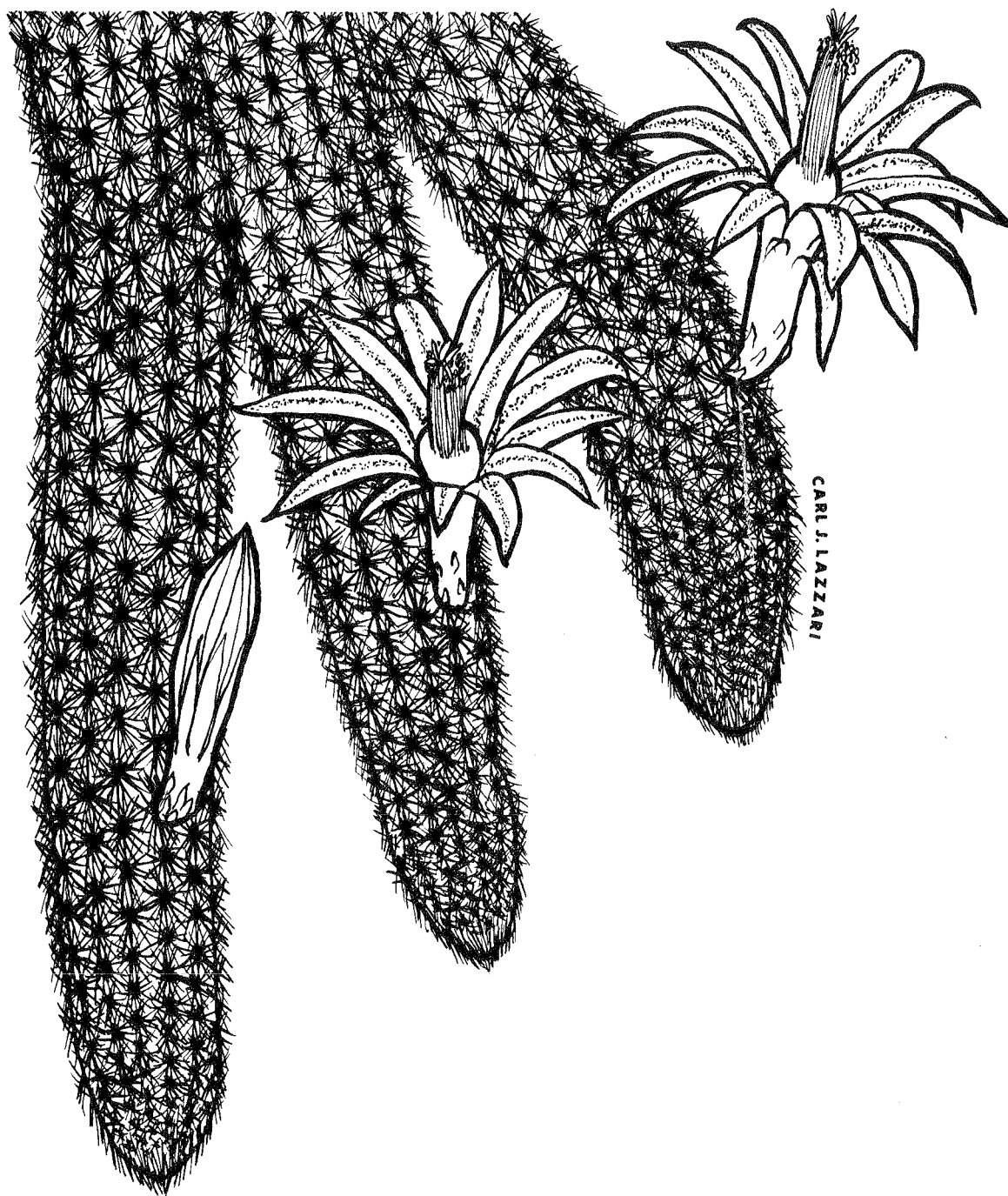


THE CHILEANS '68

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Winterocereus Aureispinus

WINTERIA AUREISPINA RITT. HAS FLOWERED

by Willy Cullmann.

(Translated from "Kakteen und andere Sukkulente", March 1964)

In the K. u. a. S. magazine 1/1962 F. Ritter described an extremely interesting new species, with up to now only one known kind, *Winteria aureispina*.

The double crown of the flower is unique in the family of the Cactaceae. Fortunately, in 1960 the firm of H. Winter was able to offer seeds of this new find, so that this interesting plant can already be found in different collections.

Our member Otto Schulz in Oberauerbach/Pfalz, was the first to succeed to bring this plant to flower. Herr Schulz sent me a flower preserved in alcohol, as well as several colour photos, and gave a report on the experiences in cultivating this plant. It concerns one of the most remarkable and seemingly most worthwhile appearances in the whole field in the world of the cacti.

In 1962 Herr Schulz grafted a 3 cm (1 3/16") cutting of *Winteria aureispina* on to a *Cleistocactus smaragdiflorus* which had a height of 93 cm (36 5/8"). The grafted piece grew in the same year a further 18 cm (7 1/16") and carried 2 flowers in June, 1963, also one in September and November.

The buds were at first a greenish colour, turning yellow and finally salmon-pink. The salmon-pink flowers opened to a width of 4.8 cm (1 7/8"). They lasted 3 days. The inner crown of the flower is a light pink and easily recognizable on the photograph. Up till now the true nature of the inner crown is not yet clear; it is doubtful whether it is a genuine second flower crown, or flower petals of a slightly different shape, rather short, or may be sterile and altered stamens in the upper row.

I have sent the flower - with permission of Herr Schulz - to Prof. Dr. Buxbaum to clear this question and above all, to clear the relationship of position and species as far as possible.

Ritter presumes a certain relationship to *Bolivocereus*. A wider relationship to the *Borzicacti*, which includes *Bolivocereus* seems indeed to exist, because the bud is extraordinarily similar to many of the *Borzicacti* (particularly *Loxanthocereus*).

It seems to me genuinely zygomorphic, not only in its position, though the zygomorphy is only slight and hardly recognizable when the flower is open.

Winteria aureispina is, because of its golden-yellow spines and salmon-pink flowers, a very beautiful plant, but has also proved to be a quick growing plant. As Herr Schulz has proved, one need not wait very long for the plant to flower when cultivated under suitable conditions. This species can be well recommended to the collector.

Herr Schulz achieved his success by growing the plant in a greenhouse in which the summer temperature fluctuates during the day time, according to the weather between 25 to 40 C, with a minimum of 15 C and a maximum of 25 C during the night. The temperatures in winter were 15 to 20 C during the day and 8 to 10 C at night.

I recommend grafting to *Cleistocactus smaragdiflorus* as stock, apparently the flower hormones of this untiring flower-producing plant seem to have a good effect on the grafted plant.

It is worth noting that the young plant grows up over at first and only turns to the hanging position after a certain length has been reached.

WINTERIA AUREISPINA RITTER

by A. F. H. Buining.

(Translated by H. Vriend from 'Succulenta' for February 1965).

This plant is one of the best of the new discoveries of F. Ritter. At the moment it is rather rare, but it is so striking with beautiful golden-yellow spines, that many people will want to own one.

It is evident that in our own climate this plant can flower in a greenhouse very well, too. Two years ago I grafted my plant as a cutting on to *Eriocereus jusbertii*. At a length of about 40 cm it flowered this spring for the first time. But I was very astonished when, after decorating itself with fine salmon-coloured flowers, again and again new buds and flowers formed and now on November 10th, 1964, still two buds are ready to unfold as a last farewell to summer. You may think me lyrical, but you should have seen these beautifully coloured flowers carried on the slender golden-yellow branch. The flowers are 4 - 6 cm. long and more than 5 cm. broad.

