow rare. Spines are usually very dark but not always, with some plants having grey or nearly white spines, although these are not common. Joints are usually purplish, especially when dormant, but some plants have little purple pigment and look greyish. Fruit are set abundantly and I only remember them being red when ripe.

They were growing in company with Puna subterranea, but they are often found growing near Oreocereus, also T.glomerata, pentlandii, or rossiana, Tunilla affinis corrugata/armata, and Lobivia - mostly Mediolobivia types, but also some that seem to be close to chrysantha, haematantha, or pugionacantha.

.....from J.Lambert

Just to the north of Humahuaca, before the road climbs to the turn off to Iturbe, It follows the river valley which here has the local name of Quebrada Sapagua. The Tephrocactus nigrispinus grew here quite cloe to the road and on the slopes to the valley sides, They were mostly clumps of a great many segments, becoming dark brown (=purpurea?), with spines that are whitish when young but rapidly darken with age. Some of these plants were in flower, of a deep cherry-red to carmine colour. More of these plants were then seen near Abra Pampa.

.....from G.Hole.

When travelling up the Quebrada Humahuaca in company with Rausch and Kuhas, we passed through Humahuaca itself and stopped close to the turn off leading to Iturbe. It was on this flat ground that Rausch had found quite a lot of Lobivia iridescens when he was here on previous occasions. But, search as we might for about three hours, there were only two or three of these particular plants to be found. But there were many other cacti growing there, including Lobivia ferox, and about half a dozen Oreocereus which grew up to roughly two feet in height, branching from the base. We also found seven different sorts of Tephrocactus - very large numbers of Tephrocactus bolivianus and T.pentlandii, some of them growing under scattered bushes, others in the open where they were nearly level with the ground. They carried lots of flowers, the T.pentlandii with flowers of red, orange, or yellow. There were some flowers standing straight up out of the ground and when we scraped some of the sandy grit away from around them we found Tephrocactus subterraneus flush with the surface of the ground, but having only about 3 to 7 heads to a plant. There was not an Opuntia sulphurea to be seen!

We saw about half a dozen plants of Tephrocactus nigrispinus, about one plant among a hundred plants of other sorts of Tephrocactus. These T.nigrispinus looked like dwarf shrubs, about six inches across and 4 or 5 inches high, with only nine or ten segments of purple black colour with black spines. The segments would be

about 40mm long and 16mm in diameter, whereas a cutting from this location which is now growing in cultivation produces segments of only 30mm long and 12mm in diameter. In habitat there were perhaps three or four plants with a flower of violet magenta colour, paler than the flowers on my plant in cultivation.
.....from R.K.Hughes

I have a small T.nigrispinus grown from an offset from the plant grown by G.Hole which originates from this spot at the turn-off to Iturbe. Also another small plant with an OF provenance originating from the Cerro Negro. These small plants produce long spines when growing well but the segments become more elongated when less well grown.
.....from R.Hillmann

On our visit to southern Bolivia we were at the start of the descent from Yunchara when we came across some T.nigrispinus, where they were growing in company with Lobivia cornuta and various sorts of Mediolobivia.
.....from T.Marshall

On our second visit to Bolivia in 1997 we set off from La Paz, travelling southwards down the altiplano via Oruro, Rio Mulatos, and Uyuni for a few days. Crossing the Cordillera brought us to Tupiza where we had an overnight stay. Then we set off southwards and only a few km to the south of Tupiza we turned out of the valley of the Rio San Juan del Oro in order to follow the much smaller valley of the Rio Talina, taking us towards the border with Argentina.

Having passed through Talina, we were not far off the turn out of the Rio Talina valley which would take us to Berque and Villazon, when decided to stop and explore the surroundings. The sides of this valley were mostly not a gentle slope, but equally not so steep as to make it difficult to walk up or down them. Between Talina and this spot we had passed occasional groups of Oreocereus clothing the valley sides to a greater or lesser extent and the Oreocereus were the first cacti to be seen at our stop here (BLMT 122). But now we also saw the columns of Cleistocactus scattered over the hillside, standing out above the bushes. We also came across Lobivia lateritia, short columns of Parodia maassii, hummocks of Tephrocactus bolivianus and Opuntia weingartiana, whilst we had to avoid getting caught up by the usual sprawling pads of Opuntia sulphurea.

Going up a shallow tributary valley, possibly some 20 to 30m wide with gently sloping banks perhaps 5 to 8m high, we came across plants of Tephrocactus nigrispinus which were growing on the bank sides - clumps of about 10 to 15cm across and perhaps 10cm high. They had segments of a very dark brown colour, with long black spines. We saw one or two flowers, of a deep orange colour. A piece of this T.nigrispinus came home with us and now grows with spindle-shaped segments, some 10mm diameter and 25mm long, of a very dark green colour, with porrect spines of a whitish colour.
.....from H.Middleditch

It is a little odd that in the Hunt & Taylor Opuntiodeae the colour picture 70 of T.nigrispinus is said to be at BLMT 63 near Yuquina - but the BLMT field list contains no such entry.
.....from T.Marshall

That attribution is a mistake in the titling of the picture.
.....from H.Middleditch

The above records for the distribution of T.nigrispinus extend over the higher ground from southern Bolivia to El Moreno. The altitude and phytogeography of the Backeberg location at the western exit to the Cachi Pampa would be reasonably comparable with these other recorded locations for this species.

DESERT TRAILS OF ATACAMA By I.Bowman 1924

[Starting from Salta] At Rosario de Lerma, the railway terminal, I met my pack train, and soon afterwards we were crossing the dry stream bed of the Rio Manzano. We passed ranch houses and irrigated alfalfa fields with orchards. In the late afternoon we ascended the Escoipe ravine. We camped on the middle slopes where a fairly heavy growth of scrub occurs and from turns in the trail we had a view out over the irrigated lands. Within the mountains the principal valleys and the gentle lower slopes are covered with grainfields, chiefly barley and wheat, up to the edge of the broken land and to the limits of cultivation. From this point the trail climbs into the higher and rougher country of the Cuesta del Obispo and neighbouring ridges that lie between Rosario de Lerma and the Calchaqui valley. Beyond these, the descent begins; but it is gentle, and after passing the small Sierra de Tintin one comes into the broad and semiarid Calchaqui valley.

Upon the eastern ranges of the Andes and upon the peaks that crown them there is wrung out of the air almost the last vestige of its moisture. On a simple mountain border upon which blow prevailing winds we always find a belt of maximum precipitation and there, too, the heaviest forest grows. Such a belt varies in height above sea level according to the general geographic situation and the height of the surrounding country. In the Himalayas it is from 4,000 to 5,000 feet; in the western slopes of the Sierra Nevada mountains in California it is at a comparable altitude.

We found the zone of maximum precipitation on the mountains west of Salta to be marked by a belt of temperate-zone woodland between 4,500 and 6,000 feet. Above the woodland, scattered groves grew in favourable places, and belts of timber extend up the shadier and moister valley floors. The higher country bears a thin cover of herbaceous vegetation which gradually changes to the scattered clumps of ichu grass at the highest elevations.

West of Rosario de Lerma the woodland begins almost at the border of the plain, clouds hanging over the head of the lower secondary ranges almost constantly winter and summer. Travelling up the Escoipe ravine one enters a zone of dense woodland with patches of true forest marked by tall, wide-spreading, moss-draped

trees and an abundance of vines, heavy undergrowth, and the like, all with distinct subtropical aspect both in type and density. The abundance and variety of the woodland flora reflects the ample seasonal rains, but the stands of timber from place to place lack that touch of luxuriance characteristic of the true tropical forest and shown not only in the height of the tallest trees but in exuberant undergrowths and a top storey of specialized climbers.

At 5,500 feet the tree growth stops, not altogether abruptly but so definitely that the outliers at the upper edge of the forest are rather closely confined to slopes with a southern exposure or to valley floors with an abundance of groundwater. Above the forest the slopes are covered with an extraordinary growth of cactus. It has in places the suggestion of a forest aspect. Between the upper edge of the forest and the settlement of San Fernando in the Escoipe valley (at 1800m) are the densest cactus stands that I have seen anywhere in south america. They are distinctly better developed upon the hillsides; the floor of the valleys is occupied by grasses and shrubs rather than by cactus.

Further up the valley we come to the Cuesta del Obispo, and here the trail zigzags upward to a height of 3,300m at the crest. Cactus appears again upon the east-facing slopes, and one looks down over them into the fertile valley floor and the terraced floor of the valley itself. It is a very pleasant landscape that is spread out to view.

West of the Cuesta del Obispo one enters a broad, waste-strewn valley floor, after descending a steep and in places rocky trail from the pass. After crossing this broad alluvium-filled depression and a second narrow range, one comes out upon the plain of Tintin, where the trail forks, one branch going west and southwest to Cachi, a town on the floor of the deep Calchaqui valley, and the other branch turning abruptly north to Payogasta and Poma. It was the latter that we followed, traversing the dry, waste-strewn plain in the middle of a hot afternoon when clouds hung over the Sierra Tintin on our left as well as the distant Cordillera, The plain of Tintin is covered with cactus and desert shrubs of many varieties.

.....from J.Piltz, In the highlands of Salta, K.u.a.S. 29.4;1978

[after leaving Cachi] From Payogasta the terrain rises almost imperceptibly from 2400m up to Cachipampa lying at about 3000m altitude. A trip over this high plateau in the clear light of a winter afternoon is an incomparable experience. A host of “Pascanas” dominate the landscape, which ascend in odd places to the high pass at the entry to the Cuesta del Obispo. Up here nothing more grows except grass and cacti.

As we rounded a rocky promontory at the top, a breathtaking view opened out before us. Below us lay a thick pall of clouds like a snow-white sea covering the Andean foothills, above which some mountain peaks projected like distant islands. Sadly there was not much time to tarry and enjoy this panorama, since we had the steep and twisting descent towards Salta still in front of us. Quite soon the vegetation on the slopes became less sparse; when the clouds which the vegetation needed were once again above us, it became moister and greener. The cultivated fields and orchards to the left and right of the road, together with the settlements and hamlets steadily appearing more often, gave us an indication that a large town was nearby. Salta finally welcomed us with a gentle drizzling rain. We were certain that we would not stop here long, for the hills of Tilcara and Humahuaca are waiting for us.

.....from J.Lambert

In travelling from Cachi towards the Quebrada Escoipe and Salta, we follow the road which takes us up to the Cachipampa. Once having crossed the Cachipampa we prepare to descend the Cuesta Obispo. But from our vantage point where we are looking down into the valley which stretches away from us, the valley is filled by a mass of white clouds, almost like a lake. The top of the clouds lie some hundred meters or so below us and once we are down into these clouds, we can see little of our surroundings. However, the altitude at which such a cloud bank forms itself may vary: it is not a constant phenomenon, but depends upon the climatic conditions of the moment: you may find it on some days, whilst on other occasions the weather may be perfectly clear.

Even on the Cachipampa itself the weather is very often cloudy and I even remember that once I had to turn back on the road from Cachipampa at 3500m to Mina Don Otto because the fog was so dense that it became no longer possible to look for cacti! The occurrence of these cloud banks hanging at certain levels around the mountains was observed on several occasions in the course of my trips to Argentina.

FROM ROSARIO DE LERMA TO CACHI By F.Kuhn
Translated by Mr.& Mrs. Collins from Boletin del Instituto Geografico Argentino Vol.24 1910.

Despite the many mountain chains of considerable altitude which occur between Salta and the Cordillera Real, crossing this part of the Cordillera Oriental is relatively easy because of the hydrographic system which exists there, and which has the characteristic of forming transverse valleys across the mountain ranges. Taking advantage of these it was possible to approach the National Territory of the Andes by a single ascent and descent. That is, by the Rio Escoipe, passing over the Cuesta del Obispo at 3360 m.

On 12 December my little convoy was standing ready at Rosario de Lerma at 1330m from whence we set off in a southerly direction. The road, wide and good, led between richly clothed hills through a very fertile district, well watered and cultivated, houses and farms being frequently seen on both sides. On the right, close by, the first undulations of the Cordillera rose in the form of gentle hills, covered in dense woodland. On the left, in the distance, were visible the blue lines of the precordilleras to the east of Salta. We crossed the Rio Rosario, which runs in a bed about 400m wide full of rounded stones, and then we crossed one dry stream-bed after another, while all the time the green hills got closer.

