

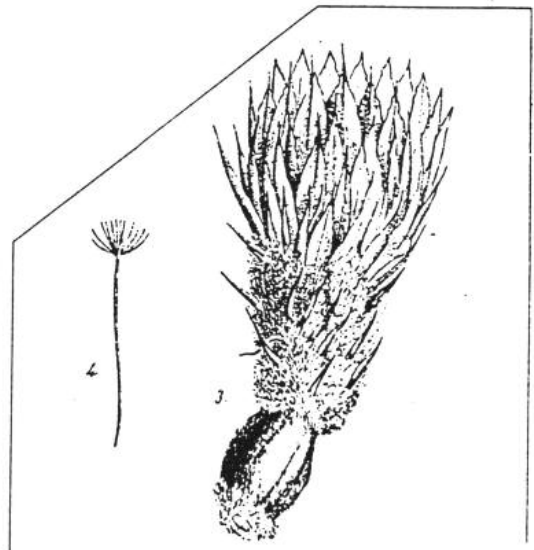
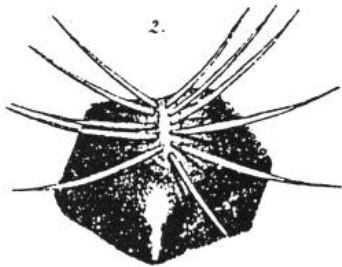
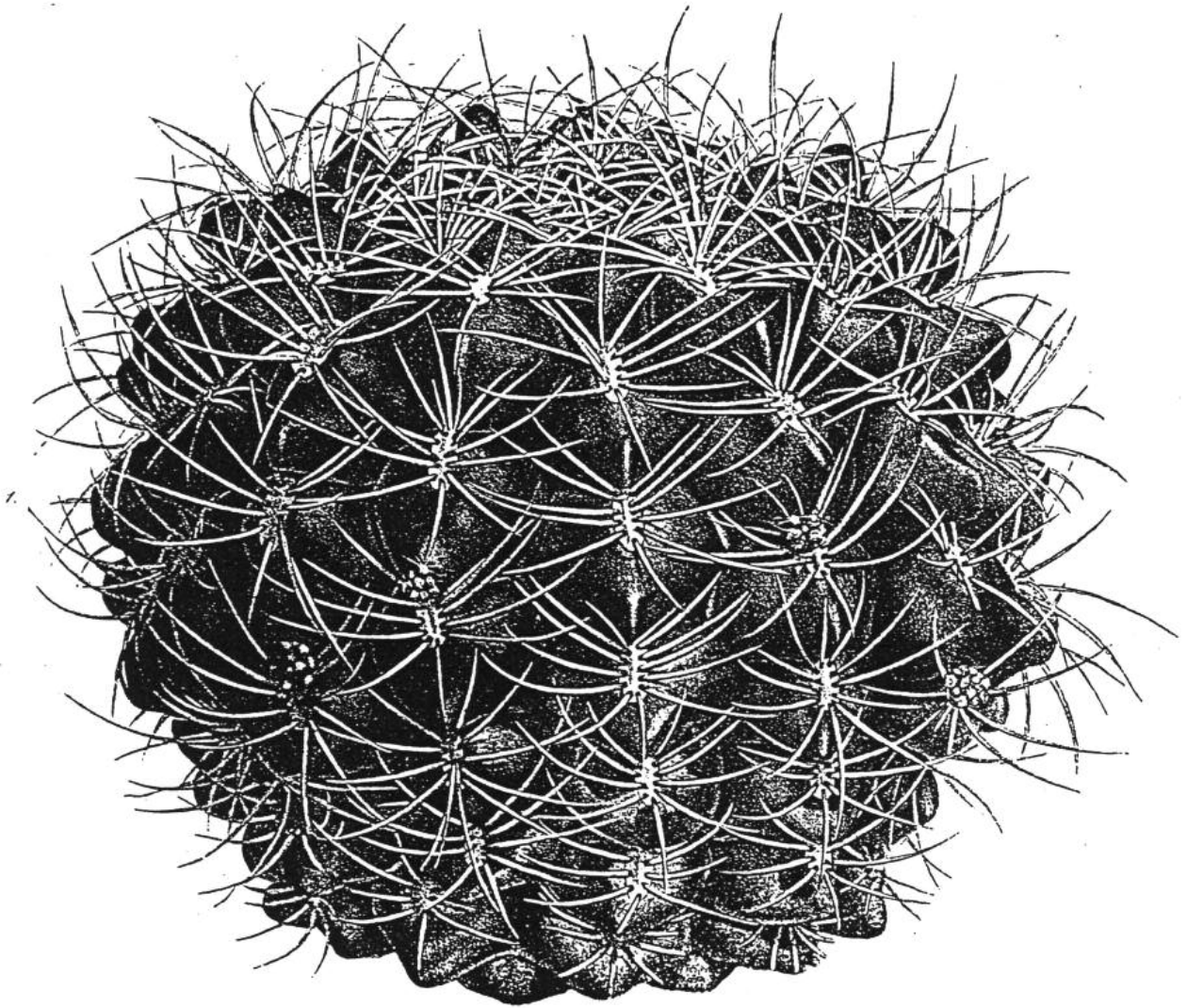
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Tephrocactus camachoi
E. of Chiuchiu

Photo. - F.Vandenbroeck



GYMNOCALYCIUM MULTIFLORUM FLOWERS From W.Phillips

It has been a real delight to see the flowers on my seed-grown *Gymnocalycium multiflorum*, a DJF 368 and a DJF 369, originating from El Condor, province Cordoba. They are in 2.5 inch pots and need to go into 3 inch pots. The flowers are a lovely vibrant lilac-pink, similar to *Acathocalycium violaceum*, with a deeper midstripe to the petals. Both plants exhibit a "semi-double" effect, for there are three rows of petals forming a camellia-like bloom.

One plant, DJF 368, has four flowers, each 35-40mm across, and has the stamens very low down in the throat - not reaching more than half-way up the style, and there are no obvious signs of any pollen grains being present. The other plant, DJF 369, has only two flowers, but they are much larger and 50-55mm in diameter. The stamens are more or less level with the stigma lobes and are full of bright yellow pollen.

This is the second year they have flowered and the number, size, and form of the flowers is similar to the 1999 flowering. The two plants have slightly different spination, one being stouter spined, the other having a purplish staining at the base of the spines, but overall they are fairly similar.

There is also a DJF 372 from Los Gigantes, province Cordoba, described in the seed catalogue as having "big heavy yellow spines", but I missed that one - also the P.12 from Cordoba, which is said to have "Large whitish-pink flower".

GYMNOCALYCIUM MULTIFLORUM By J.Lambert Translated by H.Middleditch from Succulenta 64.9:1985

When the description of *G.monvillei* by Lemaire is consulted, then one ascertains that it is restricted to the description of the outward appearance of the plant body and the spination, without any reference to nor portrayal of the flower. Consequently it provides not a single guarantee that it is appertaining to a *Gymnocalycium*. In my own view the description harmonises well enough with *G.multiflorum*, but that by no means excludes other possibilities as it might equally well apply to a number of other globular cacti.

One of the most widespread *Gymnocalycium* in amateur collections is without doubt the sort which is now labelled as *G.multiflorum*, or as *G.monvillei*.

However the habitat location was given as "Paraguai, Cordillera" which, in view of the paucity of accurate geographic knowledge possessed by the earlier botanists, we should be able to regard as the Province Cordillera in Bolivia. Those *Gymnocalycium* which, in the broadest sense, are to be found in the area of the Bolivia-Paraguay border, all belong to the *pflanzii* group, or the *megatae* group. These are two groups which in respect of morphological features are very far removed from *G.multiflorum* and also certainly have no close relationship to that species. Naturally *G.monvillei* has never been subsequently found in that area.

Because of this, I think that it is better to regard *Echinocactus monvillei* as a "nomen dubium" and to keep the name *G.multiflorum*, which has been described in more detail, as the only valid one.

This well known Argentinian species has an extensive area of distribution, which occupies practically all the hills of Cordoba province and also the north of Province San Luis. The plants also display a considerable variation, and it is possible in particular to distinguish two good distinct forms, according to the altitude at which the plants grow. The "lower" form which is met with from the lower to the middle altitudes, 700-1000m, usually looks as follows:-

Body deep green, somewhat glossy; depressed globular in form, about three-quarters as high as it is broad; ribs divided into angular tubercles, in such a manner that the ribs are more or less sinuous. The crown is depressed and bears no wool or spines. The areoles are large, oval, sparsely felted and are about 10mm long and 4mm broad. The spines are robust, projecting and curved backwards; young spines are pale green, with a brown tip; after that they become straw-yellow to brownish yellow. Usually 7 to 9 radial spines may be counted, whilst central spines are absent. The flowers arise right next to the crown and can reach 10cm in diameter; they are broad, funnel-shaped, with a short pericarpel. They are plain white, but with a brownish pink to purple midstripe on the outside of the exterior flower petals. The stamens are also white, with cream-coloured anthers. The pistil is pale yellow, the stigma has (11)-12-(13) lobes, which project above the anthers. The species does credit to its name, with a ring of up to 13 flowers being observed round the crown.

The "high" form, which is met with higher in the mountains (1500m and more) differs as follows from the foregoing:-

Body less depressed, and more globular, in adult specimens roughly as high as broad; spines with red base and more numerous - 11 to 13 radial spines and 1 or 2 central spines. Flowers distinctly pink, with a more deeply coloured carmine-pink midstripe on the outer petals. Anthers and style are pale yellow, just like the "low" form.

In this "high" form there is also found a not insignificant number of unisexual female flowers, of which the anthers contain no pollen. This peculiarity has already been mentioned by Till and Schatzl; they observe that the unisexual flowers remain smaller than the normal flowers, a feature confirmed by our own observations.

The hypothesis has been put forward by J.Piltz that the more depressed plants with the white flowers will be characteristic for the northerly section of the total distribution area, whilst the higher specimens with pink flowers should be met with more to the south. However, this theory does not conform with our own findings and we also think that the question of plant height is really a matter of the altitude.

Whilst the "lower" form often takes shelter under small bushes, the "tall" form grows in open grassland i.e. in full sunlight. The largest specimens of this species which were observed, displayed a diameter of 22 cm,

but the majority of the plants died of old age at a diameter of between 15 and 20 cm. Up to now plants were found not only solitary, but also in groups and in this instance often in company with other small plants.

Two varieties were described by K.Schumann under the names of *Echinocactus multiflorus* v.*albispinosus* and v.*parisiensis*. Backeberg renamed both as varieties of *G.multiflorum*. These two varieties conform with the “lower” and the “higher” forms as described above, but the question here is can we indeed have more than two varieties. These appear specifically as transition stages and intermediate plants also exist. So it is better to refer to them as forms rather than as varieties.

Synonyms of *G.multiflorum* are *G.brachyanthum* (Guerke) Br.& R., and *G.schuetzianum* Till and Schatzl. Some plants which are in circulation under the name *G.rosanthemum* n.n. are none other than the pink flowered forms of *G.multiflorum*.

.....from H.Middleditch

Looking at the 1838 Lemaire description for *Echinocactus monvillei*, this includes the line: “*Patria ejus Paraguai, Cordillariae*”. On the map of central Paraguay which came from C.Rodgers, there is a District of Cordillera lying immediately to the east of the capital city of Asuncion. This District takes in a large part of the mountainous area of limited extent between plains which lie to the north and to the south of it. Although it seems to be most unlikely that *Echinocactus monvillei* was collected there.

To quote just one example, it may be advisable to note that the Cactus [Notocactus] *ottonis* described by Lehmann in 1828 (*Pugillis Plantarum*) was attributed to a habitat in Mexico; the Botanical Register XXIV noted that this was “according to Pfeiffer, a Mexican plant”. In the literature of that time there are numerous examples of what we now know to be the wrong country of origin being quoted. Quoting Paraguay as the origin for *Gymnocalycium monvillei*, when it comes from Argentina, was nothing unusual for that period.

.....from H.Till, *Gymnocalycium* 3.3;1990

At the time this plant was originally collected, goods would be sent from Cordoba to the large Argentinian shipping ports on the Rio Parana, to Rosario or Santa Fe. The smaller boats went further upstream to Paraguay. If a ship came downstream from Paraguay it may be imagined that the collected plants including *Gymnocalycium monvillei* could have been loaded on to it. From that perhaps came the supposition that the habitat for *G.monvillei* was in Paraguay.

.....from H.Middleditch

A ship’s manifest would identify its cargo as being from the original port of departure, even if certain goods were picked up en route prior to the trans-ocean voyage. Thus a ship leaving Asuncion would carry a manifest identifying its cargo as being from Paraguay, even if more goods were picked up at Rosario. The suggestion by Till that this could explain the misleading habitat for the original *Gymnocalycium monvillei* would appear to be reasonably valid.

.....from T.B.Jones, *South America rediscovered* 1949

Between 1814 and 1840, Paraguay was ruled by the iron hand of the dictator Francia. Over this period, Paraguay was virtually inaccessible to foreigners; it was in 1821 that Francia finally closed all communications. Rengger & Longchamps wandered into Paraguay in 1819 and were detained there by Francia until 1825. Bonpland was whisked away to captivity in Paraguay in 1821. A party under the leadership of Pablo Soria navigated the Bermejo from Oran to the Parana in 1826; on reaching Paraguay, Soria and his companions were arrested by Francia and kept imprisoned in the country for several years.

.....from Latin America, P.E.James 1959

[Argentina] During the long domination of Rosas from 1829 to 1852, a period of many internal disturbances, the strong central authority of Buenos Aires was imposed on the outlying parts of Argentina.

.....from T.B.Jones, *Ibid*

Rosas, the Argentinian tyrant, played into the hands of Francia when he closed the Parana to international navigation, since the severance of this connecting link with the outside world helped to keep the foreigners out of Paraguay. The dictator Lopez, 1844-1862, who succeeded Francia, inclined towards a more liberal policy in the 1850’s. It was not accidental that this liberal policy of Lopez coincided in time with the opening of the Parana after the fall of Rosas in 1852. The opening of the Parana was an event of major consequence in Argentine history. From that date, the door was open to European immigration.

.....from H.Till, *Gymnocalycium* 7(4) 1994.

After the death of Francia, President of Paraguay in 1840, his successor Carlos Lopez opened up the borders of this country again. From 1843 important despatches of cacti already came to Europe through Balansa and Bonpland and later from other collectors.

.....from H.Middleditch

This observation from H.Till that Paraguay was open to visits by foreigners after 1843 would appear to conflict with available references.

.....from U.Eggl.

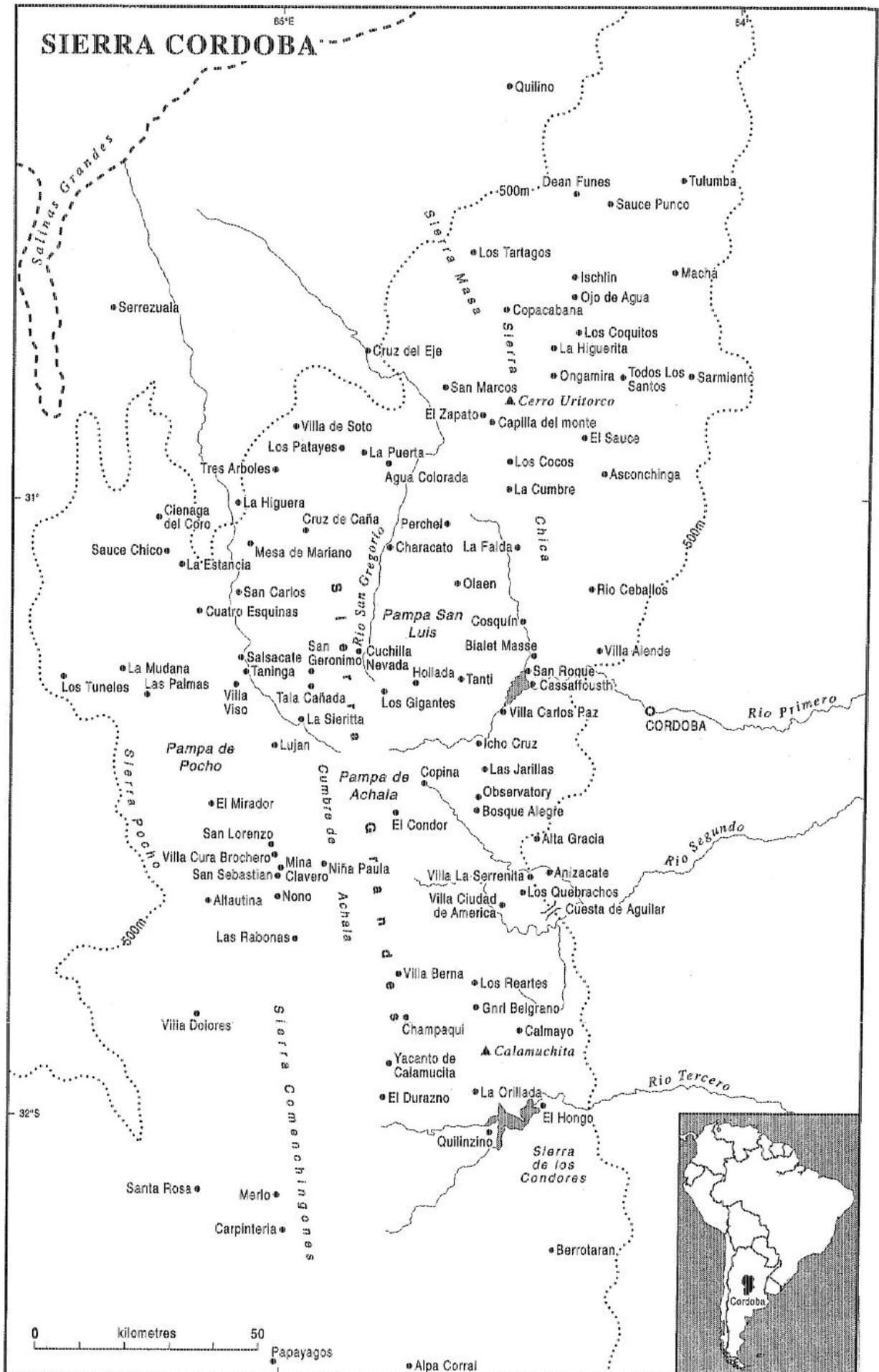
In “Taxonomic literature” by Stafleu and Mennega, Supplement 1, 1992, you will see a summary of the collecting activities of Balansa, who was engaged in field work in e.g. Algeria, Turkey, and Morocco between 1847 and 1867. Balansa made his first visit to Paraguay during 1873-1877 and a further visit during 1878-1884.

.....from A.M.Coates, *The Quest for Plants* 1969

Bonpland was released from captivity in Paraguay in 1830; he settled in the small town of Santa Borja near the Brazilian border. After 1853 he moved to a larger estate a few miles south of Restauracion.

.....from T.B.Jones, *Ibid*

In 1855 T.J.Page found Bonpland living in Corrientes - as quoted in “La Plata, the Argentine Confederation, and Paraguay” 1859.



.....from R.Mottram

There is a detailed and comprehensive biography of Bonpland in "The King's Garden", M.Duval, 1982. which indicates that after Bonpland was freed from captivity in Paraguay, he returned to Argentina, settling on an estate where he grew mate, amongst other crops. Subsequently he moved to another estate near Corrientes. He also collected in the near and far surroundings of his property and "sent packets back to Europe" of "orchids, bulbs and cacti". No clear indication is provided of the extent of his collecting trips but reference to one such collecting trip extending to "as far as the border of Paraguay" would perhaps suggest that this was the furthest extent of his collecting activity.

.....from H.Middleditch

The statement by H.Till that Balansa and Bonpland collected in Paraguay after 1843 would not appear to be supported by an encumbrance of facts.

.....from T.B.Jones, Ibid

A major concern of the rulers of Paraguay was still to gain an outlet to the sea and in 1864 the Paraguayans resorted to force. This brought Brazil, Uruguay, and Argentina into an alliance against them and started a war that lasted from 1865 to 1870; at the end of the war, Paraguay was devastated.

.....from H.Middleditch.

Looking at when foreign botanists may have undertaken field work in Paraguay, it would appear that Balansa may well have been one of the very first collectors to visit Paraguay, from 1873 onwards, even though the country was nominally open to outsiders via the Rio Parana from about 1852. But that would quite exclude either *G.monvillei* or *G.multiflorum* being found in Paraguay as they were first described in 1838 and 1845 respectively.

.....from E.Dams, Monatsschrift für Kakteenkunde, 1903

[March meeting of the German Cactus Society] It was reported by K.Schumann that the consignment of cacti from Sprenger in Vomero, notified earlier, had now arrived. This included an example of each of:- *Echinocactus submammulosus*, *Es. monvillei*, *Es. quehlianus*, *Echinopsis leucantha v.salpingophora*, *Cereus tortuosus*, and another unidentified *Cereus*. Since the habitat of *Es.quehlianum*, often imported in recent years, was known to be the Sierra Cordoba in Argentina, Prof. Schumann enquired from Sprenger by letter whether the other spp. might have originated from the same area and this was immediately confirmed to him. Thus we now know the habitat area for *Es. monvillei*, which for many decades has never again been imported and for that reason it has only been scarce in collections.

.....from H.Middleditch

Was this "Vomero" (or Volmero, as it is rendered in the Austrian *Gymnocalycium* publication No.3 of 1990) somewhere in Argentina?

.....from G.Neuhuber

I do not know of any Vomero or Volmero; but sometimes there are locations where only the people at the place know the name and then often - some years later - the hut will become abandoned and fall into complete ruin. So the name can then become lost.

.....from H.Till

The place name "Volmero" is a reference from the literature. A place of this name is also unknown to me. But there are many such possibilities in Argentina. Almost every Finca or Hacienda has its own name. Thus Hacienda Germania is given as the Type locality for a *Tillandsia*. This Hacienda does not even exist any longer. I only got to know of its whereabouts by chance when in conversation with an old olive grower. In addition many places - even town names, have become changed over the course of time. Thus Sanagasta, earlier Villa Bustos; or Recreo, previously San Domingo. Likewise each University has its own special name. For example, University Liloa at Tucuman. So far as I am aware, there was a Botanic Garden Volmero on the Riviera.

.....from H.Middleditch

Which would explain how Schumann obtained "immediate confirmation" to his enquiry - hardly likely if a double crossing of the Atlantic was involved from a Vomero in Argentina.

It was also a very long time from the original description in 1838 to finding out the real habitat area for *G.monvillei* in 1903. Possibly to be accounted for by the disturbed political conditions in Argentina until the middle of the 19th century, discouraging collecting activity in much of that period. But collecting there was; vide *Gymnocalycium saglione* Cels 1847, probably collected in the eastern foothills of the Andes.

.....from G.J.Swales

The first description of *Echinocactus monvillei* appeared in Lemaire's *Cact. aliq.nov.* of 1838, together with a full-page drawing of the plant. In the description it is noted that the plant pictured is "nondum floruit" i.e. not yet flowering, so that in this plate the plant is without any flower.

Subsequently Lemaire published a series of colour plates under the title of *Iconographie Descriptive des Cactees*, which appeared at intervals over the period 1841-1847. In Fascicle 8, presumably the eighth issue of the series, there was included *Echinocactus monvilleanus* as Plate 15; but on this occasion, the plant was drawn complete with three flowers. We might be reasonably entitled to assume that both this Plate and that of 1838 depicted the same plant in the Monville collection. Although it is perfectly correct for J.Lambert to say that the 1838 description only covered morphological features of the plant, Lemaire's 1847 description which accompanied Plate 15 did include the flowers. Hence it may be inadvisable to suggest that this latter description could apply to various possible globular cacti.

.....from C.C.Hosseus, 1938

For the flora of Cordoba the observations of Gaston Bonnier are confirmed, that for the alpine vegetation the flowers from the lower places have a less intense reddish-pink colour than those growing at higher

altitudes, as happens with specimens of *Gymnocalycium multiflorum*.

.....from G.Neuhuber

Gymnocalycium monvillei has flowers which vary from pinkish to pink colour. Buds which are growing at a more cool period will be more pink than those which have a more warm phase in their development. So J.Lambert is correct, for the temperature at higher altitudes is lower. The colour of the flower on these plants in the greenhouse is not dependant upon the altitude the plants came from, but upon the temperature in the greenhouse. From my expeditions, I know about 43 habitat locations for *G.monvillei*. Habitats of *G.monvillei* extend from the southern Sierra Ambargasta to Achiras. Most of the *G.monvillei* look like the illustration of Lemaire.

.....from J.Lambert

So far, I have never observed any changes in the flower colour of *G. multiflorum* in cultivation. However, looking at my field notes, I see that I recorded that the plants at Tanti (i.e. at low altitude) did occasionally develop pink flowers. And at Sauce Punco, at an altitude of 1050m., I noted that the flower colour was either white or pink, you might say fifty-fifty!

.....from G.Hole

I have a couple of plants of *G.monvillei* which I collected close to the tarmac highway near El Condor. One of these has now flowered with pure magenta flowers, the other having a white flower with a broad magenta stripe down each petal.

.....from F.Vandenbroeck

As to the flower colours of *G.monvillei*, I remember them ranging from pinkish to purely white. Crossing the Sierra Grande in November 1991 the weather was extremely bad, with mist and hailstorms, and all the *Gymnocalycium* were keeping their flowers tight shut. On the Pampa de Achala however, we found plants with flower colours going from pinkish to purely white, but never with "bright pink flowers with a deep purple midstripe". In the course of the years I have had some specimens of *G.monvillei* in my collection, mostly ex De Herdt, and when they flowered they always displayed colours ranging from pinkish to white, depending upon the specimen.

Once I had a plant in cultivation under the name of *G.schuetzianum*. At first sight I could not distinguish it from my *G.monvillei* plants, but when it flowered the colour could be described as a bright deep pink. The habitat of this plant is given as Cruz del Eje. I was aware of this when we were at this location in 1991 but we searched in vain and only found *Gymnocalycium bicolor* which was easily found in great numbers.

.....from H.Till, *Gymnocalycium* 3,3:1990

The distribution area for *G.monvillei* extends over the whole of the Sierra Grande and the Sierra Chica, as well as over some of the foothills. They grow mostly in higher locations, often in company with *G.bruchii*. However, they are also sometimes met with at the foot of the hills in stony ground, such as near Cosquin, where a form grows less than 100m from the road in rocks, together with *G.kurtzianum*.

In general, as far as the older plants of this species are concerned, the plants met with at the various habitat locations (with some exceptions) commonly correspond to the Lemaire description. The young forms are more open spined and the central spines are still absent, which are usually present on the older plants. At first it seemed that whilst the plants in the northern part of the distribution area were more densely spined, but after evaluation of all notes and photographs it appeared that those plants growing in the north are merely more uniform in growth and spination.

.....from G.R.Allcock

I have looked up such photos as I can find, in various publications, of *G. monvillei* and *G.multiflorum*. All of them show plants with no central spines. My own plants only grew slowly over long years in an alkaline compost and mostly produced thick radial spines only. But now, in an acid compost, they all throw out a central spine (or even two) on every new areole!

.....from W.W.Christie

My own plant of *Gymnocalycium monvillei* LB 967 does not have central spines on the areoles at ground level, but does at the remainder, so it seems as though only very juvenile plants lack the central spine. A plant received from Southfield nursery in 1983 displays central spines ranging in number from one to three per areole.