Ritter established a new genus for this plant, which occurs exclusively in Bolivia, hanging down rock faces, because of the remarkable inner short extra corolla. This inner short corolla consists of about 10 - 12 petals, standing bundled round the stamens, being 5 - 8 mm long and 3 - 5 mm broad. The corolla proper consists of 15 - 20 petals, opening out widely and being 2.0 - 3.5 cm. long and 2.5 to 5 mm broad.

Ritter advises growing this plant with the stems hanging down, because then it grows and flowers best. My experience is in agreement with this advice.

Also successful in flowering this monotypic genus is N.L. Browne (Cheltenham) who says:- 'I obtained ten seeds from Winter in 1962. Only two germinated, which was a disappointment. The plants were slow starters and the secondary spines did not appear until the plants were four years old and the stems some 9" long. These spines are very keen and the stems should not be stroked the wrong way'. Over the past two years one plant has grown vigorously, the stems being now app. $1\frac{1}{4}$ " dia. and some two feet long. The other plant is rather different, the stems being about $\frac{3}{4}$ " dia. and some 10" long and more upright in habit.

With me, the plants begin to grow in early summer and grow on until the end of October; I find that they are not eager to commence growth in spring and watering then produces no apparent effect; once growing it will take any amount of water. Both plants are in John Innes seed compost with some rough grit added. I keep these plants hanging and find they like being near to the glass - also it is the easiest way of keeping them as otherwise they take up considerable room.

The larger plant flowers continuously from about July until I dry the plant out for the winter. I find that the flowers come from the areoles, but not in rings round the stem. They appear on new growth as well as on the old. I looked at the larger plant this weekend (Jan. 1968) and the main stems are covered with flower buds which will not mature now owing to withholding water.'

In the N.C. & S.S. Journal 19, 3, p. 33, 1964, Gordon Rowley pointed out that the name *Winteria* infringed the International Code for botanical nomenclature as a genus of algae - *Wintera* - already existed. Backeberg lists this plant as *Winterocereus* in his Lexicon and Ritter proposed a revision of this name to *Hildewintera*.

HABITAT OF WINTEROCEREUS AUREISPINUS

This plant emanates from Bolivia, from the eastern flanks of the Andean foothills south of Santa Cruz.

The Rio Piray flows eastwards through Santa Cruz and about 75 miles to the south is the Rio Grande. Between the two rivers is the Sierra de Florida, rising nearly 2,000 feet above the plains to the east. The piedmont is formed of gentle rolling hills, seldom over 100 ft. high, of sand eroded from the Andean foothills and now clothed with vegetation. The Sierra de Florida is formed of alternate beds of shale and sandstone of varying thickness, the sandstone being very resistant to weathering and erosion, the shale being relatively soft in comparison.

Where the strata is relatively horizontal, as occurs near the dome of the Sierra, the slopes are carved into shelf like flats. Where the strata is inclined, dip and scarp slopes are formed by the resistant sandstone and scree slopes by the shale. There are only two youthful valleys crossing the Sierra in its 75 mile length, one of which is formed by the Rio Florida; the rivers cut steep sided valleys through the resistant sandstone.

This sierra is affected, as are most of the Andean foothills, by faulting which runs almost parallel to the line of the sierra. A massive fault has produced a sheer cliff face on the eastern front of the Sierra Florida for about 22 miles north to south from 18° 10' to 18° 35' latitude. A trail runs through Florida and Palisa towards Santa Cruz, parallel to this cliff face and some four or five miles from it.

The trade winds bring heavy summer rains to this locality between November and March, but the mountain flanks are never without moisture for long throughout the rest of the year. In consequence the hills and slopes and the piedmont are fairly well covered with close vegetation. The cacti, naturally, inhabit the well drained or less hospitable parts. Winterocereus is apparently found growing on the almost sheer sandstone cliffs.

It will be evident that the combination of severe topography and close vegetation make exploration very difficult, despite the close proximity of a well-worn trail. This could well explain why this species has only been collected in the wild on one occasion, so far as is known.

H. Middleditch.

NEOPORTERIANAE - from the Robin

After the unfortunate loss of our first Robin, the new Robin opened with a discussion on Chileorebutia. Of this group, E.W. Barnes says 'I am rather interested in 'Chileorebutias' - probably because of their ease of flowering and small size. They lend themselves well to grafting, thus reaching flowering size quite quickly, whence they may be rooted down easily enough. I find most of them to be very easy from seed, giving good germination and steady growth.'

The ease of flowering of 'Chileorebutia' would seem to be agreed by all, but the use of this group or generic name raised protests straight away. D.W. Whiteley outlines the background to this, as follows:-

'Chileorebutia Frič was first used as a nomen nudum for Echinocactus reichei K. Schuman in 1934, according to "Byles, Dictionary of Genera and sub-genera of Cactaceae (1954)", and was not validly published at that original date. An attempt at publication was later made by Frič

in the Dutch Journal 'Succulenta' in 1938. However, in the meantime, a new rule had been introduced into the I.O.B.N. (International Organisation for Botanical Nomenclature) code which required that:- On and from January 1st 1935 new names of recent plants are considered as validly published only when accompanied by a latin diagnosis. This rule also validated publication of new plant names, effectively published 1908 - 1934 inclusive in a modern language. Frič, it seems, cannot have been aware of this change in the rules which occurred between his use of *Chileorebutia* as a nomen nudum and the time he published it, as his 1938 publication was without the then required latin diagnosis.

The problem would have ended there had it not been for Ritter later trying to revive this old name of Frič's in order to sort out his own problems. Ritter started off by following Backeberg's classification of these plants. This was satisfactory until he decided that *Echinocactus jussieui* Monv. (the type species of *Neochilenia/Nichelia*) belonged more correctly in *Horridocactus*. This left Ritter with a problem on his hands as he could not remove the type species of *Neochilenia* and still continue use of the generic name *Neochilenia* for those plants within *Neoporteriae* which he wished to keep separate from *Horridocactus*.

He dealt with this problem by selecting a new type species - *Echinocactus reichei* K. Schuman - for a new genus to cover the 'other *Neochilenias*' i.e. those outside *Neoporteria*, *Horridocactus* and *Pyrrhocactus*. He selected as his new generic name *Chileorebutia* Frič. I believe that Ritter later published this genus, as he realised that Frič's publication was invalid. However, prior to Ritter's publication, Yoshio Ito had published his genus *Thelocephala* based on *Echinocactus reichei* K.Schuman as type species. This means that *Thelocephala* has precedence and must be regarded as the valid generic name.'

Following this, E.W.Putnam says "My first thought is to protest again at the use of the invalid name "*Chileorebutia*". This is not mere tiresome pedantry, as far as I am concerned. The name *Chileorebutia* was an ill-conceived one anyway and although Yoshio Ito produced many superfluous generic names, I think he did us a good turn in coining *Thelocephala* for this group and making it the only valid name (I mean the only valid name if we are to regard these plants as a separate genus, of course)".

However, many an ordinary collector faced by a change of name could well express his feelings in echoing R.Ginn's comment that 'Many of the I.O.B.N. rules are too complicated and I venture to predict that it will be a long time before the ordinary cactophile uses *Thelocephala* instead of *Chileorebutia*. I stick to *Chileorebutia*, in spite of Ito - and of Backeberg, who includes them all in *Neochilenia*'.

Maintaining the proper botanical viewpoint, J.D.Donald observes that "I refrain on principle from referring to the alternative name to *Thelocephala*. It is up to us for use the correct name and so set a good example, even if the I.O.B.N. rules are somewhat complicated at first sight.