After two hours the character of the landscape changed little by little, the cultivated fields becoming scarcer and disappearing, while in their place we now saw a more arid region covered with thorny scrub with a few scattered carob trees. Ahead we could make out the entrance to the Quebrada de Escoipe, between higher mountains overtopped by a large, bare, steep hill, the Cerro Angosto, which further shuts in the beautiful panorama. Another half-hour on the road brought us to the foot of the mountains, and turning sharply to the right we entered the Quebrada - we were in the Cordillera. The change in appearance is perceived with scarcely any transition, and is therefore very startling. Between the high slopes on both sides the Rio Escoipe runs in numerous twisting loops which alternate between south and west. Its bed, covered with large boulders, is largely dry, the river dividing into many small branches which combine into a full torrent only in the rainy season, as witness the boulders carried along by it. A very rich woodland vegetation covers the two slopes, for here we were in the subtropical forest region of the north of the Republic, a region which always enjoys regular and abundant summer rains.

Particular interest was aroused by the epiphytic flora covering the branches of the tall trees, especially an orchid with magnificent yellow flowers and the tillandsias with their enormous drooping tails. The road, only a track from there on, continued through the forest alternatively between the boulders in the river bed itself, about 500 m wide, and on the bank. The eye never tired of looking at that natural landscape so rich, varied, and picturesque. After an hour we reached a mill, where our first days journey ended at 1450 m altitude. In the night a storm broke out and the rain fell until 8 a.m. Half an hour later we continued our journey, climbing the Quebrada and using the river-bed as a road, southward for the first hour, then west, but always with many changes of direction. The landscape at first displayed the same character as on the previous day, the beautiful woods with luxuriant thickets present on both banks, covering the steep slopes, but already the valley was narrower and we could make out higher mountains, bare-topped, where the folded nature of the Cordillera presented itself more clearly to view. Thus we climbed, almost imperceptibly, for two hours, At each bend of the river fresh views of the quebrada presented themselves, but also we gradually noticed a change in the vegetation, the tall tees becoming more isolated, and the scrub beginning to dominate. Suddenly a bend the valley appeared to be completely blocked ahead, the mountains on either side uniting as it were and forming as it were an inseparable barrier. When we reached this point, however, there appeared a gorge a few metres wide between rocky walls which displayed in the scalloping of their lower part the effect of erosion.

This narrow gorge is however, very short; after a few minutes we left the shade of this narrow passage and immediately the mountains receded on both sides, the valley enlarging into a great oval basin with a completely flat bottom. Such enlargements, followed downstream by a narrow gorge, are typical of transverse valleys and are seen in places where erosion is resisted by a sill of hard rock which there intersects the line of the valley, The eroding action of the water was halted there in front of the obstruction for a time and in the face of such a natural dam the river behind it was transformed into a lake, until little by little the gorge became opened up as an outlet. The wide and flat section that we have entered is thus the bottom of a lake that has disappeared, and its former level can be clearly confirmed by the boulder terraces on both sides of the basin, which represent the shore-lines at various periods of the lake's existence. This place however is also interesting for the fact that we find there a phytogeographical boundary. Among the scrub of the slopes we see for the first time the strange shapes of cacti or Cardones and the existence of those xerophilous plants, as also the lack of trees, shows that we have passed the region of regular rainfall and are now entering, at an altitude of 1680m, the vast arid region which extends with continually decreasing atmospheric humidity from that point over the Cordilleras and the Puna as far as the Pacific coast.

In 45 minutes we crossed the basin, the mountains again drew closer and after making a huge S-bend we arrived in an hour and a half at the San Fernando trading post, very isolated there in that arid region, among strangely shaped mountains composed of very bright red rock, probably sandstone, and showing substantial displacements with the bedding planes at times almost vertical. In the background, already quite near, could be seen a large, rocky massif which indicated the position of the Cuesta Obispo pass. From San Fernando, at 1980m altitude, the road continued in a westerly direction, climbing through a region which, in the characteristic folding of the sides of the quebrada, demonstrates the large tectonic movements that created the Cordillera. We approached that massif, with whose silhouette we had already been familiar since the morning. At the foot of its high craggy wall we continued to climb over rubble-strewn ground with a stunted vegetation of small shrubs and after an hour and a half we reached the Monteal trading post at an altitude of 2580m, already close to the Cuesta de Obispo. There our second day's journey ended and very soon a dense mist enveloped the surrounding hills.

The third and final day was very long and tiring; we were in the saddle for 9 hours without dismounting in order to reach Cachi, our destination for the day. In the first hour we pursued our course along the valley. The river, better now called a stream, had driven its narrow bed through thick layers of rounded rubble which formed two or three, high, receding steps on both sides. A turn to the south next brought us to the foot of the Cuesta del Obispo at 2900m, whose high, steep wall closes off the valley. The climb, made in continual zig-zags because of the very steep slope, brought us to the summit at an altitude of 3360m, but we had already entered the cloud zone at 3200m and a thick mist made it impossible for us to observe the land-forms at that spot.

.....from H.Bort, G.O.K. Journal 1973

My seventh visit to Argentina took me all the way from San Luis to the Bolivian border, so that I was able to explore a number of cactus habitats. After visiting the Quebrada del Toro, my next trip was along the Quebrada de Escoipe, up to the Cachipampa. Only in the lower part of this quebrada did Tola bushes grow, covered with a thick white felt. Half way up, at about 2000m, I found Rebutia xanthocarpa on a wide ridge

which rose to almost 5000m. Interestingly there were spherical forms, elongated forms, sunken crowns, yellow sunken crowns - all possible forms. I should like to advance the heretical statement that all the plants under the names of R.violaciflora, kesselringiana, graciliflora, and so on, seem in my opinion to be one and the same.

The previous year, on the same slope, I had found amongst all the others, a Rebutia that was almost naked, with only a few bristles in the crown. It flowered very early this year and so I was able to photograph it before I left. The only difference between it and R.xanthocarpa is that its petals are spathulate instead of being pointed. I do not know the reason for this lack of spines. I found only very few specimens. The lack of spines has persisted until now in cultivation. It remains to be seen if it will remain so.

Soehrensia korethroides is another example of how varied plants can be in habitat and how this can often lead to mistakes. The normal form is spherical, about 30cm in diameter with dark red flowers. I have however come across almost columnar specimens, some 70cm. tall. I was able to collect some fruit off these plants.

The highest point of the road up to the Cachipampa is 3720m. Having stopped here, I thought to myself that something would grow on the mountain behind. I searched all day but there were no cacti. This can happen occasionally. The Cachipampa is a plateau lying between 4000 and 4500m, as big as lower Austria. From the flora, it should be included in the Andean zone. The bushes are typical for the lower Andean zone - the so-called Aniagua bushes. Amongst them grow Trichocereus pasacana, and of course a large number of spp. of spherical cacti. These are Lobivia drijveriana, L.kuenrichii, and Mediolobivia nigricans. Some tracks lead down to the valleys, for example the track to Amblayo. There are goat tracks over the slopes. Tufts of grass fringe the edges of these tracks under which grow Lobivia pseudocachensis, which could only be photographed by moving the grass tuft to one side.

The descent to Cachi from the high plateau runs through a a narrow pass on both sides of which grows Parodia aureicentra. They grow along the lines of rock and only on them. There was no sign of them on the steep sides of the pass. To the best of our knowledge, and Rausch said the same, this species grows on both sides of this little pass within a circle of about 1km diameter. We had come to this conclusion on more limited experience over a smaller area on our joint trip in 1962/63. It is not to be found anywhere else on the Cachipampa.

.....from H.Middleditch

The narrow pass where Bort found Parodia aureicentra is probably the place where Backeberg stopped overnight and found these plants. One might not be too surprised at having a Rebutia growing elongated in cultivation, but it is rather unexpected to hear of any growing “elongated” in habitat, as stated by Bort.

.....from R.Wahl

When these plants grow in company with clumps of Abromeitiella they become elongated in order to reach the light. They can even have a length of 10 to 15 cm. However this is only to be expected when they grow on steep rocky slopes, but elsewhere it is not normal.

.....from M.Nilsson

My trip along the Quebrada Escoipe was undertaken with the local bus, but I did break the journey at El Maray. This is not far from San Fernando and when I enquired about any place called Escoipe, it was indicated that it lay downstream, in the direction of San Fernando. I have finally found my bus ticket for this trip and you will see that Escoipe is not mentioned on it. There are quite a number of scattered small houses along the road up to the beginning of the Cuesta Obispo. Of course there are not always signs which show the names of the hamlets to tell you whereabouts you are. From El Maray I took a very narrow road which started about 200 metres north of the hostelry at El Maray and wound up the side valley for about a couple of kilometres. Climbing up the mountainside on the south wall of this side valley I eventually got high enough to be at almost at the same level as the mountain tops on the opposite side of the valley. Down below were the cultivated fields on the lower slopes of the Escoipe valley. Near the top of this climb, on ground carrying a mixture of grass and shrubs, I found some Rebutia pseudominuscula MN 29.

On the opposite side of the main valley there are a few bushes at the base of the very steep hills with a red, sandy soil, which gets muddy in the rain. They are really far too steep to try and climb.

When we were on the higher ground near the crest of the Cuesta Obispo, we were able to look across the Cachi Pampa to the line of hills which bound the plain on the western side. All the surrounding slopes as well as the plain below carried clumps of ichu grass. Of course there are many patches of bare and stony ground with little or no sign of vegetation at all, and the clumps of grass do not grow side by side, but are also separated by bare ground. There are no trees, bushes, cereiform cacti, or even low shrubs.

.....from G.Hole

During a visit to Argentina in company with Rausch and Kuhaas, we had decided to travel up the Quebrada Escoipe. This is a fairly well known route from Salta to Cachi, which Rausch had travelled previously on a couple of dozen occasions. The road through this Quebrada is rarely far from the river which flows down the valley, so that we gained steadily in altitude as we travelled up the valley. At the head of the valley is a steep and winding ascent up the Cuesta Obispo.

Approaching the start of this cuesta, close to El Sunchal, we stopped where a steep cliff was facing us on our right, with the river not far away to the left. There were no cacti to be seen from the road, but Rausch must have stopped here on a previous occasion and knew that there were Rebutia to be found at this spot. And indeed we did find Rebutia senilis in flower.

.....from K.Preston-Maffham

Climbing up the Quebrada Escoipe we made a stop close to a steep rocky cliff on our right. We could scramble up a rocky defile cut into the face of the cliff, where we found Rebutia deminuta growing in moss and grass at the base of the cliff sides, but not on the rock face itself. These plants had a very dark body, almost black.

.....from R.Hillmann

There are various names, like R.minuscula, senilis, and xanthocarpa which are probably all the same. The oldest name here, I think, is R.minuscula. The R.xanthocarpa is only separated from R.senilis on account of the smaller flower. I know of one place where R.xanthocarpa has only yellow flowers - at all other places it has a mixture of red and pink flowers.

.....from P.Smart

To me, the flower on R.xanthocarpa is smaller because it is short-tubed. I find that R.karusiana can be confused with R.xanthocarpa, which sometimes occurs in yellow spined forms.

.....from R.Moreton

I would say that R.xanthocarpa has much smaller flowers than most Rebutias and I have never seen one with a flower other than red. Rebutia karusiana seems to be reasonably distinct - I think that I could pick it out from a batch of plants as I do not think that it looks much like R.xanthocarpa.

.....from R.Wahl.

The real start of the Quebrada del Toro is at Km 31, which is joined by the Rio Capillas at Km 40. Here, at the first crossing of the river bed, the yellow flowering R.xanthocarpa grows on the right hand side of the valley. In this area, as well as in the Rio Capillas valley, the flowers of R.xanthocarpa are just as often either pale red, deep red, bluish red, or yellow, and about 1.5 cm in diameter. This also manifests itself in cultivation.

.....from R.Martin.

I would certainly agree with Hillmann that various forms of R.xanthocarpa and R.senilis cannot be told apart when out of flower. Moreover, there is a whole group of small flowered Rebutia, generally described as varieties of R.xanthocarpa, which do seem constant in their small flower size.

.....from H.Middleditch

Before my Rebutia were decimated by the pale brown discolouration of the bodies, my R.senilis and R.violaciflora gave the impression that they had spines distinctly longer than most of my other Rebutias.