.....from G.Neuhuber

You will see from the accompanying habitat photographs of *G.monvillei*, one from El Mirador, the other from east of Calmayo, that both are totally lacking in central spines, despite being fairly large plants.

.....from H.Till[Ibid]

From J.Piltz we hear that "this sp. has an extensive distribution area. We found it from the Rio Tercero in the south, north of the Rio Cuarto, up to the Sierra Tulumba. The further north they occur, the flatter and broader they become".

.....from H.Middleditch

A plot of habitat locations of *G.monvillei* from all available field records confirms that, over the Sierra Cordoba, these plants have not been reported from south of the Rio Tercero.

.....from J.Lambert

The general distribution area for *G.multiflorum* does include all the Sierras of Cordoba, plus the north of San Luis, where it is replaced further to the south by *G.achirasense*. The limit being somewhere near Playa del Mirador, i.e. about 18 km to the south of San Francisco de Monte de Oro.

.....from H.Till

In the southern part of the Sierra Grande we found two populations relatively far apart from each other and separated by a large mountain mass; these plants patently fell outside the normally accepted quite wide

breadth of variation of this species. One of these was described by Backeberg as *G.grandiflorum* - it was a single specimen found by Stueder - which differs from the Type form less on account of the short spination (specimens with long spines are also to be found there) but more on account of broader, blunt tubercles more rounded in age. Also the flowers are not always clear white, but occasionally pink tinged or the petals have a more or less pink midstripe.

The second form is noticeable on account of the elongated growth and the golden yellow, long, broomlike spines mostly with red at the base.

ECHINOCACTUS MONVILLEI By C.Lemaire

Translated by H.Middleditch from *Cactae aliquat novae* 14; Plate 1. 1838

Globular, with very large and extremely hump-like tubercles, depressed at the crown, woolly like a cephalium, lacking in some; tubercles not arranged in ribs but in seventeen almost vertical series, forming the whole; intense light green.

Tubercles very closely packed together, particularly near to the crown, hexagonal at the base, very faintly angled where closely pressed together, marked with white dots, very broad (measuring 10 by 8 lines or more) and with a stout hump at the outer end as if abruptly truncated, flattened on the upper side and armed with a long, ovate areole, furnished with short white wool, never deciduous, porrect; spines very long, 12 or 13 in number, bright yellowish, purple and slightly subulate at the base, attaining 18 or more lines long, regularly arranged in two rows, flexible, with faint narrow transverse striations and slightly flattened, presenting a most pleasing appearance, ten longer laterals, the 11th above very short; the 12th below somewhat shorter than the laterals; the 13th central, very long, straight, often two inches long and more, and like the 11th, sometimes missing; grooves between ribs pale green, with a distinctive dark green wavy line.

Sometimes this *Echinocactus* brings forth lateral offsets, of a shape like that of other spp. of the genus, without doubt very handsome and not yet flowering, although it now attains 8 and more inches in height and two feet and more in circumference. Without hesitation this plant may be placed among the *Echinocactus*, simply by looking at it, and named after Mr. Monville, who first cultivated this plant and distributed it at great expense.

.....from J.Lambert

I would like to draw your attention to Lemaire's flower, figure 3 on the 1838 Plate of his *Echinocactus monvillei*, which he does not describe. Hence the description of the plant is incomplete. This flower does not look at all like a *Gymnocalycium* flower, but could very well belong to some kind of *Notocactus*! As the plant described as *Echs. monvillei* and its location will remain for ever uncertain, I choose to discard the name as a nomen dubium.

.....from H.Middleditch

But the text which accompanies this 1838 Plate says categorically "nondum floruit" - that it has not yet flowered. So why is there a flower on the Plate if the plant has not flowered?

.....from G.J.Swales

Accompanying the full sized drawing of the plant itself on this 1838 Plate there is a sketch of a single tubercle complete with spines. In addition, enclosed in a separate boxed outline within the Plate, there is a drawing of a hairy-tubed flower and also of a style and stigma. The nature of the flower is so foreign to any *Gymnocalycium* that I have always considered it to refer to some other plant within the pages of this publication. I feel that this belief is supported by the entry under *G.monvillei* in Britton & Rose *The Cactaceae* Vol.3 page 161 where they quote the illustration for this species as "Lemaire, Cact. Aliqu. Nov. Plate 1 Figs 1 & 2.", i.e. the whole plant and the individual tubercle only, excluding the flower.

.....from R.Mottram

There is an Index incorporated in this publication of Lemaire, and the entry in the index for the Plate (there is only the one Plate) is as follows:-

Fig.1 *Echinocactus monvillei*, natural size

Fig 2. Tubercle of same

Fig 3. *Echinocactus platycereus*, flower

Fig 4. Style of same.

.....from H.Middleditch

Which does make it quite clear that the flower on this Plate has nothing whatever to do with *G.monvillei*. Hence the description in the accompanying text can hardly be described as incomplete.

.....from J.Lambert

I have now looked at the Index in the Lemaire publication, which I have never previously consulted. I can now see that this hairy flower has nothing to do with the body of the plant on this Plate. In consequence it is no longer possible to disregard the name *Gymnocalycium monvillei*.

.....from G.Charles

On the reproduction 1847 Lemaire Plate of *Echinocactus monvillei*, the height of the flower is between a quarter and a third of the body width; if the Plate is a full-size representation, then the plant body is about 23 cm across. This would make the flower between 6 and 8 cm tall.

.....from *Handbuch der Cacteenkunde*, Forster-Rumpler 1886

The first observation of a flowering specimen was in the collection of Heyder in Berlin in 1849, recorded by Dietrich.

.....from *Allgemeinen Gartenzeitung* 17, No.25, 1849

A species whose flowers have been unknown up to now is *Echinocactus monvillei*. Which cactus collector does not know this fine cactus, regarded by everyone as the finest of all *Echinocactus* species? And which to my knowledge no-one has yet flowered. Now we have had the good fortune to see it in flower. The flowers stand upright at the crown and are about 2 to 2.5 inches tall [roughly 5 to 6 cm - H.M.].

.....from G.R.Allcock

There is one factor which may be of importance in separating *G.multiflorum* and *G.monvillei* and it is this: in Britton & Rose we are told that *G.multiflorum* has a very short flower tube, with flowers 3.5 to 4 cm long, whilst *G.monvillei* has a flower endowed with a more or less elongated tube and 6 to 8 mm long.

.....from H.Middleditch

The height of the flower calculated for the 1847 Lemaire Plate at 6 to 8 cm, matches the figures given by Britton & Rose for *G.monvillei*. The 1849 A.G.Z. report gives a flower size of 2 to 2.5 inches i.e 5 to about 6.3 cm tall. How does the "3.5 to 4 cm long" flower quoted by Britton & Rose for *G.multiflorum* fit here? Can it be not just a matter of habitat plants with central spines, and others without; habitat plants with white flowers, others pink; but also habitat plants with larger flowers, and others with flowers not quite as large?

My own WO 64 *G.multiflorum* was acquired in 1974 following the visits to Argentina made by Knoll and Klein, from Austria. This plant is now in a six inch pot but as the body is about eight inches across it is well overdue to go into a larger pot, and it has not yet flowered. A second *G.multiflorum*, which is in an 8 inch pot, came from Mrs. McIntosh in New Zealand possibly thirty years ago, with a note that it was an ex-Ritter plant. Presumably this would mean that it was raised from FR seed. These two plants are quite different to one another.

.....from G.J.Swales

The ex-New Zealand *G.multiflorum* being grown by H.Middleditch is quite a fine specimen and it is the first time that I have seen one of these plants that is an excellent match for the original Lemaire drawing of *Gymnocalycium monvillei*. It is certainly quite distinct from my own selection of *G.multiflorum*, which are fairly comparable with the WO 64 plant.

.....from H.Middleditch

My WO 64 *G.multiflorum* is not as tall as it is broad and hence I would be inclined to call it flattened globular, a description which I would feel could be applied to most *G.multiflorum* which I have seen in cultivation. On the other hand my "monvillei" could fairly be described as globular. However, this is not the feature which is most eye-catching at first glance. On *G.multiflorum* it is the lengthy pale yellow spines which are most prominent and they largely obscure a view of the plant body, but on "monvillei" ones eye tends to be drawn to the large area of bare green body rather than to the somewhat less robust and much paler spines. The large protruding angular chins represented on the Lemaire drawing are equally present on my "monvillei", but this would hardly account for such a substantially different appearance. It was only when I took a measurement of the distance between the centres of two areoles on the same rib that a clear explanation for the radically different appearance became explained, On *G.multiflorum* the areoles were at 30mm centres and on "monvillei" the areoles were at 50mm centres.

Most of the *G.multiflorum* which I have seen from other collectors are depressed globular with the body largely obscured by the robust pale yellow spines, quite unlike my Lemaire-like "monvillei"; consequently I am at a loss to understand the observation by G.Neuhuber that "most of the monvillei [in habitat] look like the illustration of Lemaire"; bearing in mind that he uses the name *monvillei* where we would more likely to use the name *multiflorum*.

.....from G.R.Allcock

The *G.monvillei* in my own collection has a fairly dense spination. The spines are of a light straw or faded ivory colour, and not red at the base. On some areoles there is to be found even a plurality of central spines. The epidermis is of a lightish mid green. In my opinion the *Gymnocalycium multiflorum* in my own collection could in no way be sunk into the same species. It has considerably thicker spines, of a rich horn colour and strongly reddened at the base, fewer in number than on my *G.monvillei*, and again at least one central.

.....from M.Williams

At the moment I have several young *G.multiflorum* which are DJF 368, DJF 369, DJF 372 and RCB 504, all around about 3 inches wide. Irrespective of the provenance, they display either very thin yellowish-white spines with no colour at the base which stand well away from the body, to yellowish spines with a dark red base that are closely wrapped around the body.

.....from H.Middleditch

There are undoubtedly a number of species of *Gymnocalycium* which do produce offsets, sparingly, but it comes as rather a surprise to find *Gymnocalycium monvillei* being described in 1838 as an offsetting plant.

.....from J.Lambert

Offsetting is not uncommon in *G.multiflorum*. being more frequent and significant in plants growing at higher altitude. There are several examples of offsetting in nature among the habitat pictures in the "Gymnocalycium" number in which this species is discussed. At Hollada, between Tanti and Los Gigantes, I observed and photographed huge clusters of one metre and more in diameter.

.....from G.Charles

These pictures in "Gymnocalycium" do show clumps made up of several heads, but these could be either one offsetting plant, or a cluster of individual plants. Where a cluster is formed of heads of similar size, this could have been produced by several seeds from a fruit germinating more or less side by side. Where there is a large head accompanied by smaller heads, seeds could have been shed and then germinated around the base of

the original plant.

.....from J.Lambert

On the question of offsetting *G.multiflorum*, I must say that I have observed both situations which are mentioned i.e. clusters of plants originating from different seeds but growing closely together, and also clusters formed definitely by offsetting from a single mother-plant. My photograph of a clustering plant seen near Hollada is of a plant with several heads, on at least one of which the new offsets may be clearly seen attached part-way up the body of the plant.

.....from H.Middleditch

This is the first occasion on which I have seen a habitat photograph of *G.multiflorum* where small offsets can clearly be seen growing part-way up the main stem.

.....from C.C.Hosseus, *Notas sobre Cactaceas Argentinas*, 1939

It is true that the formation of a considerable number of lateral offsets occurs on *G.multiflorum*, often extending to a total diameter of 60 cm taking in the old and the recent offsets. This species extends as much over granite and gneiss as over ground with ample vegetation, on the high prairies as at La Cumbre or Capilla del Monte, where they become taller with age.

.....from P.Harper

I have about six plants of *G.multiflorum*, one or two having been brought back from Argentina many years ago by a friend who was sent out there on business. One of these collected plants is quite lacking in central spines. When my *multiflorum* get to a certain width, of about 20cm, they start to grow taller; one of mine is now 23 cm high. Another plant is offsetting and it has produced a clump of 33cm across.

.....from H.Middleditch

But have any of these clumping *G.monvillei* as illustrated in the Austrian "Gymnocalycium" been unearthed in the field to find out if they are one plant with several heads or several plants in a group?

.....from H.Till

Gymnocalycium monvillei grows mostly solitary in Nature, but often also in groups of individual heads as shown in my pictures in "Gymnocalycium". In my opinion they are the surviving seedlings from a single fruit, which have grown together into a clump as they have become larger. I have seen many plants of *G.monvillei v.steineri* which were however always solitary specimens; they always grew on the west side of the Sierra Grande. Offsetting is possible with older specimens of *G.monvillei*, but in general terms one seldom finds offsetting examples of *G.monvillei* in the field. However, there are indeed exceptions. In the Sierras de San Luis I have come across many offsetting specimens of *G.monvillei v.brachyanthum f.gertrudae*. But in both *G.horridispinum* and *G.achirasense* only very occasionally.

.....from P.Bint

My own *Gymnocalycium multiflorum* was acquired in about 1985; it does bear a resemblance to the Lemaire drawing of *G.monvillei*, but it is wider than it is tall. Up to the present time it has not flowered. None of the *G.multiflorum* which I am growing at present have any offsets and an even larger old plant which is no longer with me was also without offsets.

.....from A.W.Craig

My two *Gymnocalycium multiflorum* have been in my collection for many years. They are both about 12 cm tall and 10 cm in diameter and both are offsetting at the base. One of them in fact has 25 offsets round the base, each roughly 2 cm in diameter.

.....from H.Middleditch

Both these plants grown by A.W.Craig display the chin-like tubercles which are characteristic of *G.monvillii*, but these tubercles are formed into more distinctive ribs than on the Lemaire picture of *G.monvillei*. At half way up the plant, the areoles are about 30 mm centre-to centre distance on each rib.

.....from T.Doyle

About a couple of years ago, when an old collection was being sold up, I acquired a plant of *G.multiflorum* of about 8 inches in diameter. This plant produces offsets at various places around its circumference, up to nearly waist level.

.....from J.Arnold

It will be about ten years ago that I acquired a cultivated plant of *G.multiflorum*, which is now in quite a large pot. Whilst it has been in my collection it has started to produce one or two offsets from above the base and one of these is now about 4cm in diameter.

.....from G.Slack

In 1979 I obtained an imported plant of B17 *G.multiflorum* from Whitestones, which has grown to about 8 inches in diameter. It is producing a few offsets from near the base. About two years ago I acquired from G.Hole an offset of his large plant of B17 *G.multiflorum*, but I have never been able to find out where these B17 may have been collected.

.....from H.Middleditch

My short list of "B" field numbers includes B17 from Pampa de Pocho, presumably an area of level ground, located to the SW of Salsacate. The DJF location of Vila Viso lies on its northern edge, the Neuhuber location of El Mirador on its southern edge.

All the four foregoing offsetting *G.multiflorum* were on the display table at the Chileans' 2000 Weekend.

.....from G.R.Allcock

One of my *G.monvillei* in a 3.5 inch pot is carrying newly emergent offsets.

.....from L.Bercht

Plants of *Gymnocalycium monvillei* bearing offsets have been found in habitat near Alta Gracia, where these plants are also rather similar to the plant in the Lemaire illustration. In addition, quite a few of the

G.monvillei in my own collection are now producing offsets, these being:-

- LB 479, from La Verbena, San Luis
- LB 1396 from south of Inti Huasi, Paso del Rey, San Luis
- LB 1402 from Baldecitos, San Luis.
- LB 1124 from west of Ongamira, Sierra Chica
- LB 1361 from Nina Paula, east of Mina Claveros, Cordoba
- LB 1362 from Villa Gulio Cesare, Sierra Grande, and
- LB 1364 from El Condor.

All these plants are still adopting the mode of growth where their height is less than the width of the body.

.....from G.Neuhuber

G.monvillei is to be found growing at altitudes from as low as about 450m to generally up as far as 1100m, but also up to 2000m on the crowns of the Sierra Grande, in the form of G.monvillei v. steineri. That is why the plants differ so much in spination and habit. Mostly G.monvillei does not grow in the company of bushes or long grasses, but by preference on rocky meadows where the grass is not as long. It is at various different places where G.monvillei can be found producing offsets, sometimes a few, sometimes many. In the surroundings of Pampa de Pocho to the west of Sierra Grande the G.monvillei there displays a typical production of offsets.

.....from G.Hole

In the course of visiting collections in Austria I have been fortunate in obtaining a number of *Gymnocalycium monvillei* in the form of an offset which was removed from the parent plant for my benefit. These include:- P.12 Sierra Tulumba; STO.HA 193-1 Cuchilla Nevada; P.12d Copina; STO.HA 220.2 El Condor; S.104 Tanninga; STO.HA 226-2 Asconchinga; S.10 Tanti; STO.HA 501-2 La Sierrita.

.....from G.Charles

On our last visit to Argentina, we crossed the Sierra Cordoba. On a hill to the west of Tanninga, overlooking the valley, we found some *Gymnocalycium monvillei*. One of these plants had a number of offsets round the base, some of which could possibly be seedlings. But we were able to see that one or two of these offsets quite definitely arose from areoles closely above the base of the plant.

.....from G.J.Swales

Perhaps it may have been as far back as 1954 that I obtained my first *Gymnocalycium* and certainly *G.multiflorum* must have been one of my early acquisitions. Over the intervening period of time since then, quite a number of *G.multiflorum* have been added to my collection whilst various specimens have also expired. Not a single one of these plants has ever shown the slightest inclination to produce any offsets. Over the course of quite a number of years I have concerned myself with *Gymnocalycium* in particular and I did feel that I was fairly familiar with the features and characteristics of many species of this genus. In consequence I have to say that I am absolutely astonished by all these reports of offsetting taking place on these plants. If it had only been reported to occur on plants in collections, then from my own experience I would have concluded that it was simply an effect of cultivation. But it has quite evidently been observed in habitat. So now I must come to terms with the existence of a feature which I would never have believed to exist.

.....from H.Middleditch

We are still left in the position of having two names in common use for what appear to be the same group of plants; that of *G.multiflorum* being commonly used in this country and *G.monvillei* apparently preferred on the continent. The original description of *G.monvillei* in 1838 noted that no flowers had been seen, despite the available plants being quite large. Doubtless the delay between drawing in 1836, lithographing in 1837, and publishing in 1838, was in the hope of seeing flowers prior to publication. Not until 1847 was there a report from the continent of flowers on a *G.monvillei*. By comparison, the earlier flowering of a distinctly smaller plant in this country would lead to it being described as *G.multiflorum* in Hooker's *Botanical Magazine* of 1845. As illustrated in Chileans number 31. The Lemaire illustration may well have appeared to Hooker to be of a quite different plant to that in his possession. However, the photographs of these plants which were on display at The Chileans' 2000 Weekend covered a range of forms far greater than that between the 1838 Lemaire and 1845 Hooker illustrations. Which would suggest that we have two names for one sort.

.....from H.Till

In "The Cactaceae" of Britton & Rose the Fig.XVIII is of a plant collected by Rose at Cosquin. Whether this name and this plant form was a synonym of *monvillei* was reviewed in an article in *Succulenta* in 1975, without reaching any consensus of opinion. In 1988 we also travelled around the habitat area near Cosquin and were able to observe that the forms of *G.monvillei* growing in that area bore an undoubted resemblance to the illustration of *Echinocactus multiflorus* in Curtis' *Botanical Magazine* of 1845.

.....from H.Middleditch

Which seems to leave no alternative but to acknowledge the priority name of *G.monvillei*.

.....from G.R.Allcock

If you care to consult the Austrian *Gymnocalycium* publication of 1990, you will read there that the plant found near Cosquin and identified as *G.multiflorum* by Britton & Rose is in fact *G.monvillei*. Yet there is nothing in that article which states unequivocally "*Gymnocalycium monvillei* Lem., synonym *G.multiflorum* Hooker". In addition, it is stated that this naming of the plant from Cosquin by Britton and Rose was the cause of repeated subsequent confusion "between these two species". How could there be two species if we are being asked to accept that *multiflorum* and *monvillei* are synonymous?

.....from H.Middleditch

Possibly this apparent anomaly might be explained by a comment received from one of the Austrian *Gymnocalycium* group, as follows

.....from G.Neuhuber

Gymnocalycium monvillei from Cordoba, in England falsely named *G.multiflorum* from Brazil, is

.....from H.Middleditch

Which would suggest that G.Neuhuber believes the original *Echinocactus multiflorum* Hooker came from Brazil.

.....from J.Lambert, *Cactus d'Argentine*

Some authors designate *Gymnocalycium multiflorum* (Hooker) Br.& Rose under the name of *G.monvillei*, and consider that *Echinocactus multiflorum* Hooker originates from the south of Brazil. From what it has been possible to establish, *G.multiflorum* sensu Till should be nothing more than a form of *G.megalothelos*.

.....from H.Middleditch

So the explanation for the "two species" referred to by H.Till in *Gymnocalycium* 3(3) 1990 is that Till regards *Gymnocalycium multiflorum* (Hook) Br & R as merely a form of *G.monvillei*, whilst *Echinocactus multiflorus* Hooker 1845 is regarded as a different species which emanates from Brazil. What has led the Austrian *Gymnocalycium* group to come to this conclusion? Perhaps an answer to this question may be found in the reference by H.& W.Till in "*Gymnocalycium*" 7(4) 1994 to a report of the German Cactus Society 1897 August monthly meeting, in which Walter Mundt reports receipt of a large importation of cacti from Paraguay. It was agreed by the German Cactus Society's "Nomenclature Commission" that these could be named as *Echinocactus denudatum*. And then;

.....from *Monatsschrift für Kakteenkunde*, 1897.

There was with this consignment a noteworthy form that even definitely seemed to be an atypical *Echinocactus multiflorus* Hook (Echs. *ourselianus* Lem.); the very depressed. almost cake-shaped bodies and the deeply indented ribs are almost reminiscent of *Echs. megalothelos* Sencke.

.....from H.& W.Till, *Gymnocalycium* 7(4) 1994

What does this report tell us?

1. That at the end of January 1896 a large consignment of cacti imported from Paraguay was received by Walter Mundt in Eberswalde, which included among other sorts, plants of the genus *Echinocactus*

2. That with this consignment the occurrence of *Echinocactus multiflorus* (*E.ourselianus*) from Paraguay was confirmed

3. That with these imported plants from Paraguay was also to be found an untypical form of *Echs. megalothelos* with deeply indented ribs.

.....from H.Middleditch

Information is presented above regarding the inability of foreigners to gain access to Paraguay from about 1830 to 1852, during which period there occurred the original collection of *Echinocactus multiflorum* Hooker 1845. From the observations (above) which are made in the review of *G.monvillei* in *Gymnocalycium* 3(3)1990, it is evident that H. & W.Till were unaware of the inaccessibility of Paraguay at the relevant time. From that, it was erroneously concluded in the foregoing comments that *Gymnocalycium multiflorum* Hooker comes from Paraguay. With the August 1897 monthly report of the D.K.G. open before me as I write, I am unable to find a single word therein which would justify the conclusion (2) above by Till & Till that "with this consignment the occurrence of *Echs. multiflorus* from Paraguay is confirmed".

This would at least explain why Till & Till do not quote *G.multiflorum* as a synonym of *G.monvillei*, and also why they speak of these two names as "two species".

.....from G.R.Allcock

Many of the *Gymnocalycium* are very confusing, and so variable that I do think that far too many names float around without even the possibility of any definitive attachment. Thus my two plants of *Gymnocalycium ourselianum* could be equated to the traditional *G.multiflorum*.

.....from R.Mottram

The name *ourselianum* seems to have originated in the Monville collection, at the time one of the largest collections in Europe, possibly comparable to that of Salm-Dyck. The catalogue of plants in the Monville collection, produced by Lemaire in 1838, makes no reference to this name, nor does the catalogue likewise produced by Lemaire in 1839. There was also a catalogue of this collection produced in 1842 but no copy of that publication appears to have survived. However, the sale catalogue for the Monville collection, dated 1846, does include *Echinocactus ourselianus* Mon. Also in 1846, Förster included the name *Echinocactus ourselianus* in his *Handbuch der Cacteenkunde* in a plain list of names which lacked any description or observations.

Then in the 1849 catalogue of Salm-Dyck plants, published 1850, there is included *Echinocactus ourselianus* Cels, syn. *Echinocactus multiflorum* Hook. The first Cels catalogue was published in 1817, subsequent issues covering many other plants in addition to Cacti, but none of the earlier Cels catalogues are still in existence. This was probably the largest cactus nursery in Europe at the time and the attribution of the name *ourselianus* to Cels by Salm Dyck in 1849 would suggest that this name may well have first appeared in Cels' sales catalogue. The 1858 catalogue from Cels' nursery listed *Echinocactus ourselianus* Lem. syn. *Echs. multiflorus* Hook.

The 1886 Förster-Rümppler *Cactus Handbook* included *Es.multiflorus* with *Es. ourselianus* Cels as a synonym, whilst Schumann in 1898 listed *Es. ourselianus* as a synonym under *Echs. multiflorus* Hook.

Thus there would not appear to have been any valid publication of the name *Echinocactus ourselianus*.

.....from H.Middleditch

The name *ourselianus* seems to have surfaced originally shortly prior to 1845 when Hooker published his first description of *Echs.multiflorus*. It is quite possible that a consignment of imported plants came to Europe and, as was not unusual at that time, the same sort of plants received one name in France, another in Germany and perhaps yet another in Britain. From Salm-Dyck 1849 onwards there appears to have been an acceptance of the Hooker name being validly published and the name *ourselianum* being submerged into synonymy with it. Effectively, the name *ourselianum* does not exist as a plant identification.

.....from G.R.Allcock

My *G.ourselianum* has not only flowered but also set seed and I am enclosing some seeds from this plant.

.....from G.J.Swales

Without even removing these seeds from their cellophane wrapper, they can be seen to belong to the Macrosemiae seed group i.e to the *Gymnocalycium* originating from Uruguay, southern Brazil, and the adjacent part of Paraguay.

.....from G.R.Allcock

My *G.ourselianum* do have quite a "Paraguayan" look about them. More glossy than any *denudatum*, and fatter, but otherwise quite similar, more spherical.

.....from H.Middleditch

So they could be equated to "*G.multiflorum* Hook. from Brazil", could they? Or could they?

.....from L.Bercht

My own *G.ourselianum* produces seed which has a definite Macrosemiae form, but the seed which I receive from Czechoslovakia under this name has rather more of an *Ovatisemineae* appearance.

.....from H.Middleditch

Reflecting the somewhat indeterminate nature of plants labelled with a name that has no valid existence?

.....from J.Lambert

A plant which I received from H.Till as the "true *G.multiflorum*" proved to be no more than some form of *G.megalothelos*.

.....from H.Middleditch

In conclusion it would appear to be reasonable to put the name *multiflorum* into synonymy with *G.monvillei*, in accordance with ICBN rules on priority, even though that will probably horrify collectors in the UK whose label alone on their *multiflorum* might qualify for vintage status.

PILOCEREUS STRAUSSII By I.Dorfler

Translated by H.Middleditch from Monatschrift der Deutschen Kakteen Gesellschaft No.2 1930

Unquestionably the *Pilocerei* belong to the choicest favourites of the cactophile. There is this one group of columnar cacti which distinguish themselves by their more or less abundantly hairy bodies. They belong to various subgenera of the composite genus *Cereus*. An adherence to the collective name *Pilocereus* is - strictly speaking - only a concession to the adopted usage in the field of cactophiles and nurserymen.