If we are to deliberately separate this particular group of plants the difficulty is probably not so much in the collective name but in defining the limits of the group. Of the many new taxa described, how is to be decided what is to be included in *Thelocephala*? I doubt if Ritter's description or the brief Ito diagnosis for *Thelocephala* is good enough to decide unequivocally the border line cases. They cannot be separated easily from *Nichelia* generally, apart from vague statements about small globular bodies and relatively short spines and windborne fruits.

A geographical limit on the other hand is a distinct, valuable, and instructive method of separation. If truly diagnosed, all the *Thelocephala* probably occur in a relatively small area, without much intermixing of the *Nichelia* species, in the region between Freirina and Huasco in the South to just northeast of Totoral south of Copiapo.

Walter Kinze has collected extensively here and he finds much intergrading of species within this group of *Thelocephala*. Each form occurs in very small localities of less than a few hundred square metres and then quite a separate form occurs similarly a few kilometers higher up the dry valleys. Each valley appears to be unique to a particular species with considerable variation within the species population, as localised forms. (A similar situation exists in Peru for *Islaya*).'

We hope to be able to include a map in our next issue which will enable you to locate the habitat referred to by J.D.Donald.

Again on nomenclature, M.Gilbert says that he 'must admit to having got into the habit of using the unmentionable alternative to *Thelocephala* before I knew any better so it still crops of quite frequently in conversation but, as I label everything in the Neoporterianae group *Neoporteria*, the problem does not arise there. I am still not absolutely convinced about putting everything into one genus and frequently feel tempted to regard them as two genera corresponding to D & R's subgenera but am convinced that the other genera included within *Pyrrhocactus* are not worth recognition at all.'

Now after all that we are faced with the problem of how to refer to this genus in our pages in future. We could always follow that well known advertiser and say "Ch..... (you know which'.)' If we were to use only *Thelocephala*, I suspect many readers could be somewhat puzzled, although there is no question at all that that is what we should do. Perhaps if we were to say *Thelocephala* (*Chileorebutia*) it might be best; I must admit my own plants are liable to be found labelled the same way as R.Ginns' for a time yet'.

The variability between plants in one species comes in for comment. On *N.napina*, plants without centrals are generally felt to be typical of the species, but E.W.Barnes has raised one of these plants from Winter's seed which has long, thin, matt black central spines and which presumably must reproduce a habitat form. However, R.Ginns puts forward a logical explanation for this when he observes that Winter sold both habitat collected seed and seed produced in the nursery. This latter could well be hybridised although it continued to be sold as FR numbered seed.

The extent of the variation in plants sold as *N.malleolata* also receives comment and D.W.Whiteley says "I find it very hard to tell *malleolata* and *kraussii* apart, possibly because both have become mixed up in cultivation". The variation in plants in the group as a whole is nicely summed up by J.D.Donald saying "There are in cultivation quite a number of green or brown forms of several species e.g. *fulva*, *malleolata*, *mitis*/*glabrescens*, *aerocarpa*, and *reichei*, to name only a few".

On cultivation, it is suggested that there is a tendency for grafted plants to pup more readily e.g. *N.esmeraldana* and *malleolata*, or grow abnormally columnar. On this last feature, J.D.Donald records having seen grafted *N.reichei* and *duripulpa* over one meter long. These views will be found to confirm those put forward by Dr.Priessnitz reported in *The Chileans* No.3 p.6.

The Neoporterianae robin is now on its second ring in Britain before going off on its overseas ring.

MELOCACTUS

Those of us attending the National Society Cactus Weekend at Grantley Hall this spring were privileged to see a rather remarkable slide taken by W. Oesterreicher in the West Indies, of a *Melocactus* with a cephalium, which had been cut vertically through the growing tip to expose a cross section of the plant.

The information afforded by this slide is reproduced in the illustration Fig. 3, from which one can see that the plant body continues to grow once a cephalium is produced, but the body is of much reduced diameter.

Most of us will be familiar with the accepted form of growth of *Melocactus*, our ideas no doubt conditioned by seeing it oft repeated e.g. "When (the cephalium) begins to form, the plant ceases to grow in size" - Borg, p. 336; "Plants old enough to flower do not continue to grow, but form a woolly head (cephalium) which goes on growing until finally it may become cylindrical" - Buxbaum, *Cactus Culture based on Biology*, p. 189; "With *Melocactus* the plant body stops growing when the cephalium has formed and the only development is the elongation of the cephalium" - G. Frank, *Kakteen und a. Sukkulenten* May 1964 - see the *Chileans* No. 9 p. 6.

All these statements can now be seen to be incorrect and if we compare the growth of a typical cephalium in another genus we can observe basic similarities with the cephalium on *Melocactus*.

The mass of wool in the long side cephalium of an *Epostoa* or *Thrixanthocereus* or *Cephalocereus* makes it difficult to see the precise form of the cephalium, but the mode of growth can be readily observed in a cross section through the plant stem and the cephalium. The first illustration Fig. 1 below is adapted from Backeberg's *Lexicon* and is of *Thrixanthocereus*. The long cephalium hairs can be seen growing out of the base of the trough or gutter which runs down the side of the plant. There are two features which can be observed in this cross section which are common to almost all cephalia; one is clear from the illustration and that is that the root of the long cephalium hairs is closer to the vascular bundle than either the normal areoles or the base of the ribs. The second feature can only be seen by close examination of the cut specimen - and that is the almost complete absence of epidermis at the inner part of the trough or gutter, around the root of the long hairs.

Turning now to the second illustration, this is of *Epostoa* and is from the article on 'What is a cephalium' by F. Buxbaum in *Kakteen und a. S.* for March 1958. Again the same two features will be observed - the depth of the trough or gutter containing the cephalium, approaching quite close to the vascular bundle - indeed it has affected the shape of the vascular bundle - and the absence of epidermis.

At this juncture it may be as well to point out the very obvious fact that can be clearly seen on a plant with a cephalium, that the plant body continues to grow and the cephalium of course elongates with it.

During our 1967 Continental Cactus Tour to the Riviera the party visited Stern's nursery in San Remo, where the private collection contained some very fine specimens of *Vatricania guentheri* (syn. *Cephalocereus guentheri*). Many of the mature branches - some two or three metres high - carried side cephalia, whilst on two stems the cephalia had enveloped the last few inches of the complete growing head of the plant. One would assume that the form of growth demonstrated in the cephalium gutter would then apply to the full circumference of the plant head. Thus the plant body would continue to grow, but at a much reduced diameter, rather in the same way as the cross section of *Melocactus* shown as our third illustration below.