.....from R.Martin

I think that spines can be variable on Rebutias and indeed this is pretty much what separates R.minuscula from R.senilis. I have seen various intermediates, and plants with spine colour varying from straw (yellowish or brownish) through to pretty pure white. I think that short forms with purplish/pinkish flowers get called R.violaciflora, while ones with longer spines get called R.senilis v. violaciflora, or R.lilacinorosea. Ultimately, you can have long or short spines, with red, purplish-pink, or yellow flowers in any combination, e.g R.senilis v.kesselringiana, or even pale pink to white flowers, when we get R.karusiana. Some flowers are larger and in the past were called R.grandiflora, and some smaller than usual - R.xanthocarpa. However, the latter does consistently produce small flowers from self-set seed.

Sometimes these features seem to be somewhat correlated. Thus R.xanthocarpa also has pale coloured seed pods as they are starting to form, which makes me believe that most forms of this type have some common ancestry, rather than a repeated mutation of “ordinary” plants to smaller flowered ones. Also R.xanthocarpa always has pretty well medium length spines. Whilst R.violaciflora, at least in some of its forms, seems to have a darker body - and so does R.marsoneri. I do believe that there are many more-or-less isolated populations in the wild, evolving separately, leading to many subtly different forms. The more distinctive in terms of flower colour, spine length or colour, flower size, etc., get singled out and named.

.....from M.Wimberg

The fruits on Rebutia are not all the same when I come to remove the seed. Normally I use a small spoon which I carefully put under the fruit, and then touch it gently with a pincette. The fruit on R.senilis and R.wessneriana have a tendency to disintegrate as soon as you just look at them.

.....from R.Hillmann

As far as we can see at the present time, Rebutia wessneriana should be a good species, because it’s habitat locations are far to the north of the others and there are clear gaps between the distribution areas.

.....from A.de Barmon

My own plants of R.xanthocarpa may be distinguished by their yellowish central spines, whereas all my plants of violaciflora, kesselringiana, minuscula, senilis, and karusiana have brownish or slightly brownish central spines. In addition, the flower tube on R.xanthocarpa is only 10mm long, compared with 20mm long on R.minuscula and 30mm long for the other four sorts. I would describe the flower on my R.violaciflora as violet, compared with red flowers on xanthocarpa, minuscula, and senilis, whilst karusiana has a yellow flower. In addition, fresh fruit on violaciflora is a violet colour whilst on xanthocarpa and kesselringiana it is yellow. I find that R.karusiana are self-sterile, whilst all the others are self-fertile. However, the most obvious feature at first sight is the spine length, of 1 cm on both R.senilis and R.karusiana, the other four sorts having spines of only 5mm in length.

.....from H.Middleditch

Would this last set of observations form an acceptable basis for separating the various names for the Rebutia seen in the Quebrada Escoipe?

AUSTROCACTUS - BACK TO THE ROOTS From A.Johnston

When I was looking at a pretty comprehensive list of herbarium specimens of collected Pterocactus, I noticed that one species had been collected by Dusen. Is this the Dusen that Austrocactus dusenii is named for? Is anything known about him? Also do we know whom Austrocactus bertinii was named after?

.....from The Princetown University Expeditions to Patagonia 1896-1899, Vol VIII Botany, 1903 Part 1 - The

Vegetation of Western Patagonia by P.Dusen

In the years 1895-1897 I travelled in Tierra del Fuego, Patagonia and southern Chili on a general exploration of the botany and geology of that section, but making moss-vegetation of the several districts the subject of my particular attention.

.....Britton & Rose The Cactaceae Vol.III 1920

Austrocactus bertinii was discovered in 1855 by E.Cels, a brother of F.Cels, at one time a cactus dealer, who first described the plant; it was again collected at the type locality by Captain Bertin in 1861, for whom it was named. The first plants obtained did not live, but those of the second collection lived and flowered.

.....from G.J.Swales

With the reference to the original description of this species to hand, we were able to consult the periodical in which it appeared, in the course of a visit to Kew.

CEREUS BERTINII By F.Cels
Translated by H.Middleditch from L'Horticulteur Francais, Vol.13 1863

In 1855 my brother, E.Cels, master mariner, whilst going to collect guano on the islands of Towa [Toba] and Leones (where he had collected the fine varieties of Echinocactus gibbosus which had been put into commerce by myself) made an excursion on to the nearby coast of the mainland at 45°30' latitude on the Atlantic shore. There he found Piereskia poeppigii and a columnar cactus which did not survive. E.Cels, being unable to return to these waters, requested Mr. Bertin, his second-in-command of long standing who had by then become captain, to look for this plant. The searches for it were in vain on his voyages of 1859-1860. It was not until 1861 that he found it under the bushes. In this locality it does not rain; only the dews are very abundant. In winter the thermometer drops to little more than 1 or 2 degrees, and in summer (December, January) there is tropical heat. Captain Bertin, not being able to return to France, dispatched the plant in question to his old Captain, E.Cels; there were about ten branches having roots, at the top of a stalk of 15 cm. These branches were at most 15 to 20 cm tall and still retained several old dried up flowers.

I believe that a short description of the plant will be adequate to distinguish it from all the other species of the genus and even of the family, since it is the only curving Cereus, and of which the stems are recognisable by the number of ribs. The branching stems ought not to attain more than 40 cm, of a dark green, with ten straight ribs. The areoles are always projecting, almost circular; the areole wool is yellowish and short; 4 central spines the lower is the longest, of 27 mm, rarely 30; the three other spines of 20 to 25 mm are translucent at the base, oyster brown and curved at the tip. There are 15 other radial spines, translucent, much more slender, rarely exceeding 10 mm, straight. Sometimes two or three intermediate spines are curved at the tip, but not hooked.

.....from H.Middleditch

In his Nova addenda ad Floram Patagonicum of 1899, Spegazzini provided a description of "Cereus dusenii Web., (in litt)". The habitat was stated to be "on steep rocks near Trelew, Chubut, found Nov.1897 by J.Valentin" and to be "remarkably resembling the very distinctive species Cereus bertinii".

Then in Part IV of his Nova Addenda Floram Patagonicum, which appeared in 1902, under the heading of Cereus dusenii, Spegazzini makes no reference to the collection by Valentin, but refers to a collection made in 1899 "in very dry meadows along the Rio Chubut" and also in 1900 "in mountains along the Rio Alumine". Also "from the mountains of Teka-choique is present a prostrate etiolated worm-shaped form 15-35 cm long by 0.8 to 0.15 mm thick". One might presume the latter dimension is a misprint, or even a dual misprint, since a stem of this diameter is a nonsense, so that 0.8 to 1.5 cm thick might possibly have been intended. In any case, these stem dimensions diverge radically from the "20-60 cm tall by 3 to 5 cm thick" of the 1899 description by the same author. The thinner stemmed plants from Teka-choique, are evidently from the lower slopes of the Andes mountains and not from the Patagonian plateau; they may possibly not be A.dusenii, but a different species.

In his Cactacearum Platensium Tentamen of 1905, Spegazzini records Cereus dusenii as "not rare in the arid plains of Patagonia between the rivers Santa Cruz and Rio Negro". This area effectively comprises almost the whole of the Patagonian plateau.

In Vol 96 of the Ann. d. l. Soc. Cient. Argentina for 1923, there appears an article by Spegazzini which covers a range of Argentinian cacti of various genera. This includes a review of Austrocactus, with a tabulated comparison of the features attributed to each species, a fairly detailed history of the species names from a range of literature, and an appreciation of the nomenclature, altogether running to over five pages. This article makes reference to the name Cereus bertinii in Hort. France of 1863, in which there appears an illustration of a Cereus bertinii of short columnar stature, complete with hooked spines over its full height, which was reproduced by Britton & Rose in their monograph. But this seemingly comprehensive article does not make any reference to A.bertinii originating from the coast near the Isle Leones, even though Spegazzini does quote from a letter "from Dr.Weber of 10 August 1897 in which he says 'from the Isles Leones, Towa, etc., I have seen many varieties of Echinocactus gibbosus and Cereus bertinii Cels, a species close to Cereus patagonicus, but distinct on account of its hooked spines'". So it would appear that Spegazzini was not aware that Austrocactus bertinii was first collected at the coast near Isles Toba and Leones.

.....from D.J.Ferguson

I am very convinced that there are only two species of Austrocactus over most of Patagonia. My problem is deciding which name fits which type. I have no doubt that A.bertinii and A.dusenii are the same thing, and that they are the names for the common larger species that dominates in northern Patagonia and extends

somewhat down to the Atlantic coast. In this larger species, we found no distinctions worthy of note any where except in the northeast part of their distribution. Near Trelew we looked at hundreds of these large plants, where the spines are often hooked on adult plants, but usually not. On juvenile plants, the centrals are nearly always hooked. In the granite uplifts in eastern Rio Negro and S.W. Buenos Aires provinces, the plants become clustering. These were more varied in spine colour than usual, and the spine colours were more often in the yellow and the reds than they are anywhere else. This form probably deserves varietal recognition, but as far as I know it does not have a name.

Otherwise, variation was pretty much individual and not regional. The most noticeable trait of individual variation is probably the hooking (or not) of the central spines, which often changes as the plant matures. We looked at thousands of ovaries and fruits, and most bear bristles, but rare individuals everywhere do not. The spine colour varied little,, generally dull greys, grey-browns, or sometimes almost black. Occasionally there are plants with nearly white or even slightly yellowish spines. The variants with light-coloured spines were most common inland in south Chubut (i.e. near Sarmiento) and this is perhaps the closest to a regional trend that I saw - but it is only an average difference, and not constant, whilst the normal darker spine colours were not unusual there.

As for flower colours, we saw very few actually in flower, but my impression is that the flower colour is highly variable, with brassy yellow to orangy-brownish being most common, but also varying towards white and pinkish.

The smaller, generally more southerly - or from higher elevations - species clusters from the base and commonly sends out rhizomes and what I would call stolons (skinny etiolated stems) sent through dense cushion plants or cracks in rocks to establish new clumps of normal stems. It is also very stable east of the Andes, with perhaps even less variation than in the northern species. It also varies in the hooked spine trait and in flower colour. However, again we saw very few plants with flowers open, generally in the same yellowish to brownish range. But the plants at Las Lenas had pale pink flowers. Mostly we found them with green to ripe fruits. Again, I think that the trait of presence or absence of bristles on the fruit is purely an individual variation, and not taxonomically significant. The bristle-less fruits do not occur over whole populations, but as scattered individuals.