The history of this species is as intriguing as the plant itself. It begins for us with Karl Fiebrig, a Zoologist in San Berdino, Paraguay, who also took an active part in botany. An important consignment of succulent plants came out of Bolivia from him early in April of the year 1904, to the Botanical Museum in Berlin-Dahlem. The plants arrived in "pretty mummified condition". In addition, disproportionately high costs were accumulated in consequence of overcoming difficulties with customs. It was thus indeed welcome to the Directors of the Museums and Gardens that the wholesaler Emil Heese offered to take over half of the marketable consignment - all as recorded in *Gartenflora* 56, 1907.

This consignment now contained, amongst others, several specimens of a white haired *Cereus*, which held out little promise owing to the very poor state in which they arrived. Heese also received some of them in his share. He had a very valuable cactus collection in Berlin-Lichterfelde, being an expert and skilled grower of these succulents. Like the Botanic Gardens, his aim was to see the specimens of the unidentified *Cereus* recover and flourish.

Heese took this *Cereus* to be a new species. He described it in the 1907 Vol.56 of the *Berlin Gartenflora*, along with an illustration of some cuttings of this species. The original description ran as follows:

"*Pilocereus straussii* sp.nov. E.Heese. Columnar growth, upright, growing in habitat more than one metre high, cylindrical, slightly tapered towards the top, above which rises pure white, splendid silky white hairs. Diameter up to 5 cm; ribs ca.25, projecting slightly. Areoles 5 mm apart, almost circular, 2.5 mm in diameter, furnished with short pure white wool, which is retained on the body for a fairly long time. Out of each areole projects up to 40 slender, up to 17mm long, initially soft, later stiff white hairs, which entirely cover the body. In addition at the centre of the older areoles stand four reddish white central spines of which the lowermost is the longest, becoming 2 cm long, and with the tip mostly pointing downwards. Habitat - Bolivia.

The plants is up to now only available in a few specimens, growing very freely however, even grafted, and ought to be one of the finest showpieces of a collection. It has no affinity with *Pilocereus verheinii*, under which name it is carried in the Berlin Botanic Gardens.

I name this after the ardent cactophile L.Strauss in Bruchsal"

In the May issue of *M.f.K.* for the year 1913, F.Vaupel published a list of newly described cactus names, in which *Pilocereus straussii* was renamed *Cereus straussii*. Soon afterwards Heese produced a notice in the August 1913 number of *Gartenflora*, headed *Cereus (Pilocereus) straussii* Heese. Along with this is an illustration of a group of 18 fine specimens, all grafted, propagated by cuttings. Heese observed that it had no

special cultural requirements and grew easily and freely just as well on its own roots as when grafted upon *Cereus spachianus*.

The following extract is important. "Like so many imports, the plant shed in cultivation the wool coating brought out of habitat, from high places. Likewise the reddish brown central spines of habitat, in place of which however the spines on each areole are packed together in a bundle - they densely surround the body and have a colour and consistency of spun glass." Heese closes with the words "Despite almost a decade of cultivation, up to now unfortunately no specimen has yet put out any flowers". That was in 1913; and Heese did not live to see the flowers of his *Pilocereus straussii*. He died on June 6th 1914.

After Heese's death his collection - at that time surely the finest and with the most species in Germany - passed into various hands; only a small remnant was retained by the widow. She informed the German Cactus Society in 1917 that "the *Cereus straussii* has flowered for the first time. The flower is insignificant and cereiform" (M.f.K. 28.1918). A description of the flower was given by Vaupel (M.f.K. 30.1920):

"In the early days of June 1920 both plants of *Pilocereus straussii* in the Botanic Gardens at Dahlem have flowered. In this way a significant gap in our knowledge of this fine plant has been filled and its relationship clarified. It belongs in the subgenus *Cleistocactus*. Both these plants survived the winter in the large showhouse and often endured low temperatures not far away from freezing point, because of the dearth of coal.

The development of the flowers extends more or less over four weeks, their expansion more or less to two or three days. The flowers are located about 5-10 cm below the crown and stand out at right angles from the plant. They are 8-9 cm long, tubular and only open wide enough for the stamens to become visible. The carmine red tube is fluted, furnished with scales, and profusely clad with hairs. The hairs are 1 cm long, reddish brown on the exterior of the ovary, very dense, paler on the tube ("blond"), and sparser above. The scales on the tube are numerous, pointed lanceolate, 2-3 mm long, changing gradually upwards into petals. These are very numerous, lanceolate, pointed, the inner ones up to 2 cm long, 4-5mm broad, dark carmine with a hint of violet. Above the ovary is an open space of about 5 mm height. Above that the tube is closely packed with filaments in two groups; one group arising from a 5 mm deep zone, the other group attached at the throat but adnate to the tube wall below. The lowermost stamens are fused together into a short tube, like *Cereus aurivillus*. The filaments are whitish below, changing to carmine above. The anthers, about 1 mm long, are attached to the filaments at one end by a very slender, short white stalk. The style, a little paler than the tube, projects round about 1 cm above the stamens. Stigma lobes 12, green, furry."

Some months later (M.f.K. 30.1920) Vaupel reported that the flower had been followed by a fruit, attributing its origin to "the fortunate chance" that the flowers on both plants came to maturity only one day apart. Pollen was conveyed from the older flowers to the stigma of the newer one. After only a few days the ovary swelled up. One morning the cactus gardener commented that the flower remains had fallen off and the fruit had opened at the top. The fruit was the size of a cherry and was spherical. Externally it was furnished with a great deal of reddish brown wool, which sat in the axils of the small lanceolate scales. Fruit flesh white. Seeds very numerous, especially crowded in the upper half of the fruit, blackish brown, both sides lightly depressed, punctured with tiny pits, 1 mm long.

Appended thereto was a written communication from the renowned De Laet, of Contich, of 30 July 1920, according to which *Pilocereus straussii* had flowered with him "in the last year" exactly in accordance with the Vaupel description and had set abundant seeds, that had germinated very well and produced fine seedlings.

In the summer of 1921 the plants in the Dahlem Botanic Gardens flowered again. In the 1921 M.f.K., Vaupel presented a picture of a flower for the first time. It was accompanied by "On the following six flowers it was possible to establish that a single plant was sufficient for the production of viable seeds". [Further comments from Vaupel on seed production and plants grown from seed appeared in M.f.K. 32.1922].

The way was thus paved for the swift increase in this splendid species, from the few original plants that reached the Berlin Dahlem Gardens in miserable condition in 1904. Neither original plants nor seed have been brought here again from that time to last year.

We are particularly indebted to the cultivation and propagation of *Pilocereus straussii* to the firm of H.Schulz, cactus wholesalers in Breslau-Gruneiche, who had acquired the stock plants from the collection left by Heese. At the end of the war it consisted of about 30 large plants. Whilst the largest known show plants barely exceed a height of 1 to 1.2 metres, H.Schulz possesses a specimen at a fabulous height for the species of 3 m, by a circumference of 24 cm [7 cm or 2.75 inches diameter - H.M.] at one metre height. This giant, raised from a cutting and about 12 years old, flowers every year since 1923. The buds appear in great numbers as early as December and specifically always on the sunny side of the plant, although not all of them come to full development. The disposition of the buds starts about 1.3m above the ground and stretches over a length of more than a metre. Further examples grown by Schulz measure over 2.5 m high. These too, as well as some of 1 m high, carry abundant flowers and fruit each year.

About *P.straussii* in its habitat we know nothing up to the present. First the well-known cactus hunter A.V.Fric, in his eighth collecting trip, when he was travelling in the border area between Bolivia and north Argentina, succeeded there in discovering *P.straussii* again at Christmas 1928. On this account, I am indebted to Fric for some extremely interesting information. Among his few imported plants, Fric possesses a notable and very striking variety. In that, the areoles - mainly in the upper part of the stem and at the crown of the plant, display wisps of white woolly hairs up to 5 cm in length that wrap loosely round the body, in addition to the bunch of bristles and central spines. I designate it as *Pilocereus straussii* v.Fricii.

Raising *Pilocereus straussii* from seed is not difficult. The seedlings are relatively rapid growing, and at one year old they are usually 8-10 cm tall; half a year later about 18 cm high by 3-4 cm in diameter. In 6-7

years with good cultivation, seedlings can grow up to fine plants of 1m in height.

.....from H.Middleditch

The above article purports to provide the description of the flower of *Cleistocactus straussii* as reported by Vaupel in M.f.K 30.1920. However, consulting that particular copy of M.f.K. revealed that certain material observations, including features of the flower, had been omitted by Dorfler; these omissions have been incorporated in their original context in the above translation.

Contrary to the assertion made in this article by Dorfler, we now know that Fric never travelled anywhere near the border area between Argentina and Bolivia, and that in all probability the so-called *straussii* was collected by Fric in the lower section of the Quebrada del Toro. Consequently the original *Cleistocactus straussii* v. *fricii* was not a form of *Cleistocactus straussii* at all.

It appears that no information was available in Europe regarding the habitat location for *Cleistocactus straussii* not only in 1930, but even as late as 1960, when the following article appeared.

**THE HABITAT OF CLEISTOCACTUS STRAUSSII By W.Hoffmann
Translated by H.Middleditch from K.u.a.S December 1960**

During the preparatory work for my second trip to South America, I read in Volume 2 of Backeberg's *Die Cactaceae* (p.1014) concerning *Cleistocactus straussii*: "About the finding place - Dorfler reports in M.d.K-G 52. 1930 according to information from Fric, north Argentinian - Bolivian border area from 1200 to 2000m. Heese writes 'from higher spots in Bolivia'. It remains to wait for where the species is rediscovered". So much for Backeberg.

Since I passed through Villazon into southern Bolivia in the February of 1960, I was curious whether I would get to know something about the *Cleistocactus straussii* from the further journey Tarija-Tupiza.

The unusually fierce rainy season this year has brought the traffic in Bolivia almost to a halt. Even in the north argentinian border town of La Quiaca I had to wait for one week for transport to Bolivia. The railway from Uyuni via Oruro to La Paz was interrupted in several places; the autobus for Tarija ran only irregularly. So I travelled as on my first trip, by goods vehicle and witnessed in the few rainfree hours the unique spectacle that the cactus world of south Bolivia can offer in this stretch. *Helianthocereus poco*, *Trichocereus werdermannianus*, *Oreocereus trollii*, *Parodia maassii* and the fine *Cleistocactus tupizensis* colonised by preference the sides of that deeply entrenched valley whose north-Argentinian continuation is the Quebrada Humahuaca. With its variations of height, spination, and hair, *Oreocereus celsianus* revealed the whole problem of nomenclature in the genus *Oreocereus*.

In Tarija I find a hospitable reception at the home of a German family and had an opportunity to reconnoitre on foot in the immediate vicinity of this town. I found *Cleistocactus tarijensis* right on the edge of the town, certainly in a very wretched condition. The tops of the stems were apparently stopped repeatedly in their normal development on account of damage by slugs.

On 13 February there was opportunity to collect herbarium material, besides what my new acquaintances would show to me, in a valley in which there was a splendid waterfall and fine bathing spots. The approach was difficult, since the track ran first on this side and then on the other side of the river, which on account of the rainy season carried great volumes of loamy brown waters. The bathing was almost unnecessary, after we had forded the river repeatedly as far as the sought-after quebrada.

At the side of the river there was much potential herbarium material - red flowering *Verbenas*, blue *Tradescantia*, innumerable *Ageratum*. Even the steep sides at the entrance to the valley were densely overgrown, yellow green rosettes of a huge bromeliad commanded the scene, between which I saw cushions of *Abromeitiella*, ferns, bulb-forming *Begonias* and *Echeveria peruviana*. From the most inaccessible spots glittered white columns which I first of all took to be *Oreocereus*. Once besides them, however, I corrected myself - they could only be *Cleistocactus straussii*,

As Backeberg surmised, the plants in the wild are more compact than in our collections. Around Tarija they seldom attain a height of more than one metre, generally even only 50 cm. At this location *Cleistocactus straussii* grew only on the northern rocky cliff, also orientated towards the sun. The noisy waterfalls in the narrow valley provided constant high humidity. As my companion assured me, this river always runs with water even in the long dry season.

In order to discount any doubts about my discovery, I immediately sent one of the collected specimens to Dr. Cardenas at Cochabamba, who unquestionably identified it as *Cleistocactus straussii*. In regard to the distribution area of this species, I cannot comment. The occurrence established by me is to be found in the near vicinity of Tarija and at a less altitude than that town, around about 1750m. Heese's statement "from higher places in Bolivia" is therefore misleading, since there are Andean heights of more than 2500m altitude.

The question of habitat location for *Cleistocactus straussii* should now no longer be shrouded in mystery.

.....from H.Middleditch

The seed list issued by H.Winter in 1952 (received from New Zealand) includes an entry for *Cleistocactus straussii* "import"; the 1953/II seed list issued by H.Winter (likewise received from New Zealand) of Ritter-collected ex habitat seed, does not include any entry for *C. straussii*. There is no real treatment of *Cleistocactus straussii* in Ritter's *Kakteen in Südamerika*. However in Englera 16 1995 under FR 68 there are two collections of *C. straussii* recorded, material of each being held in the Zurich Municipal succulent collection: one from Tarija dated 1953, the other from Padcaya dated 1958. It is hardly surprising

that Ritter would keep this information to himself at that particular time, so that the above article by Hoffmann represented the first public statement of the habitat location for *Cleistocactus straussii*.

.....from R.K.Hughes

On our trip to Bolivia with B.Bates we passed through Tarija and travelled from there eastwards along the road which leads to Entre Rios. However, before reaching the Abra Condor we made a stop at a rocky cliff close besides the road. Here there were some *Cleistocactus straussii* growing on the steep rock face so that it was very difficult to stand in a position where a close-up photograph could be taken. My recollection is that these plants certainly grew there to over half a metre high but probably not to one metre in height.

.....from R.Hillmann

Cleistocactus straussii has a wide distribution in Tarija. This species grows to the north of Tarija in places like Canasmoro and Tomatas Grande, as well as both east and west of the Abra Condor and further east still in the whole valley forward from Narvaez. More to the south, I found some plants near Padcaya, where I found the tallest growing plants, up to 3 or 4 metres high. This last location seems to be rather drier than the other finding places in the smaller valleys more to the east. The surrounding vegetation had more vegetation cover in the form of shrubs, but the ground there was very stony together with some large boulders. It is not at all easy to establish any reason why some populations of this species should be growing higher than others.

.....from F.Vandenbroeck, *Succulenta* 77.4;1998

From Tarija, we went down in an easterly direction towards the town of Entre Rios which lies at a height of 1200m. This region forms a sort of intermediate zone between the higher Andes and the flat plains of the Gran Chaco. Such transition zones are always rich in all sorts of plant species, also often in cacti. When we left Tarija at the beginning of December 1992 and started southeastwards along the Chaco road, before long we started to ascend the so-called Condor pass (2,500m). The road climbed through a dry stony landscape and we repeatedly searched the surroundings.

We also passed through this area on a few occasions in another season when there was little life to be seen in this stony loneliness. We climbed further and shortly after midday we reached the place Junacas. Close to the pass we take the narrow track towards Alto Espana. It is an intensely cultivated area with a fine extensive settlement. A local inhabitant led us to mossy stony slopes on which we came across abundant numbers of red flowering *Rebutias*. After leaving Alto Espana we see close to the top of the pass between Junacas and Tambo a rock formation covered with elegant clumps of grass and red flowering begonias. Our attention was really caught by the groups of slender columnar cacti which it displayed. After a short laborious climb we were confronted with the first specimens of *Cleistocactus straussii*, so well known as a cultivated plant, together with some clumps of the rare *Trichocereus tenuispinus*. Also *Echinopsis mamillosa* grows here among the luxuriant growth of herbs. It is the form that Ritter described under the varietal name "tamboensis". Further eastwards the track descended into the Tambo valley. At the bottom ran the Rio Caneletas and the valley was now and then very narrow so that it took on the form of a canyon. Along the often perpendicular walls of this canyon we saw widespread stands of *Cleistocactus straussii*. The plants are usually inaccessible and grow among grasses and low shrubs.

During attempts to get up close to these plants we found the elegant white bristle-like spined *Rebutia muscula* with their orange-yellow flowers. The plants seem however to occur only sparsely. In contrast to most other *Cleistocactus* species, the *C. straussii* here grew straight upright and can attain a length of about 3 metres. The plants remain solitary or form small clumps. With their thick silver-white spination they have a splendid appearance. It is consequently no wonder that these cacti succeeded in starting a commercial career. When we descended still further, the *C. straussii* disappeared. The area became more luxuriant with here and there dense woodland and small red-flowering begonias alongside the track

.....from R.Hillmann

Rancho Tambo is situated a few km to the east of Canaletas. A little canyon starts from here, going in a southeasterly direction. We were mindful of exploring it in 1992, but it was raining heavily at the time so we had to abandon this idea. To the east and west of the Abra Condor there are often groups of *C. straussii* to be found in the side valleys, in the company of *Abromeitiella* and different spp. of *Rebutia*, but these places are only accessible on foot.

.....from M.Lowry

We came across *Cleistocactus straussii* on both our visits to Bolivia, to the east and southeast of Tarija. On our first trip, they were seen at Santa Ana, then when approaching the Abra Condor. and also to the south of La Angostura. Then subsequently near Padcaya, also near Alto Espana (north of Abra Condor), and at Camaron, well to the north of Tarija. Certainly the height of 3m for the stems of these plants, as quoted by F.Vandenbroeck, was by no means unusual, and indeed I would be inclined to say grew up to nearly twelve feet in height. But it is not really possible to be precise about their height, as almost all the plants we saw were growing on virtually vertical rock faces, where they were quite inaccessible. At least it was not difficult to make an estimate of their height as there was nothing in the way of any bushes growing along with the *Cleistocacti* on these rock faces. Even near Camaron, where the *Cleistocactus straussii* were growing on a very steep rocky slope, they were still inaccessible. But again there were no problems in seeing their full height. It was not unusual to find *Echinopsis kermesina* growing in the close vicinity of *Cleistocactus straussii*.

.....from R.K.Hughes

At our BDH16 site approaching Abra Condor from Tarija, there were just a few flowers to be seen on the *Cleistocactus straussii*, and those were on the taller stems. There was one stem which carried a single open flower and three well-developed buds. There was no fruit to be seen - this in mid-December. Returning to Tarija, we made a stop along the way at BDH 17 where there was a different type of *Cleistocactus*, probably *C. tarijensis*; these plants were only about up to 2 ft high, growing in clumps of two or three stems, or even up

to a couple of dozen stems to a clump. They were growing on an arid hillside in the company of chest-high leafless bushes. Most of these *Cleistocacti* had quite a few flowers on any one stem, a quite different display to the *C. straussii*.

.....from H.Middleditch

My impression is that I am lucky to have one flower out at a time on my *C. straussii*, whereas most of my other *Cleistocactus* seem to produce a real display of flowers all together.

.....from R.K.Hughes

It would be during the 1980's that I sowed some seed of *Cleistocactus straussii*, from a commercial source. Two of the resultant plants have been kept, but growth has been rather slow. After cutting back those which have stopped growing at the top, the remaining stems are now about two feet tall. The slightly shorter plant has now produced flowers for the first time this year.

.....from M.Lowry

It was on our first trip to Bolivia when we saw some flowers on the *C. straussii* west of the Abra Condor (BLMT 80), more or less the same place as the BDH 16 site; this was early January. But I do not recollect seeing any flowers on these plants anywhere else. It was on our first trip when we were able to collect fruit from these plants at Padcaya and at Alto Espana, that being late December.

.....from F.Vandenbroeck

In July of 1988 we saw the *Cleistocactus straussii* growing in the gorge of the Rio Canaletas, east of Tarija, for the first time. It was the dry and sunny season and the plants were obviously at rest. They grow by the thousands there, on the steep rocky walls bordering the river and are most difficult to reach. In December 1992 we were back there again and on this occasion we were able to take pictures of these plants in flower.

But there were only two or three open flowers per plant. Other species of *Cleistocactus* normally display a fair number of flowers, possibly up to 10/15 flowers per stem at one time. It is possible that *Cleistocactus straussii* deviates from other *Cleistocactus* in this respect.

.....from W.Rausch, G.O.K. journal 1968

Here in Tarija, we are in *Cleistocactus* territory, where Hoffmann had "rediscovered" the *straussii* - notwithstanding that Ritter had already found it the year before - likewise in Tarija. At this present time I can add to that: *Cleistocactus straussii* occurs in Tarija, southwards as far as Santa Victoria in Argentina, and northwards up to El Palmas. It would be well worth an article dealing with its various habitat locations, where it does occur and where it does not occur. Data in the literature is mostly only very vague, since the collector was often nowhere near the stated location.

.....from H.Middleditch

This appears to be the only report of *Cleistocactus straussii* being found as far south as Santa Victoria, which lies a relatively short distance to the south of the border between Bolivia and Argentina - but still on the wet side of the main chain of the cordillera. At the time of writing, the location of El Palmas has not been established.

AKERSIA ROSEIFLORA From G.Charles

Akersia roseiflora is far from an uncommon plant as it is represented in many collections. From its general appearance, this plant looks like *Seticereus icosagonus* but with particularly hairy flower tubes. I received a habitat cutting from Madsen of his No.50225 collected between La Toma and Loja in Ecuador. This has a number of features in common with *Akersia* including hairy flower tubes. See the colour illustration of this and other similar taxa in BCSS 18(4) Dec. 2000, pp 206-208. The original description gives Chala as the type locality, which lies close to the coast in southern Peru. But this must surely be a mistake, as a plant like *Akersia* is hardly likely to grow in the desert landscape around Chala? Is there a less well known place of the same name, Chala, in the north of Peru or Ecuador?

.....from A.F.H.Buining, Succulenta 3:1961

[Fully detailed description provided] This interesting plant, which should have been described several years ago, and with the full permission of Mr. John Akers, has given me much headache over all that time. It can find no appropriate place in the list of genera according to the method followed by Backeberg. Indeed, Backeberg, who saw my plant in flower, did not know it and thought that it did not belong to any genus he knew. Ritter, to whom I sent photos and seeds, is also of the opinion that the plant does not belong in any of the genera described in Backeberg's new work.

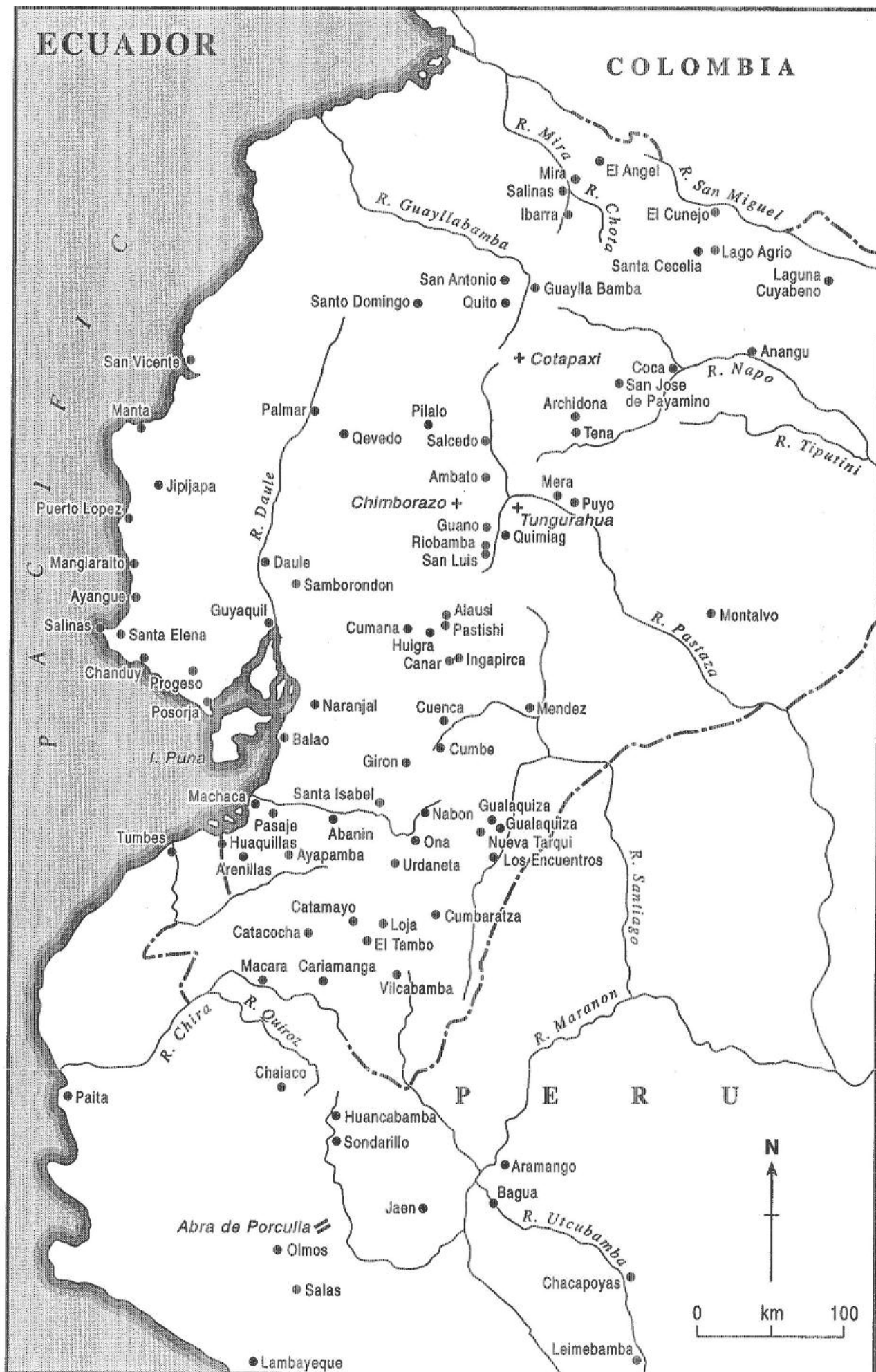
Ritter's judgement, which I value greatly, is that the fruit, tube, ovary and seeds do not conform with *Loxanthocereus*, even though the seeds are nearer to those of *Loxanthocereus* than of *Borzicactus*, *Arequipa*, *Matucana*, etc. There is no more of a near relationship with *Seticereus* (in so far as this genus has any reason to exist). Even though the seeds are closely related to *Haageocereus* and *Weberbauerocereus*, the flowers are so different, that the plant cannot be reckoned in these genera.

Through the presence of some black-brown bristly spines in the axils of the scales of the tube, ovary, and fruit, it is justifiable to set up a separate genus, according to the currently used method for the so-called small genera. The name of this genus is in honour of my friend John Akers of Los Angeles, California, U.S.A., who spentmany years collecting Cactaceae in Peru and who also found this plant.

Finding place in southern Peru by Chala.

.....from C.Backeberg, Die Cactaceae Vol.6

The statement regarding the occurrence of *Akersia roseiflora* in the south of Peru, near Chala, originated from Akers as far as I am aware, but it seems to me not to be reliable, partly on account of a communication to



me from Hutchison as well as in the fact that several people have collected around Chala but have not seen the plant there.

.....from G.Charles

I have asked L.Mitich of the U.S. Cactus & Succulent Society about Akers' travels in Peru and received the following response:

"I will not be able to shed much new light on the genus *Akersia*. There has always been some doubt about the type locality. It has been reported from various areas - from northern Peru in the interior of the country or to the south, the Chala site.