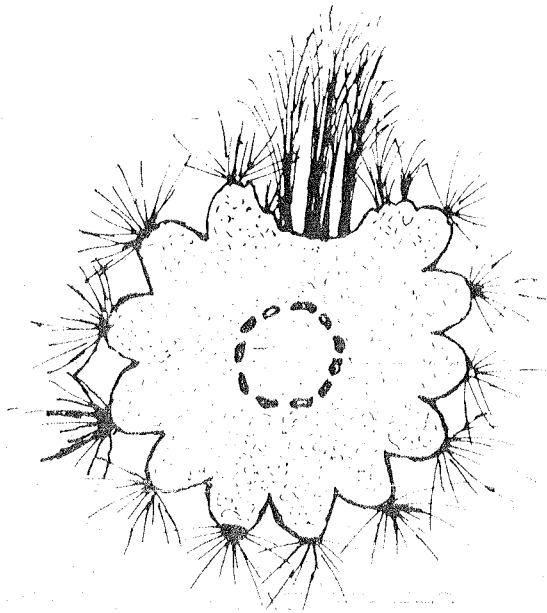


Figure 1
Thrixanthocereus

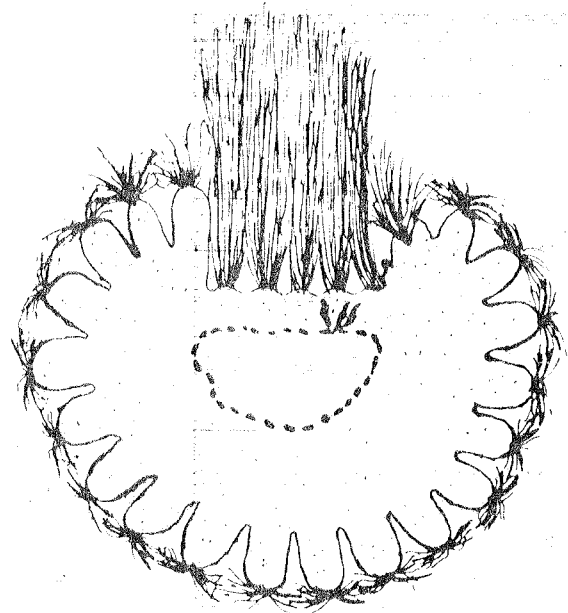


Figure 2
Espostoa

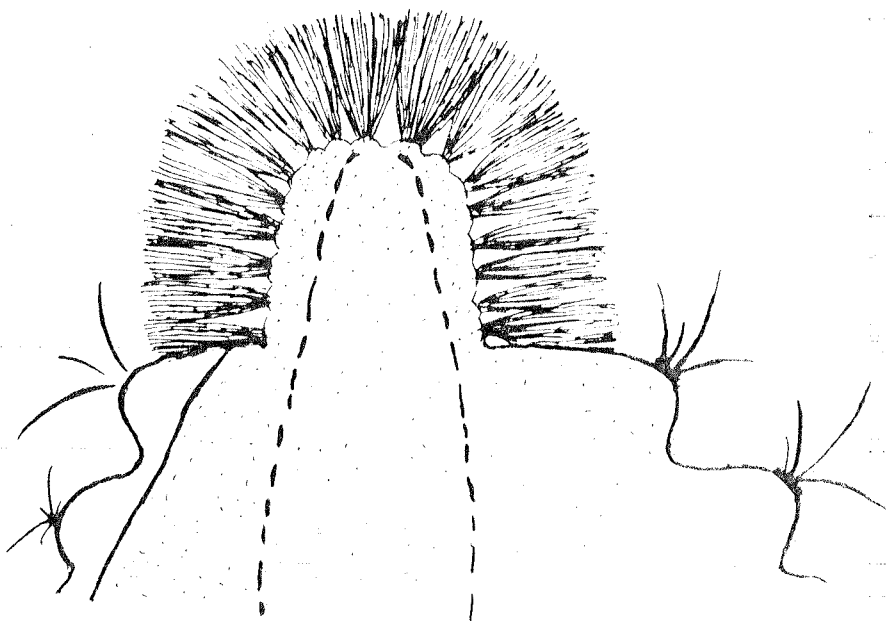


Figure 3
Melocactus

Neither of the full-head cephalia observed on *Vatricania* extended for more than a few inches of the upper end of the stem; this could be because this form of growth had only been developed the year before we saw it; on the other hand, growth may be at a much reduced rate once a full head cephalium exists. An illustration of this species with this form of growth may be found in Backeberg's *Lexicon* p.733 Abb 444. A similar terminal cephalium is formed on *Mitrocereus* (syn. *Backebergia*) *militaris*, also illustrated in the *Lexicon* on p.505 Abb 30.

If anyone has a fifteen or twenty year old *Vatricania* or *Backebergia* with a terminal cephalium, which they feel inclined to cut down the middle to ascertain whether the cephalium is indeed the same as the *Melocactus*, we shall be very pleased to hear about it.

H. Middleditch.

PARODIA

The first species in what is now the genus *Parodia* was described by Weber in 1896 as *Echinocactus microspermus*, coming from North-west Argentina. This plant was described by Britton and Rose as *Hickenia microsperma* in 1922; at the same time they retained under *Echinocactus* the species *Echinocactus chrysacanthion*, described by Dr. Spegazzini in 1898, and also *E. maasii*, described by Heese in 1907.

These three plants were transferred to *Parodia* when Dr. Spegazzini established the genus in 1923. The genus was named after Dr. Domingo Parodi, one of the earliest scientific workers on the flora of Paraguay. *Parodia erythrantha* was added shortly afterwards by Spegazzini; a few more species were added between that time and 1940 and many more in recent years, so that by 1966 some ninety species of *Parodia* were known.

With the exception of a few species, many of which are currently under consideration for transfer to *Notocactus*, almost all *Parodia* are found in the Eastern Andes in Bolivia and Northern Argentina. There they grow mainly on the sandstone front ranges of the Andes, but an examination of quoted habitats suggests that some species may grow in the volcanic debris from the chain of volcanoes forming the high eastern rim of the Andes. In either case, a very well drained locality would be suggested. *Parodia* do not appear to grow in the lowlands of Bolivia or Paraguay or Argentina.

These plants all have yellow, orange or red flowers, with very hairy and bristly flower tubes. The flowers all appear from the crown of the plant, often from a mass of wool and short bristles in the crown of the plant. In cultivation some species produce flowers when the plants are very small - say 1" in diameter. Those plants with somewhat longer, stouter, hooked spines, of which *Parodia maasii* is typical, are perhaps rather shy to flower, even when larger. This may be accounted for to some extent by their growing at generally greater altitudes, indeed species in this group are found at altitudes of up to 4,000 metres (13,500 ft). The flowers on these plants seem to be not quite as large as those on other *Parodias*.

There are two distinct types of seed found in *Parodia* - the very fine, dust-like seed, which is no larger than 0.2 mm in size, of which *P. microsperma* is typical; other species have seed no less than 0.5 mm in size. The *P. microsperma* group is found in Northern Argentina and in Southern Bolivia, whereas the larger seed types are found mainly in Bolivia, the two overlapping geographically. The largest seeds in this latter section are found in the same long hooked-spine group of which *P. maasii* is typical.

Buxbaum, in 'Die Kakteen' for September 1966, gives five categories of seed for *Parodia* and quotes some species in each category or series, as follows:-

Series Parodia	setifera, microsperma, erythrantha, nivosa, rigidispina. (smallest seeds)
Series Macranthae	maasii (largest seeds)
Series Oblongispermae	comarapana, tuberculata. (large seeds)
Series Brachyspermae	chrysacanthion, schuetzena, mairanana, schwebsiana. (large seeds)
Series Obtextosperma	ayopayana (large seeds).

The value of this classification, if applied to all species of Parodia, would be of most value to those collectors wishing to grow Parodia from seed who wished to avoid the species which are more difficult to raise from seed. Buxbaum, in his book 'Cactus culture based on Biology', says that the small-seed Parodias i.e. the P. microsperma type, are difficult to raise from seed, as the very tiny seedlings grow so slowly. Based on their own experience in growing from seed, this view is also held by H. Ewald and D. Angus. E. W. Barnes comments that "I haven't a lot of trouble with Parodia seed, but it is as well to bear in mind that as a lot of this is so very fine, germination can have taken place but the seedlings are so small that they lie between the 'pebbles' of a gritty seed compost and are therefore unobserved - rather like the seedlings of Blossfeldias. If some of the seed compost is carefully moved the seedlings may be exposed. I think that overhead watering washes the seed down in to the compost before germination, that being the reason they are hidden - coupled with the fact that the dust-like Parodia seed would naturally fall into any crevices in the compost.