.....from K.Gilmer

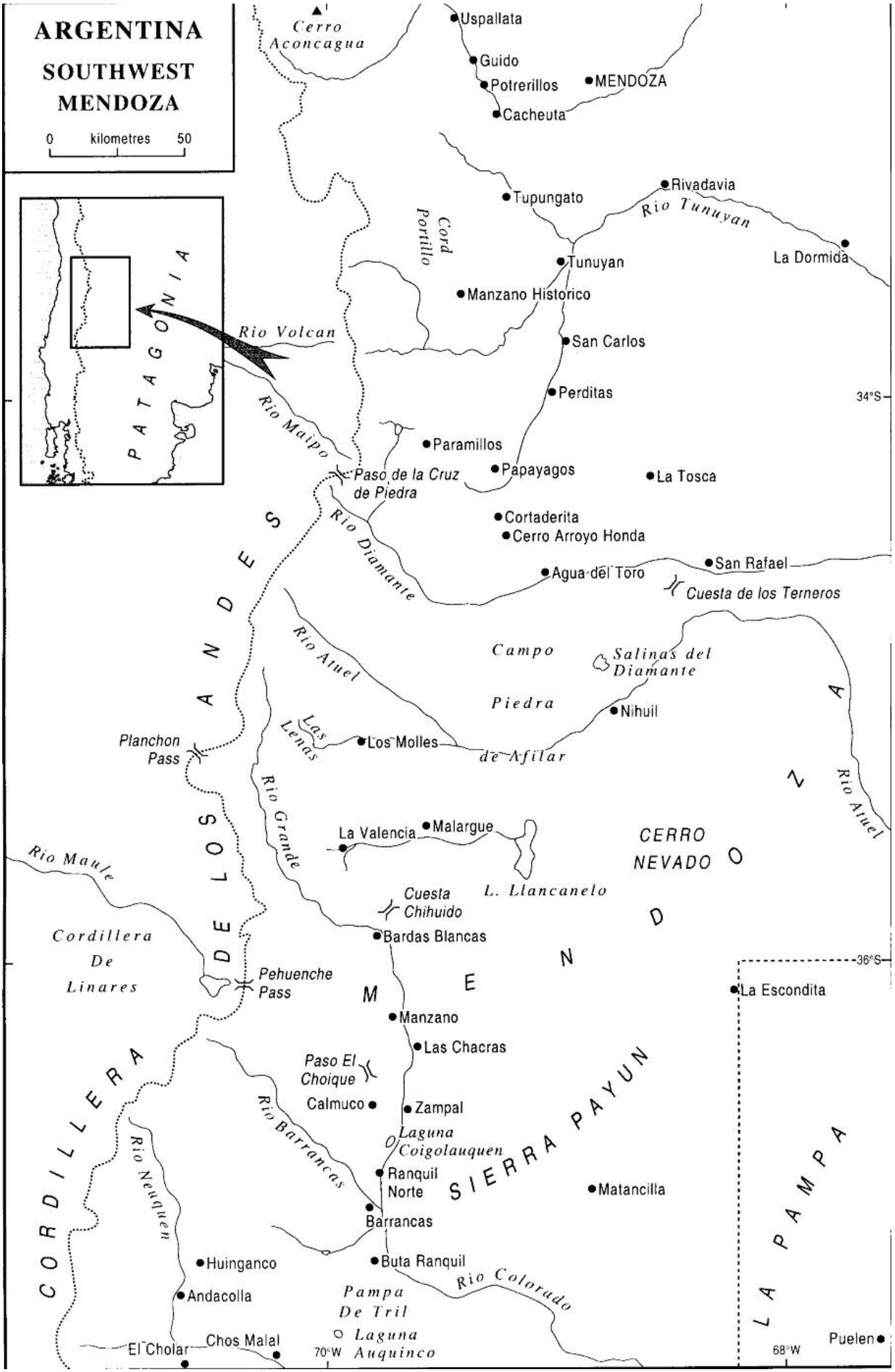
Our second field trip to Argentina started off in the month of November. After travelling through the provinces of Catamarca, La Rioja, and San Juan, we set off from Mendoza city along the road going to the south in the direction of Neuquen. After some 30km or so, we turned off to go along the road to Tupungato. Whilst still on fairly level ground,we made a stop where there was only a scattering of vegetation. Here we saw quite a lot of Tephrocactus aoracanthus, T.articulatus, and Platyopuntia sulphurea, as well as Trichocereus candicans.

Only some 5 or 6km further on, the road had started to go over somewhat undulating ground where the vegetation did change a little. So we stopped to walk round the gentle slopes. On closer inspection we found some small specimens of Denmoza rhodacantha, some Pyrrhocactus strausianus, and more Trichocereus candicans now with their white flowers fully open. At this spot, the boundary between Tephrocactus ovatus and T.darwinii becomes blurred because the plants we found here looked like a transition stage between these two species. Then, a pleasant surprise, for most unexpectedly we saw some Austrocactus patagonicus with their first flower buds, many of these plants growing a in a clump of grass. They were mostly solitary plants, growing no higher than about 15cm tall, but some of them were branched from part-way up the stem.

From here, we continued to travel south until we were some 5km beyond Tupungato. The surroundings here were not very different from those at our previous stop, except that they seemed to be rather more dry and we were now on an area of fairly level ground. We stopped when we saw from the vehicle some nice Cereus aethiops. The tallest plants of this Cereus were seen on our earlier field trip to northern Argentina - in the Quebrada de la Rio de las Conchas and in the Quebrada del Rio Calchaqui, where the Cereus aethiops were to be seen growing in dry river beds between bushes, where some specimens were up to 3m in height, but most were less than 1.5m tall. Here, near Tupungato, the Cereus aethiops grew up to about 1.2m high, but they still stood out well above the surrounding vegetation. Walking round, we did not see any Austrocactus here, but we did come across plants of Trichocereus candicans, and some solitary Echinopsis leucantha growing up to almost two meters in height, as well as Pyrrhocactus strausianus with ripe, pink coloured fruits. And also some Ephedras with many bright red fruits.

Continuing on our way to Manzano Historico, the gently undulating landscape now gave way to low, easy sloping hills, evidently outlyers of the eastern foothills of the Andes. The vegetation was becoming a little less sparse, and even slightly greener. Once beyond Manzano Historico, we followed a river valley into the Andes, with the mountains rising steadily ever higher at either side. We stopped when we saw from the vehicle numerous plants of Tephrocactus ovatus/darwinii which were in flower, on the nearby slopes. Here, the vegetation looked as though it had had the benefit of a better rainfall, the bushes and shrubs being taller and more numerous by comparison with those at our previous stop. Although Notocactus submammulosus has been reported to grow in this area, we did not come across any of these plants here. Nor did we find any Trichocereus candicans - at 2000m altitude here it was probably too high for these plants. But once again we did come across Pyrrhocactus strausianus. There were also a good number of Austrocactus to be seen, which grew up to about 20cm high, many of them branching from ground level, so forming clumps, but with no signs of buds or flowers.

As we drove further up the now fairly narrow valley - and so further into the mountains - the road sometimes wound across moderate slopes, sometimes across steep slopes. At the customs post at 2600m., on the nearby steep slopes, quite close to and above the road, we found some Gymnocalycium strigelianum - low


ARGENTINA
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Tupungato
Rivadavia
Rio Tunuyan
Cord Portillo
Tunuyan
La Dormida
Manzano Historico
Rio Volcan
San Carlos
Perditas
34°S
Rio Maipo
Paramillos
Paso de la Cruz de Piedra
Papayagos
La Tosca
Cortaderita
Cerro Arroyo Honda
Rio Diamante
Agua del Toro
San Rafael
Cuesta de los Terneros
ANDES
Rio Atuel
Campo
Piedra
Salinas del Diamante
Nihuil
Planchon Pass
Las Lenas
Los Molles
de Afilar
Rio Grande
La Valencia
Malargue
CERRO NEVADO
Rio Atuel
Rio Maule
Cuesta Chihuido
L. Llancanelo
Bardas Blancas
Cordillera De Linares
DE LOS
Pehuenche Pass
MENDOZA
36°S
La Escondita
Manzano
Las Chacras
CORDILLERA
Paso El Choique
Calmuco
Zampal
Rio Barrancas
Laguna Coigolauquen
Rio Neuquen
Ranquil Norte
SIERRA PAYUN
Matancilla
Barrancas
Huinganco
Buta Ranquil
Rio Colorado
Andacolla
Pampa De Tril
LA PAMPA
El Cholar
Chos Malal
70°W
Laguna Auquinco
68°W
Puelen

growing plants of up to about 8cm in diameter. Also some Soehrensia formosa growing up to about 30cm in diameter and height, which we had also seen at our previous stop at lower altitude. Here, once again, the Austrocactus grew in clumps, branching from the base, with stems up to 20cm high. But - another very pleasant surprise - most of them were in flower, with petals of a bronze-yellow colour with reddish-brown tips, together with a pale pink throat and a very dark crimson coloured stigma. Many of these Austrocactus grew in the midst of clumps of grass- there was not a great deal of bare ground to be seen and what there was, was usually sandy and nearly covered with small stones.

Continuing even further up this same valley, the road became steeper, often with a zig-zag climb. A few km before reaching the pass over the Cordillera del Portillo, we could go no further as the road was blocked by drifts of snow. So we turned round and went down the valley the way we had come, until rejoining the main road south at Tunuyan. This road now followed fairly level ground away from the lower slopes of the Andean foothills. Near Papayagos we turned westwards again to head up into the Andes, going towards Paranillos. As on the previous ascent, the vegetation became gradually greener the higher up we went. But when we reached 2500m altitude, at the entrance to a nature reserve, the moderately steep mountain slopes rising on all sides carried only rather sparser vegatation - nothing like the moist green surroundings where we had stopped previously near the customs post, at a roughly similar altitude, even though the nature of the ground was about the same - sandy with small stones. There were lots of Denmoza rhodacantha to be seen here, often only a pace or two away from each other, but only growing up to about 20cm tall, none of them in bud or flower. Once again we found some Austrocactus, but here they were only fairly short plants, about 5 or 10cm high, mostly to be seen on the bare patches of ground. Most of these Austrocactus were solitary plants, very few of them branching from the base and then with only one or two branches. A few of these plants were in bud, but we saw no open flowers.

Travelling back east down the valley and out of the Cordillera on to the wide open plain, we headed south again, turning back up into the mountains after passing through Sosneado, going towards Los Molles. At a stop at 2500m near the ski slopes of Las Lenas, no Austrocactus were to be found. Once again it was back to the main road and further south, stopping a few km beyond Malargue, where we were going down the hillside towards the Rio Malargue. Once more we found some Austrocactus which were not in flower, together with both Trichocereus candicans and Denmoza rhodacantha. Still further to the south, we came to Bardas Blancas on the Rio Grande, then followed this river valley south via Manzano to Zampal. Here, on a gravelly hill, we found more Austrocactus - again, not in flower, which were growing in company with Pterocactus and also clumps of Tephrocactus platyacanthus.

Now we directed our steps back northwards, firstly along the Puntilla de los Huincanes. Just to the north of Calmuco we stopped near Laguna Huca Lauquen, where the road was following a flat bottomed valley of not quite half a km in width, with steepish hills at either side. We were rather impressed by the fairly abundant and very green vegetation here, which would cover roughly half the ground surface not only on the level ground but also on the hillsides. It was easy to see the bare ground between the various clumps of dwarf bushes. There were darker green bushes which formed clumps of between less than half a meter across up to several meters across, all growing to little over knee height. There were other dwarf bushes of a more yellowy-green colour and growing to a lower height, which formed mats of perhaps little more than 20cm in height and of various sizes up to over a metre across. Unlike our other stopping places where we found Austrocactus growing in quite good numbers, here we found only a few of these plants. All of them were growing up through the yellow-green mats of dwarf bushes, which was where we first caught sight of their pale pink flowers. These Austrocactus were probably no more than 30cm tall. They probably had very few branches, as we saw only two or three heads close together, projecting out of the top of the dwarf bushes. The climate here was rather too cold and too damp to suit Trichocereus candicans or any Pyrrhocactus. The only other cacti that we saw here were Tephrocactus ovatus, a Maihuenia, and hundreds of Pterocactus valentinii with open red flowers.

Going north to El Sosneado, we took the road leading towards San Rafael, stopping near Salinas del Diamante. Rising up here out of the very extensive flat plain, there were occasional smaller mountains and hills, covered with bushes. These hills consisted of crumbling granite and were often only 10-20m in height, but on them grew a vegetation quite different to that to be found on the sand- and dust-covered plain. We had a good look round one or two of these granite hills, and found Notocactus submammulosus in flower. Now it was time to go back to Mendoza to catch our flight back home.

.....from H.Middleditch

By comparison with the information previously available, this travelogue apparently records the finding of Austrocactus at several places which extends the distribution of these plants in a more northerly direction. These places may be located on the accompanying map.

.....from J.Lambert.

The Notocactus submammulosus which we found near Manzano Historico was seen just before reaching that place, when we were coming from Tupungato.

.....from W.Papsch, K.u.a.S. 52 (9) 2001. Patagonian cacti

Austrocactus patagonicus usually has a more open spination, but with spines that are stronger, blacker, thicker at the base, and hooked, and is offsetting only by exception, thus distinguishing itself readily in habit from the offsetting and often clump-building A.bertinii with its denser spination, with its colourful and frequently straight spines. Both forms go through a strongly hooked-spine juvenile stage, this spine formation remaining on the adult stage of A.patagonicus, whereas with advancing age, straight spines evolve on A.bertinii.

This strategy of adapting different spine forms is readily explained. On account of its hooked spines,

A.patagonicus can climb up to a height of a meter in and between bushes. At the habitat locations where A.bertinii grows, such numerous bushes growing close together are absent, whilst wide open flat spaces with dwarf shrubs and tussocks of grass predominate, so that the clambering capability is no longer needed. On the other hand, A.bertinii requires more protection against the effects of an extreme climate and on that account develops a more dense spine cladding.