At first the opinion was that it was perhaps a hybrid. It was not located by P.Hutchison when he explored the type locality. I have not been able to find any record that Akers collected the Type specimen. And he did not visit Ecuador. I do not know for certain if J.Akers travelled in northern Peru, but I believe that he did not.

Apparently J.Akers did not research the literature when it came to describe new species. So many of his names were merely synonyms of plants that had been described already."

So we really do not know where Buining got the Type plant or why he named it after Akers. I am personally convinced that it comes from the south of Ecuador and that it is closely related to, or the same species as, *Seticereus icosagonus*.

.....from W.Rauh, Peruvian Cactus Vegetation

The overall impression of the zoning of the cacti in Peru closely follows orographic divisions, which are exhibited in no other South American country as clearly as they are in Peru.

Dominating the country is the enormous chain of the Andes mountains, which descend to the coastal plain bordering the Pacific ocean to the west - which is to a large extent a sandy desert. The breadth of this coastal desert varies tremendously; in places the Andes come right to the shore, in other places e.g. near Nazca, the desert plain is 150km broad.

The plants which are found in the coastal desert display specific characteristics - their roots lie close below ground level where they can take advantage of dew from the mist which soaks only a few cm into the ground. Or they are completely rootless, such as lichen, moss, and Tillansias. Within the Tillansia zone are to be found *Haageocereus*, *Loxanthocereus*, and *Islaya*.

Seticereus icosagonus.petals carmine, vermilion, or orange. Found at Huancabamba and Sondorillo, also on the west and east side of the Cordillera between Olmos and Jaen, between 1800 and 2000m.

Seticereus humboldtii ...found in the same distribution area as *Seticereus icosagonus* and frequently growing with it.

Seticereus oehmianus ...from the Huancabamba valley

.....from J.Madsen, Flora of Ecuador No.35

Cleistocactus icosagonus.petals red, pink, or orange.originally collected by Humboldt and Bonpland in about 1823 at Nabon, Ecuador. Found at Giron, at Loja, and intermediate locations.

.....from H.Middleditch

A trawl through recent literature has failed to reveal any data regarding the habitat location for *Akersia roseiflora*, other than the foregoing. However, in one of the 1969 issues of *Kaktusy* (Czechoslovakia) there is an account by K.Knize of his trip to Ecuador, concluding with a list of cacti found on that trip together with relevant KK numbers and a very brief commentary for each entry. However, one entry is without a KK no. because "no plants were collected" and that was for *Akersia roseiflora* which was found near Macara. This place lies virtually on the border with Peru on the western flank of the cordillera, nearly within an area enclosing the locations quoted (above) in Rauh's book for *Seticereus icosagonus*.

.....from M.Williams

Not far to the southeast of Macara there is a place called Chalaco, which is even closer to the Huancabamba valley than Macara. Is it not possible that the original Type location for *Akersia* was really at Chalaco and that at some stage between discovery and publication this has become erroneously rendered as "Chala"?

.....from H.Middleditch

From the accompanying map of Ecuador, which also includes the part of northern Peru in which grow the various sorts of *Seticereus* noted above, it will be evident that both Macara and Chalaco lie within the bounds of the distribution area for this *Seticereus* group. A golden opportunity for an enterprising field trip?

.....from J.C.Hughes

Before setting off on my visit to Ecuador, my attention had been drawn by H.Middleditch to the discovery of *Akersia roseiflora* by K.Knize, in the surroundings of Macara. After travelling to various other places during my stay in Ecuador, I was able to take a service bus down to Macara, which lies on the border between Ecuador and Peru, on the western side of the Cordillera.

I had travelled south through the Andes from Quito, passing over cool misty mountain passes and stopping off at towns on the way. At this time of year, this part of Ecuador evidently enjoyed a wet - or very wet - climate, but Macara was quite different. It was situated at 470m altitude with a temperature of around 90°F as befitted its location at only four degrees of latitude south of the Equator. The bottom of the valley was hot, dry, and dusty, the river providing a source of water used to irrigate the rice fields.

The hillsides behind Macara were also dry and dusty, although rain was due within the next month, but not so steep as to make climbing them a forbidding task. As usual, I sought a dried up river course to make my way upwards. There were Kapok trees and bushes, but fairly open so that progress uphill was not too difficult. Quite soon I did find one solitary plant of an *Armatocereus* which was in pretty poor condition at the side of

the track. At 780m I met only the second cactus that I saw, stems of *Monvillea diffusa* sprawling on the ground or growing up in the bushes, but they did not seem to be in as good a condition as the *Monvillea* seen in the damper climate of the Rio Vulcera, further to the north.

The ex-Mayor of Macara was a keen naturalist and in the course of discussing with him it became clear that he was familiar with the local plants. But he knew of nothing in the vicinity which might have been the sought-for *Akersia*, even though I did show him a photograph of this type of plant.

PARODIA GIGANTEA Fric ex Krainz. By H.Krainz
Translated by H.Middleditch from Sukkulantenkunde VI January 1957

The plants of this species were collected in the Argentinian Andes by A.V.Fric of Prague in the year 1928 and were mentioned for the first time in "Moellers Deutscher Gartnerzeitung 45, 1930" under the designation of *Microspermia gigantea* Fric (1928) without a description. In the Kreuzinger catalogue of 1935 (Verzeichnis amerikanischer und andere Sukkulanten) this plant was again quoted and put into synonymy with the *Echinocactus stuemeri* described by Werdermann in 1931. Apart from this, since both plants are not identical, the priority should fall to Werdermann's *Echinocactus stuemeri* since Fric's plant was a *nomen nudum*. In the M.DKG for 1931, Werdermann wrote under observations to his description of *E.stuemeri*: "Fric sent in exchange to the Botanic Garden a specimen of his *Microspermia gigantea* n.n. which is more weakly spined than the large plants originating from Stuemmer. In other respects it corresponds well with them and has positively hooked spines". As far as that plant is concerned, it must again have been something else other than those Fric sold at another time as *Microsperma gigantea*. In the Zurich city collection we possess an example of his *Microsperma gigantea* originating from Fric 20 years ago, which however possess no "positively hooked spines" and in addition does not conform with Werdermann's *Echinocactus stuemeri*, although an undoubted relationship - especially in respect of the seeds - is established. Our plant however is also different in several respects from Werdermann's *Parodia stuemeri* v.*tilcarensis*, which was later raised to species level by Backeberg.

The plant described below is distinguished from *P.tilcarensis* (Werd. & Backbg.) in several respects, especially on account of the columnar growth, the dark green body, the smaller indistinct tubercles, the larger number of radial spines and their disposition, by the stronger accompanying spination and the differently coloured flowers. This plant was seen previously by Buining at Fric's collection in Prague and he recognises it in his key to the *Parodia* as a separate species. The plant still exists today in some European collections and goes under Fric's designation. Since this name was recently quoted again by collectors, it becomes necessary to describe this plant under retention of its original name.

.....from H.Middleditch

Perhaps this plant is still in cultivation in the Zurich City Cactus collection? By now it might have grown to quite a considerable height!

.....from D.Supthut

Unfortunately I have to make it known to other people who have made similar enquiries, that plant material which got into our collection before 1972 cannot be identified. The labels on plants from prior to that year do not contain any detail about localities or senders. In the past, documentation was confined mainly to the herbarium specimens. It was not so important to have documented plant material; often it was more important to have a new or rare plant species in the collection, regardless of the origin of the material. Even nowadays there are renowned Botanical Gardens with a very poor documentation of their plants! Since H.Krainz took with him all correspondence when he retired, and it is no longer available to us here, I am unable to reconstruct where individual older items in the collection came from.

One can hardly over-emphasise the importance of written documentation for all plants in a collection such as we have here. Since 1972, accession numbers have been allocated to all new acquisitions and a written record of them has been maintained. We do now have in our collection one plant bearing the name *P.gigantea* which came from W.Rausch.

.....from H.Middleditch

In his *Die Cactaceae*, Backeberg places the Krainz *P.gigantea* under *P.tilcarensis* as *P.tilcarensis* v.*gigantea*. In a footnote he observes that in the collection of Gutekunst at Kircheim he saw an old *P.tilcarensis* of the same elongated cylindrical shape and length as the *P.gigantea* in the collection of Andreae. Although our 1964 Continental Cactus Tour paid a visit to the Andreae collection, this particular plant was never sought out nor observed on that occasion. Has this *P.gigantea* survived the passage of time since it was noted by Backeberg?

.....from K.Gilmer

A visit is planned to the Andreae collection in the summer; we will keep a look-out for this tall *Parodia* to compare it with the plants we saw in the Quebrada del Toro.

.....later

Both H-P Thomas and myself have now been able to pay a visit to the nursery of Andreae. We did not see any plant there that was similar to the tall *Parodia* that we saw in the Quebrada del Toro.

.....from H.Middleditch

It is observed by Krainz that the ex-Fric *Parodia gigantea* growing at that time in the Zurich City collection was lacking in "obvious hooked spines". From this, Krainz concludes that the Zurich *P.gigantea* is not the same sort as the *P.gigantea* sent by Fric to the Berlin Dahlem Botanic Garden. This view does not appear to take account of the comment by Werdermann [M.DKG 1931] that a later consignment of *P.stuemeri*



Ex-Lau Import
Hollygate Nursery

Photo:R.Moreton

GC55.03
North of Chorrillos
Qu. del Toro

Photo:G.Charles



Between Golgota and
Chorrillos, Qu. del Toro

Photo:M.Winberg

Parodia stuemeri

which had been collected by Stueder contained some specimens with straight spines and others with the lowermost central spine strongly hooked. It may well be that Stueder had collected the plants in that consignment from more than one population. If they were all collected in the Quebrada del Toro, then it would appear that the presence or absence of an obviously hooked central spine is not a constant feature of this species.

It was also noted by Werdermann that the ex-Fric *Parodia gigantea* received by the Berlin Dahlem Botanic Garden had "weaker spination" than the plants originating directly from Stueder. If the ex-Stueder plants had been growing in habitat and the ex-Fric plant had been growing in cultivation, it would not be too surprising to find that the habitat plant was the rather more strongly spined. Alternatively, the Stueder plant may have simply come from a more exposed location in habitat.

.....from C.Backeberg, *Die Cactaceae* Vol.III

Parodia stuederi is very variable in the colour and consistency of the spination The Fric *Parodia gigantea* n.n. is held both by Kreuzinger (*Verzeichnis* 22, 1935) as well as by Werdermann (M.DKG 1931) to be a synonym of *P.stuederi*. Fric appears to have distributed various plants under this name so that it can no longer be certain what he really understood by this name.

.....from H.Middleditch

To Backeberg, the existence of a different flower colour, or some minor variation in spine colour or disposition, was not infrequently seized upon as a basis for producing yet another species or varietal name. However, from his foregoing remarks it appears that in this instance he accepts that plants of *P.stuederi* do display variation in the colour and nature of the spination. But evidently he did not feel that this extended as far as encompassing within his understanding of *P.stuederi* the plants distributed by Fric under the name *P.gigantea*.

Before Fric visited the Quebrada del Toro he had seen *Parodia* on his travels from Tucuman to Catamarca, La Rioja, and Nonogasta [*Chileans* No.50 pp.80-83]. These *Parodia* would be members of the small-seeded *Microspermae* group, many of which do not appear to grow to a fairly substantial size in old age. Consequently it is unlikely that Fric had seen any *Parodias* in habitat in excess of perhaps 4 inches or so in diameter, prior to visiting the Quebrada del Toro. It is quite probable that Fric was not familiar with the fairly large size which can be attained by older members of the *maassii* group, for example; nor with the height to which members of the *aureicentra* group might grow. Hence it is quite possible that by comparison with the *Parodias* previously seen in the wild by Fric, the large plants of *P.stuederi* would indeed seem to be gigantic. Particularly if the plants seen and collected by Fric bore some resemblance to the height of the specimen seen by K.Gilmer & party in the Quebrada del Toro - some 40 cm high. [*Chileans* 51 p.111]. Perhaps on that occasion it was observed whether the spination on the tall plants was hooked or not?

.....from K.Gilmer

Unfortunately I must tell you that the spination of these tall *Parodias* which we came across in the Quebrada del Toro was not examined in detail and on that account it would not be possible to make any statement about the precise appearance of the spines. My travelling companion, to whom I have also put your question, finds he is not able to recall any such detail. But on one point we are both fairly (but not absolutely) certain, and that is that the spines were probably more or less curved, but in my view not definitely hooked.

In my view there exists a clear distinction between the two descriptions "etwas gebogen" - somewhat bent or curved - and "ein wenig hakig gebogen" - bent into a slight hook. In German, "zuruckgebogen" - bent back, similar to a fish hook, would be regarded as a synonym of "hakig" - hooked. Thus "hakig" - hooked - is really a particular form of "gebogen" - bent.

.....from H.Middleditch

It was also noted previously by K.Gilmer that these tall *Parodias* seen in the Quebrada del Toro appeared to be offsetting from the base, although it was also commented that they may have equally been seedling plants.

.....from P.Down

As yet I have never seen any plants grown under the name of *Parodia stuederi*, *P.pseudostuederi*, or *P.tilcarensis*, which have produced offsets. None of the plants I have grown (or seen grown) under these names has yet attained the proportions of the *P.gigantea* described and illustrated by Krainz, but I have seen hundreds of other *Parodias* making elongated growth of those proportions, in the field in Bolivia.

.....from G.R.Allcock

In the Fric biography, *Lovec Kaktusu*, by K.Crkal, there is a short commentary on this species, as follows: "*Microsperma gigantea* Fric. According to a note in the Fric-Kreuzinger *Verzeichnis*, this species is the same as *Parodia stuederi* (Werd) Bkbg 1935. According to the herbarium, however, it does not answer to that orange-flowered plant, nor to the red-flowered one which is grown by us today. On the photograph, this globular plant is endowed with conspicuously bent hooked spines. The deposited spine sample corresponds tolerably to the photographs. The structures of the seed of both the indicated species are the same, however the seeds of the Fric plant are distinctly larger. A very distinctive feature is the membranous fruit, 4-5 cms (centimetres!) long. The four middle spines are 1.0-1.5 cm long, brown to black, later going grey, the three upper ones straight, the lower one slightly or strongly hooked. Exterior spines 20-30. Buds covered with light wool and dark brown spines.

.....from H.Middleditch

From this abstract it appears that the author of *Lovec Kaktusu* also regarded *Parodia stuederi* (Werd) Bkbg as an orange-flowered plant. However, we are faced with finding an explanation for the size of the fruit for *Parodia gigantea* in the Fric herbarium as noted by the writer: 4 to 5 cm long. This is hardly believable! But the author would hardly make this up; his own incredulity is expressed by his interjection "(centimetres!)"

Could it be a misinterpretation?

.....from J.Lambert

I did not see any fruits on *P.stueneri* in the Quebrada del Toro, but a length of some 15 mm would be expected. A fruit of 4 to 5 cms long does not correspond to what we know nowadays about this species.

.....from F.Vandenbroeck

When we were in the Quebrada del Toro in April-May 1985, we saw *Parodia* in large quantities which must be the plant in the picture of *Echinocactus stueneri* Werd [M.DKG 1931]. These plants usually grew on gently sloping ground in the company of *Platyopuntia sulphurea* or some smaller bushes. I never saw them on a steep rock face. We found many of these plants in flower, with orange or red flowers. Also many plants were full of fruits at the time. We brought back home with us large quantities of the seeds which were distributed among cactophiles here. [Belgium].

.....from H.Middleditch

And what sort of shape and size would the fruit have been on the *Parodia stueneri*?

.....from F.Vandenbroeck

As to your query about the length of the fruits; I talked about it with my wife as she usually does the seed-collecting. As far as she can remember, and as far as I do, most *Parodia* fruits we came upon were very similar: reddish or yellowish, somewhat woolly club-like bodies which are partly pushed out of the woolly apex of the plants. The usual length must have been up to 5 cm. The fruits have to be gathered with a pair of tweezers, which is not easy because of the long, pungent, spines and when pulling them out usually half or more of the seeds will fall out of the fruit by the hole at the base and thus be spilled and lost. This was particularly the case, so my wife remembers, gathering seeds of *Parodia aureicentra* near Cachi. But we cannot remember any specific details of the fruit on *P.stueneri*.

.....from H.Middleditch

If the long fruits were indeed seen on *P.stueneri* by F.Vandenbroeck in April-May, this would be the early part of the dry season, The assumption would be that the seeds would be distributed at the onset of the next rainy season and so provide any young seedlings with the best chance of becoming established prior to the onset of the next dry season. On this basis it is not surprising that M.Nilsson did not find any fruit when seeing these plants at the start of the rainy season.

.....from F.Kasinger

Unfortunately we did not find any fruit on *P.stueneri* on our 1998 trip to Argentina during February and March. Nevertheless the time when fruit is to be found on *Parodia* is the period between the end of December to the end of January. Thereafter they take a long time to dry up and the seeds start to ripen.

.....from R.Ferryman

The seed that I collected from *Parodias* in Argentina was not particularly new (as against "fresh") and therefore it would be difficult to confirm any fruit size. There was much discussion amongst the group as to whether we were collecting this year's seed, or seed from a previous year. It would be wrong, however, to assume that all *Parodia* fruit is "about 5 cm long" as with, for instance, the fruit of *nivosa* and *chrysacanthion*, the fruit was globular and much like that of *Rebutia*.

The fruits removed from *P.stueneri/gigantea* were dry but in this state they were about 20 to 25 mm in length. The fruit looked as though it was somewhat shrivelled, rather like a fruit that had been left on a plant in the greenhouse for the better part of a year. Experience tells me that fleshy fruits reduce in size when dry, but I have not yet encountered a two-fold reduction. *Neoporteria* fruits, for instance, loose about 10% of their length when they go dry.

.....from W.Weskamp, *Parodia* 2.

[Regarding *Parodia stueneri*] ... A surprise concerns the nature of the fruits, which are not small and rounded, but measure up to 15 mm long. These remain, with the dried flower remains, on the plants and are so thickly enveloped in wool that only the upper parts remain visible. If pulled from the crown they tend to come away missing their lower part - perhaps explaining why Werdermann described smaller fruits. The fruits are not hollow, but are packed full of seeds. The features shown by this species with regard to flowers and fruit set it apart from the *tilcarensis* group of forms.

.....from H.Middleditch

The seed collection made by R.Ferryman was in November i.e. the start of the rainy season, when the fruit had presumably been on the plants over the course of the dry season; they could possibly have shrunk over the course of the dry season from their reputedly original 40-50 mm length. The visit by Fric to this habitat was during the course of January/February when any available fruit must have been quite new, when the 50 mm fruit length may have been observed. Alternatively this long fruit may have been produced in cultivation, which would then compare poorly with the fruit size quoted in the Krainz description, presumably based on the plant in cultivation at Zurich at the time (1956) as well as on the flowers and fruit which it carried.

.....from J.Brickwood

Following successful cross pollination of two plants of *P.stueneri* GC 56.02, I can now confirm the fruit size. I missed the initial fruit colour observations - which in *Parodia* can change like traffic lights during ripening - but observed the following details later: Fruit 15-23 mm long, 8-12 mm diameter, drying pale yellow-green to dirty yellow and somewhat glossy, with sparse, lineate, bristle-like scales bearing tufts of long, white, cotton-wool like hairs, these obscuring sight of the fruit wall, but with no bristles. Fruit hollow with the seeds fairly well scattered along the length of the inner fruit wall. Fruit wall thin, slightly fleshy. Dried floral remains very firmly attached. Fruit dehiscing via a large, round basal pore. These observations from ca. 5 fruits on two plants.

..... from H.Krainz, Sukkulentenkunde VI.1957.

Parodia gigantea Fric ex Krainz

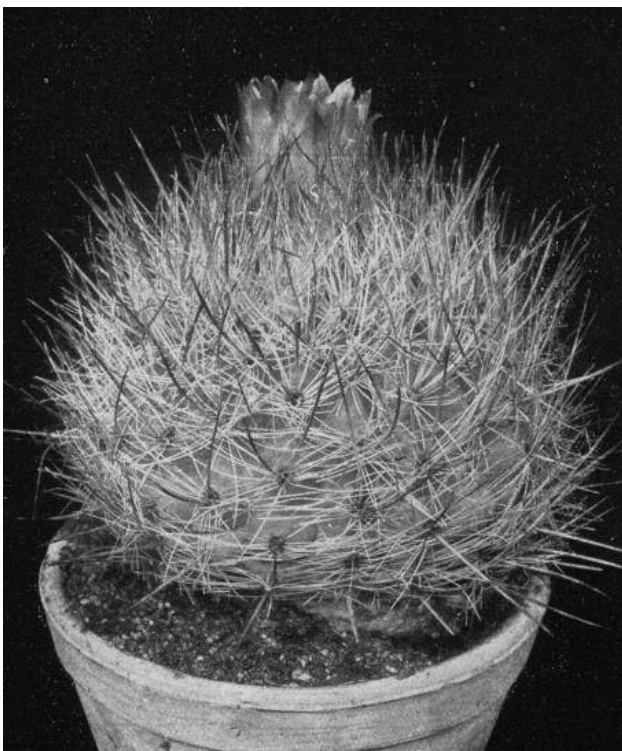
Body solitary, columnar, plant being described 25 cm tall and 7 cm diameter, dark green. Crown densely covered with white wool, above which project the dark brown spines. Ribs 19-20, running vertically, divided into small tubercles and separated from each other by distinct intercostal grooves. Areoles round, 4-5 mm in diameter, 6-8 mm apart, those close to the crown with a lot of white wool, shortly becoming bare. Radial spines 12-14, 7 to 13 mm long, pale yellow to honey yellow, pectinate. Central spines 4, strong, 14-18 mm long, often accompanied by 4-5 almost equally strong but somewhat shorter spines, all sharp, very stiff, swollen at the base, initially honey brown, black towards the tip. In the crown all uniformly dark brown; the end of the downwardly directed central spine occasionally somewhat bent, yet never hooked.

Flower brownish red, about 35 mm long, 30-35 mm in diameter when opened, appearing from close to the growing point. Pericarpel 4 mm long by 3 mm broad, light green, with some scales and little white hairs above. Receptacle (tube) funneliform, with pointed to lanceolate scales and long, white to brownish, woolly hairs. Outer petals 11 mm long by 2 mm broad. Inner petals 20 mm long by 3 mm broad, slim spatulate, pointed above, with stiff pointed tip, coral pink (Ostwald 06.19), translucent, with darker middle stripe. Filaments 4-6 mm long, covering the whole interior of the tube, the lowermost inserted 2 mm above the base of the nectar chamber; anthers yellow. Style thickened club-like below, 1.5 mm thick, 19 mm long, pale yellow. Stigma lobes 10, 20 mm long, rising above the uppermost anthers. Fruit small, globular with a few tiny scales and some little woolly hairs. Seed globular to egg-shaped, 0.5 - 0.8 mm in diameter; hilum usually oblique, somewhat sunken, with only scarcely prominent only single-toothed arillus. Testa black, finely tuberculate.

Habitat - Argentine Andes, around 2400-3000 m altitude according to Fric. A more precise habitat location was not provided by the collector.

.....from H.Middleditch

Perhaps the original description of *Parodia stuemeri* may afford some useful comparison with the foregoing?



Echinocactus Stümeri
Werdermann spec. nova.
Monatsschrift der DKG Vol.3, No.5 1931

ECHINOCACTUS STUEMERI sp. nov. By E.Werdermann

Translated by E.W Bentley from *Monatsschrift der Deutschen Kakteen Gesellschaft* Vol.3, No.5, 1931

Body mostly simple, sometimes several-headed, fairly spherical, up to 10 cm high and about as broad, seldom larger, usually smaller, dull light green, often grey and corky at the base, new growth deeper green; crown topped by upwardly directed light or blackish brown, thickly clustered spines and thickly covered with whitish to dirty grey-brown wool. Ribs 20 (-22), in the crown separated by sharp furrows, that gradually flatten out towards the base, a few mm high, often running obliquely, mostly indented between the areoles to half their height or deeper so that they are divided into conical tubercles. The course of the ribs is however quite clearly distinguishable. Areoles about 1 cm apart, covered when young with thick greyish or brownish-white woolly felt, later going quite bald.

Outer spines about 25, needle-like, horizontally spreading, or directed somewhat forwards, interwoven

with each other laterally, whitish, somewhat rough, the longest directed sideways and upwards, the uppermost nearly like the centrals and dark tipped, not all the same size, somewhat thickened at the base and brownish, mostly 1.0 to 1.5 cm, sometimes 2 cm long and more. Centre spines typically 4, set more or less cross-wise, the upper and the two side ones curved upwards with straight tips, the lowest (the longest) often curved downwards, frequently (but not always, in strongly growing single individuals) slightly hooked; all central spines stiff, needle-like, stronger than the outer spines, brownish with black-brown tips, with a somewhat bluish shimmer imparted by the rough surface, roundish in cross-section, sharply pointed, black-brown at the base and bulbous, about 1.0 to 2.5 cm long

Flowers several. one after the other from the thick wool of the crown, up to 4 cm long, pericarpel spherical, light yellowish-green, with tiny awl-like scales, completely enveloped in ca. 10 to 15 mm long, thick, snow-white wool. Flower tube likewise covered with similar awl-shaped small scales from the axils of which springs white to light reddish-brown wool about 1 cm long, also usually three unequal sized (up to 1 cm) somewhat curved brown bristles. Outer petals slender lanceolate up to about 12 mm long, pointed, greenish-yellow. Inner petals up to 2 cm long, oblong to lanceolate, light golden-yellow at the base, darker coloured at the tip and light orange to brownish, irregularly weakly denticulate at the edge, with clearly distinguishable, often darker tips which are a continuation of the darker middle stripe on the back, glossy silk-like. Throat golden yellow. The funneliform tube is occupied by numerous but short stamens which are curved towards the middle. Filaments pale yellow below, golden yellow above, anthers light yellow. Style shorter than the petals, slender columnar, pale yellow below, somewhat deeper yellow above, stigma lobes 9 to 11 extending above the stamens, about 2 mm long, somewhat spreading, pale yellow.

Fruits small, remaining sticking in the wool of the crown with the flower remains, pale brown when ripe, apparently springing open by a cross-wise tear below the middle; seeds ovoid, some 0.8 to 1.0 mm long, smooth matt black, dotted with fine tubercles, with a small white hilum at the basal end.

Habitat locality: Argentina, Salta province, 1000 to 2000m altitude on mountain slopes.

Echinocactus stuemeri stands closest in relationship to *Echinocactus microspermus* Web. from which it differs mainly through the even more definite rib structure, the number and size of the outer spines, and the smaller and differently coloured seeds. However, the new species seems to vary very much. An individual of this species which agreed well with the plant illustrated here came into the possession of the Garden for the first time in 1929 through the firm of F.Ad. Haage. It originated perhaps from Prof. Hosseus. Prof. Hosseus later brought to the Gardens some specimens including a six-headed group of plants which however had encountered frost during transport in the cold winter of 1929-30 and soon died on us. While a single plant exhibited at various points a hooked curvature of the lowest centre spine, that plant group showed almost entirely straight spines. A specimen of his "*Microsperma gigantea* n.n." was sent in exchange to the Botanic Gardens by Fric, which has weaker spination than the large plants originating from Stuemmer. Otherwise it agrees well with them and has obvious hooked spines.