I favour this method of raising Parodia and utilise a very open and gritty compost for seed sowing. A seed which falls down between the 'pebbles' of such a compost is in an ideal micro-climate for germination which is humid and well shaded. Some of the seed is washed too far in to the compost and is lost. But if seed is sown on a damp flannel, almost 100% can be had - but this method is not suited to raising seedlings as they do not grow on very well. But if they are to be raised for seedling grafting on epiphytes, this method is worth a try as the seedlings will keep healthy long enough for this. They do seem to be hard to graft as very tiny seedlings on to epiphytes, not because they are hard to handle but, I think, because of their poor affinity with the stocks.

On their own roots, the growth of many Parodia seedlings is very slow, except in the large seed types.'

D. Angus comments "Parodia seed sown fresh from the seed pods off my own plants seems to germinate much better than purchased seed - this is not uncommon in other genera, but is particularly noticeable in Parodia. I have sown seed of P. mutabilis, mairanana, and chrysacanthion taken straight from my own plants and P. aurispina likewise from a plant in H. Middleditch's collection; all these have germinated well".

In the German Parodia Robin, Frau Fretzdorff mentioned that "seed from cultivated plants is commonly better germinating than imported seed, which is not surprising since seed from cultivated plants is fresher. But at the same time it is seldom above suspicion. An acquaintance of mine once had the opportunity to see how commercial cactus seed was produced. The proprietress of a well-known nursery used for this purpose one paint brush for the whole greenhouse, without cleaning it. "What is finally produced by this is undoubtedly a cross between an elephant and a ring snake".

(Well, now I know what that peculiar thing is that keeps eyeing me from the corner of the greenhouse, from amongst the Parodias! - H.M.)

Our next Journal will include extracts from our English Parodia Robin, now in New Zealand. The leader of the Parodia Robin (see final page) would be pleased to hear from anyone wishing to participate in this Robin.

SOUTH AMERICAN SAFARI

Markus & Rausch.

(Based upon a lecture given to the Austrian Cactus Society in September 1966 and translated from the G.O.K. Newsletter)

by E.W. Bentley

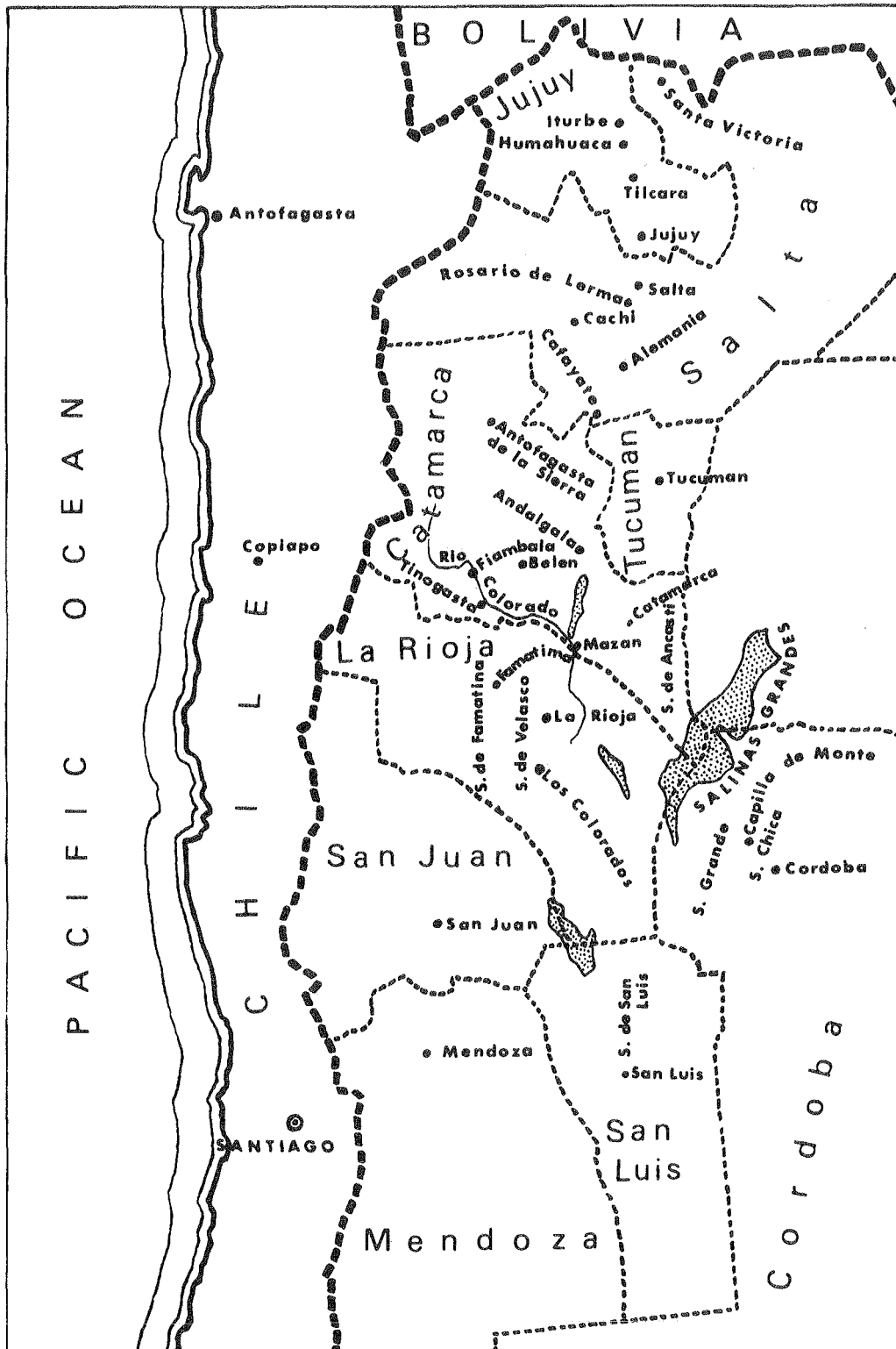
An extensive research and collecting expedition was undertaken in 1965 in Argentina by Ing. Ernst Markus in company with Herr Walter Rausch. This journey went northwards and on to Bolivia. It served no commercial purpose but was solely for studying cactus populations in their natural habitat - the distribution of single species and the establishment of the species status of plants that have been carelessly described in recent years and decades.

The two men were ten months on the trip, covered about 2,000 Km. - mostly on foot - and were able to find about 200 different (good) species. They observed that only a few species occurred in pure stands (e.g. the *Tephrocacti*). In by far the greater number of species scarcely one plant was the same as its neighbour. Further, it was found that a particular locality rarely yielded several species of the same genus. Perhaps *Gymnocalycium baldianum* and *asterium* frequently occur together, but bloom at different times, so that hybridisation scarcely happens in nature.

There was great variation within a species, especially in *G. baldianum* (this was illustrated by slides). There was *G. baldianum* with the usual blood-red flower colour, then again in a paler red, some with a pink flower margin and finally even white flowered plants (*G. baldianum* v. *albiflorum*, collection No. 141). The perianth leaves are on one occasion lancet shaped and splayed out, on another broad and rounded. These were differences in flower colour and form which, without a knowledge of the population in its habitat, could easily lead to the setting up of varieties or even species. Ing. Markus repeatedly condemned the frequent occurrence in the past and still now of making new descriptions of 'species' by means of a single specimen from a commercial importer which produces a jumble of names but which on later investigation in the natural habitat proves to be completely valueless and false.