.....from H.Middleditch

This explanation by W.Papsch would appear to be perfectly logical, but then the straight-spined characteristic of his A.bertinii has to be balanced against "hooked spines" which are included in the first description for A.bertinii in 1863. At over 30cm long, it would not be easy to suggest that the original piece of "Cereus bertinii" brought back to Europe was a relatively new offset which was displaying the juvenile hooked spines to which Papsch refers.

.....from C.Spegazzini, Primitae Florae Chubutensis, Revista de la Facultad de Agronomia y Veterinaria, III, Nos. 32-33, 1897

Cereus patagonicus Web. (in litt.) Proliferating, cylindrical, small, (20 to 30 cm tall, by 5 to 8 cm diam. spines 1-4 erect centrals.

.....from C.Spegazzini, Nova Addenda ad Floram Patagonicum, Annales de la Sociedad Cientifica Argentina, Vol. XLVIII 1899.

Cereus dusenii Web. (in litt). Habitat - in steep rocky places near Trelew. 20 to 60 cm tall, 3 to 5 cm thick, central spines hooked at the tip. [Collected by] J.Valentin Nov. 1897. Species very distinct from Cereus bertinii

.....from H.Middleditch

In the 1897 Spegazzini description of Cereus patagonicus, the central spines are described as erect with no mention whatsoever of being hooked. Together with the clumping habit of stems up to 8 to 12 inches tall, this would nicely match the lower-growing, offsetting Austrocactus which we are told by Papsch grow in the wide-open spaces with few, if any, bushes. Unfortunately, Papsch uses the name A.bertinii for this lower growing, proliferating form which Spegazzini described as A. patagonicus. The 1863 Cels description of bertinii includes hooked spines, stems up to 40cm long i.e longer than Spegazzini's 30cm long stems for patagonicus, again conflicting with the name given by Papsch.

In the 1899 description of Austrocactus dusenii, the central spines are described as hooked and the stem is described as up to 24 inches tall, without any reference whatsoever to having any offsets. This description would conveniently fit the Austrocactus which Papsch describes as clambering up bushes by means of the hooked spines. Whilst Papsch applies the name A.patagonicus to this form, on the basis of the hooked spines either the name bertinii or dusenii could be adopted here.

.....from R.Kiesling, Cacti of Patagonia

Austrocactus.

Spines straight	A.patagonicus
Central spines hooked.	
Flowers with bristles and hairs	A.bertinii
Flowers with hairs and no bristles	A.dusenii

.....from H.Middleditch

As far as applying names on the basis of hooked or straight spines, Kiesling follows Spegazzini, whereas Papsch does not. On the other hand, Papsch does explain the reason for the difference. From the observations made by D.J.Ferguson during his field trip, concerning the erratic occurrence of bristles on the flowers and fruit of Austrocactus, it becomes difficult to accept Kiesling's distinction between A.bertinii and A.dusenii based on the presence or absence of such bristles.

.....from U.Eggli

Yes, I would accept that the article by W.Papsch in the 2001 K.u.a.S. does clearly indicate that he regards Austrocactus patagonicus as having hooked spines, whereas Kiesling in his Cacti de Patagonica provides a key for Austrocactus which equally clearly states - "straight spines- Austrocactus patagonicus". However, when it comes to using hooked spines as a key character, I do have my reservations and I think that this particular feature is not very suitable for this purpose. The combination of growth form, geographical occurrence, spine sturdiness, and flower colour are probably sufficient to define groups, with some potential overlap. For example, I think that the rather heavy spination with usually some hooked spines on seedlings, plus pink flowers, would be diagnostic for A.patagonicus.

As to growth form, I never really did have the impression that any Austrocactus were to be seen climbing up into shrubs. I would rather describe them as frequently growing amongst shrubs or at the base of shrubs, or having become overgrown by shrubs and just sticking out their tops. We did identify as A.patagonicus those plants which we saw at four places during our travels in Patagonia, where they were accompanied by shrubs, but none of which were climbing to any extent and none of them showed any offsets - or very few. One such location was where we were approaching Portezuelo de Choique, on sandy or gravelly hills at 1950m altitude; another was near Buta Ranquil at 1120m where the Austrocactus were growing on limestone hills at one side of the road and on dark volcanic rocks at the other side of the road. And at a third place when we were going towards Chos Malal from Buta Ranquil, on gravelly slopes at 1250m. None of the plants at any of these three places displayed any flowers.

At several other places we came across Austrocactus of a somewhat different appearance, as they did display a tendency to offset from the base. Near Las Lenas at 2200m we saw such plants with flowers of an orange-ochre-yellowish colour, which were growing among scattered dwarf shrubs on a pebbly slope between the road and the river. Then, to the west of Malargue at 2100m, en route to La Valencia, along a gravel road going up into the Cordillera, we came across more Austrocactus, this time with coppery-orange flowers, which

were growing among shrubs on small hills composed of a whitish-grey hard gypsum rock and of orange-brown volcanic rock. Then on a limestone plateau above the Cuesta El Chihuido at 1920m, there were more similar looking Austrocactus to be seen with flowers of a similar orange-brown colour. These plants were all tentatively identified as A.phillipi.

It is difficult to check Kiesling's argument for separating A.bertinii and A.dusenii on the basis of the presence or absence of bristles on the flower tube, as I do not have any flowers available of all our collection numbers. However, the A.patagonicus which we saw as we were approaching Chos Malal, certainly does have numerous and quite strong bristles on the fruit.

.....from D.W.Whiteley

I would not be surprised if an Austrocactus growing in a bush used this as a support to grow upright. Many clambering Cerei do this. I even have an aubrietia in the garden which is normally a low spreading ground hugging plant, which has got intertwined with my privet hedge and clambered 18" to 20" vertically up the face of it. Prostrate plants are usually weak stemmed and though they grow upwards, gravity bends them over very quickly unless another stronger shrub provides support.

With its hooked spines, Austrocactus would be an ideal candidate for using stronger growing bushes for support. Plus, of course, as the bush would provide some degree of shading the Austrocactus would tend to grow upwards towards the higher light intensity. Growth in the shaded environment would in any case tend to be longer towards the light than in full sun

.....from W.Papsch (Ibid)

Austrocactus patagonicus grows in more or less sandy alluvial areas of lower altitude. In the flat regions near the coast as well as along the Rio Negro valley and the Rio Colorado valley, this form is dominant. In more inland areas at higher altitude, as well as in the volcanic ranges which reach to the Atlantic coast, is where A,bertinii is to be found. Whilst A.patagonicus is always isolated, often with great gaps between individual populations, in the shelter of more or less dense bushy thickets, A.bertinii frequently forms extensive colonies in coarse gravelly and not very steep hillsides, where here too the shelter of bushes and grasses is also preferred.

The ground in which the cacti grow in Patagonia is very variable in its nature. North of the Rio Negro is preponderantly a stone-free loess-rich soil, being of alluvial origin almost throughout. Cacti are to be found throughout this region and to some extent in populations of numerous plants, mostly in the shelter of bushes and trees. Towards the south there are increasing areas of sand and gravel flats which become separated from each other in the region of the widespread rocky flats of the Patagonia and coastal volcanic zone. Stony slopes of modest gradient can be regarded as certain cactus habitats, but also markedly disintegrating rock formations are also colonised.

These various ground conditions have a marked influence on the external appearance of the plants. According to upon which ground (Basalt, stony, or fine sand) the plants grow, they present a specific Phenotype. On this account considerable differences in the growth form and in the spination occur within a single species. However, this makes it difficult, without knowledge of the necessary data on the locality, to establish the taxonomic relationship of the basic and extreme forms of any one species, which can easily be regarded as a new taxon.

.....from H.Middleditch

In the foregoing abstract, the names bertinii and patagonicus have been reproduced exactly as they appear in the article by Papsch. The observations by Papsch in regard to ecological variations of these Austrocactus might well be applicable in principle to a great many other groups (or names) of cacti.

.....from F.Vandenbroeck

In the course of my visit to Patagonia I was making a search for Pyrrhocactus platyacanthus around Malargue when we came across hairy-bristly fruits on a supposed plant of this sort, which proved that these plants were in fact Austrocactus. Going further south, we came across more Austrocactus when we were near Calmuco on the Puntilla de los Huincanes. We also found these plants in fruit and it was quite clear that the bristles protruded above the top of the fruit. Austrocactus may grow at fairly high locations since to the north of Barrancas we found them at the foot of snow-covered mountains, growing together with Maihuenia latispina, a Pterocactus, and another Tephrocactus with golden yellow curved spines which at times formed large hummocks.

Our visit to Patagonia was made in the Spring of the year (November to December) when we found plants flowering in parts of the pampa whilst in other places it was absolutely barren and dry with boisterous dust-laden winds sweeping over the open ground. It was my impression that Austrocactus was not very prolific in this region and indeed I only recall seeing these plants in a few places. The Austrocactus which we saw in fruit near Malargue and on the Valdez peninsula were few in number and rather small and insignificant. I believed them to be young seedlings with an as-yet untypical spination. But at Dique Arroyito in the valley of the Rio Limay, just to the south of the city of Neuquen, the Austrocactus were rather more numerous. Then near Las Plumas in the valley of the Rio Chubut, however, I found many very impressive plants growing up to 30cm tall with a dense reddish to blackish spination. They grew in open ground in an arid soil amongst sparse taller bushes. Yet I believe them to belong to the same species, probably A.patagonicus, which often shows hooked spines. The small plant growing on an open patch of ground photographed by K.Gilmer must be a young plant of A.patagonicus as the hooked spines are evident on that picture.

.....from K.Preston-Mafham

Our visit to Patagonia took us to Puerto Madryn, right on the coast, where the surroundings were quite flat. Just outside the houses there were bushes every yard or so which were about two or three feet in height, all over the pretty well level ground. There were plants of Austrocactus patagonicus with hooked spines that


PATAGONIA
0 miles 200
Rio Maute
36°
Buta Ranquil
LA PAMPA
Chos Malal
Pacific Ocean
Lagunda La Laja
NEUQUEN
Puelches
BUENOS AIRES
Anelo
Las Lajas
Neuquen
General Roca
Rio Colorado
Bahia Blanca
Zapala
Alumine
Dique Arroydito
Villa Regina
Chelforo
El Chocon
Choele Choel
Rio Negro
Junin de los Andes
Rio Limay
Santa Rosa
Sierra Colorado
Valcheta
San Antonio Oeste
RIO NEGRO
Aguda Cecilio
Carmen de Patagones
Nahuel Huapi
Talcahuala
Bariloche
Huanaluan
Sierra Grande
Punta Colorado
Norquinea
Puerto Lobos
El Maiten
Talacapa
Peninsula Valdez
Telsen
Rio Chubut
Puerto Madryn
Esquel
CHUBUT
Trelaw
Rawson
Teka
Las Plumas
Paso de Indios
44°
Rio Chico
Cabo Raso
Luebecka
Malaspina
Camerones
I. Leones
I. Toba
Alto Rio Senguera
Bahia Bustamente
Facundo
Sarmiento
Paso Rio Mayo
Lake Colhue
Comodoro Rivadavia
Caleta Chivira
Lake Buenos Aires
Caleta Olivia
Perito Moreno
Rio Deseado
Chile Chico
Deseado
Lago Posados
Bosques Petrificados
Rio Chico
SANTA CRUZ
Lago San Martin
Gbr. Gregores
Est. Leonardo
Lago Tar
San Julian
Lago Viedma
Luis Piedra Buena
Santa Cruz
Rio Santa Cruz
Lago Argentino
Atlantic Ocean
Rio Gallegos
52°S
TIERRA DEL FUEGO
Cape Horn
72°W
64°

were growing up through the bushes, but only the odd one here and there, certainly not in every bush. Further from the coast, on the way to Puerto Tambo, we found more Austrocactus patagonicus growing under bushes, in similar surroundings. None of these plants were in flower.

.....from R.Hillmann

My visit to Patagonia occupied some seven weeks, from the end of November to mid January. Our travels started at Bariloche, on Lake Nahuel Huapi, visiting the Chileans lake district down to Puerto Montt, then returning across the border back into Argentina. Our aim was to travel south down the east side of the Cordillera and then return north nearer to the coast, but crossing back towards the Cordillera on two occasions in the course of the north-bound leg of our trip. In the general surroundings of Lago Buenos Aires, we found plants of Austrocactus bertinii at four different places. Then more of these plants were seen at Gobernor Gregores, as well as at two places on the southern shore of Lago Viedma. Only a few of these A.bertinii were to be seen in flower, with whitish, pinkish, or yellow flowers, but we did find some fruit on the Austrocactus at both places on the southern shore of L.Viedma. Most of the fruit that we found on the A.bertinii had dried up and contained ripe seeds, the fruit having more spines surrounding it than hairs.