In the specimens collected by Stuemmer for which the Dahlem Botanic Garden has to thank the cooperation of the firm A.Hahn, Lichterfelde, there are some with only straight spines and again, others of which the lowest central spine is strongly hooked. A young specimen exhibits strong division at the ribs into tubercles, but nevertheless the course of the ribs is even here easily distinguished. The longitudinal furrows between the ribs are clearly delineated.

This species was named after E.Stuemmer, who at this time is touring the Argentine Andes as a collector.

.....from H.Middleditch.

In this original description of *Parodia stuemeri*, Werdermann states that the first plant of this sort came to the Berlin Dahlem Botanic Gardens in 1929 through the firm of Haage, "perhaps originating from Prof. Hosseus". However, it is unlikely that Prof. Hosseus would go into the field to dig up cacti for a commercial nursery in Europe. It is more likely that it would be collected for him by one of his field contacts. The specimen of *Lobivia chrysantha* in the New York Botanic Garden herbarium was consulted by M.Lowry who noted that it was accredited to Venturi and its collection was dated 1929. Since *Parodia stuemeri* and *Lobivia chrysantha* both occur in the middle reaches of the Quebrada del Toro, it might not be too surprising if Venturi also had a hand in collecting the *Parodia stuemeri* that eventually reached Werdermann via Hosseus in the same year of 1929.

.....from G.Haag.

As is obvious from the description of *Echinocactus stuemeri*, the flower is given as yellow-coloured, and here begins a problem. Among all my friends and acquaintances who are especially concerned with the genus *Parodia*, no *P.stuemeri* with yellow flowers is known. All plants that are growing under this name and agree in character with the description, flower red. The reflection can be put forward that the description by Prof. Werdermann was based upon a yellow flowering specimen and he was not aware that the same plant occurred with a red flower colour. To my knowledge, in the collections known to me, there is no *P.stuemeri* with yellow flowers. Yet there must have been a plant with yellow flowers, for Prof. Werdermann always described plants exactly and with great scrupulousness. As a sum total of the foregoing one can make the supposition that the flower colour of *P.stuemeri* is variable and there are yellow and red flowering plants.

.....from J.Brickwood.

I do not really understand the comments from G.Haag; I believe that he has completely misinterpreted Werdermann's flower description. Many *Protoparodias* have flowers with petals which have paler margins and darker midstripes. There may be differences in the precise shade, but the overall visual effect is usually that of a particular single colour - in this case light to pale orange, not yellow or red. I recall that the flowers on my own plant opened as light orange and faded to a paler shade, but not to yellow! I do not believe that there is

such a thing as a yellow flowered *P.stueneri*, in cultivation at least.
.....from J.Lambert.

The few plants of this species which I saw in the Quebrada del Toro were very similar indeed in appearance to the photograph which was published by Werdermann with his original description. The flowers on *P.stueneri* which I saw and photographed in habitat had outside tepals of orange with a reddish mid-stripe, whilst the inside tepals are golden-yellow to orange - more yellow at the base. This corresponds quite well with Werdermann's "luteo-aurantiaca". These plants were not confined to growing in one particular set of circumstances; they grew in flat places where there was very little else in the way of vegetation, they also grew on sloping ground in the company of bushes and grasses, and sometimes even on steep and quite rocky slopes. In this latter situation they were usually in the company of *Abromeitiella*.

.....from K.Preston-Mafham

The picture which accompanied the original description of *P.stueneri* by Werdermann [M.DKG 1931] does indeed portray the *P.stueneri* as seen in the Quebrada del Toro. The plant pictured has a less neat arrangement of spines than the average plant in the wild, and they are slightly longer than average, but the overall appearance is typical, while the small flower scarcely able to open because of the spines is almost diagnostic and found on no other plant in the area. *Parodia stueneri* grows on steep slopes of friable rock, as well as among shingle-sized pebbles on flat or only gently sloping areas at the base of the hills, often with *Opuntia sulphurea*, *O. longispina*, *Trichocereus atacamensis*, *Pyrrhocactus umadeave*, *Lobivia chrysantha* and *Gymnocalycium spegazzinii*. It is found in a similar variety of situations in the Quebrada de Humahuaca, although a small softer-spined form at Volcan is distinctive. In the Quebrada del Toro, the lowermost populations (above Chorrillos) seem only to have red flowers, while further up they can be red, red-brown, or yellow. They stop well short of Las Cuevas, where *Parodia nivosa* "faustiana" is abundant. *Parodia stueneri* is not particularly associated with the *Abromeitiellas*, which are more abundant lower down the valley, and in which often grow *P.nivosa* and *Rebutia minuscula*.

.....from M.Winberg.

In the Quebrada del Toro I found *Parodia stueneri* MN 107 on the slopes at Cerro Golgota where it grows side by side with *P.nivosa*. Often they grow near to cushions of *Abromeitiella*, sometimes in the middle of the bed of Bromeliads. Other plants in the same vicinity are *Opuntia sulphurea*, *Gymnocalycium spegazzinii*, and *Lobivia chrysantha*. Somewhat higher up the slope is found *Rebutia einsteinii* MN 110. The *Parodia stueneri* often grows cylindrical in shape and is covered with brush-like spines in white, grey, and fox-brown. The spination at the apex is often reddish brown and the crown is covered with a dense spination and wool. The plants may be solitary or they may grow in groups. Plants were seen up to 20 cm high and 10-15 cm broad. The general appearance was very similar to the *P.rubricentra* in Fig. 1542 of Backeberg's *Die Cactaceae*. In the Quebrada del Toro all the *Parodias* grow at no great distance away from *Trichocereus pasacana*.

.....from R.Ferryman.

We stopped at a number of places in the Quebrada del Toro and found perhaps four or five different populations of *Parodia stueneri*. The spination was more of a white colour on the plants in the first population we saw, and there was a cline to the predominantly brown spination of the plants at the last population we saw.

.....from D.J.Ferguson

In the Quebrada del Toro I saw only two distinct *Parodias*. These were what I would refer to as *P.nivosa* and *P.stueneri*. The *P.nivosa* were strictly white-spined and red-flowered. This was seen primarily on rock faces, often with *Rebutia* and with *Blossfeldia*, but only in the lower portion of the Quebrada. The *P.stueneri* was found in much of the canyon, but most especially near Puerta Tastil. The spination was variable in colour, the flowers even more so, varying from yellow to deep red.

.....from P.Down

My own collection includes a number of *Parodia* which have now attained a fairly mature age and size. My *P.stueneri* is now about 15 years old; it was acquired from Windyridge and is now 7cm thick and 8.5 cm high. It has rusty-brown wool completely covering the growing point. There are about 20 radial spines, 8 to 12 mm long, spreading laterally, white, whilst the central spines are about 15 mm long. Most of the lower central spines curve slightly in a downward direction but some of them are hooked at the very tip. There does seem to be an absence of these hooked spines over the top quarter of the body. This plant flowers regularly each summer, the flowers being a yellowy orange colour, roughly 30mm tall. There are rarely more than four or five flowers on the plant at the same time, but there are a succession of flowers opening over a period of perhaps two or three weeks. My second plant of the same name was grown from seed in 1986 and is now about 7 cm wide and tall. It is of slightly more open growth than the older plant, with more space between the areoles, and all the spines are only about three quarters as long as those on my older plant. But it has the same sort of rusty brown wool covering the growing point. The flowers are slightly smaller, barely 30 mm tall, and of a reddish-orange colour rather than a yellowish-orange. There are no hooked spines at all on this plant but some of the lower central spines are bent rather sharply downwards at the tip.

.....from H.Middleditch

Some years ago I received a number of very interesting photographs from F.Brandt of various species of *Parodia* in cultivation. Almost all of them displayed a mass of wool covering the whole of the crown of the plant right as far out as the shoulders. This struck me as being rather exceptional by comparison with the plants of *Parodia* which I had seen in various collections in this country. When P.Down observes that the top of his *P.stueneri* was covered with wool, does this extend well out from the growing point?

.....from P.Down.

No, the wool covers a patch round the growing point which extends to about one inch in diameter. If I did

not water my plants from overhead, it is quite possible that this wool would remain on the plant for a longer length of time. I have seen some beautiful *Parodias* in this country with their tops covered in wool. This is quite un-natural. To judge by the *Parodias* which I have seen in habitat, the heavy rains wash away the wool from all but the growing centre. The woolly specimens in cultivation here can only be achieved by avoiding overhead watering.

.....from W.Weskamp, *Parodia* 2

[Details of flower of *P.stueneri*, based upon his own observations] Pericarpel completely covered with yellowish, dark-tipped scales, from the axils of which emerges long, thick, white wool, as well as at first two white, then brown, bristles; scales on the tube up to 1.5 mm long, awl-like, slightly rough, pointed, matt-yellow, later darker. Fruit greenish-yellow, flushed reddish, ca. 15 mm high, 5 mm broad, becoming somewhat smaller when ripe and yellowish-brown, not particularly so hard-skinned, enveloped in long, white wool.

Seeds 0.7 mm long, almost as broad, slightly laterally compressed; testa black, somewhat glossy, covered with small, round, tubercles; hilum completely flat, covered with brownish strophiole tissue.

As Werdermann noted in the original description, *P.stueneri* varies in its spination (both in number and colour) and may display straight or curved, hooked spines. Rausch, who was the first collector to rediscover the species in 1963 in the Quebrada del Toro, noted that it also varied in the colour of the flowers. Lau later collected *P.stueneri* from the same location in 1971 - Lau 529.

I have made some studies of the imported material from Rausch and Lau, particularly of their flowers, fruit, and seeds and they have produced some surprises. The biggest surprise was the observation that the flower tube bears bristles in all of the scale axils. In addition to *P.crysacanthion*, *P.stueneri* is therefore only the second known species in the subgenus *Protoparodia* to deviate from the norm in this respect. Werdermann did note the occurrence of bristles on the receptacle, but up until now it was not clear from his description that they occurred over the whole of the receptacle. The other characteristics of the flower agree with those stated in the original description, except that the inner and outer petals are of a pale orange colour, being somewhat lighter coloured towards the throat. However, this variation is of no consequence, being one already known to occur in this species.

.....from J.Brickwood.

I have looked for the bristles in the pericarpel scales that Weskamp claimed was a major distinction between *P.stueneri* - which is supposed to have them - and *P.tilcarensis* (which does not), but found that both merely had lineate pericarpel scales which look a bit like bristles. If *P.stueneri* has bristles in the axils of these scales, I certainly could not see them even with the aid of a hand lens.

I have been able to acquire what I regard as reliably named seed of *Parodia stueneri*, which germinated fairly well so that I now have a number of plants of flowering size. From my plants of DJF 433, FK 28, and PM 321, I am now able to confirm that *Parodia stueneri* does indeed flower yellow. In fact the flowers are variable in colour from yellow, through yellow-orange, light orange, coppery orange, reddish-orange, to brick red or red, all with darker coloured midstripes, ranging from orange to crimson-red or blood red midstripes.

.....from R.Moreton.

When I was at Hollygate there were several Lau imported plants of *Parodia stueneri* and I have a slide of one of these in flower. Comparing it with Werdermann's picture in his original description of *Echinocactus stueneri*, on both plants the radial spines are white and quite long so that they bend away from the body, especially where they press against other spines; the central spines are dark and many of them are curved upwards to such an extent that they are almost vertical, even at the sides of the body. The flower is a yellow colour with the tips of the petals a brownish yellow that might almost be described as pale orange. Therefore I think that this Lau plant matches the original description very well. But that is far from the end of the story, as seedlings from the Lau plant eventually produced red flowers!

.....from H.Middleditch.

Considering these observations on flower colour from R.Moreton, there are clearly two alternatives - plants of *P.stueneri* of one flower colour may produce seed and progeny which in turn produce flowers of the same colour as the parent plant; or plants having flowers of one colour may produce progeny with another flower colour - or even of the various colours observed in habitat. The observations on the Lau plant at Hollygate might suggest that the latter is likely. Similarly if we refer to the observations by K.Preston-Mafham, at about Km 45 along the Quebrada del Toro where *Pyrrhocactus umadeave* was first seen, there was "a form of *P.stueneri* with strange yellowish-brown flowers". This may possibly have been the Werdermann/Lau flower colour. And then south of Puerta Tastil at Km 75 "there is a typical yellow flowering *P.stueneri* mixed with the normal red flowering plants". The Lau plant at Hollygate may have been from this location where the flower colours may change from generation to generation.

.....from F.Kasinger.

During my travels in Argentina in February-March of 1998, we travelled up the Quebrada del Toro and continued on to San Antonio de los Cobres. From there we set off towards Tres Morros, where we turned south in the direction of El Moreno. Just before El Moreno the road divides, the turn to the right taking us to that place, but this road ends in the village. So we take the left hand fork and carry on for a further 6 or 8 km along a very poor track. Then on the left hand side we see some rising rocky ground which carries only sparse vegetation. It was there where we saw some large *Lobivias* and where I met with the largest *Parodias* that I have ever seen. They could be *Parodia gigantea*. In my view they are a transition form from *P.stueneri* to *P.tilcarensis*.

.....from H.Middleditch

Up to the present time F.Kasinger has made five visits to northwestern Argentina for the sole purpose of seeking *Parodias*. His travels have taken him to a great many *Parodia* locations in Argentina, as may be noted

from The Chileans' Field lists. His observation regarding the plants which he found at no great distance to the south of El Moreno may be seen in that context, which might well suggest that there are few places in Argentina where the Parodias grow larger than at this particular location. Had Kasinger continued to travel southwards along the track from El Moreno, he would have crossed the mountain ridge separating the altiplano from the Quebrada del Toro by the Abra de Palomar, which is the route used by Fric when he travelled north from Toro. Consequently there appears to be every probability that it was this self-same population that was seen by Fric, so it is hardly surprising that he described these as *Parodia gigantea*.

A WOOLLY TEPHROCACTUS STORY From G.Hole

Travelling in company with Rausch and Kuhas, the plan was to visit western Argentina first, and then go via Fiambala and Chaschuil, over the border into Chile, via the San Francisco pass. Shortly after crossing to the Chile side of this pass, we came close to an azure blue lake in which there were many flamingoes. [Laguna Santa Rosa]. After this, the road went over a flat, dusty area for quite some distance, with some high mountain peaks standing out to our left hand side. Then eventually the road started to descend into a steep-sided valley.

We stopped at the Km 130 post where there were compact hummocks of *Tephrocactus* and some grasses in the gravel at the side of the road, but nothing else. There was barely 20 to 30 feet either side of the road to the roadside barriers, then behind the barriers were the steep rocky slopes of the mountains to our left and to our right, which were so rough and steep that they would have been difficult to climb. We saw perhaps just over a dozen plants here, low mounds of about 12 to 16 inches across, with segments ranging from 1.5 to 2.5 inches in length by three-quarter inch in diameter. These were not obviously tuberculate, spines were numerous about 30mm long, pointing half-upwards. We took these to be *T.camachoi* as Km 130 from Copiapo is given by Ritter as the habitat locality for this species.

No flowers were to be seen on these plants, but fruit was to be seen on about five plants. These yellowish fruits were about 1.25 to 1.5 inches in diameter, with a large floral scar. None of these fruits had already split, so we collected a few of them and on prising open one of these fruits it was found to be very slimy inside. We kept the other 2 or 3 fruits without opening them. putting them on the dashboard shelf and occasionally laying them down in the sun. Eventually, after about a week of further travelling, one of these fruits split in the heat and oozed out a dreadfully sticky slime. It was wrapped up but the slimy liquid escaped for several days and made a sticky mess of everything it came into contact with. It took a few more days together with changes of wrapping, as well as being laid out in the sun from time to time, before this slime had dried up. When it had dried up sufficiently for us to look at the contents of the fruit, this seemed at first to consist of fluff and seed, but it was very difficult to separate the seeds from one another. The "fluff" was attached to the seed and it was this which caused the seeds to cling together, so that a pair of tweezers had to be used to separate the seeds from one another. Each seed was about 1 to 1.5 mm in diameter but looked much larger on account of its coat of what seemed to be fluff, but which turned out to be a coat of tiny, fine hairs all over the surface of the seed.

Leaving the Km 130 location, we continued along the same road which went westwards in the direction of Copiapo. At Km 90 we saw more of the *Tephrocactus* that we had seen at Km 130, but here they were growing on the steeply sloping valley sides, maybe only thirty yards off the road. Here the mountainsides were so steep and littered with rocks and stones, that even climbing them with hands and feet was rather difficult, not to say a little hazardous. So we only climbed up about 25 feet to take a close look at one or two of the *Tephrocactus*. Here again there were grasses and bushes; again the grass did not form a carpet and the bushes were still scattered, but now up to 3 feet high.

.....from K.Preston-Mafham

Travelling inland from Copiapo in company with F.Kattermann, we were heading for Salar Maricunga. Some way east of Puquios, we were following a wide, flat, valley; the surroundings were a bit odd as there seemed to be patches of black volcanic soil here and there. We began to see some *Tephrocactus* growing right besides the road, so we stopped to take a closer look at these plants. The hummocks here were fairly large, and grew in a rather odd shape, about 2 feet tall and 2 feet in diameter. We did manage to collect some seed. In habitat the individual segments were about 2.5 inches long, but cultivated plants raised from seed collected at that spot display segments which are not as large as those seen in habitat. After our return home we gathered that these plants would be *Tephrocactus colorea*. We then continued along our planned route going further eastwards. The further we went the gradually narrower became the valley and the poorer the state of the road, so that we had to abandon our plans and retrace our steps.

.....from G.Hole

A few days after leaving Copiapo, we were travelling along the road from Calama to San Pedro de Atacama, which climbs gradually through a hilly, undulating landscape. the first section with very little sign of any bushes, grasses, or herbs. We stopped when our altimeter read 2950m, when we were some 270 km from Antofagasta, because this was a location that had been given to Rausch and Kuhas by an earlier visitor to that spot. Here we could see a few hummocks of *Tephrocactus*, perhaps a score of them, which were between 1 and 1.5 meters across and about half a meter tall. They were rather peculiar shaped hummocks, tending to be more rectangular than hemispherical in outline. The segments were really large, ranging from 2 inches to 4 inches in length on the same plant, with tremendous spines about five inches long, standing stiff and straight, pointing half upwards from each segment. Apart from size, the basic form of the segment and the spination was the same as on the plants we had seen at Km130 between the Sao Francisco pass and Copiapo. Here, east of Calama, the plants displayed some buds, but only one open flower was to be seen, together with a few fruits. The fruit were a pale yellow colour but not obviously ripe; we collected one of them about 1.75 inches in

diameter. Later, this proved to have just the same type of hair-covered seed that we had found on the plants at Km130 east of Copiapo.

At 270 km from Antofagasta there was no sign of any life which might have been involved in dispersal of the fruit or seed. It was not until we were travelling east from San Pedro de Atacama towards the Paso de Jama at the border with Argentina that we caught sight in the distance both of some Guanaco and some Rheas.

.....from A.W.Craig

Travel from Antofagasta to Calama is almost entirely through a featureless desert area devoid of any signs of animal or vegetable life. Between Calama and San Pedro de Atacama there is a broad range of hills so that the road has to rise in order to cross them, doing so quite gradually. It is fifty miles or more between these last two places and in consequence we found the increase in altitude after Calama so gradual as to be almost imperceptible. But the altimeter did indeed confirm that we were gradually gaining altitude.

We were some 52 km to the east of Calama, barely 10 km short of 270km from Antofagasta, when we spotted the first *Tephrocactus* on this stretch, only few clumps in what was otherwise an open, flat, featureless desert. At 2950m altitude we were indeed almost exactly 270km from Antofagasta, passing more clumps of *Tephrocactus* here and there on the way. Shortly after that there was a gradual loss of altitude as we headed for San Pedro de Atacama.

.....from J.Iliff

From the original description of *Opuntia camachoi* by M.R.Espinosa, you will see that the Type location was on the road between Calama and San Pedro de Atacama.

.....from M.R.Espinosa, Revista Chilena Historia Natural, 1933

Opuntia camachoi: *Opuntia* forming cushions 50-60cm high and 1 to 1.5 m in diameter ...; segments ovate, 3-4 cm long by 2 to 2.5 cm diameter; tubercles not very conspicuous; spines - 1-3 longer centrals, up to 6.5 cm long, rigid, erect, slightly flattened and twisted ;lower spines 1-2, short, bristle-like, flattened, stiff, almost always reflexed.

.....from F.Ritter, Kakteen in Südamerika 4.

Tephrocactus camachoi

Originally described by Espinosa as *Opuntia camachoi*. The essential differences in comparison with *T. atacamensis* are: [detailed]

.....from R.Moreton

Regarding *T.atacamensis*, I am coming to the conclusion that at least two different spp. are given this name, the one that A.Hoffmann illustrates in Lamina 83 of her book, which seems to me to be the one found at Cuesta Camarones, and secondly that originally described by Philippi, which is illustrated on p.339 of Die Cactaceae. Surely these two cannot be the same? Even the latter one does not really look like the plants I saw virtually all over the Altiplano in Chile, as the Philippi plants seem to have the segments almost compressed together, whereas I recollect them as quite large mounds.

.....from J.Iliff

Opuntia atacamensis has had a history of misunderstanding, and various long-spined plants have been taken for it. Most recently, Ritter has misread Philippi's spine measurements of 9-12 lines, which equals 18-24 mm, as "9-12cms" and has quite misconceived this taxon. His *Maihueniopsis atacamensis* is a plant with spines to 16 cm. and woolly seeds. In addition, A.Hoffmann has unfortunately given fresh currency to Ritter's misreading, under *Opuntia atacamensis*.

.....from H.Middleditch

This observation from J.Iliff draws a clear distinction between the relatively small-segmented and quite short-spined *Opuntia atacamensis* Philippi and Ritter's misinterpretation of it as a longer-spined plant which he calls "*Maihueniopsis*" *atacamensis*. This means that when consulting any statements about *Tephrocactus atacamensis* which appear in Ritter's book, one should read *T.camachoi* in place of *T.atacamensis*.

.....from F.Vandenbroeck

Looking at the original description of *Opuntia camachoi* which you sent to me, I see that the location for the Type is given as "Pampa de Antofagasta, junto el camino entre Calama y San Pedro de Atacama". I know this location very well, in fact I have visited it three times. The plants to be seen there reach an enormous size: over 2 metres across. I had always considered these plants to be *Opuntia atacamensis*, just like the ones I saw at Chiu Chiu, above Caspana, north of San Pedro de Atacama, as well as near Socaire. The size of the hummocks and length of the spines may vary according to the different locations, but on the whole the plants have the same appearance and characteristics.

In 1990 we came across hummocks of *Opuntia* near Carrera Pinto (north of Puquios) where we also found *Eriosyce spinibarbis*. Although these plants are located much more to the south, they bear a strong resemblance to the ones cited above. During my recent travel, between Puquios and Salar Maricunga, we came across hummocks of *Opuntia* that were quite conspicuous because of the intensely orange-red colour of the spination. I assume they must be Ritter's *Maihueniopsis colorea* but I tend to believe that these plants are mere variants of *Opuntia atacamensis*.

.....from G.J.Swales

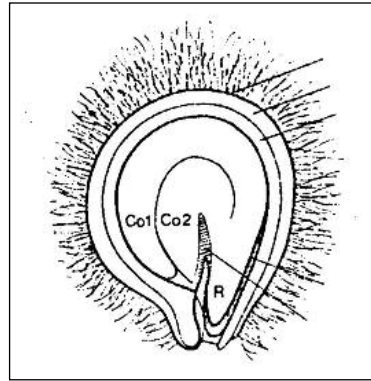
Looking at the seed of *Tephrocactus* collected by G.Hole on the road from Calama to San Pedro de Atacama, there is a feature which I have not seen before on other seed which I have examined under the microscope. The whole of the surface of the seed seems to be coated with trichomes, or hairs, These are white in colour and by carefully prising away a few of them from the surface of the seed, the chestnut brown colour of the body of the seed may be seen more clearly.

.....from H.Middleditch

Ritter's description of *T.camachoi* (above) places this at Km.130 on the road from Copiapo to Salar



Maihueniopsis seed, PW6473



F.Buxbaum, Mikrokosmos 66. 9; 1977

Maricunga, the same location at which G.Hole stopped and collected the slimy fruit which yielded the hairy seed. Yet Ritter states categorically that the seed of *T.camachoi* is "ohne Wolle". Does this mean that at Km 130 out of Copiapoa, there are two different *Tephrocactus* growing side by side, one with hairy seed and the other without hairy seed?

.....from R.Ferryman.

It will be quite a few years ago now that I made a stop not far from Puquios where there was an opportunity to collect a ripe fruit of a *Tephrocactus*. This fruit was dried up and had to be broken open almost like breaking into a nut. I do believe that when removing the seed from the fruit, it produced an irritation on the fingers as if they had been rubbed over glochids. Even when sowing the seed, I am sure the same irritation occurred. Unfortunately none of this seed now remains, so that I not able to offer any comment about the seed having any form of hairy coating.

.....from R.Moreton

In the course of our visit to Chile in 1999, a *Tephrocactus* fruit was collected by R.Ferryman at Montes de la Luna, which was dried up and had to be broken open like breaking into a nut. It was dry internally and contained the lenticular or *Maihueniopsis* type of seed but this time lacking any woolly coating. This same type of seed, but now with a woolly coating, was found in a slime-filled fruit on the *Tephrocactus* near Caspana.

.....from H.Middleditch

In the picture taken by F.Vandenbroeck of a fruit removed from a plant of *T.camachoi* near Chiu-Chiu, the fruit wall has been broken open to reveal the colourless slime filling the interior. The fruit wall also seems to be quite turgid and possibly about a couple of mm in thickness. The individual seeds may be seen inside the fruit, although much of the chestnut-brown colouring of the body of the seed is obscured by the mass of trichomes (wool or hairs) coating the exterior of the seed.

This particular fruit is presumably a "this year's" fruit which is just ripe, still having a fairly thick and turgid wall which has been cut open or squeezed and broken open with little difficulty, exposing the slime filled interior. By comparison, a "last year's" fruit which has been subject to a twelve months of a daily freeze-cook temperature cycle may well have a dried and hardened wall, requiring far more force to break into and obtain the seed. In addition, the slime in the interior of the fruit, which probably has a high water content, may well have dried up over the course of many months and merely left a film on the seeds and internal fruit wall. Similarly, the trichomes - the wool or hairs - surrounding the seed are minute but have a definite thickness and probably also have a fairly high water content. These may likewise dry up over the course of a twelve-month and in consequence they may give the impression of being entirely absent when the seed is examined.