After the sea journey via Tenerife they set foot on Brazilian soil beneath the spectacular sugar-loaf mount in Rio de Janeiro. They then travelled on to Buenos Aires and thence to Cordoba. In the Sierra Chica there occurred *Gymnocalycium multiflorum* (or *monvillei*?) as large specimens, *Notocactus mammulosus*, as well as large expanses of *Gymnocalycium mostii* in which glowed Verbenas in their varied fiery colours. In yet other biotypes *G. lafaldense* and the bigger but closely related *G. proliferum*. *Lafaldense* has round fruits and *proliferum* elongated ones. Two cristates of *lafaldense* were also found. Cristate formation is very rare but the frequency varies with different species.

Accompanying an attractive passiflora species was *Gymnocalycium capillaense*. On then to Capilla del Monte where *G. andreae* should have occurred. All the plants found, however, turned out to be *G. bruchii*. They moved over to the Sierra Grande where *G. andreae* was found sparingly. The fine sulphur-yellow flowers were now bigger - now smaller; the variety *grandiflorum* clearly comes under the species as a form with bigger flowers. Via El Condor with stands of *Gymnocalycium multiflorum* with interesting pink flowers to visit Nono, the classical locality of *Gymnocalycium vatteri*. Two days of zealous searching revealed only *G. proliferum* and very fine *Acanthocalycium violaceum*. *G. vatteri* was first found on the third day, but among some thousand plants only three were found in accordance with the description, namely only one spine per areole. All other plants had two and three spines. According to the description young plants should have three spines at first and then later on, one only. In the locality, however, young plants had only one spine. The number of spines is not therefore diagnostic.



NORTHWEST ARGENTINA



CARL J. LAZZARI

In the Sierra San Luis, *Lobivia leucomella* was sought, but in the immense area extending 150 Km. to the Sierra Grande, was found only after 14 days. There were specimens with very long twisted spines, then again with shorter ones, up to the usual short soft bristles which bestow on the plant the appearance of short-clipped fur. In the terrible thorn-scrub of these wide plains occurred *Echinopsis leucantha* next to *tephrocacti*, in the shade of bushes. In an area of 500 metres square was the locality of *Gymnocalycium ochoterenai*. Black and strongly spined plants on the rocks and weaker and lighter spined in the shade of shrubs and in the sand. With irresponsibility a heap of species could be set up from these plants.

On the road to the town of San Luis a huge flood barred the way, but only for three hours - as the local inhabitants forecast. After three hours it had become an easily traversable stream. In the Sierra of San Luis were *Gymnocalyciums* - perhaps *parvulum* - and *Lobivia leucomella*. They wandered over La Rioja and came to Famatima. In the neighbourhood of this lonely spot on the river is a cactus paradise. It is the locality of *Echinocactus reicheii* or *pseudoreichii* (*Neochilenia*, *Chileorebutia*), which was actually found after troublesome searches. High up on the mountains above Famatima occurred *Lobivia famatimensis*, *Gymnocalycium saglionis*, *Trichocereus terscheckii*, *Denmoza* and *Helianthocereus huascha* next to *echinopsis* and *opuntias*. Two species of *Denmoza* have been described; *erythrocephala* and *rhodacantha*. Both descriptions concern plants from the same locality!

Helianthocereus huascha varies greatly and produces flowers and ripe seed at the same time. The flower colour varies from pure red to pale pink, violet to orange and yellow, almost white. A rarity found was a cristate of *G. saglionis*, 50 cm. in diameter. Noteworthy was a *Gymnocalycium* sp. quite ensheathed in a thick tangled spine coat.

On the neighbouring Sierra Velasco which they visited, *Neochilenia* or *Chileorebutia reicheii* occurred at a height of 3,200 m. (app. 10,000 ft) far away from the Chilean border, and the very rare (for the locality) *Neochilenia andraeana* - also a *Soehrensia* species. From the mountains which towered up to 6,000 m, down again to the oppressive heat of La Rioja was found, in the neighbourhood of charming *Portulak-Roschen*, *Setiechinopsis mirabilis* and *Pterocactus*. In Los Colorados was a bizarre desert landscape of bright red rocks where were found *Gymnocalycium asterium*, *Parodia catamarcensis* and - above a height of 2,300 m. - white flowering *G. baldianum*, *Trichocereus terscheckii*, *Echinopsis aurea* v. *falla* together with the afore-mentioned species.

Further along the road to Mazan the sand was so hot that it could not be traversed until the late afternoon hours. There occurred here *Echinopsis leucantha* and *Gymnocalycium mazanense* with enormous tap roots. Up in the heights of Andalgala were found *Acanthocalycium glaucum* and four *Gymno. cristates*, but also a surprising first new discovery, a *Lobivia* from the *Stilowiana* group. Also there were *Denmozas* and *Soehrensia ingens* or *grandis*. Above them occurred stony woodlands with huge *Trichocereus pasacana*, *Acanthocalycium glaucum* v. *thionanthum* (very variable!) and near the descent to Catamarca, *Lobivia aurea* v. *shaferi*. The Sierra de Ancasti, visited next, yielded *G. baldianum* and *G. asterium*, white and black-spined *Cleistocactus*, a *Parodia* with straight spines, *Echinopsis aurea* with a green throat and *Rhipsalis*.

Then they went far to the north, to Salta, where a base camp was set up from which excursions were made into the mighty ravine-studded alpine world. The mountains and gullies gave up a *Lobivia* not yet identified but standing near *drijveriana*, a *Gymnocalycium* from the *marsoneri* group and in a frequently flooded stream bed *Pseudolobivia ancistrophora*, *Pygmaeolobivia rubroviridis*, *Lobivia kuenrichii* - 4 cm. plants with flowers of 9 cm. in diameter, also *Tephrocacti*. In the vicinity of the impressive Cachi mountains they found *Parodia rauschii*, tangle spined *Gymnocalycium spegazzinii*, and *Tephrocactus weberii*. In vertical rock walls grew *Parodia kilianana*, which until then had not been brought into cultivation. On the Cochibamba were found *Lobivia drijveriana* with yellow and orange flowers, also *Soehrensia smrziana* which

occurred infrequently but in large stands. On leaving Salta, which was damp and misty the whole year round, they came to Tucuman, seeing *Lobivia schreiteri* and *L.stilowiana* and *Soehrensia bruchii*. Finally they crossed Santa Victoria with the finding of a white flowering *Pseudolobivia kermesiana*.

The immense area of the mountainous north of Argentina has been explored only along the railways and the Pan-American Highway. What the remote sierras and the mighty mountains shelter in the way of cactus treasures will only be known if investigators are able to advance into these virgin regions.

GYMNOCALYCIUM PROBLEMS FROM THE SPECIALIST'S VIEWPOINT

by Dr. Bohumil Schutz

(Translated by E.W.Bentley from the G.O.K. Newsletter)

This year (1964) was the 120th year since the name of our beloved genus *Gymnocalycium* was published. That the name has remained valid for more than 100 years and since the conception of the genus has not altered, shows that it represents a very characteristic group of cacti.

The boundary of the genus *Gymnocalycium* is precise and there exist no plants that appear to be transitional with another genus. Nor are there any species whose presence in the genus is in doubt. In cactus systematics this is an exceptional situation. Recall how many moot questions must be answered in other genera and what difficulties there are about the correct determination of species in certain genera. While continual changes occur in the conception of the genus in *Mammillaria*, *Coryphantha*, *Echinopsis*, *Lobivia*, *Horridocactus*, *Neoporteria*, *Neochilenia*, etc., that of *Gymnocalycium* is completely unaltered.

The boundary of this genus is exact and clear. The identification of a plant as a *Gymnocalycium* produces no difficulties. The naked flowers are a completely reliable character while the habit of growth is characteristic and only sporadically does it lead to an incorrect attribution to this genus. Thus at one time imports arrived under the designation '*Echinocactus centeterius*'. The habit indicated *Echinocactus* characters, but when the buds appeared there was no doubt that it was a *Gymnocalycium*. It was a new species which was described as *G.valnicekianum*. A short while ago another case occurred, *G.horridispinum* Frank was originally taken for a *Pyrrhocactus*.