Travelling north on the coastal side of Patagonia, we turned inland at Comodoro Rivadavia, going via Sarmiento to Est. Lubecka, where once gain we found plants of A.bertinii in fruit. All the A.bertinii which we saw usually had quite short stems, perhaps 15 to 25 cm long, of greenish colour, which formed clumps by branches arising from the base. Very few were seen growing on bare, open ground, perhaps due to the attentions of the the sheep or the guanacos. Mostly these A.bertinii were found growing on flat hillsides or on the floor of fairly broad valleys. Often they grew up through mat-forming low growing spiny shrubs, of some 10 to 15cm in height, or projected up through the branches of low-growing bushes, which would serve to protect the young Austrocactus.

From Lago Viedma we crossed over to the coastal side of Patagonia, finding A.patagonicus at Luis Piedra Buena, near Santa Cruz. Many of the A.patagonicus we saw there were carrying fruit, some of which was still unripe but there were also many ripe fruits. On our way travelling north, often at no great distance from the coast, we came across A.patagonicus at another dozen places until finally along the Rio Negro we found them at Chelforo and lastly near the Sierra de Portezuelo which is roughly half way between Neuquen and Zapala. All these places were in the area of the Patagonian plateau, not on any mountainside. North from Santa Cruz, the ground was composed only of earth - it was not until we reached the Peninsula Valdez that we came across any stony or rocky ground. In the south, along the coast, the Austrocactus were mostly growing up through mats of low shrubs whilst in the north they were usually growing up among the branches of the rather taller bushes to be found there. These A.patagonicus would be up to 30cm tall, only occasionally branching from the base or from part way up the stem, with dark green to chocolate brown stems. None of these plants were seen in flower, but fruit was found on the plants which were growing among the stumps of the ancient trees that had been turned to stone in the Bosque Petrifidos, as well as at Caleta Chivira and on the Peninsula Valdez.

At the Bosque Petrificados, the Austrocactus were growing among the stumps of the ancient trees that had been turned to stone on a flat area that was between the table mountains and so had some degree of shelter. The coastline is full of cacti - some of them directly next to the shore, growing in the shrubs that cover the sandy hills right behind the beach. But then you have to find a way to gain access to these areas.

Near Caleta Chivira we turned off the tarmac road to follow a farm track, until we came to where a river had cut a shallow valley some 50 to 80m wide and some 20m below the surrounding flat, exposed, windy plateau which was typical of our surroundings whilst travelling up the coast. Here the plants found themselves in a quite different environment to that of the plateau, being sheltered from the almost constant winds blowing over the flat area. Here some of the Austrocactus grew in the grass tussocks, some in the low mats of spiny bushes, whilst others grew up through the taller bushes which could be up to 50cm high. When the Austrocactus were growing up through the branches of a taller bush, we could see them if they happened to be at the side of the bush we were looking at, but not if they were hidden from our view by the very compact branches of the bush. It can be very difficult to find Austrocactus on the east side of Patagonia, because they seem to be very selective in where they are able to grow successfully.

At many of the places where we came across Austrocactus, they were growing in company with both Maihuenia and Pterocactus. Travelling north along the coast, we met with the first Gymnocalycium gibbosum near Camarones, then we came across more of these Gymnocalycium on the Peninsula Valdez. Then we saw Cereus aethiops near Choel Choel and Echinopsis leucantha near Chelforo. Three years later, we found some more A.patagonicus at Dique Arroydito and at El Chocon, before our field trip took us much further to the north.

In cultivation in a cold frame, my Austrocactus are given their first watering, and a fairly generous one, at about the end of February, when there is a warm, sunny spell in the weather. This represents the soaking they would get in habitat from the melting snows. They have no more water until some time in April, when again they have plenty, but watering stops in early summer. The plants flower better with this treatment and the A.bertinii raised from my collected seed are now 10cm tall in the cold frames.

(Many of these place names are to be found on the adjoining map of Patagonia)

.....from H.Middleditch

When E. Cels dropped anchor off the coast of Patagonia near I.Toba and I.Leones in 1861 this would very likely be to undertake the very necessary task of finding some fresh water with which to top up the water barrels on board ship. Fresh water would be almost non-existent on the vast extent of the flat plateau, but would be found in those rivers which ran down to the coast. Such as that visited by R.Hillmann not far from the coast at Caleta Chivara. Any river running down to the coast opposite I.Toba or I.Leones visited by Cels for fresh water, would probably be comparable in nature to that described by R.Hillmann. These islands lie

fairly close to Camarones, which is where R.Hillmann first came across Gymnocalycium gibbosum on his field trip through Patagonia, a spot no great distance from where Cels also found this same Gymnocalycium.

There appears to be a general consensus of opinion among those who have travelled through Patagonia, that the Austrocactus which grow on the slopes or foothills of the Cordillera, in the west of Patagonia, can be regarded as a separate species from those which are to be found within the area of the plateau, including near the coast. The first name bestowed upon the Austrocactus to be found growing near the coast, was A.bertinii and in accordance with accepted nomenclatural practice, this name evidently needs to be applied to the Austrocactus growing over the plateau and coastal area of Patagonia. Which would leave the name patagonicus to be applied to the Austrocactus found close to the Cordillera in the west of Patagonia. The species names used in the above contributions have been quoted as received, but many of them apparently need to transposed.

The distribution of Austrocactus over the Patagonian plateau, east of the Cordillera and down to the coast, extends for almost a thousand miles from the Rio Gallegos to the Rio Negro, over some twelve degrees of latitude. It is hardly surprising that R.Hillmann should observe changes in the appearance of the Austrocactus over that distance.

.....from H.Sonnermo

There are about a hundred plants of Austrocactus in my collection, some of them raised from seed, but I did get a lot of my material from Papsch and from Scheck in Austria. They are all grown in my usual compost which is made up of 25% vermiculite, 25% humus, and 50% sand. They are not easy to grow as they do not like to be in the greenhouse when it is too warm so I move them outside as soon as the night temperature makes it possible, where they stay until October. But some of my Austrocactus are out of doors for the whole of the winter, where they are protected from too much rain, but they do get covered in snow and the temperature can go down to -20°C. I have plants of A.patagonicus, bertinii and hibernus growing in this way and they flower much better than plants overwintered in the greenhouse.

Even if they do not all look the same, I still think that there are not so many species, perhaps four, and a lot of varieties or forms. For example, I do have some plants of A.coxii with a very thin pencil-like body and other plants of this same species with a much thicker body. Supposedly A.patagonicus has hooked spines and A.bertinii has straight spines, but this is not a clear basis for separating out the two species. After checking all my plants called patagonicus and bertinii I can see hooked and straight spines on both species. In addition, there is a range of spine colour in each species - there is a patagonicus with white spines, another with black spines; a bertinii with white spines another with purplish-red spines. And I also see that flower colour can be a weak distinguishing factor - my A.bertinii have flowers of a whitish-yellow colour whilst my A.dusenii have flowers of a yellowish-orange colour. Also one A.bertinii from “near Sarmiento” has rose-pink flowers. But all my A.patagonicus flowers are of the same light yellowish-white colour. One of my A.bertinii ‘from the Rio Negro’ has a flower with a pleasant sweet smell, and a flower on A.patagonicus has as scent like honey. I have been counting the stigma lobes to find out if the number can differ in the same species and I need to do much more of this.

My biggest A.patagonicus is now ten years old and came from Bleicher in Germany. It is now about 30cm high and it is growing upright without any support and has no branches. It flowers every year with large cream coloured flowers. I have a lot of A.patagonicus, some of them now ten years old, and none of them have any branches. I have other Austrocactus, much smaller plants than A.patagonicus, that are growing along the ground. Even if I try to get them to grow upright, they will soon go back to growing along the ground.

My Austrocactus from Las Lenas is different to all my bertinii and patagonicus, it is a slender creeping plant with several branches.

.....from A.Johnston

Of my own plants of Austrocactus “from Las Lenas” I have several clones of DJF 190 and others which came from Scheck. They are not as strong growers as either A.patagonicus or A.bertinii - the stems are thinner, like A.coxii, and all the lower parts of the stem lie on the soil. Nor are these plants as strongly spined as either patagonicus or bertinii - the spines are definitely less robust. But of my DJF 190, there is one clone with very short spines and another clone with much longer spines.

I think that these plants need to have maximum light if they are to flower - if not, they do not develop the strong spination but stop weak little things like cuttings one sees that are nothing like the mature growth. Seedlings have a tendency to dry up from the base - I have found that by planting them a bit deeper, they will carry on growing.

The flowers on my DVV2 are very bristly, but I do not recollect any flowers on my Austrocactus that do not have bristles. Having had a lot of flowers on my Austrocactus early this summer, I have checked them for bristles but I cannot say what is a bristle and what is a hair, because there appear to be fine bristles and fine hairs as well as coarse ones. But now I have had the first flower on my Austrocactus which is labelled “second most eastern” - which I brought back from Scheck. The flower was pink, similar to that on a plant which I have with the “most southern” label. What was interesting was that there were no bristles on the flower tube, only short hairs. The flowers on those of my Austrocactus that I would regard as A.patagonicus are pinkish white in colour, whilst on A.bertinii they can range from white, through cream to yellow and orange.

Some of my Austrocactus have only short stems, which produce new branches from the base, so making clumps without ever growing long stems. Like my Austrocactus “ex Maiten” raised from seed collected by L.v.d.Hoeven, which is making a clump of branches of about two and a half to three inches in length. Some seedlings raised from seed from Nyfeller are now large enough to get some idea of what they may be. Some of them are labelled patagonicus, but they are growing with most of the stem lying on the soil, with less robust spines than patagonicus, and unlike patagonicus are offsetting much more readily from part-way along the

stem, all features like A.coxii. I also have many Austrocactus with a KF provenance of which some are robust and slow growing, with only a few branches, that are obviously patagonicus.

I think that the Austrians each seem to have their own ideas of what to call their plants. They all seem to distribute similar material but with different names. For instance, I have had several specimens which came as A.bertinii that all looked different, some of them were obviously A.coxii, others A.patagonicus.

.....from U.Eggli

In general terms, the systematics of Austrocactus are ill-known, and this is also true for the identification of some names usually associated with Austrocactus. We would need more observations in the field, especially in relation to the various characters mentioned above.

(Abstracts from various Natural History publications and travelogues describing Patagonia, appear in Chileans No.39, together with contributions about these plants, whilst further contributions on Austrocactus appear in Nos.40, 46 and 47.)

DID WE FIND PARODIA OBTUSA? From J.Fahr

We set off on 2 January 1996 for our trip to Bolivia. Our intention was to make a few stops on our way south to reach Escayache fairly quickly and then make various stops on our return journey. We drove from La Paz to Potosi and thence to Camargo. On reaching the mouth of the Rio Tumusla we took the road leading up this river valley in the direction of Cotagaita. We went about 21 km up this valley before turning round in preparation for retracing our steps, as it was getting late in the day. We were then at FA9 at about 2490 m altitude.

On the steep slopes of the valley side here we found a Parodia which grew here in an elongated manner, up to 50 cm tall, with 13 ribs when young but with about 19 ribs when older, with straight, stiff spines with only a few of the central spines having a curved tip, not really hooked. Many of the plants were in bloom, with a clear pale lemon yellow flower. We were all rather puzzled by these plants we had found there. What can they be? While the others were enjoying their tea-break I am absorbed by this particular question. I work through my detractors' ideas, and I am only able to settle on Parodia obtusa. Hence the designation on my list. They grew on a dark grey coloured slate-like rock, in company with a Trichocereus species. I set about harvesting some seed, even though this was very difficult among the stones on the slope.

My travelling companion Heger however told me that these are not the same plant that occurs near Cotagaita. He was in Cotagaita on several occasions and was very familiar with the plants occurring there. However, Cotagaita is only about 15-20 km distant as the crow flies from our FA9 location.