.....from G.J.Swales

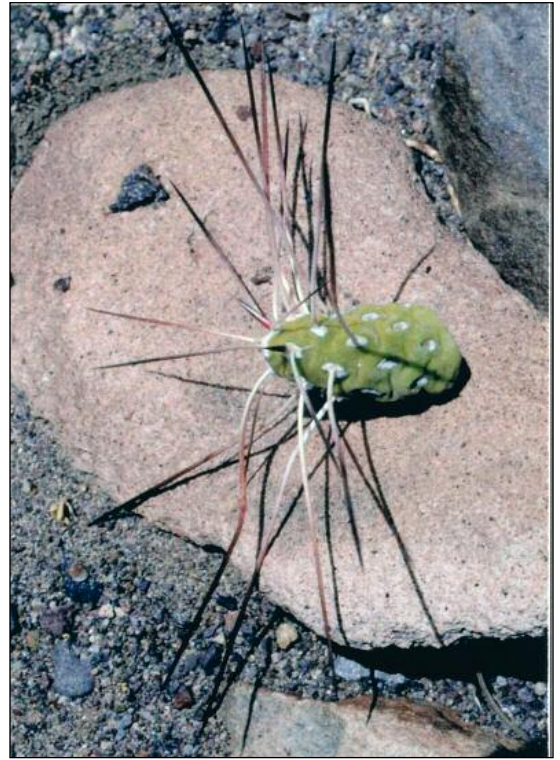
Several samples of seed collected from *Tephrocactus* in the general area around San Pedro de Atacama were examined under the microscope. These were all of the lenticular seed shape and with one single exception displayed the slightly curly white trichomes or wool around the periphery. The exception was the seed from Monte de la Luna [originally collected by R.Ferryman] which was of the usual chestnut colour but lacked any wool.

.....from H.Middleditch

So if this particular fruit was a "last year's" fruit it was presumably not easily detached from the clump, but had to be removed from further down between the segments?

.....from R.Ferryman

This particular fruit was not close to the surface of the plant, but its removal did not call for any great deep digging down between the segments. But far enough down for it most probably to be a "last year's" fruit. It was also quite dried up and hard which I would regard as being typical of a previous season's fruit. Fruit of this sort is quite difficult to break open and sometimes I have had to put such a dried up fruit under my heel and stand on it to break it open. Inside such a fruit there is no jelly-like substance, whose presence typifies the ripe fruit of the present season. The walls of the previous season's fruit are wrinkled and trap the seeds so it has to be squeezed free. I feel that I could go along with the idea that any lenticular seed without wool has very probably been obtained from an old fruit and not from a fresh one.



East of Calama

Photos: A.Craig



East of Chuichui

Photo: F.Vandenbroek

Tephrocactus camachoi

.....from H.Middleditch

Which would suggest that Ritter's seed "without wool" from his Km 130 Tephrocactus camachoi was taken from an old, dried-up fruit, whilst that collected by G.Hole at this same location was known to be a fresh fruit which contained woolly seed. So perhaps the presence or absence of wool on a lenticular ("Maihueniopsis") seed is an indication of the age of the fruit it was taken from and not a character of the seed.

Fortunately further samples of "Maihueniopsis" seed were received from members, mainly of T.camachoi and T.glomeratus, some from commercial suppliers. some ex-habitat collected; these were carefully examined under a binocular microscope. The very thin transparent external coating had become broken in places, with ragged ends partially detached from the surface of the body of the seed, standing up in a straggly fashion. But there were none of the cylindrical trichomes round the periphery which were clearly visible on the sample seed collected by R.Moreton

.....from G.J.Swales

But if you take one of the seed with no peripheral hairs, by looking very carefully at the face of the white external seed coating you will see a patch of the surface covered by narrow parallel lines. Is that just surface markings, or is it the dried up trichomes which have been pressed flat on the surface?

.....from H.Middleditch

Taking another of the "Maihueniopsis" seeds lacking any peripheral hairs, by standing it up on its thin edge on the double-sided sellotape, it is again possible to see under the microscope a patch of the white surface coating which looks just like a miniature version of a wheat field flattened by a storm, all the stalks lying on the ground in one direction. It is not too difficult to imagine that the flattened and dehydrated trichomes will display a comparable appearance.

.....from G.J.Swales

Taking a further sample packet and picking a white coated seed which again lacks any obvious signs of hair, yet under the microscope another patch can be found which appears to be flattened trichomes. So perhaps all these white coated seeds which now display no obvious signs of hair, would be more or less covered with hairs when the fruit was ripe and internally moist?

One of these white coated seeds which displayed no signs of any trichomes or hairs on the surface, was put into water to soak for several hours and then put back under the microscope. Now there were quite a number of trichomes to be seen standing up on the surface of the seed, although not as tall as the trichomes to be seen on the sample collected by R.Moreton

.....from H.Middleditch

It will be approaching twenty years ago that some very fine photographs were received from F.Fuschillo of seeds of a wide selection of genera, including a number of Tephrocactus. Of these, the "Maihueniopsis" type of seed displayed the typical lenticular shape, but without the slightest trace of any external coat of hair. Why should we now be finding that the great majority of samples of this "Maihueniopsis" seed coming to hand, do display either a hairy coat, or what is evidently a dried up shrunken version of it?

.....from G.J.Swales

One of these packets contained seed on which the original hairy coating appeared to have dried up, the residue forming merely a thin white layer on the surface of the seed. This was evidently starting to peel off the chestnut brown body of the seed in one or two places. Putting this seed on some double sided sellotape under the microscope, it was possible by using fine dissecting implements, to detach pieces of this friable thin white coating with no real difficulty.

.....from H.Middleditch

If this thin white coating does indeed represent the dried up and friable version of the hairy coating, then presumably subsequent handling of the seed, especially when going through the process of being packaged for commercial sale, would result in this friable coating becoming entirely detached, leaving the plain chestnut brown seed as on the slides taken by F.Fuschillo.

.....from G.J.Swales

You may find confirmation of that idea in an article written by F.Buxbaum on the subject of Opuntiodae seed.

.....from F.Buxbaum, Kakteensamen unter Lupe und Mikroskop. Mikrokosmos 66. 9; 1977

Opuntioideae seed are completely enclosed by an extremely hard arillus layer ... Since the arillus layer however originates from just one part of the funicular strand, which in many of the Opuntias, especially the subgenus Tephrocactus, is thickly covered with shaggy hair, so that finally the arillus layer is still covered with stiff, shaggy hair, which almost completely fills the fruit cavity. Probably this tufted coating has the primary biological purpose of assisting water absorption through the arillus layer. [Reference to Tacinga seed] These seeds are likewise covered overall with sticky hairs, which however is shed relatively easily.

.....from H.Middleditch

The fresh fruit, opened to display the internal slime surrounding the "Maihueniopsis" seed, from the T.camachoi photographed by F.Vandenbroeck at a spot to the east of Chiu-Chiu appears to have a set of fairly spiny areoles disposed close to the top of the fruit, around the periphery of the floral scar.

.....from U.Eggli

The fruit on our 2705 T.camachoi collected at some 36 km east of Chiu Chiu did have a few (ca.7-8) scattered areoles on their sides, these areoles with a tuft of white wool, usually spineless, but occasionally with a spine some mm long, and with or without a fascicle of glochids; further areoles on the top rim or immediately below it, these with long spines intermixed with some bristles.

.....from H.Middleditch

Armed with this observation, a careful examination was made of the close up photograph taken by

F.Vandenbroeck of the fruit taken off *T.camachoi* east of Chiu-Chiu. And indeed there are one or two areoles in camera well below the rim of the fruit. On the photograph taken by F.Vandenbroeck of the plant itself, the fruit stands fully exposed to the camera, but on this picture it is not possible to distinguish the detail of the areoles on the fruit.

.....from A.W.Craig

At our stopping point at 52 km east of Calama we did see one or two yellow flowers on the clumps of *Tephrocactus*, which at the time were recorded as *T.atacamensis*. One of the flowers was removed and cut in two halves, vertically, for photographing. For practical purposes all the areoles were in the upper half of the exterior of the flower tube. On the lowest of these areoles the bristles - they could hardly be called spines - were so short as to be insignificant. But the spines became longer as the areoles came nearer to the base of the petals and on the areoles at the base of the petals the spines were nearly as long as the petals.

.....from H.Middleditch

The areole disposition on the flower tube of *T.camachoi* in the illustration which accompanies Espinosa's original description of the species, appears to be comparable on the two photographs, from F.Vandenbroeck and from A.W.Craig respectively, and also to compare well with the detail reported by U.Eggl.

There would appear to be more than one sort of *Tephrocactus* growing in the area between Calama, El Tatio, and San Pedro de Atacama; indeed there may be five different names attributed to this general area. Which begs the question, how they might be told apart from one another.

.....from U.Eggl

These *Opuntias* from the high Andes are a very complicated group, with nearly identical-looking plants growing side-by-side. They present appreciable difficulties in determining their taxonomic affiliation.

FINDING WHICH SORT OF TRICHOCEREUS? From J.C.Hughes

After spending almost five weeks in Chile, travelling from Temuco to Antofagasta, it was time to return to Argentina. A scheduled coach service took me from San Pedro de Atacama, full of seasonal tourists, to Salta, full of commercial bustle. There were several places around Salta that I wished to visit, and a full day was occupied in going to the Quebrada del Toro with a hired taxi. This took me as far as Santa Rosa de Tastil, with several stops en route when I was able to browse around.

On the next day I took the bus to Cafayate, first going across the flat, open farmland lying to the south of Salta. Then the hills at either side gradually came closer and closer until we were travelling down a fairly narrow valley, which shortly turned into almost a canyon, with vertical walls close beside the road in places. The scenery was stunning, with pink rock structures in a miniature "monument" valley. We came out from this valley into a quite different flat area with the mountains several miles away, where there were few signs of any farming activity. We followed a similar sort of landscape as far as Cafayate.

In my hotel in Cafayate, I made friends with Erik, whom I discovered lived in a flat in Salta city. During the following week he was on holiday and he loved to travel the countryside. Very kindly he invited me not only to stay with the family but he also offered to take me to various other places of interest over the course of the next few days. Even one trip to Quebrada Humahuaca. It was then that I discovered he was the owner of a small farm near Yacones. This farm was evidently on a relatively cheap bit of land, owing to its inaccessibility.

Before leaving home for this field trip, I had been told by H.Middleditch of a *Trichocereus* which had been found in the area of San Lorenzo - Yacones, by Shafer, in 1916, when he was on a field trip on behalf of the New York Botanic Gardens. Furthermore, it appeared that this plant may not have been recollected, or possibly had not even been resighted in habitat, since 1916.

So we drove out of Salta, going via Vaqueros. Our road then took us via a broad, flat river valley where there was mostly grass to be seen. Much of the surroundings was evidently devoted to farming activities. San Lorenzo itself is now an area where the rich of Salta have lovely homes in large grounds, but we were travelling away from there in the direction of Yacones. Now we had to park the car on a local farm close to a new line of electricity pylons. Here there was a branch road which had been built by the electricity company but it was barred by a bolted gate. So we were obliged to vault the gate and set off along this branch road on foot. At first the track provided easy walking, going steadily uphill, but once we were over a ridge which separated the two valleys, it degenerated into a terrible state. Since my friend's last visit by this route during the previous year, torrents of water running off the hills after the frequent heavy storms had torn up parts of the road. So we managed to cross the mountainside by using the track as best we could, and going an appreciable way downhill in the process. Then we found ourselves walking alongside a stream with an accompanying band of trees, which carried some *Rhipsalis* and an interesting very dwarf *Peperomia*. We were now in a district called San Francisco.

All the time we were coming closer to the Rio Yacones. Eventually, after a walk of almost two hours duration, we were at the foot of the hill slopes, which were grassy in places, but mainly planted with conifers or *Eucalyptus*. Here we crossed the boundary of a small farm known as Vina Vieja, nearly at our intended destination. This farm was owned by my friend's neighbour, where we had lunch. One of the brothers seemed to be familiar with the surrounding countryside, so I enquired from him if he knew of anywhere not too far away where there grew a stout columnar cactus about one metre high, with big white flowers. He appeared to understand my description of *Trichocereus shaferi*, but called it by the local name of "Pasacana"; the locals knew it because they ate the fruit. He said that he could take me to a place where it grew, not so far away.

So we set off, at first retracing our steps some way, going uphill along a faint footpath. After about twenty

minutes walk we found ourselves standing on the edge of a gully which might have been about 20 yards wide, with steep rocky sides. There was quite thick vegetation in the gully - it was February and so well into the wet season - and we had to clear some of it in order to be able to see the cacti. On the rocky sides there could be seen a few *Trichocereus*, with perhaps up to 6 stems to a plant, reaching up to about a yard high. These stems seemed to be mostly propped up against the rock faces and there did not seem to be any stems hanging downwards. The stems could have been between about 3 and 6 inches in thickness. These plants must surely have been *Trichocereus shaferi*.

None of these plants was in flower. We were told that they flowered in September and then the fruits were eaten by the local inhabitants in October. Another neighbour, who helped at my friend's farm, told us that there were more places in the surrounding area where these plants could be found growing. Clearly they would be easier to see in the dry season, when the locality should be easier of access via the valley of the Rio Yacones. When the water in this river is lower, apparently access to our objective would be along the valley of the Rio Yacones. When my friend visited his farm by that route, he was often met by his neighbour who brought along an extra horse for him to ride.

As we started on our return journey, the sky became overcast and there were rumbles of thunder. When it rains here it can be really torrential so we kept walking at a good pace; but as it might have been as much as a thousand feet of climb from the valley to the ridge, it was a really tiring trek. Fortunately the rain did hold off and eventually we got back to the vehicle, exhausted but still dry.

.....from M.Winberg

When we visited Salta in 1990, a trip was made along the valley of the Rio Yacones, in company with R.Neumann, in the hope of finding some interesting *Rebutia* on the mountainsides. But the area proved to be very grassy and the surroundings did not seem to hold out much hope of providing the sort of rocky patches where *Rebutia* usually grow. So we did not undertake any trekking up the mountainsides there.

.....from R.Neumann

I have come across *Trichocereus schickendantzii* above Yacones, mainly on rocky outcrops inside the rain forest or even in the mountain grassland, above the timber line. It usually grows in company with small shrubs, herbs, and grasses, at between 1500 and 2000m altitude. With an average annual rainfall here of between 800 and 1200mm [ca. 30 to 50 inches] there is no wonder that this species needs a well drained ground to avoid rotting, as well as little competition for light. Both factors happen on immature rocky soils. These plants are multi-stemmed, in clumps of up to 1-2m in diameter. They grow straight up to 60 cm in height with stems 10-12cm in width, occasionally 15cm. They are always erect, not curved. The stem colour is light green to dark green. This plant is also found near Dique Campo Alegre.

.....from R.Wahl

There is a problem for anyone walking across the countryside in the area of San Lorenzo to Yacones; all the mountainside around Yacones is private land, divided up by fences. But I was very fortunately able to find a *Trichocereus* growing there on a steep rocky slope, almost completely shaded by the surrounding trees and bushes. Is this *Trichocereus shaferi*? It must have been fairly moist here as there were fronds of a green epiphyte hanging from the branches.

.....from J.Hughes

The picture from R.Wahl of some shortish columnar *Trichocereus* growing on a steep rocky slope in the shade of tall trees, is very reminiscent of the circumstances in which I saw *Trichocereus* growing in the vicinity of Yacones. We were there in the wet season and the surroundings in the gully were certainly damp.

.....from H.Middleditch

Not a lot of detail can be seen on the habitat picture received from R.Wahl, as these particular plants are in deep shade from the trees and bushes all around. However, the ribs do appear to be fairly sharp, with fairly deep intercostal grooves of Vee section. These features are not typical of the plants which I am familiar with as *T.schickendantzii*. It is possible that the picture was taken in the dry season when the stems may have been somewhat shrunken.

.....from F.Kattermann

Field list: FK 683a *Trichocereus volcanensis/ fabrisii*?

This was collected along the road from Salta to Jujuy near La Calera at 240 38'S and 650 29'W. My records do not have the altitude. The name I used may not be correct.

.....from H.Middleditch

It is possible that this "La Calera" is the La Caldera, which lies along the road from Salta to Abra Santa Laura, quite close to Dique Campo Alegre. The Argentine Automobile Club maps do not provide a longitude and latitude grid, so they cannot be used to position this habitat location

.....from M.Winberg

You may be able to find this location on the enclosed part-copy of the 1:500,000 scale map which covers northern Salta.

.....from H.Middleditch

On this map from M.Winberg, the co-ordinates for the location of FK 683a lie virtually at Estancia Los Yacones, which is situated on the Rio Yacones, at a point some 9 km due west of Caldera, itself on the main road from Salta to Jujuy. This location is some 14 km due north of San Lorenzo. However, on available maps the longitude disposition does appear to vary, by some minutes, between one map and another. Hence the actual location for FK 683a may well be closer to La Caldera than to Yacones.

TRICHOCEREUS SHAFERI Britton & Rose
From Britton & Rose The Cactaceae 1920

Caespitose, cylindric, 30 to 50 cm tall, 10 to 12.5 cm in diameter, light green; ribs about 14, 10 to 15 mm high, areoles close together, 5 to 7 mm apart, white felted when young; spines about 10, acicular, 12 mm long or less, light yellow; flowers from the top of the plant, 15 to 18 cm long, tube slender, outer perianth segments linear, inner segments probably white; scales of the ovary and flower tube bearing long brown hairs.

Collected by J. Shafer in a wooded ravine at an altitude of 1,800 m near San Lorenzo, Salta; Shafer No.44.
.....from H.Middleditch

It might be presumed that Britton & Rose would base this description on habitat data recorded by Shafer. However, it might be advisable to enquire if any original data is still available.

.....from The New York Botanical Garden.

Yes we do have the original Shafer field note book but due to its fragile nature the book cannot be opened flat. However, the conservation librarian thinks that it is possible to photocopy the page containing entry No.44, which is enclosed.

.....from J.Shafer, Field Note book.

January 11th. To San Lorenzo, Prov. Salta. Number 44. ?Echinocactus

Clumps of 3 or 4 curved cylinders, 12-18 inches high x 4-5 ins. diameter, light green, spines short, light yellow, with tufts of white wool at base - about 14 ribed [sic!]

Flowers at apex, 6-7 inches long, tube rather narrow, scaly, and with dense tufts of long brown hairs, probably white, filaments green, anthers and stigma cream coloured - only one seen and it was closed at 3 p.m.

One clump seen at about 5400 ft. in wooded ravine, 3 or 4 others at top of wooded hill on bare rocky exposure, one seen on hill NE of village, about 6300 ft. altitude.

.....from H.Middleditch

The word caespitose used by Britton & Rose tends to convey an impression of upwards of anything from perhaps half a dozen stems (or heads); "caespitose" would certainly not suggest to me only three or four heads, as reported from habitat by Shafer. The "curved cylinders" expression on the other hand would suggest by inference branching from the base, each branch being more or less comparable in height, as opposed to one upright stem and shorter basal offsets.

Taking into account the main features of these descriptions, together with the indications of altitude and environment, it is not too surprising that Kiesling regards this species as synonymous with his conception of *T.schickendantzii*. However, Kiesling gives no indication of having visited the locality of San Lorenzo where this plant was first found.

.....from W.Clarke

Some ten years ago I bought some seed from Steve Brack of a number of *Trichocereus*, some with Ferguson field numbers. I now have two plants of DJF 295, a *Trichocereus* species from Salta; they are about 55cm and 48 cm tall and 8 cm in diameter. The areoles are small and the spines do not overlap - there is a distinct gap between the spines of each successive areole on a rib.

.....from H.Middleditch

Abstracts from Steve Brack's seed catalogues for DJF 295 have included both "north of Salta" and "south of Salta"; hence the actual identity of DJF 295 would appear to remain an open question.

.....from D.J.Ferguson

Unfortunately I have mislaid my field note book for the part of my field trip which included the visit to Salta. But my best recollection is that we found these *Trichocereus* a short distance to the north of Salta, near La Caldera.

.....from H.Middleditch

This place La Caldera is barely a km away from the Dique Campo Alegre mentioned by R. Neumann as a location for this *Trichocereus*.

.....from W.Clarke

My DJF 295 has now flowered, the buds appearing from about the shoulder of the stem, an areole or two above where it becomes cylindrical. The flower stands out sideways, slightly above the horizontal, and adopts a very slight "S" shape

.....from H.Middleditch

A couple of cuttings of a quite substantial *Trichocereus* were brought along to our Chileans' 2001 Weekend, by G.R. Allcock. Because of the very substantial nature of the stem, almost exactly 4 inches across, it had been suggested that this plant could be *T.manguinii*. However, the Britton & Rose description of *T.shaferei* might accommodate this plant.

.....from G.R.Allcock

According to the authors of the name, *T.shaferei* has ribs about 14 and a diameter of 10 to 12.5 cm. These numbers fit my plant very well and so does the specific colour - light green. With this in mind, and also considering that Backeberg specifies his *T.manguinii* to have a dark greyish-green epidermis and a higher rib count, (18-20) I feel minded to rename my plant as *T.shaferei*. There is also the consideration that Backeberg's plant is supposed to display sepals of a reddish brown, which my plant does not have. They are in fact green on my plant.

This plant already flowered quite freely when in a 7 inch pot. The flowers appear from the crown and stand straight out from the stem, rather in the same manner as illustrated in Chileans No.57. A flower arising from the edge of the crown will face only half-upwards and will adopt a slight upward curvature.

This plant was grown from Kohres' seed, supplied under the name *T.schickendantzii*. Altogether 4

seedlings resulted, two of them thick-stemmed and the other two thin-stemmed and thus, if we wish to use the various available names, two *T.shaferei* and two *T.schickendantzii* respectively. When one of these *T.shaferei* was given a free root run the number of stems branching from the base steadily increased in number, up to about 50. They also grew stouter and much longer, mostly to round about 5 feet in length, but a few reaching up to twelve feet long. They fall over under their own weight, but then the length of stem at the growing point turns to grow upwards again.

.....from J.C.Hughes

When we were at the gulley which was only a short way from Yacones, the *T.shaferei* which we saw in and on the rim of the gulley, would also be about 4 inches thick. Those on the rim of the gulley, growing in the midst of grass but clear of any shade from the bushes, were clumps of a few upright stems of perhaps a foot high at most

The plants growing actually in the gulley itself were really in the shade - they had either upright stems or stems which drooped somewhat along their lower part and then turned upright. They would probably be up to about 3 or four feet in length.

.....from H.Middleditch

Rather like the plants seen by G.Charles and C.Pugh below Tafi del Valle, the short stems on the slope exposed to full sun, the longer stems more or less in the shade? [Chileans No.57]

.....from C.Norton

The *T.schickendantzii* that I am familiar with is a low growing plant with many heads. The plant which I bought as *T.smrzianus* is now three and a half feet high and 4.5 inches thick. When I entered it in the last National Show I found out that it was the tall growing form of *T.schickendantzii*.

.....from W.Clarke

The two plants of DJF 295 are still in their 6 inch pots, one now being 60cm tall by 9 cm diameter, the other 69 cm by 10cm.

.....from H.Middleditch

Both the foregoing, a good body thickness for *T.shaferei*?

TRICHOCEREUS SPACHIANOIDES By F.Ritter From Kakteen in Südamerika 1980.

Offered in the 1960/1962 Winter catalogue under this name. Similar to *T.shaferei*: offsetting from the base but not decumbent, 8-10 cm thick, ribs about 18, narrower and less blunt edges, more or less the same height and tuberculation as *shaferei*. Areoles with grey felted wool, 2-3 mm in diameter, 4-7 mm gap between them, Spines fine needle-like, honey-yellow, tips not darker, radial spines 10-12 of 4-7 mm [long], spreading sideways, central spines 1-4 of the same size. Flower from near the crown, no further data. Fruit not especially different, but with darker wool. Seeds similar, somewhat less glossy, with distinct pits. Habitat location in province Salta close to the border with province Jujuy at about 1400 m height. In the absence of knowledge of the flower, it is uncertain whether this should be regarded as a self-standing species or as a variety of *T.shaferei*.

.....from H.Middleditch

For his FR 980 *T.spachianoides*, Ritter provides one location "in Prov.Salta near the border with prov. Jujuy" and a second location "50 km south of Jujuy". It appears to be very probable that these locations will be in the vicinity of the Abra Santa Laura, on the road from Salta to Jujuy. From travellogues presented to the Chileans' Weekends by J.Lambert and by K.Preston-Mafham it appears that the approach to the Abra Santa Laura from the south does go through quite dense semi-tropical forest.

The wide valley in which the city of Salta stands is bounded on the north and to the west by two ranges of mountains arising in the knot of the Vulcan Chani; the further the distance from Vulcan Chani itself, the lower become the peaks of these two mountain ranges. The rain bearing winds from the south-east first cross the northern extension of the Cumbres Calchaquies and then pass over the broad valley of the R.Lerma before they impinge on the mountains to the north and to the west of Salta city. The consequent rainfall gives rise to a band of semitropical forest which appears to run from the mouth of the Quebrada del Toro via Yacones to the Abra Santa Laura, forming a crescent around the margin of the plain on which the city of Salta stands.

It is in, or on the margins of this wet zone, that *Trichocereus shaferei/schickendantzii* has been found in drier spots in the "wet" zone at the entrance to the Quebrada del Toro (Chileans No.51 p.117), near Yacones, and on the north side of the Abra Santa Laura. It would appear from both the Type location and the form of the plant that Ritter's *T.spachianoides* may well fall into this same group.

.....from M.Lowry

Our trip to Argentina at the end of 1999 took us north to Salta, from where we set off for the Quebrada Humahuaca. There is an old and fairly direct road from Salta to Jujuy via Abra Santa Laura, which although it is narrow and winding, passes through an interesting cloud forest, unlike the cultivated land around the new road via General Guemes, which we used the following year.

After leaving Salta, the road crosses the Rio Vacqueros and then follows a valley heading north for several kms. Eventually, after passing through La Caldera, the road begins to climb. For many kms both to the south and to the north of where the road crosses the ridge at the Abra Santa Laura the hillsides were clothed with vegetation which could be described as very humid forest, composed not just of trees, but also of bushes and lower undergrowth. Some little way after crossing the Abra Santa Laura we spotted some short columnar cacti fairly close to the road and on stopping to look at them, we found they were *Trichocereus*.

The few plants we saw ranged from 60cm to 1.5m tall but only about 9 or 10 cm in diameter. They had about 8 ribs, straight, which were carrying areoles about 2cm apart. The spines were short and yellow.

Unfortunately there was neither flowers nor fruit. These plants were growing amongst ferns and terrestrial bromeliads in a fairly shaded location due to the surrounding trees and bushes and in addition it was approaching dusk, so opportunities for photography were far from good. As we were not a great distance from the Type location of *T.shaferei* it was considered that this might be a suitable identification. The picture from R.Wahl is quite reminiscent of the type of terrain in which we found our plants, as well as the hanging "epiphyte" which might be a *Tillandsia* sp.

.....from J.Lambert

The height of the pass at the Abra Santa Laura is only 1300m, which may be a bit low for this *Trichocereus*, as Ritter says it is encountered between 1500 and 2000m altitude.

.....from H.Middleditch

This observation from M.Lowry would appear to take the distribution of *T.shaferei* to the north side of the Abra Santa Laura. In just the same way that the rain-bearing winds from the south-east produce a continually moist zone on the mountains at the northern end of the Salta plain, they also produce a similar moist zone in the Quebrada Humahuaca, to the north of the city of Jujuy. It is in this zone, near Leon, where Ritter provides a further location for a *Trichocereus* of the *shaferei* type.