P.C.Hutchinson in 1957 tried to include *Weingartia* in *Gymnocalycium*. No gymno specialist has accepted this view. The whole character of the genus *Weingartia* is completely different from *Gymnocalycium*. Backeberg refers in this connection, certainly correctly, to the divergent structure of the fruit. In the same way the view that *Brachycalycium* should be separated off as a genus of its own found no echo amongst the specialists. Until recently it was difficult to get a clear idea of this genus, for the diagnosis was extraordinarily short: '*Globosum breviusculi, quasiatubulati, campanulati, glaberrimi; stylus brevissimus, squamae cariosemarginatae; mammae ab ineunte sulcatae*'. In German: 'Single, (not sprouting), a fairly big - becoming spherical - body; flowers as good as tubeless, campanulate and robust (the German word here is not a translation of 'glaberrimi - E.W.B.), with a very short style, broad, dry-edged; on older tubercles a furrow-like areole cleft' (Diagnosis and description in the 1941 D.K.G. Year Book 'Cactaceae').

This gives only two differentiating characters from the genus *Gymnocalycium* - namely an incision above the areoles and the flower almost without a tube. Now imports have arrived and it is possible to compare the description with these and come to a sound conclusion. The plants have indeed a cleft over the areole similar to that in *Coryphantha* or *Thelocactus*, but a

similar cleft can also be observed in the true *G. saglione*. Naturally we must have full-grown plants for this. I have established that other *Gymnocalycium*s also have a similar cleft, namely *monvillei*, *multiflorum*, and *gibbosum*. Also the short flower tube is not only confined to *G. tilcareense*. *G. saglione* has the same structure. Short tubes are also found in plants of the *microsemineae* series, in the group *hybopleura* and in others. I deduce from this that these plants should be known as *Gymnocalycium tilcareense* (Bkbg) Schutz comb. nova.

I suppose that not once has the attempt to include the genus *Neowerdermannia* in *Gymnocalycium* succeeded. If considered anatomically, the fact that the fruit arises not within the body but in a kind of cavity which is part of the skin, gives us a significant characteristic which provides the justification for the genus *Neowerdermannia*.

The number of species in the genus *Gymnocalycium* mounts steadily and will soon reach one hundred. The division of the genus into groups using the seed form facilitates the classification of the species considerably. Acquiring seeds presents no difficulty with the *Gymnocalycium*s. A further step was the analysis of groups related to each other. The knowledge of the discovery site is of enormous importance to the solution of various problems. The 'place of discovery' map very carefully worked out by Zdenek Andrejs, Brunn, will be of significant help here.

Comparatively little attention has been paid hitherto to the form of the flower and the fruit. Dr. Carlos Spegazzini commented already in the year 1925 on the differences in the structure of the flowers. This professional botanist even put together a key exclusively based on differences of the flowers. I might here stress particularly that Spegazzini paid attention to two flower types. In the first type the stamens are arranged in a single continuous row; in the second type in two rows, whereby one row is round the pistil, the other somewhat higher and between both is a definite ring structure without stamens. It will be necessary to scrutinize the flowers of all species in this respect.

Comments on Dr. Schutz's article from E.W. Putnam.

In the few years that have passed since this article appeared in the *G.O.K. Newsletter* there have been a number of startling discoveries among the cacti of South America. The precise boundaries of some genera (notably *Parodia*) have been brought in question, but the genus *Gymnocalycium* still remains inviolate in this respect. The allegedly "gymnocalycioid" *Notocacti* recently found are seen to have only superficial resemblances to *Gymnocalycium*s and the boundary of the genus *Gymnocalycium* remains "exact and clear" as Dr. Schutz described it.

P.C. Hutchison's placing of *Weingartia* in *Gymnocalycium* has still found no favour with the majority of specialists and, on the other hand, Backeberg's *Brachycalycium* is equally rejected and survives now mainly only as a name in nurserymen's lists.

Dr. Schutz is a leading worker in the classifying of *Gymnocalycium*s by their seed-types, of which five, or possibly six, are recognised (the classification is still under discussion). He and Herr Hans Till have published a number of useful articles on this subject which would be of great interest to us here if they could be translated for 'The Chileans'. (it is translated and will appear in a future issue - H.M.)

A problem as yet hardly faced by *Gymnocalycium* specialists is that of nomenclature. There seems little doubt that a number of "species" do not really merit specific rank at all. As with all the *Cactaceae*, the proliferation of specific names for plants which are no more than minor variants of other species has led to a devaluation of the meaning of the word "species".

..... from R.Ginns.

It would be nice to think that the boundaries of *Gymnocalycium* remain precise and clear, but do they? Only the other day I was present at a meeting where there was a long argument as to whether *Weingartia* could be exhibited in classes for *Gymnocalyciums*. A prominent member of the N.C.S.S. said 'Yes'. What, too, is the position of *Neowerdermannia*? To me they seem distinct but other people wish to merge them with *Gymnos*.

One hears much speculation about certain newly found *Notocacti* being intermediate between the two genera and acting as link plants. I don't agree. Protagonists of this theory seem never to have heard of 'parallel development'. At any rate there is considerable disagreement as to what plants are included in the genus.

I agree that there seems no justification for *Brachycalycium*. It always seemed strange to me that a plant, formerly considered to be a mere variety of *G.saglione*, should form the type of a new genus. It goes to show the divergence of views on generic and specific characters among taxonomists.

I don't look forward with any enthusiasm to basing species on seed structure. Must we wait for a plant to produce seeds and then examine them with a microscope before we can say what species it is? We might have to wait for a long time. Still less do I like basing species on habitat as is done with *G.baldianum*. If this is done only habitat collected plants can be named with any degree of certainty. With *G.baldianum*, flower colour, body shape and colour and spination are all variable so what is the constant factor by which the plant can be named, apart from habitat?

It seems to me that some of the logical thinking applied in chemistry and physics is needed in taxonomy.

Perhaps Mr.Putnam can tell us just what a 'species' is? Surely different plants that come true from seed are worthy of different names, otherwise the name has no meaning.

COPIAPOA

An introductory article on *Copiapoa* appeared in *The Chileans* No.9 and we have received several interesting comments on these plants following this article. We might introduce these by referring to Backeberg's *Kakteen Lexicon*, where he describes *Copiapoa* as "One of the most interesting spherical cactus genera, with two different development forms: some species spherical, sprouting or clump building: others when older cereoid species up to 1 meter high, also sprouting. While the latter flower first when large specimens, the sphericals sometimes show flowers when small, some when fairly large.

'There are however fairly dwarf species, partly one finds with thickened roots. Body and spine colour are very variable. There are mealy-white plants, others are olive-green, others again grey or green, of various shades, more or less brownish all over or quite brown. The spination likewise exhibits every imaginable shade from black through brown to white, sometimes differing in the same species, as also in number, length and position of spines'.

'Sometimes, e.g. in *C.krainziana*, very different forms come from seed, also varying strongly in spine character. It also happens that plants very strongly grey in habitat have pure green bodies as seedling plants in cultivation. (This can be seen in our slides - H.M.) The descriptions can therefore only be of the chief forms.

'The flowers are moderately large to considerable, more or less yellow or yellowish with only one more or less red-flowering exception; a number of species have fragrant flowers; all are short-tubed. The fruits split mostly on top, then open and the ants carry off the seeds with the fleshy seed-strings.'