Back at home I had then consulted the literature in company with E.Heger. In his Vol.2 of his Kakteen in Südamerika Ritter provides a description of Parodia obtusa which includes " in age up to 50 (-80) cm tall". We have also taken into account his picture Fig.385. In addition, the seed sizes from our plant correspond well with Ritter's description. We had identified plants with 13-19 ribs (13-21 for Ritter's obtusa), radials about 8, central spines 1(-3), not hooked, straight. My seedlings still have only one central spine. Heger had brought along two plants from Uhlig, with the name P.obtusa, for comparison. He was of the opinion that that they were indeed the same plants that he came across near Cotagaita. These do have 9 radial spines, but 4 central spines. Heger has now concluded that the plants coming from Cotagaita are by no means P.obtusa, and are more correctly attributable to P.maassii. Perhaps Weskamp may have some correspondence from Ritter in which he is more precise about the habitat location for his P.obtusa? Heger also supposed that all Ritter's collections were made around Cotagaita and that he had not investigated the general surroundings.

.....from H.Middleditch

In Englera 16, 1995, Ritter's FR 1125 Parodia obtusa is recorded as from Cotagaita; the location for P.obtusa FR 1125a is quoted as 25 km to the west of Cotagaita, in the direction of Quechisla. This is an area very rarely visited by cactus travellers.

.....from J.Fahr

Our FA9 location was conveyed to K.Beckert; in November 1996 K.Beckert and E.Heger travelled up the valley of the R.Tumusla. Subsequently they told me that a few km beyond location FA9 this population of Parodia obtusa suddenly ceased and then began again some km further on, only with plants which did not match those at FA9. They also told me that these plants extended more or less to Cotagaita, but changed somewhat as Cotagaita came nearer.

In the course of my next trip I intend to travel further along the valley of the Rio Tumusla from the FA9 location, to Cotagaita. Whether it is even possible to travel along the Rio Cotagaita, I do not know

.....from J.Fahr (later)

I was able to make a return visit to the Tumusla valley in 1998. We noticed that the rock changed from a red sandstone to the nearly black slate after we had travelled only some 8 or 9 km into the valley. We stopped at FA 51 at 10 km into the Tumusla valley where we found more plants of Parodia obtusa. Here the Trichocereus camarguensis hung snake-like over the rocks or crept over the ground, just as they did a little lower down the valley at FA 11. We then continued upstream beyond our FA 9 location to a spot some 5 km beyond Pampa Grande, where Parodia obtusa was still to be seen, growing in the company of some dwarf bushes and some platyopuntia.

We continued in the direction of Cotagaita to a point 8 km from the bridge. Here grew more dwarf thornbushes and platyopuntias, Oreocereus, Trichocereus, and a large Weingartia. In addition to the yellow-flowering P.obtusa there were also red-flowering dark-spined and more globular shaped plants of a Parodia which were probably P.maassii. After travelling a further 12 km in the direction of Cotagaita, we made a

further stop at 3145 m altitude and again found the yellow spined columnar Parodia and the globular brown spined Parodia growing together.

From this spot we turned round and drove back along our route, stopping once again at about 5km before the Rio Tumusla joined the Cinti valley. Here at FA 11 there were more Parodia to be seen, much shorter in stature, with orange flowers, which we identified as P.camargensis. They grew on a red sandstone rock, in company with Trichocereus camarguensis.

.....from P.Down

Leaving Cotagaita we travelled north until we came to the turn off which took us eastwards for about 60 kms to where we eventually joined the main road in the Cinti valley, close to Palca Grande. Along this road from Cotagaita we made a stop at BDH 11 which was 25 km from the western junction and hence 35 km from the eastern end. At all times when we were in Bolivia we had only a limited time at our disposal so that I took quite a number of shots from the vehicle whilst we were on the move. After a long, steady, but relatively gentle climb pretty well all the way from the western junction, we came to the place where the road started to descend into the valley of the Rio Tumusla. Here we passed close to a slope on which were growing great numbers of Parodia obtusa. The very long yellow plants which also grew there are either very old Parodias or something like Cleistocactus.

.....from H.Middleditch

Perhaps the very long yellow plants may possibly have been Trichocereus camarguensis?

.....from B.Bates

On our BDH trip round Bolivia we made an overnight stop at Cotagaita. Before breakfast I go for a walk and climb the nearby hill to the monument. Climbing up, I find some plants which turn out to be Lobivia cotagaitensis, no different out of flower from the Lobivia lateritia near San Pedro. Parodias then come into view; after breakfast we all go up the hill. The Parodias are up to 18 cm in diameter by 50 cm tall, many of the longer stems being decumbent. On return to England, J.Arnold identifies them as Parodia obtusa with the type locality at Cotagaita.

.....from R.K.Hughes

Approaching Cotagaita from the north, the road dropped down into the river valley and we were able to find accommodation here for the night. On the following morning B.Bates decided to climb up the hill on the opposite side of the river, before breakfast. We had to call him down for breakfast and he was shouting back that he had found some Weingartia. So after breakfast we all went up the hill. There was a monument part way up the hill and it was only when we had climbed a short way above the monument that we found the first cacti. These supposed Weingartia were depressed globular plants, growing out in the open, so spiny that it was quite impossible to see the body. Further up we found more plants, but now they were mostly growing under the shade of bushes; they were elongate and not so spiny so that we could see the green body under the spines. So we could identify them as Lobivia lateritia.

Then we came across some Parodia. There were both tall, fat plants as well as smaller globular plants. We had the impression that we were looking at the younger, globular, plants and older, elongate plants. These were growing on a strata made up of thin slabs of rock formed a bit like puffed pastry, with the bedding planes standing not far off vertical. Broken pieces of rock, from grit size upwards, partly covered the rock outcrop. The cacti must have put their roots down in places where they could get between the plates of rock.

.....from P.Down

This BDH 10 location was on a fairly steep hill overlooking Cotagaita, but walking uphill was not difficult, only the odd patches of ground requiring a steadying hand. The vegetation on the climb was very sparse, a few shrubby Jatrophas and some other insignificant bits of vegetation. But when we reached the height that the Parodias grew at, they were plentiful. Most of them grew in a very rocky situation almost like settled scree. It was obviously settled because many of the plants were of great age. Although most of the cacti were growing in this scree, a few plants were growing where there there was a little more soil, in company with a few red spined Oreocereus celsianus and some Lobivia lateritia. The Lobivia lateritia were up to about 12 to 14 inches high, some of them out in flower, with pale yellow blooms, but there were no flowers on the Parodia obtusa.

Perhaps Parodia obtusa is rather less uncommon in collections now my seedlings have become distributed, but at that time it was quite uncommon in collections so that none of us recognised it and thought that we had discovered a new species. After doing some research back at home we found that Lau had discovered it first. Although these Parodia were plentiful, most of these plants were growing a pace or two apart from one another. But in places they were much closer together. We were amazed by the size of the larger plants, many 15 to 18 inches high and 9 to 10 inches across.

.....from T.Marshall

In the course of our visit to Bolivia in 1996/97 we made an overnight stop at Tupiza, from where we set out northwards the following morning. Our route took us across the wide, open, Pampa Mochara and then after the Rio Blanco, through more undulating terrain, but with only gentle gradients. Here the surrounding landscape carried an open covering of mainly low growing vegetation; close to the road it was mostly dwarf bushes and sparse tufts of grass, with some herbs. The only trees to be seen were the common Acacias, rather scattered and not very tall. There was also very little in the way of taller growing cacti. This covering seemed to stretch unchanged into the far distance.

Some 10 or 11 km before reaching Cotagaita we crossed the Rio Totora at Estancia Cajon. The road dropped some 50m or so down into the river valley, which was about a km wide at this point. The temperature difference was most remarkable between the open Pampas we had just left and the bottom of this valley; in fact it was so hot and close in the valley bottom as to be not just uncomfortable but almost unbearable. In the

valley bottom there were swathes of Lobivia lateritia, the Parodia obtusa being more in evidence on the valley sides, all in company with Acacias and other trees.

Climbing out of this valley we came back on to the open Pampas again, still with the mountain tops a great many miles away at either side, and still with the same sparse, mostly dwarf, vegetation cover. We did not gain much altitude before we reached Cotagaita, which once again lay in a river valley. This Rio Cotagaita was fairly large and the valley was deeper and wider than that at El Cajon. Once again it was much hotter in the valley than on the open Pampas, but the temperature difference between the two was not quite as marked here at Cotagaita as it had been at El Cajon, perhaps because it was a little later in the day.

After our overnight stop in Cotagaita we set out to climb the hillside just outside the town, which had been visited by the BDH party a few years previously. There were no cacti to be seen either in the immediate vicinity of Cotagaita or on the lower slopes of the valley sides, which are quite steep in places. So steep that both hands and feet were needed to help at one or two spots on our climb. The upper part of the hillside had an open covering of Acacia trees which rose perhaps 2 to 2.5m high, together with bushes and shrubs of less height. This was not a dense covering, but fairly open, so that it was not difficult to progress uphill simply by picking a way between the trees and bushes.

Part way up the hillside we started to see columnar plants of Parodia, which grew mostly in the shade of the trees rather than in open patches exposed to the full sun. There were younger plants, up to perhaps about 30cm tall, standing solitary and upright, but older and taller plants were rarely if at all upright, collapsing under their own weight. Some of these older Parodia would be anything from 1 to 1.5 metre long, drooping over, decumbent, the uppermost portion being mostly upright again. Some patches of the hillside displayed few, if any, of these plants, but at other places a colony occupied a limited area.

Far less numerous were the Lobivia lateritia which did not grow as high as half a metre tall, always upright, distinctly slimmer than the Parodia, with shorter spines. A quick trot back downhill and we were on our way again.

.....from M.Lowry

At Cotagaita the village was situated on the west bank of the river. We were able to walk across the river bed as there was little more than a trickle of water in the river. Once on the east side of the river we set out to climb the steep, west facing, slatey slope in front of us. It was indeed a steep slope, lying at an angle not far off 45°. We had no difficulty finding the Parodia obtusa, but we made no record of having seen Parodia maassii.

At Estancia Cajon we were at 2844m altitude in the valley bottom and we were probably at a similar altitude at the bottom of the valley at Cotagaita. It was the hottest part of the afternoon when we were in the valley at El Cajon, but early in the morning when we were in the valley at Cotagaita, so we had no opportunity to find out how hot it could get at Cotagaita. From there, the climb at the east side of the river might have been as much as 100m. This would just bring us to an altitude where Parodia maassii might be found growing. However, it would have greatly surprised me to find any P.maassii growing on such a steep slope. Everywhere else where we found P.maassii they were growing on ground which was either flat and level or nearly so.

.....from H.Middleditch

When the collection of J.Forrest was sold up, I was able to acquire a fairly mature plant of Parodia obtusa. It was about 20 or 25 cm tall and some 10 or 11 cm across the coat of robust spines, giving every appearance of matching its reputation as an ex-Lau import. Unfortunately it did not produce any flowers.

.....from J.Brickwood

My Parodia obtusa raised from seed collected at BDH10 has now flowered with a yellow flower.

.....from J.Fahr

In the picture of his P.obtusa in flower from J.Brickwood, I recognise the selfsame plant that Ritter has found under his field number FR 1125. From the original offering of FR 1125 seed, De Cocker in Belgium raised some plants which look just like that in the picture. Most fortunately De Cocker let me have one of those plants about two years ago.

Looking at the pictures taken near Cotagaita by P.Down, I recognise plants similar to the P.obtusa which I found in the Rio Tumusla canyon; but in these same pictures there are both P.obtusa as well as plants of P.maassii.

.....from J.Brickwood

The picture from J.Fahr of his FR 1125 obtained from De Cocker has no significant differences from the BDH 10 obtusa; it is in effect the same plant. However, I am rather puzzled that anyone from the Inter Parodia Group should query the identity of the Parodia on the pictures of BDH 10, taken near Cotagaita by P.Down. I have re-examined all those pictures and they are plainly P.obtusa.

.....from H.Middleditch

It is observed by P.Down that some of the Parodia seen above Cotagaita were up to “9 to ten inches across”, i.e. some 25 cm. diameter. Ritter quotes for P.obtusa a body of “up to” 17 cm thick and adding spines to this figure would quite likely reach 25 cm across the plant. Or were the plants of 25 cm across which were seen by Ritter at this location, actually P.maassii? As usual when a party visits a spot such as this, each member of the group does not stand over precisely the same plant, so the different observations in respect of body height should occasion no great surprise.