.....from F.Ritter, *Kakteen in Südamerika* 1980

The description of *T.shaferei* provided by Britton & Rose is inadequate and here I provide additional data: a bush up to 1.5 m tall, offsetting from the base, the lower sections of the stem decumbent; stem more or less grey-green, 6 to 12 cm thick. Ribs usually 16 to 18 (according to Britton & Rose, 14), about 5 to 10 mm high, somewhat crenate, very blunt, intercostal groove usually sinuous. Areoles on the upper slope of the tubercles, with white felt, 2 to 5 mm diameter, 5 to 10 mm gap between one and another. Spines needle-like, yellowish with darker tips, radial spines 8 to 10 of 5 to 8 mm [long] directed slightly outwards; central spines 1 to 3 of 10 - 15 mm [long], the selfsame colour. Flower close to the crown....; Fruit almost globular, 40 to 50 mm in diameter, green, with 1 to 2 mm long narrow green scales and longer white wool, sweet and palatable. Seeds about 1.5 mm long, 1mm broad, 0.7 mm thick, black, fairly glossy, bag-shaped, with a keel, fine flat tubercles running into one another, often with some small pits; hilum oblique, oval, white, slightly sunken, micropyle included. Observed near Leon and on the mountains near the city of Jujuy at a height of 1500 to 1800 m, on rocky terrain. Those plants found by me in province Jujuy may be a regional variety of *T.shaferei*, which could only be established by a comparison with plants from the Type location.

.....from H.Middleditch

Effectively Ritter is telling us that he has not been to the type location of *T.shaferei* at San Lorenzo. If this Ritter *T.shaferei* from near Leon in Qu.Humahuaca is regarded as falling within the Kiesling synonymy of *T.shaferei* = *T.schickendantzii*, then this would take *T.schickendantzii* well into the Quebrada Humahuaca. Some ten miles further to the north of Leon there lies Volcan, still within the influence of the moist zone. In the vicinity of Volcan yet another medium-height *Trichocereus* is to be found

TRICHOCEREUS VOLCANENSIS F.Ritter **From Kakteen in Südamerika 1980**

Body offsetting sparsely from the base, becoming up to 1.5m long and then only with the end upright, somewhat grey green, body 12-16 cm thick. Ribs about 14-18, not tuberculate, fairly blunt, about 20mm high. Areoles slightly raised, oval, 5 to 8mm in greatest diameter, 8 to 12mm away from each other, with grey felted wool. Spines brownish yellow or brown, stout needle-like, straight, radial spines 7-14, standing outwards somewhat, 10 to 30mm long, central spines one or few. sometimes in old age increasing up to about ten, 15 to 40mm long. Flower near the crown, large, long, woolly, probably white. Fruit green, roundish, very blunt below, tapering above, 3 to 7 cm long, with long flat tubercles, with 1-3mm long yellowish-green scales with long drawn-out tips. opening out when ripe, flesh white, juicy mucilage, insipid. Seeds similar to those of *T.shaferei*, but more glossy, slightly longer, hilum not sunken. Type location Volcan, around 2100-2500m altitude on rocky terrain, rare. Discovered by me 1955.

.....from K.Preston-Mafham

We certainly climbed up out of the valley at the west of Volcan until we came to a point overlooking Laguna Volcan. But we did not see any *Trichocereus* which might have been similar to *T.shaferei*.

.....from G.Charles

In 1992 we climbed the hill to the west of Volcan, up to 2200m altitude and then in 1995 we walked up the next hill behind, but still saw no sign of any *Trichocereus* of the *shaferei* or *schickendantzii* sort.

.....from R.Slaba

In the habitat of Volcan I also did not find plants which would answer to the description of *T.volcanensis*.

.....from R.Hillmann

We were able to find some plants of *T.volcanensis* at the Ritter Type locality at Volcan. The plants here grew in company with bromeliads; some of the stems were standing upright, some were lying down but curved at the end so that the growing point faced upwards.

.....from J.Lambert

I do have a plant, JL-132, which I believe to be this species, which I collected in the Quebrada Humahuaca, near to Tumbaya, along the main road, at an altitude of 2150m; Ritter quotes an altitude range of 2100-2500m for this species. The biotype was a stoney slope, not especially steep, which I climbed up for about 50 metres starting from the road. The accompanying vegetation consisted of quite small bushes, *Trichocereus pasacana*, *Cleistocactus hyalacanthus* and *Gymnocalycium saglione*; but no grass. I saw no other

specimens whatever at this spot, so that I am inclined to share Ritter's opinion that it is a rare species, not occurring in numbers at a given place.

Trichocereus schickendantzii and *T.volcanensis* do indeed look closely related, with about the same number of ribs (11-14 for *schickendantzii*, 10-14 for *volcanensis*) and the same kind of spination. However, the spination is altogether stronger in *T.volcanensis*, and particularly the major central spine, which at up to 3 to 4 cm long is about twice as long as on *T.schickendantzii*.

My own plant, which had only ten ribs at the time I found it (1986), has now developed into a specimen with 14 ribs. My find was a piece of luck, as I collected a very small young plant of no more than 40mm in height and 70mm in diameter. It is now 20 cm in height and 13 cm in diameter, the diameter being proportionately thicker in comparison with *T.schickendantzii*. These plants grow only slowly and do not flower readily in cultivation, so that I have not had an opportunity to see any flower so far.

I would be inclined to say that the part of Quebrada Humahuaca near Tumbaya is just as dry as more to the north. A more compact vegetation, due to more humid conditions, is only encountered further south, starting near Leon.

.....from M.Lowry

A common sight along the Quebrada Humahuaca is the bromeliad *Abromeitiella breviflora*. It always grows on near vertical slopes and is very common where these slopes are exposed to moisture bearing winds. It is generally associated with *Cleistocactus hyalacanthus* and *Rebutia fiebrigii* forms. We saw this plant above Tilcara, at Tumbaya, near Volcan, and as far south as Leon.

.....from H.Middleditch

If this bromeliad extends only as far south in Quebrada Humahuaca as Leon, it would appear to avoid the "more humid conditions" observed by J.Lambert. Does *T.volcanensis* likewise avoid the "more humid conditions"?

On the basis of this Ritter description of *T.volcanensis* there does not seem to be any feature which is outstandingly different from *T.schickendantzii*, *shaferi*, or *spachianoides*. It may be considered that *T.volcanensis* is a taller plant; but then *T.schickendantzii* grew from 25cm with Weber to 60cm with Kiesling, whilst *T.shaferi* grew from 50cm with Britton & Rose to 150cm with Ritter. A different view is adopted by Kiesling

TRICHOCEREUS FABRISII R.Kiesling **Hickenia 1.6.1976**

Caespitose plant, branched only at the base, with several (3-10) erect stems, parallel, of various heights and occasionally a longer one decumbent. Stems ascending, short cylindrical (globular when young), up to 1m tall and some 20cm in diameter, with rounded apex, sometimes oblique. Ribs about 22, shallow, 10mm high and 20mm broad. Areoles woolly, whitish, 15mm away from each other, 8mm high and 6mm wide. Spines rigid, awl-like, not differentiated into radials and centrals 1-4 (-6) cm long by half a mm in diameter, of chestnut red colour.

Flowers almost at the apex of the stem, narrow bell-shaped, sometimes curved. Pericarpel and floral tube conical, about 90mm long and about 20mm diameter in the region of the ovary and about 50mm diameter at the mouth, with small triangular scales (5mm long) and abundant wavy chestnut coloured woolly hairs about 10mm long. Outer petals fleshy, with a back of purple colour, somewhat paler on the inside, 20mm long by 5 cm wide, with a transition to the inner petals, thin, white, spatulate, mucronate, about 40mm long and 12mm wide. Stamens in two series, extending to the base of the stigma, the upper [series] 25mm long, forming a ring at the throat, the lower [series] 45mm long spirally inserted from the base up to 35mm up the tube. Style cylindrical about 9cm long and 2.5mm in diameter, somewhat enlarged towards the top. Stigma with 17 nearly cylindrical lobes, long and slender, 15mm long and 2 to 3mm in diameter.

Fruit green or yellowish, of 3 to 6cm in diameter, globose, scaly and hairy. Seeds dark chestnut colour, shiny, stippled with dots, 1.1 to 1.3mm long, 0.8mm high and 0.5mm wide with oblique hilum and dorsal keel.

Holotype: Jujuy, Dept.Tumbaya, Abra de Cerro Morado, 3300m altitude. collected by H.A.Fabris 6203, 7 January 1966 (LP).

Distribution and Ecology. Grows in high altitude grasslands in the upper part of the phytogeographic province of the Yungas on the east facing slopes of the ranges of the Nevada Chani, at 3000 to 3300m altitude. (Zapla, Lagunas de Yala). From an examination of the two photographs taken by Dr.Fabris at the time of collection it can be said that it is associated with *Festuca hieronymii* and other grasses, *Begonia* sp. and *Oenothera* sp. among the herbs, and small bushes such as *Adesmia cystodes* and *Chuquiraga longiflora*.

Observations. This species seems to be related to *T.shaferi* Br.& R. and to *T.schickendantzii* (Web) Br.& R., but is readily distinguishable from them by its much greater diameter. Certainly *T.volcanensis* Ritter n.n. which I have never seen in flower and which grows in the hills which surround the Laguna de Volcan, is identical to this. In Caspala (prov.Jujuy, Dept. Valle Grande) various examples were seen of a *Trichocereus* (out of flower) which possibly belongs to this species as well. *Trichocereus narvaecensis* Cardenas from Narvaez in Bolivia is also similar, according to the description.

.....from H.Middleditch

On the 1:500,000 scale map of northern Jujuy province, received from M.Nilsson, there is a Quebrada Morado which appears to lie at about 3000m altitude to the west of Purmamarca, Dept. Tumbaya; but no Cerro Morado has been found. Lagunas de Yala lies to the west of Yala, itself some half-way between Jujuy and Leon and thus the nearest location to Abra Santa Laura for *T.fabrisii*, *T.volcanensis*, or *T.shaferi sensu Ritter*.

So far, no place by the name of Zapla has been located.

After the first publication of *T.fabrisii* this description appeared again in Kiesling's review of *Trichocereus* in *Darwiniana* 21, 2-4; 1978. A number of additional pieces of information appeared in the latter which were not included in the original description; this extra data has been included in the description reproduced above, for convenience of reference. In the later *Darwiniana* publication, the reference to the original description is quoted as "Hickenia 1 (6):29, 1970", but with the offprint of the original description in front of me as I write, the subheading reads Volumen 1, Setiembre de 1976, No.6. This anomaly probably falls into the same category as the "Style 2.5cm diameter" in the *Darwiniana* version. Of a different nature is the note in the 1976 *Hickenia* description that this species was related to *T.shaferi* and *T.schickendantzii* whilst the 1978 description noted only that this species was related to *T.schickendantzii*; in the intervening period Kiesling had evidently decided that *T.shaferi* was a synonym of *T.schickendantzii*.

The flower of *T.fabrisii* is stated quite unambiguously by Kiesling to be bell-shaped, but the sketch of the flower section accompanying the description in *Darwiniana* is of a flower which is virtually funneliform in shape. Kiesling does not appear to provide any explanation for the discrepancy between the flower form given in the text and that in the drawing.

The illustrations of *T.schickendantzii* reproduced in *Chileans* No.57 p.132 demonstrate that the flowers on those plants of *T.schickendantzii* displayed a flower with a virtually straight tube. In his description for *T.fabrisii*, Kiesling observes that the flowers are "sometimes curved", but if the extent of that curvature is represented by the degree of curvature on the flower sketch which accompanies Kiesling's description, it is indeed very slight. Certainly not the almost right-angle bend to be seen on the flower tube of certain other *Trichocereus*.

.....from J.Lambert

When Kiesling writes that Ritter's *T.volcanensis* is probably the same as Kiesling's *T.fabrisii*, I think that he is mistaken. *Trichocereus fabrisii* has thinner and more numerous ribs (22) and seems to grow at a higher altitude in the mountains - 3000m and more.

.....from H.Middleditch

From the reports and observations recorded above and in *Chileans* No.57, it is quite evident that the habit of *T.schickendantzii* can vary in habitat from short and squat to markedly elongate, a degree of variation which appears to make it difficult to justify a separate status for *T.shaferi*. The very limited data relating to *T.volcanensis* hardly allows of any firm comparisons with *T.schickendantzii*, although it does appear to grow in similar surroundings. Although *T.fabrisii* is recorded from a much higher altitude than *T.volcanensis*, again the absence of firm observations from habitat or cultivation make it difficult to define any relationship with the group around *T.schickendantzii*.

OPUNTIA AURANTIACA From Dr.V.C.Moran

Opuntia aurantiaca was first described in 1833 by Dr.John Lindley who wrote "A native of Chile, whence it was originally sent to this country, in 1824, by Mr.Nugent. It has also been brought home by Dr.Gillies whose unpublished *Cactus aurantiacus* it appears to be". The plant illustrated so well in the colour painting in Lindley's original description of *Opuntia aurantiaca* looks exactly like the thing that is a weed in eastern Australia and southern Africa. Mechanical and chemical control is ineffective and costly; the most feasible alternative is biological control using imported natural enemies of the weed. An understanding of the distribution and identity of the plant is a pre-requisite in attempts to find natural enemies, which can be expected to have co-evolved with the plant in its original home.

Consequently I must concern myself with the origin of the plant that Lindley described. In this regard there is no doubt that Gillies is a red herring and following him up can be no help. That leaves the mysterious Mr.Nugent. Who was Mr.Nugent and where did he obtain his specimens of *O.aurantiaca* that he sent from South America to England in 1824? It seems that the plant was collected by a Nicolas Nugent who lived in Antigua and collected either from the island or from Trinidad.

(See *Chileans* No.30 pp.157-162; *Taxon* 25,2/3, 1976)

.....from F.W.Gibbs "John Gillies M.D. Traveller and Botanist" 1952

In a letter to Hooker in September 1824 Gillies mentioned that Basil Hall was then at Valparaiso on H.M.S. Conway.

.....from Captain Basil Hall, "Extracts from a journal written on the coasts of Chile..." 1825

I had occasion to send a despatch to the naval C-in-C, Sir Thomas Hardy, which might be expected to reach Buenos Aires from Santiago in twelve days. The distance is 1365 miles so that the courier must travel, on average, about 114 miles a day. The independence of the South American states has not yet been acknowledged by England, neither had any consuls or accredited political agents been sent out. The commercial intercourse between the two countries being already very extensive, points of doubt often arose which made it necessary to open frequent correspondence of a diplomatic nature with the various local governments. The only constituted authority on the part of England in that quarter of the globe was the naval C-in-C and upon him necessarily devolved the whole responsibility of these discussions. The ships of the squadron were therefore distributed at those points where the presence of a British authority was most essentially required, namely, Rio de Janeiro, Buenos Aires, Valparaiso, Lima, and San Blas in Mexico. The whole of the consulate affairs fell to the charge of the captains of His Majesty's ships stationed along these coasts.

.....from John Miers "Travels in Chile and La Plata" 1826

Not only did the officers of the Royal Navy have to act as regulators of custom-houses, consuls, and plenipotentiaries, but they were also responsible for the safe conveyance of homeward remittances, which necessarily consisted of dollars and bullion.

.....from H.Middleditch.

Did the homeward remittances always and exclusively consist of dollars and bullion?

.....from T.Jones "South America rediscovered" 1949

In the twenties there was no organised transportation between Buenos Aires and Mendoza. Thus it was necessary for the prospective traveller to hire or buy a coach, engage riders and a guide, and lay in a few provisions. Although a government courier might make the trip between Buenos Aires and Mendoza in about five days (between 900 and 1000 miles), the journey thither in a galera (a four-wheeled cart) took more than two weeks. Distance travelled each day varied considerably depending upon the number of streams to be forded (there were no bridges) and the stops which had to be made for repairs to the galera. Over the first half of the route, where the post houses averaged perhaps five leagues apart, it was possible to get fresh horses at regular intervals. In the west however, the distance lengthened to more than fifty miles; then it became necessary to travel with a tropa, a number of extra horses which served as relays on the road.

Travellers usually spent the night at a post house in order to be reasonably assured of food, shelter, and protection from the indians. A post house on the pampas was in no sense a tavern or an inn. It was an adobe hut with a mud floor and a thatched roof where the travellers mixed indiscriminately with the post keeper and his family. At a good post house a traveller might hope to purchase eggs, fowls, vegetables, or perhaps mutton. It was not unusual, however, to find that the inhabitants of the post houses had nothing at the moment to eat, much less to sell.

.....from F.B.Head "The Pampas and the Andes" 1826

[Riding from San Luis to Buenos Aires] We galloped through the dry grass towards a small black-looking hut in ruins, It was one of those which had been burnt by the indians, and the whole family had been murdered in it. In the hut lay the body of the courier ...several of the courier's letters were lying about.

.....from H.Middleditch.

Although the letters carried by the official courier would occasionally be lost in this way, it was a much quicker method of communication between the Naval captains in Valparaiso and Buenos Aires rather than by sea round Cape Horn.

.....from British Consular reports on the trade and politics of Latin-America 1824-26

In July 16th 1810 the Spanish Captain-General of Chile was forced to resign. In September of that year a provisional junta was elected to rule the country. A national congress met in July 1811 but attempts at independence were ruined by internecine strife and Chile was reconquered from Peru in 1815. Final liberation came by the march of San Martin across the Andes and the battle of Maipu in 1818. A constitution was framed the same year, to be replaced by a second in 1822 and by yet a third (also short lived) in 1823. Bernard O'Higgins was forced to resign in 1823, succeeded by Ramon Friere who ruled until 1826. Great constitutional and political disorder prevailed until 1831.

It was not until 1817 that Englishmen arrived in any numbers. John Miers (Travels in Chile and La Plata 1826) estimated their numbers at Valparaiso at 400, many being "sailors or persons in the lowest sphere of life". Robert Proctor (Narrative of a journey across the Cordillera of the Andes 1825) described the town as "full of English, many of them of the lowest description and of the worst characters" who acted as brokers and smugglers. Maria Graham (Journal of a residence in Chile during the years 1822-1824) wrote "English tailors, shoemakers, saddlers and innkeepers hang out their signs in every street". Consul Rowcroft, who passed through Santiago in 1824 on his way to Peru, found the English merchants there "very few and inconsiderable".

The first British consul-general for Chile, appointed in 1823, was Christopher Richard Nugent.

.....from British Consular reports, Foreign Office archive FO/16.2 British Consulate Valparaiso, 17 March 1825.

Christopher Richard Nugent to George Canning

The total want of regularity in the public offices, the suspicions of the British merchants apprehensive of the imposition of new charges upon trade, the regular systems of smuggling carried on throughout the country are, among a variety of lesser ones, the obstacles that I have to contend with.

.....from H.Middleditch.

Put yourself in Gillies' shoes, resident in Mendoza where he would be five days' journey from Valparaiso, two weeks or so from Buenos Aires. Apart from the official courier, no carriers of goods or mail. Concern about the Brazilian blockade and possible loss of goods shipped out from Buenos Aires. Promised literature and samples that take a year or more to arrive from England. How do you set about getting your botanical specimens back to England? See them into the care of a passing European traveller who would put them into the hands of Woodbine Parish in Buenos Aires until a British ship arrived - or alternatively someone equally reliable in Valparaiso? When Consul Rowcroft calls in 1824 en route to Valparaiso, do you make use of him in this way? And who is likely to be the first person that Consul Rowcroft will visit on arrival in Valparaiso. The resident British Consul? And would he leave Gillies' case of specimens with Mr.Christopher Nugent for forwarding by ship?

In Chileans No.30 a possible origin for *O.aurantiaca* was discussed and views on this were expressed by Dr.V.Moran, who is a botanist. He scoured botanical literature and other sources for the Mr.Nugent who sent *O.aurantiaca* from Chile to the U.K. and Dr.Moran concluded that "this plant could not have been collected by Gillies". It is quite clear that Dr.Moran has investigated the subject pretty thoroughly from a botanical

standpoint but I believe that his conclusions about a West Indian origin for this species are erroneous. It seems to be far more likely that *O.aurantiaca* was indeed collected by Gillies and despatched to the U.K. via Chile.

.....from T.H.Arnold "The origins and relationships of *Opuntia aurantiaca* Lindley"

Botanical Research Institute, Pretoria. (Not dated, but received subsequent to the foregoing)

It is now known that Christopher Richard Nugent was stationed in Chile from May 1824 as British Consul-General and could have sent material of *O.aurantiaca* to England from Chile during 1824. However, this official is not considered to have been responsible for collecting this material as at no time during or prior to 1824 was he anywhere within the existing distribution range of this species. His journey to South America on H.M.S. Cambridge was broken only at Rio de Janeiro early in March 1824 and later at the Falklands (see Captain's log ADM1/3085). Apart from travelling to Santiago, where he stayed for nearly two months during 1824, Christopher Nugent spent the rest of that year at Valparaiso. The specimens could have been given to him by one of the many botanists or explorers known to have been travelling in South America at that time, namely John Gillies, John Miers, Francis Place, John McRae, Lord Cochrane, Mr.Cruickshank and others, all of whom it is known collected and sent plants back to England from South America.

.....from H.Middleditch.

Both Moran and Arnold describe the occurrence of *O.aurantiaca* in eastern Argentina and Uruguay as secondary i.e. it was introduced there, not endemic. A piece of this species was kindly sent to me by Dieter Supthut of Zurich City cactus collection and now grows in my greenhouse, where there is no doubt that a joint will remove itself from this plant and become attached to any passing limb or piece of clothing, apparently by nothing more than sleight of hand. Hence I expect it will behave in a similar manner in the wild and thus it could have been carried from west to east across the pampas when cattle were driven to the coast.

TEPHROCACTUS FROM SEED By G.Frank

Translated by E.W.Bentley from K.u.a.S. 8.10:1957

One of my first visits in Cochabamba was to the University and the head of the botanical institute, Prof. Cardenas. For our onward journey Prof. Cardenas gave me addresses of friends in Sucre and in Potosi so that we would be well informed of the cactus flora in those areas.

From Potosi, a tin mining city located at 4000m elevation, we roamed the rocky surroundings in the company of the friendly and helpful teacher A.Vidaurre. I was able to collect a fine specimen of *Lobivia longispina* and a also a wildly black spined plant which my travelling companion called *Lobivia boliviensis*. At the same time numerous fruits of *Tephrocactus minimus* and *T.soehrensii* found their way into my collecting bag. Of all the *Tephrocactus* seed which I brought back home with me, however, neither for myself nor my friends has a single seed germinated. Even the overwintering of the seed coats in the open air and tricks like freezing and thawing them several times still brought no results. As a last attempt the hard coated seed will be treated with digestive juices before sowing, this year.

.....from F.Wakefield

Some time ago I received seed of *Tephrocactus molinensis* from Mesa Garden. If anything, this seemed to be even harder than the usual feel of *Tephrocactus* seed. So I soaked it in water, but this did not seem to soften it at all; even a repeat soaking appeared to have no effect. In all I gave the seed a soaking in water for seven times, but it was all still as hard as granite. Finally I got hold of the seed with a pair of pincers and then cut off part of the seed coat with a scalpel - only to find that there was nothing at all inside. In fact every single seed turned out to be hollow.

.....from R.Moreton.

It will be a few years ago that I sowed several pots of seed of various *Tephrocactus* spp. and germination was not very good; in fact, for quite a few pots, germination was nil. These pots were left in the trays, which were put out into the cold frame, and forgotten. The cold frame, of course, has no winter heating and the summer watering is effectively left to the rain. It was rather surprising to find several germinations appear the following Spring, a good year after the sowing. Even more surprising, after the trays were left for yet another year under just the same circumstances, there were some more germinations the following Spring, two years after the original sowing. More recently, from a sowing of *Opuntia macrorhiza*, there was only one germination; in this instance the seed tray was left in the greenhouse all the time and in the following Spring there were many germinations. In fact it probably represented 100% germination. By comparison, a sowing of *Opuntia basilaris* produced nearly 100% germination fairly soon after sowing.

A recent order of seed from S.Brack was accompanied by a note saying that *Tephrocactus* and *Opuntia* seed would stand temperatures of up to 50°C after sowing, so this year I have sown some of these seeds in May, covered them with grit, and put them up under the ridge close to the glass where they will get really warm. Results awaited.

The problem is that evidently some spp. of *Opuntia* and *Tephrocactus* need one sort of sowing treatment, other spp. must need a different treatment. The real problem lies in not knowing which is the best treatment for each species.

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

It will be quite a few years ago that I received 20 *Tephrocactus* seeds from Kohres, which were sown and produced four germinations. Because of changes being made to the greenhouse, this pot had to be left in the garage, from where it was rescued two years later. It then came back into the greenhouse, and four years after the sowing, another seedling emerged.

.....from R.Marriott

A couple of years ago I tried sowing some seed of ZJ 191 sold as *Tephrocactus fiambalensis*. It was about twelve months before there was any germination, five or six germinations appearing in quick succession. Previously I have tried cutting into the aril of *Tephrocactus* seed in order to expose the embryo, in an attempt to promote germination, but with no success.

.....from W.Phillips.

Currently I am trying to find the best method of germinating seed of the *Austrocylindropuntia*, *Maihueniopsis*, *Tephrocactus*, etc. Unlike many other South American cacti there is virtually no commercial source of plants with any provenance whatsoever, let alone field collection numbers, so seed raising is the only way to come into possession of plants of this group with respectable antecedents. Seed has been obtained from Mesa Garden and Steven Brack has been most generous with his suggestions as to the best way to germinate such seed, but inevitably this advice is geared towards the climate of New Mexico!

At the moment I am experimenting with various methods of either reducing or neutralising the germination inhibitors present in seeds of *Opuntioideae* from the Andean plateau; so part of my seed sowing is to raise plants if possible, and part is to conduct my trials as a research programme. I do feel that there must be a way of ensuring reliable and reproducible germination. One of my propagators is controlled at about 18°C., the other variable between 18°C and 30°C, so that I can alter these seed raising conditions to quite a degree. It is the various other tricks of pretreatment, etc., that I am searching for.

Having consulted the various views on seed raising which were presented in Chileans No.47, I found it difficult to satisfy myself as to the precise details of some of the methods adopted, in particular those originating from Thompson & Morgan. I had my suspicions that much of this work was not at all scientific, having been involved in analytical work much of my life. So I wrote to Thompson & Morgan outlining my queries, receiving a series of decidedly unsatisfactory replies. Finally they admitted that they had not kept any records of the work done or methods used!

Perhaps it is not so much a question of the viability of *Tephrocactus* seed, as that of natural dormancy caused by various natural biochemical germination inhibitors. Hence the not infrequently reported phenomenon of seeds germinating spasmodically over many years.

.....from H.Middleditch

On a recent visit to an Open Garden, the owner was being asked how he was coping with the weeds indigenous to the small paddock now incorporated into his garden. His response indicated that he did not expect to eradicate them speedily - "one year's seeds, seven years weeds". It appears that some of the South American weeds may have a comparable spread of germination.

.....from A.Johnston

A packet of *Tephrocactus* seed arrived recently from Mesa Garden. This sort of seed can usually be tipped straight out of the packet, but this time the seed simply stopped inside the packet when it was opened and tipped up. It had to be lifted out of the packet and then I found that it did not want to leave my fingers. All the seed felt quite soft which seemed to be very peculiar because *Tephrocactus* seed is usually very hard indeed. It was sown without any sort of pretreatment and germinated rapidly with a good percentage germination.

.....from R.Moreton

In regard to germination of various sorts of *Tephrocactus*, the lenticular seed (the *Maihueniopsis*) are the ones which are least problem to germinate. The rice-crispy sort of seed - the true *Tephrocactus* according to Kiesling - germinate fairly well. But it is the orange-pip sorts of seed, which includes all the *Austrocylindropuntia*, which are very difficult. I have tried chipping this type of seed to obtain better germination results but it has not yielded any improvement for me.

.....from K.Preston-Mafham

Yes indeed, I would agree that the "maihueniopsis" type of seed is probably the least difficult to germinate. My own habitat collections of both *archiconoideus* and *coloreus* seed germinated quite well. But on the other hand my habitat collected seed of *T.floccosus* produced no germination whatsoever; I tried freezing it, leaving it out of doors over winter, keeping it a year or two before sowing - all to no avail. In fact, about 15 years after making a habitat collection I came across a packet of this seed which had been put away - that was sown, and still nothing came up!

.....from T.Marshall

The comment from G.Frank about zero germination of his *Tephrocactus* seed does surprise me, as I usually get 80-90% germination from *Tephrocactus* seed which I have collected myself in the field. It usually goes straight into the propagator which is equipped with fluorescent tubular lights, the heating and lighting both being run off the same timer. The tubular lights are on for twelve hours daytime when the temperature is set at about 30°C; the lights are off for twelve hours night-time when the temperature is set at about 25°C.

.....from R.Moreton

I used to have the problem of roots on germinating seeds of *Maihuenia* and *Tephrocactus* which did not want to go down into the compost, just as R.Allcock describes in Chileans 47 p.99, but that problem does not seem to occur now to anything like the same extent. In the intervening period, the only change which has been made to my seed compost mix is that I am now using coir instead of peat.

.....from C.Holland

Yes, I have had the roots of seedlings being unable to penetrate the compost, but I have not observed this problem with seeds of about 1 mm in diameter or less. Seeds of this small size tend to produce roots which are fine enough to find their way into anything when they first germinate. Seeds of *Maihuenia* are of course much bigger, as are the resulting freshly-germinated seedlings as well as their roots. Due to a low density of germination from seeds with a robust newly germinated root, I have not needed to transfer them into a coarser

mix. I tend to do just the opposite, by getting some fine mix and sprinkling some over the root to bury it. Generally this is possible because after a few days the root will be so long as to have toppled over, changing from initially trying to go skywards, and will be lying more or less prostrate on the surface of the seed mix. In any case, I usually cover larger seeds with around 2 mm of finer material, which may provide a bit of resistance, so forcing the roots downwards initially. I find that sowing large seeds on to a coarser medium can produce the same initial problem e.g. if the tip of a root stubs on a piece of grit - say about 4 mm size.

.....from T.Marshall

Although I do occasionally find other kinds of germinating seed putting a root out of the compost, this does not happen with *Tephrocactus*; these seeds are sown and then pushed just into the seed compost, followed by a covering of an additional half inch layer of compost. The seed compost is fairly fine textured, being Levingtons seed compost without any additional grit, so it does not really contain anything which would obstruct progress of a newly germinated root.

.....from R.K.Hughes

As I became interested in growing *Tephrocacti* I became aware that they rarely flowered and were grown for other reasons. Two clones of *T.articulatus*, one with a pure white flower, the other pinkish white, have flowered a number of times, but never together to allow cross pollination. The only other plant to have flowered a number of times is a *Tephrocactus mistiensis*, whilst a *T.weberi* and a *T.ovatus* form labelled *T.russellii* have both flowered just the once.

During 1999 this *T.russellii* again produced a bud while at the same time a spiny *T.ovatus* (ex C.Hall) produced two buds for the first time. These buds developed alongside each other but typically the opening of the flowers did not exactly coincide. However, one of the ovatus flowers and one russelli flower were open at more or less the same time, sufficient to expect good cross-pollination to produce a fruit on each plant. In attempting to pollinate the second ovatus flower, the withered petals of the russelli flower had to be parted to get at the pollen. These flowers did not open fully on the first day and tended to close at night. On the second day they opened wide in full sun, tending to close towards evening or when the sensitive anthers were touched. Similarly on the third day the flowers seemed to open even wider, offering plenty of loose pollen, then closing less before the petals started to wither and close up on the fourth day.

The result of this was a fruit on each plant that fattened up into a similar shape to the segments of their respective plants i.e. thin cylindrical ovoid on the russellii and fat spherically ovoid on the ovata. Additionally there was a second fruit on the ovata that did not fatten up in the same manner and I expected that it would not contain any seeds. Both of these plants were on the display table at The Chileans' 1999 Weekend, complete with fruit.

These fruits were watched as I waited for them to ripen, expecting them to turn yellow and eventually dry up. The *T.russellii* fruit did this on the 5 October, so the fruit was taken off the plant. The thin dried wall of the fruit casing was cut open, to find inside 74 closely packed seeds all quite dry. They were the basic lenticular shape of the *Maihueniopsis* group, but with flat faces where they had been pressed against each other as they grew.

I expected that the fruit on the *T.ovatus* would also ripen in the same way and start to dry up at about the same time, but it continued to remain green. On the 5 November, with only a trace of some yellowing, I decided to remove it from the plant. The fruit was cut into two halves so that I could photograph it with the seeds inside. At the centre of this thick-walled fruit were the seeds set in a very glutinous translucent pulp that later made it very difficult to clean the seeds. In the final stages of cleaning, the seeds seemed to have a clear jelly-like coat, similar to tomato seeds, that needs to be removed. Although this ovatus fruit was larger than the russellii fruit, it contained only 41 seeds. They were lenticular without any flats on them; some time later, when they had dried out, they were found to be larger than the russelli seed. The second *T.ovatus* fruit which had not expanded was also removed from the plant; expecting it to be empty of seed, it was cut open and surprisingly it contained just two seeds in a similar condition to the above.

Although it was late in the year, I had plenty of seed to find out if some of it would germinate fresh off the plant. There were 12 russelli seed and 9 ovatus seed put into pots and given some bottom heat during daylight hours. Within a fortnight there were 9 and 7 respectively germinated or showing signs of germination. Unfortunately the first to germinate were producing elongated growth beyond the cotyledon leaves so the bottom heat was switched off, leaving them to rely on any sunshine falling on the windowsill. On the first day of the new year another count was made and I was surprised to find that 12 and 9 had germinated. Although this was 100% germination success, some failed to prosper, either through being unable to put down a root from a healthy top growth or to squeeze the cotyledons from the seed case without damage to the growing point. A further sowing was made in early April of that year, resulting in less % germination - which could be due to them not receiving the same attention as was given to the first sowing.

In the course of the year 2000, both these plants performed in a similar way, although perhaps a little earlier in the season. The dried out fruit was removed from *T.russellii* on 11 September and contained 94 seeds. The fruits on *T.ovatus*, still on the plant, were quite green, although the larger one, (properly pollinated), became streaked with yellow and then turned yellowish green all over.

Over the course of time many comments have been made about cross-pollinating two different sorts of cacti and the hybrids that have resulted. Even hybrids between plants of two different genera are known to exist. On the other hand, it is also known that cross pollination between two different species and sowing seed from the subsequent fruit can produce seedling plants that are a replica of the parent bearing the fruit. From what I read of more recent work in this field it appears that cross pollination using foreign pollen from as different a genera as possible, can stimulate the recipient flower to self set.

NEW WAYS OF SECURING TRUE TO TYPE SEED By B.Schutz
From N.C.S.S.Journal 4.1949 (Abstracted)

It is well known that most discoveries, in whatever sphere of activities, are made accidentally. This article starts with such an accident. A Czechoslovak cactus grower tried to hybridise *Astrophytum asterias* and *Astrophytum myriostigma* with *Hamatocactus setispinus*. The *Astrophytums* set seed, but the *Hamatocactus* remained sterile. Our friend was delighted and looked forward to seeing the resultant hybrid.

The seeds germinated surprisingly well and a number were grafted. The result of this work was a whole batch of true-to-type *Astrophytum asterias* and *A.myriostigma*. Naturally this was a disappointment but the report interested me very much as I knew of similar results with plants from families which have nothing in common with cacti. Science has never yet satisfactorily explained the appearance of true-to-type seed resulting from the fertilisation of one species with the pollen of an entirely different species.

I took a deep interest in the attempts of another friend who tried to hybridise as many different species of *Gymnocalycium* as possible. Quite unintentionally his experiments did lead to something positive as I was able to ascertain that the mother plants which had been apparently cross-fertilised produced true-to-type seedlings instead of hybrids. For instance, *Gymnocalycium venturianum* pollinated with *Thelocactus bicolor* produced true *G.venturianum* offspring.

Then another Czechoslovak cactophile made trials which also showed positive results. He owned two fine plants of *Lobivia sanguiniflora* which he had vainly tried to cross fertilise with each other. Having familiarised himself with the above experiences he then fertilised every flower of one of the plants of *L.sanguiniflora* with pollen of *Astrophytum asterias*. All the flowers of the second *L.sanguiniflora* were treated with pollen of *Lobivia ducis-pauli*. Both plants produced seed capsules and the resultant seed was sown separately. Germination was good.

When the seedlings had grown somewhat it was found that the *Lobivia sanguiniflora* pollinated with *Astrophytum asterias* produced true-to-type *Lobivia sanguiniflora*, whilst the descendents of *L.sanguiniflora* x *L.ducis-pauli* were emphatically hybrids. [Other similar examples are also quoted]

This development may be explained in two ways. Either the strange pollen excites the stigma lobes in such a manner that the own-pollen of the seed-bearer is enabled to fertilise, and self-fertilisation takes place; or the foreign pollen excites the stigma lobes in such a way that seed develops without fertilisation, so-called parthenogenesis. In my opinion these new methods of obtaining true-to-type seedlings by using foreign pollen are of far-reaching importance.

Now to some comments of a practical nature:-

Never cross-pollinate two closely related plants such as *Astrophytum* with *Astrophytum*, *Gymnocalycium* with *Gymnocalycium*, etc. With 95% probability these will produce worthless hybrids. Only pollen from cactus species quite foreign to the plants will exclude hybridisation with reasonable certainty. 2. Use pollen of as many different plants as possible simultaneously. For example to pollinate *Astrophytum asterias*, transfer pollen from *Thelocactus*, *Parodia*, *Gymnocalycium*, *Notocactus*, *Coryphantha*, *Echinopsis*, etc.

.....from K.Gilmer

When pollen lands on a stigma, a bio-chemical reaction can take place which stimulates the pollen into sending out a pollen tube that will enter one of the minute openings in the surface of the stigma lobe. The pollen tube will grow down the interior of the style until it can transfer the DNA from the anther via the pollen tube to one of the ovules and so fertilisation will occur.

On the other hand, there can be a self-sterility if the stigma recognises its own pollen and no bio-chemical reaction occurs to start the growth of the pollen tube. However, if some foreign pollen comes on to the stigma immediately next to the plant's own pollen, it is hardly possible for the stigma to distinguish between the two; consequently it is unable to both allow the growth of the pollen hose for one and not for the other. In this way the "own pollen" can bring about fertilisation of the ovules and production of viable seed. It would be possible for a fruit of a plant that has been treated in this way to enclose both pure seeds and hybrid seeds.

.....from A.W.Craig

My *Pilosocereus magnificus* is kept in a 6ft by 4 ft glass paned greenhouse which stands inside my main greenhouse; it is used for growing *Arthrocerus*, *Buiningia*, and other sorts which require a more elevated temperature than that which I maintain in the big greenhouse. Two or three years ago the *Pilosocereus* put out a flower, but there was nothing else to pollinate it with. So I went round the rest of the greenhouse and made use of pollen from *Copiapoa* and various other plants that were out in flower at the time, daubing it on to the stigma of the *Pilosocereus* flower. The *Pilosocereus* did set fruit and the subsequent seed was sown, the seedlings now looking all like peas out of a pod.

Conversely, a couple of fruits were collected from the cephalium of an *Espostoa melanosteles* when we were in Peru and the seed was sown after we returned home. Germination was quite good, producing some seedlings where the body is completely obscured by the white woolly coat and these look just like miniature *Espostoa melanosteles*. But several seedlings from this same pair of fruits have an entirely different appearance, one of them looking just like a *Neobinghamia*, another looking like a pale brown spined *Haageocereus* with somewhat darker, hairlike, spines at the apex.

.....from H.Middleditch

It appears that the local pollinating agents in that part of Peru had not been properly trained to avoid visiting flowers of different genera which were closely related and consequently they have evidently generated hybrids. My own inclination is to use such as *Cleistocactus* pollen on *Echinopsis* and *Tephrocactus* flowers in order to encourage fruit to set and avoid hybrids in the process.

GETTING CROSS OVER NOTOCACTUS From N.Gerloff

You will see from the pair of slides herewith that it has been possible to cross *Notocactus horstii* with *Notocactus neohorstii* (= *Wigginsia horstii*) and produce viable seed. From this seed has been raised the plant shown on one slide, which in turn has flowered, the flower being shown in section on the second slide. Since these two plants can be crossed successfully, it proves that they both belong to the same genus.
.....from H.Middleditch.

Is it being suggested that just because this particular cross has been successful, that this alone justifies the conclusion that both *Notocactus* and *Wigginsia* constitute just a single genus?

NOT SETTING FRUIT ON REBUTIA GONJIANII From A.de Barmon

When I moved my collection into my new greenhouse in 1997, the greenhouse was nearly empty. It is a common problem here on the continent to have plants nibbled by mice or some other form of animal life, so in order to avoid this problem I keep my greenhouse closed at all times, without any vents. This means that the air temperature inside the greenhouse can become rather high. This was not much of a problem whilst the greenhouse was nearly empty but by the following year it contained many more plants and during sunny days in summer the temperature rise at the level of the plants on the bench caused problems. The *Rebutia* in particular seem to react to this condition by shrivelling, especially if they are due for a watering and are rather dry! After a few years of unsuccessful searching for plants of *Rebutia gonjiani*, a plant of MN 211 was acquired in 1966 and in addition I received from W.Krahn four clones of WR 578 in the form of cuttings, which rooted down very promptly. All these flowered very well in 1998 and they were carefully hand pollinated between the clones. One of these plants had become about 50% shrivelled on account of the heat, so it was moved to a shady location whilst it was flowering. I was astonished by the end of the flowering season to find that this was the only *R.gonjiani* that had developed a fruit

The May of 1999 was very hot and the temperature inside the greenhouse usually gets to 40°C in full sun. As soon as the first flower opened the *Rebutia gonjiani* were moved to a shaded area where the temperature always stays under 30°C. However, the lack of sun did not help further flower bud development. Indeed some of my friends who do not have enough light in their greenhouses do not succeed in flowering *R.gonjiani* at all. The first lot of flowers to open on my *R.gonjiani* were normal, but subsequent ones gradually began to lack pollen. Fruit was set by the normal flowers and the fruits contained between 10 and 50 seeds. Now I have installed a new method of ventilating my greenhouse, by installing two 250 watt extraction fans which are controlled by a thermostat to bring them into operation when the outside temperature is 30°C

.....from H.Middleditch

In the summer months it is remarkable how warm a temperature can be retained within a greenhouse well after sundown. Especially a timber greenhouse with timber staging. In the higher parts of the Andes, away from the moist slopes which receive a rainfall that supports green woodland with green undergrowth, clear skies at night-time allow unimpeded radiation of the heat which was absorbed by the plants and the ground during the daylight hours. As a result, the cacti which grow at high altitudes are commonly exposed to the consequent low overnight temperatures. Depending upon the altitude, this can even get down to freezing point. As the diurnal temperature measurements taken at higher altitudes by R.Kraus (published in K.u.a.S.) indicate clearly, the temperature of both the surface of the ground and of the air temperature next to the ground, can fall significantly, far more than the temperature of the body of the plant. Thus the natural environment for many of the high altitude cacti is a low night time air temperature.

Consequently I would have been inclined to look at venting the warm air out of the greenhouse on a summer evening as one possible approach to the foregoing problem outlined by A.de Barmon. The roof ventilators and external door on my own greenhouse are opened about Easter and closed roughly early October, never being touched in between. But that is still insufficient to clear out the warm air on a midsummer evening. And most of the plants in the greenhouse tend to give the impression that their growth slows down, as the night temperature inside the greenhouse becomes warmer.

ISLAYA LAUII - OR NOT ISLAYA LAUII? From J.Gamesby

Last year I was able to set fruit on my two plants of *Islaya lauii* by hand pollination. Although my two plants were grown together and flowered at the same time this year, neither one set fruit. Perhaps they have a specific pollinator? Last year's fruits took a full year to ripen. In three stages. Firstly a dark brown, leathery, flask shaped fruit. Next, the fruit remained the same shape but changed its colour to a plum colour. The third stage was a pale yellow fruit, but still flask shaped and ribbed. The fruit was found one morning on the gravel covering the top of the plant pot, so it is assumed that it dropped off. Quite definitely no long thin, pink coloured fruit. It measured 12 mm tall (under the flower remains) and 10 mm in diameter.

.....later. Some of the seed from this fruit was sown and produced reasonable germination. The rest of the seed (not a great deal) was conveyed to R.Mottram

.....from R.Mottram.

The seed of *Islaya lauii* received from J.Gamesby was sown and produced quite good germination.

.....from A.de Barmon.

I have had many recent opportunities to make observations on *Eriosyce lauii*. First of all, the flowers are definitely not related to *Islaya* - which have a broad tube covered with bristles and never more than one flower per areole, whereas the flower on *E.lauii* lacks external bristles or hair. The seeds of *E.lauii* are also quite

unique, as they are two to three times larger than the seed of *Islaya*. The seedlings at the very juvenile stage are unlike *Islaya*, as the cotyledons are very small and the seedlings very nearly spherical, unlike those of *Islaya* which are always elongated and bear well developed cotyledons.

A MATTER OF DEEP SIGNIFICANCE From A.W.Craig

It is some year ago now when a number of seeds were made available from the Pern & Watson expedition to the southern Andes, which included two or three sorts of *Tephrocactus*. Having germinated some of this *Tephrocactus* seed, in due course the time came when the seedlings needed to be potted on. It just so happened by chance that a pair of these P & W seedlings (of the same collection number) were put into two different pots. One of them was put into my usual plastic pots which would be a little greater in depth than in diameter, the other being put into a long tom pot. The seedling put into my usual sort of pot did add to its growth each year, but the new segments continued to be of the immature growth form which seems to be a feature of *Tephrocactus* seedlings. It would be about three years before it recently produced new segments of the mature growth form. The companion seedling which went into the long tom pot produced a mature form of segment virtually straight away and has continued to do so since. Not only that, it has really grown well and is now very much the larger clump of the two.

Having observed this difference in growth, I decided last year to put many more of my *Tephrocacti* into long tom pots and there is no doubt at all in my mind that their growth has materially improved since that change was made. Even *T.berteri* has been put into a long tom pot and seems to prefer the treatment, even though none of this group will produce a thickened rootstock. Perhaps it is because the lowest portion of the compost in the pot takes longer to dry out, so that the roots have some moisture to reach down for which was not there previously in the less-deep pots.

For years I have struggled to persuade *Pterocactus* to grow in my normal shape of pots, but they have very seldom made good growth. Having tried one or two *Pterocactus* in longer than normal pots, and found how well they responded, all my *Pterocactus* have also been transferred into long tom pots. They are now growing well and have ceased to be a problem. Even cuttings are being put into long tom pots for rooting down and these seem to get away far better than my previous experience.

The only problem now is to obtain suitable long tom pots as I have used up all my existing stock, which was purchased as a discontinued line

.....from A.Johnston.

Over the course of several years I have been fortunate in obtaining plants and cuttings of *Pterocactus* from various sources, including one or two growers on the Continent who had ex-habitat material in cultivation. In order to be able to propagate these plants, some cuttings have been taken each year and now each sort of *Pterocactus* in my collection has been duplicated.

Some of these cuttings have been rooted down in seed trays, some of them in pots. Apart from any rooting cuttings getting a fairly good soak when the greenhouse is watered, they are also given a regular light spraying between waterings. Spraying will usually be at least once a week, but most often two or three times a week. The idea is to ensure that the compost remains at least just moist.

With the slender stemmed *Pterocactus* it is rather important to remove a good length of stem from the donor plant, a few inches long, as otherwise there is more chance of a short length of slender stem drying up before it roots down. With the thicker or globular stemmed sorts of *Pterocactus*, like *hickenii*, even a half-inch length of stem can be encouraged to root down.

THE MISSING MILLIONS? From R.Ferryman

Going along the main highway from San Juan to Talacasto in 1996, we passed a number of sandy hills adjoining that road. It was here we came across a number of plants of *Pyrrhocactus*. But this habitat is under threat from mining activities and urbanisation - when travelling this same route in 1999, two of the hills where I had previously photographed these plants are no longer there, one of them now supporting an "aerodrome" for go-karting!

Each trip I make seems to bring the same conclusions, that whilst CITES concerns itself with trade in endangered species, the populations of both common and rare plants are being ripped away. It is an offence to remove plants from the wild, yet it is not an offence to bulldoze vast areas of land on which they grow! Native plants in Chile and Argentina are being uprooted by the thousands as vast hectares of olive or vineyards are being planted. I have witnessed this very destruction many times and can list numerous sites where the native flora exists no more. Indeed, one can even obtain financial support to clear areas of supposed desert - and where oh! where is CITES in these plants moment of need? A friend in Chile saved me a score of *Eriosyce* the size of footballs from an area which he cleared to plant vines. He was amazed when I refused the offer, by saying that it would be breaking the law if I took them - he had bulldozed not just these plants but a great many more of them as well as a large number of *Eulychnia* and *Neoporteria* without needing any permission to do so!

CHILEANS WEEKEND 2002

As we go to press, no location has been found in the general Midlands area with both suitable facilities and a weekend availability around the middle of September to the end of October for the year 2002. Any suggestions of a venue which might be suitable would be gratefully received.

ERRATA No.57

No.57, page 21. Following the contribution from P.Hoxey, the paragraph commencing “from H.Middleditch” should have commenced as follows:-

It is suggested by P.Hoxey that the green body colour and more golden spines allow of the ex-De Herdt *Espostoa* sp. Amazonas being regarded as *E.calva*. It is suggested by T.Mace that this De Herdt sp. Amazonas was grown from seed produced in the De Herdt nursery from the “cephalia of habitat top cuttings”. However, the account by Lau in the NCSS Jnl states that, when Lau was near Chanchillo and standing next to *E.calva*, “I was unable to collect top cuttings”. Could the De Herdt plants from which he collected seed of sp. Amazonas have themselves been raised from “the few seeds from the fruits” of *E.calva*, collected by Lau? But this would fail to explain how De Herdt could have been growing a top cutting of *E.sp. Amazonas* = *E.calva* when it was seen and photographed there by G.Charles in the 1970’s.

No.57 p.35. Add to the very end of “The Elusive *Echinopsis tucumanense*”:-

Most of the features and place names referred to above may be found in The Chileans maps of the Lerma valley (No.56) and northern Tucuman

REPORT & ACCOUNTS, CHILEANS NO. 55 TO 57.

Income		
Balance brought forward		6,506.91
Subscriptions		2,689.30
Back numbers		1,175.05
Other publications		472.51
Sale of Plants and seeds		251.60
Donations & sundry income		72.93
Bank Interest		403.80
		11,572.10
		11,572.10
Expenditure		
Printing		2,654.91
Postage, Stationery, etc		2,375.32
Nottingham Weekends Cost, nett	5,986.65	
Less income	5,714.59	
	272.06	272.06
		5,302.29
		5,302.29
Balance carried forward		6,269.81
		11,572.10

At our 1997 Chileans' Weekend, we did not have the full unrestricted use of the Meeting room, due to refurbishment work in the adjacent foyer being behind schedule. Following the submission of an appropriate complaint, the University agreed to make a refund on their charges for that particular Event. The loss on Nottingham Weekends, arising from e.g. costs for visiting speakers, would otherwise have been very considerably more than the figure recorded above.

Over a period of some twenty years the duties of membership secretary have been undertaken by Mrs.G.Craig, who has accommodated a gradually increasing stock of back numbers, compendia, etc., as well as dealing with any enquiries from members or potential members for for publications or information regarding membership. The published issues of any current volume would be extracted from storage, enveloped, addressed, and despatched to new members and to late subscription renewals, as well as fulfilling all orders for compendia and indices. Now that this post has been relinquished, it is a pleasure to be able to place on record the indebtedness of all members for this valued service to The Chileans.

For a similar period of time, each issue of the Chileans, as it was published, has been delivered into the hands of F.Wakefield, who attended to enveloping, addressing, and despatch of a copy to each current member. The residue of each issue was then transported and delivered to the membership secretary. Now that this function is in other hands, it is likewise a pleasure to record the sterling service which has been afforded to The Chileans.

The commitment of considerable time and effort to The Chileans by our Treasurer is not limited purely to subscriptions, as the appreciable income recorded above for sales of back numbers and other publications will indicate. It is also a pleasure to acknowledge the valuable assistance provided by G.Charles in formatting each issue. Without this assistance, together with the many and various forms of support from many individual members, it would be quite impossible to continue publication of this periodical.

There is now little demand for early back numbers of The Chileans; reprinting of odd pages to make up full issues is no longer practical or economical. Any remaining early issues are consequently being disposed of at a purely nominal price.

SLIDE LIBRARY

Several members have helpfully offered to look after slides of their particular interest which are part of the Chileans' Slide Library. These are available for loan to members. Offers to act as caretaker for the slides of any of the other genera in the Slide Library will be welcome. Most of the slides were presented to the library some years ago by many of our then members. Of some genera there are only slides of a very few species. Please see if you can spare any duplicates among your own slides for donation to the library. Only in this way will there be an improvement in the overall coverage, so enhancing the value of the slide library to our members who wish to make use of the loan facility.

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Slide Library Holders and Particular Interests

Austrocactus	A.Johnston, 11 Malvern Rd., 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, Waterside, Leigh WN7 4QQ	
Echinopsis	M.Muse, 32 Fielding Rd., Birstall, Leicester, LE4 3AJ	
\$ Gymnocalycium	S.G.Slack, 50, Sunnyside, Edenthorpe DN3 2PH	graham@slack28.freemove.co.uk
Haageocereus	J.Arnold, Suffolk House, 2, Oak Hill, Washingborough, LN4 1BA	
\$ Islaya	M.Williams, 62, Bickerton Avenue, Higher Bebington L63 5NB	maurice.williams@cwcom.net
\$ Lobivia	J.R.Kirtley, 11, Fire Station Houses, Alnwick NE66 2PB	jim@kirtley7.fsnet.co.uk
\$ Matucana/Borzicactinae	P.Hoxey, 34, Stonehill Road, Great Shelford CB2 5JL	paul@hoxey.com
Neoporteriae	R.M.Ferryman, Nichelia, Leckhampton Hill, Cheltenham GL53 9QJ	roger.ferryman@btinternet.com
\$ Notocactus	P.Moor, 60, Milton Hall Road, Gravesend DA12 1QW	philip.moor@blueyonder.co.uk
Opuntia	R.Crook, 35 Cardinal Close, Worcester Park, Surrey KT4 7EH	
\$ Parodia	J. Brickwood, 48 Haselworth Dr., Gosport, PO12 2UH	john@brickwood.freemove.co.uk
\$ Sulcorebutia	J.Cooke, Orchard End, Chipperfield Road, Bovingdon HP3 0JR	julian@cactusorchard.freemove.co.uk
Tephrocactus	R.K.Hughes, 16 Ashbourne Ave., 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. Number of slides vary from genus to genus from a few to a considerable quantity. Slide quality and species coverage are also very variable. Donations of further slides will always be very welcome.

The Chileans

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