One picture taken by P.Downs at BDH 10 is of a Parodia with two buds whose very tops are only just appearing through the wool in the crown; it is suggested by J.Fahr that this is a P.maassii. But these buds are yellow. Surely P.maassii does not produce yellow flowers?

.....from M.Lowry

I would have regarded all the plants on the slide taken by P.Down above Cotagaita as P.obtusa. Has anyone ever heard of P.maassii with yellow flowers? Ridiculous!

.....from T.Marshall

I am quite convinced that we have seen Parodia maassii in flower in habitat with yellow flowers, but I am not able to recollect just where it was seen.

.....from R.K.Hughes

Although we do have an altitude record of 2800m for Cotagaita, this was obtained by use of a digital altimeter. There had been only a few occasions on which we had been able to reset this instrument at a large town of known altitude. Consequently it may not be correct to suggest that we found the Parodia here at about 2850m altitude.

.....from H.Middleditch

Working through various field lists for both Bolivia and Argentina, and abstracting entries for Parodia maassii, relevant habitat altitudes range from 3000 to 4100m. If it is supposed that the BDH 10 site lies at barely 2900m altitude, this would be the lowest recorded altitude for the occurrence of P.maassii. But without a reasonably accurate altitude record for the BDH 10 site it becomes difficult to question the identification of some Parodia there as maassii.

.....from J.Fahr

Another yellow-flowering P.maassii has been found by K.Beckert near Curqui, which lies between Iscayache and Tojo near Yunchara.

.....from H.Middeditch

My Inst. Geogr. Militar La Paz map provides a place by the name of Churquis not far from Yunchara, apparently at an altitude of about 3400m. This is a patch of Bolivia very rarely visited by cactus travellers. It may be the same as the "Curqui" quoted by J.Fahr.

.....from J.Brickwood

The I.P.K. group have evidently decided that the yellow flowering Parodia seen at FA54 along the road to Cotagaita from the Cinti valley, at 2788m altitude, is to be identified as P.maassii.

.....from H.Middleditch

And how does this compare with the altitude at which various other yellow-flowering Parodia (but not P.maassii) as well as Lobivia lateritia, are to be found in the Cinti valley, along its length to the south of San Pedro?

At the confluence of the Rio Tumusla and the Rio San Juan del Oro to form the Rio Pilaya, near Villa Abecia, the floor of the Cinti valley will be about 2300m altitude. Going upstream to the south it will rise to about 2600m altitude near Tojo and likewise upstream to the north to Camargo. The Cinti valley is bordered both on the east and west sides by mountain ranges which rise to well over 3500m and peak at over 4000m in places. As a direct consequence of this difference in altitude, as well as the influence of the relatively narrow confines of the valley, the climate of the valley floor is quite different from that of the mountains and plateaux to the east and to the west. This situation brings about a difference between the flora of the valley and of the adjacent heights, which is reflected in the cacti which grow there. Although it has to be said that cacti are rarely, if ever, to be found on the actual flat floor of the valley, but start from the very feet of the slopes at either side. Were the Lobivia lateritia reviewed in Chileans No.58 to be seen growing nearly right down to the foot of the mountain slopes, or mostly starting to appear a km or two up from the actual valley floor and extending no great distance up the slopes? And not overlapping the occurrence of Parodia maassii? In other words, did those two sorts appear to occupy two different ecological zones?

.....from M.Lowry

Travelling from Tupiza to Impora, we crossed the pass at Mal Paso when we made a stop before starting the real descent. We had seen Parodia maassii at places on this stretch of our route, but we did not keep a lookout for Parodia maassii on the descent, as others had previously made stops and observations here, although we did note the Lobivia lateritia on almost the last section of the descent, shortly before Impora.

Climbing up out of San Pedro on the road to Culpina, we met up with Lobivia lateritia shortly after the start of the climb. Several stops were made on the zig-zag ascent of this west-facing slope and at each of these stops my clear impression was that Lobivia lateritia was sympatric there with Parodia roseo-alba. Roughly 11 km out of San Pedro, the road came on to a much less severe gradient and turned east, running towards a gap in the hills. No more Lobivia lateritia were seen after the last of the zig-zags, but that does not preclude their occurring somewhere on the mountainsides at either side of the road. We were quite some distance beyond the last of the zig-zags before we came across our first sighting of P.maassii v.albescens.

Further south down the Cinti valley we stopped at the village of Carrizal, where we again found some Lobivia lateritia, growing on a west facing slope, slightly up from the valley bottom. They were growing in company with Gymnocalycium cardenasianum and Parodia fulvispina. We never did find any Lobivia lateritia growing on the flat floor of the valley and our observations would suggest that the habitats of Lobivia lateritia and Parodia maassii do not overlap.

.....from T.Marshall

The Lobivia lateritia which we saw above Impora occurred only a short distance after the road started to climb out of the valley floor. They were growing on just the one slope, possibly only over a 200m length of that road. We must have travelled quite a few km between seeing the last of the Parodia maassii on the descent to Impora, and meeting with these Lobivia lateritia.

From San Pedro we might have climbed for several hundred metres out of the valley before we saw the first Lobivia lateritia. We had climbed well up out of the valley before we left behind the last of the Lobivia lateritia and I have certainly no recollection of seeing any Parodia maassii before that point. It was quite interesting to see how the flower colours changed on the Lobivia lateritia the further we climbed on the ascent. They started off with yellow flowers and then as we climbed further we saw orange flowers, and then finally

red flowers. There was certainly a change in flower colour with altitude, as all the flowers were the same colour at any one point on the climb.

The Lobivia lateritia at Cana Cruz were rather different, being shorter in stature than the plants we had seen elsewhere, as well as being thinner. We found these plants at the top of a slope where the ground levelled off, right on the brow, looking over the village of Cana Cruz.

.....from H.Middleditch

In the same way that the Parodia maassii do not leave their ecological niche on the heights to descend into the Cinti valley, the Lobivia lateritia does not appear to leave its ecological niche in the Cinti valley to spread into the heights. In consequence it is somewhat surprising for the suggestion to be made that the two can be found growing together on the hillside above Cotagaita.

SEED RAISING BY THE BAGGY METHOD By A.Laroze
Translated by H.Middleditch from Succulentes (France) 24.2

Raising cactus from seed is a little more ticklish than raising tomatoes or beans from seed - why is that?

The main reasons are their slow rate of growth and their sensitivity to fungal attack. For the first month after the seeds are sown, it is necessary to dose them with water so that the seedlings do not die of thirst and also to dose them so that fungi are prevented from developing. That involves keeping an eye on their daily condition, with a good dose of common sense. An adequate moisture level can be maintained by regular watering whilst preventing the growth of fungi by using fungicides. This does not prevent the development of algae which, whilst theoretically being of no hazard to the seedlings, has a tendency to smother them.

To get away from all these petty problems, there exists the “baggy” method, or a sachet. The basic idea is simple - it maintains the seed within a hermetically sealed environment and it excludes pathogenic agents whilst at the same time it keeps the moisture at an adequate and consistent level. A minimum of preparation and precision is required but once the seeds are sown, it is only necessary to provide the appropriate amount of heat and light.

To start with, the compost I use is a basis of commercially available compost to which I add sand, perlite, and vermiculite. Sometimes, according to the species concerned, I replace the whole or part of the basic compost with garden soil. It is essential to have a compost which will admit air and drain well. The pots are filled with compost which needs to be well watered but not soggy, using either boiled or sterilised water, with the addition of a fertiliser and a fungicide, such as benlate or cryptanol. The pots are then put into a microwave at full power for 15 minutes, and when cooled somewhat, the seeds are sown in the pots. Each pot is then put into a transparent plastic bag which is hermetically sealed. These sealed bags are then put into an enclosure under fluorescent lights which are lit for 8 to 12 hours each day, together with a thermostatically controlled heater to maintain a temperature of 25° to 30°C during the day and 18° to 22°C at night. After that, the bags are left unopened for several months.

There is a tendency to try and wipe away the condensation which forms in the interior of the bags and I would advise against doing that. This condensation has no adverse effect. The less the sachets are interfered with, the less the risk of contamination.

.....from I.Crooke

Recently I used this method to raise a selection of seeds purchased from my usual sources, which have previously given good germination when using more traditional seed raising methods. But only about half of the pots had any germination. The fungicide used was chinosol - can this be the cause of the problem?

Income			
Balance brought forward		5,113.17	
Subscriptions		2,281.00	
Sales of Back Numbers		210.25	
Sales of other publications		134.00	
Sales of plants etc.		12.00	
Sundry income		33.95	
Loughborough Weekend - Income	3,426.50		
Cost	3,331.00		
Nett		95.50	
Bank Interest		486.85	
		8,366.72	8,336.72
Expenditure			
Printing		1,781.62	
Postage, Stationery & other administrative expenses		2,040.47	
		4,544.63	4,544.63
Balance carried forward			3,822.09

When The Chileans was originally launched, there was a great paucity of information about South American cacti in the literature then available in the U.K. Over the intervening period of almost forty years there has been much new information on these plants that has been presented both in The Chileans and at the Annual Weekends. And, in more recent years, in other publications as well as at BCSS meetings where habitat slides have been shown by various Chileans' members who have undertaken field trips to South America. As a result of the knowledge of South American cacti now being far more widespread, the demand for back numbers of The Chileans has fallen off materially and income from such sales has been greatly reduced. Print orders have been reduced accordingly but there has been a material decrease in nett income from this source, which has resulted in a very marked reduction in the balance carried forward in the above accounts.

Since going to press with the subscription rate for Volume 20 of The Chileans, an appreciable increase in postal rates have again occurred which will not be covered by the current subscription. It may also be advisable to put on record that the PC which has been used almost exclusively for preparing text for The Chileans since it was acquired, has not yet been a charge on the accounts.

It is a pleasure to place on record all the many and various contributions which are made towards the publication of The Chileans. Providing comments and observations on plants in the field and in cultivation, supplying pictures as prints or slides or on disk, formatting text from disk for the printers, keeping track of the funds, despatching each issue - without all of which this publication could not continue.

CONTENTS

Slide and CD Library Holders and Particular Interests

Austrocactus	A.Johnston, 11 Malvern Road, Scunthorpe DN17 1EL	
Cereanae	G.J.Charles, Briars Bank, Fosters Bridge, Ketton, Stamford PE9 3UU	graham.charles@btinternet.com
$ Cleistocactus	T.Lavender, Kalanchoe, Market Place, Tetney DN36 5NN	
$ Copiapoa	B.Burke, 23 Jessica Way, Leigh WN7 4QG	brendanburke@blueyonder.co.uk
Echinopsis	M.Muse, 32 Fielding Road, Birstall, Leicester LE4 3AJ	
$ Frailea	R.Gillman, Oddyns Farm, High Cross Lane, Little Canfield CM6 1TF	
$ Gymnocalycium	S.G.Slack, 50 Sunnyside, Edenthorpe DN3 2PH	grahamandirene@slack2830.freeserve.co.uk
Haageocereus	J.Arnold, Suffolk House, 2 Oak Hill, Washingbrough LN4 1BA	john_joan.arnold@2oakhill.freeserve.co.uk
$ Islaya	M.Williams, 40, Long Lane, Harrishead, Stoke on Trent, ST7 4LQ	mowhizz@tesco.net
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$ Matucana	P.Hoxey, 34 Stonehill Road, Great Shelford CB2 5JL	paul@hoxey.com
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Opuntia	R.Crook, 35 Cardinal Close, Worcester Park, KT4 7EH	
$ Parodia	J.Brickwood, 48 Haselworth Drive, Gosport PO12 2UH	john@jbrickwood.freeserve.co.uk
$ Sulcorebutia	J.Cooke, Orchard End, Chipperfield Road, Bovingdon HP3 OJR	julian@cactusorchard.freeserve.co.uk
Tephrocactus	R.K.Hughes, 16 Ashbourne Avenue, Bootle L30 3SF	
$ Weingartia	A.Glen, 5 Hall Grove, Macclesfield SK10 2HQ	aglen@tinyworld.co.uk

$ indicates that a list of slides of that genus is available on request by s.a.e. or E-mail. Numbers of slides per genus vary from a few to a considerable number. Slide quality and species coverage are also very variable. Also available are CD's for Notocactus, Parodia, Sulcorebutia, and Weingartia. Any additions to this library in the form of slides or a CD will always be very welcome

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