In concurrence with these views on variability are the comments from E.W. Bentley - "Many Copiapos seem to change very much with age - though slowly - and some of them seem to respond very differently at first to conditions of cultivation. I would tend to think that this necessitates one being rather more evasive in describing the characteristics of a particular species.

"For example, all my *C. montana*'s have tubercles so flat that, were they not in line, with a shallow but distinct furrow between rows, the ribs would be almost non-existent. My *C. echinoides* and *C. grandiflora* are too young to forecast what kind of ribs they will have - but they are not at all shallow, so far. The spines of my small, grafted *C. cinerascens* are dark brown at first but very soon become whitish grey. Almost every Copiapoa I have has curved spines."

A. C. lembckeii in the collection of F. J. Warne (Newcastle) has thrown out a new offset from near the base during 1967. The parent plant is imported, ex Uhlig, about 6" high and some 3" body diameter, very corky indeed for almost half its height. The new offset has burst its way out from under the epidermis, making a vertical tear in the epidermis in the process, the torn edges of the epidermis still embracing the offset. It appears as if the offset has been forced fully formed out of the plant body rather than growing from an areole.

On a much smaller and younger plant, A.W. Craig has observed an offset forming on his *C. hypogea*, a grafted plant ex Uebelmann, about 3.5 cms. dia. over the body. In late February this year four new offsets were produced near the base, one being nearly 1 cm. in diameter; these offsets were fully formed with areoles and spines when they burst through the epidermis of the parent plant. It is assumed that these offsets formed and grew out of the plant during the winter months, which is the normal growing season for the plant in habitat.

Also commenting on Copiapoa, J.D. Donald says "The distinction between species is most marked in their juvenile seedling and young adult forms and home grown plants are much easier to identify than hoary old imports.

"Copiapos seem to thrive on a cool dampish winter, but they object to a very hot, dry summer strangely, in cultivation. The young growth of late winter and early spring can be severely scorched by hot direct sunshine through glass.

"*C. humilis* forms were re-collected by both Paul Hutchinson and Friedrich Ritter in the region north of Copiapo - both are Dr. Phillipi's plants but differ slightly from each other in body form and spination.

"The dwarf Copiapos e.g. *C. humilis*, *tenuissima*, *mollicula*, etc. are quite distinct from the larger growing species. They flower more easily and offset far more profusely and have softer bodies. With the larger species, some patience is needed before flowering occurs, particularly with imported plants, yet on the other hand quite small seedlings flower readily while their imported bretheren of the same species refuse to do so e.g. *C. haseltoniana*, *C. wagenknechtii* and *C. montana*."

On this last point W.F. Maddams says 'species such as *C. montana* and *C. hypogea* flower when quite young. My plant of the former, which I estimate is five or six years old, had two flowers last year and I would not be at all surprised if my still smaller plant of the latter obliged this year (1968)."

Flowers have been obtained on 2½ to 3 inch high plants of *C. humilis* by T. Lavender and on *C. humilis* and *montana* by H. Ewald.

A rather interesting point is raised by R. Ginns who says "The article on Copiapoa does not mention that most Copiapoas have tuberous or tap roots. A point worth remembering is that grafted plants, if taken off the graft and rooted, might first form fibrous roots before the tap root developed."

This last comment leads to an interesting thought; is this really the cause of the difference between Backeberg's Copiapoa coquimbana ('fibrous root' - Lexicon) and his pseudocoquimbana (long thin, carrot like root, narrowed at the top - Lexicon).

Perusal of 'Succulenta', of Britton and Rose, of the G.O.K. Newsletter, and of Backeberg's Lexicon, yields the following information on thickened roots:-

- C. coquimbana - Fibrous root (Lexicon); turnip-like (Br. & R.)
- coquimbana v. wagenknechtii - short cylindrical
- echinata - root carrot-like, with neck
- hypogea - thick and tuberous, can be much larger than plant body
- longistaminea - short carrot-like
- megarhiza - turnip like root
- mollicula - long thick tap root narrowed on top
- pendulina - tuberous
- pseudocoquimbana, long, thick, carrot-like, narrowed at top
- rubriflora - thick, carrot-like, narrowed at the neck
- rupestris - tuberous
- tenuissima - long thick tap root
- tortalensis - large tuberous root

Referring back to the comment above from J.D. Donald about Copiapoa preferring a cool damp winter, Mrs V. Frost has previously observed that her Copiapoa grew splendidly when they had to spend the winter months tucked amongst her epiphytes and perforce received the same regularly spraying as the epiphytes. This probably produced a passable imitation of their winter garua climate to which they naturally responded.

We should be pleased to have any further views or comments on Copiapoa. Slides would be especially welcome since illustrations of these plants are not exactly prolific. Our Robin on Copiapoa has now returned from its trip to New Zealand and is on its second British ring. The Robin leader (see last page) would be pleased to hear from anyone else desirous of participating in this Robin.

SEED GERMINATION by D.J. Lewis

As raising plants from seed becomes even more popular, a simple explanation of the various parts of the seed and of germinating seedlings may prove helpful.

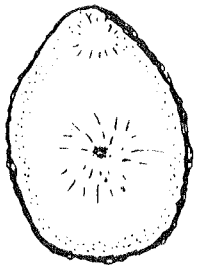
Figure A. This is a side view of Notocactus ottonis seed. It is typical of a large number of the same group of plants as well as some Malacocarpus (Wigginsia) and Gymnocalyciums. The embryo seed is enclosed in a hard impervious case with the basal surface lighter in colour and of a more spongy texture.

Figure B. The basal view showing the lighter-coloured spongy area which is called the hilum. This surface was once connected to the inner wall of the ovary, the actual connecting strand being called the funicle. Towards the centre of the hilum there is a minute opening. This is called the micropyle and it is through this opening that the first moisture reaches the dormant embryo.

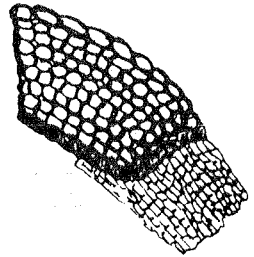
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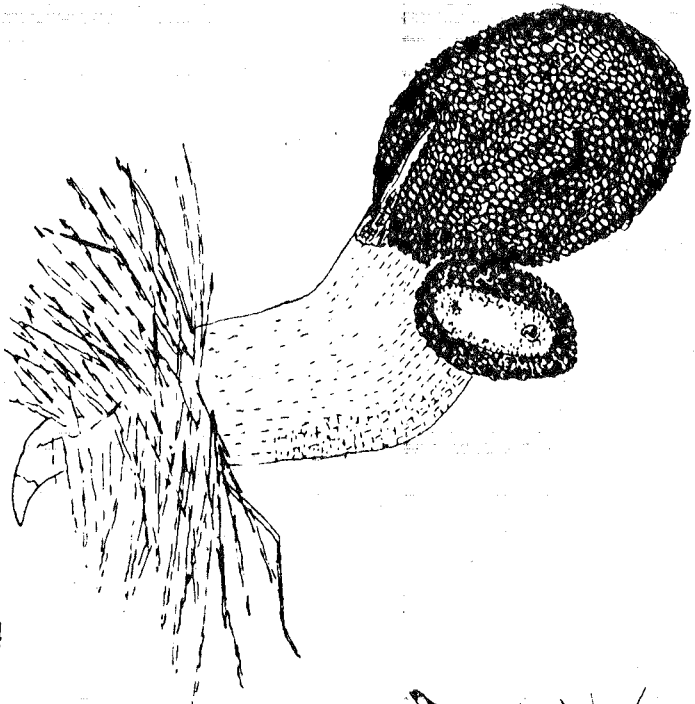
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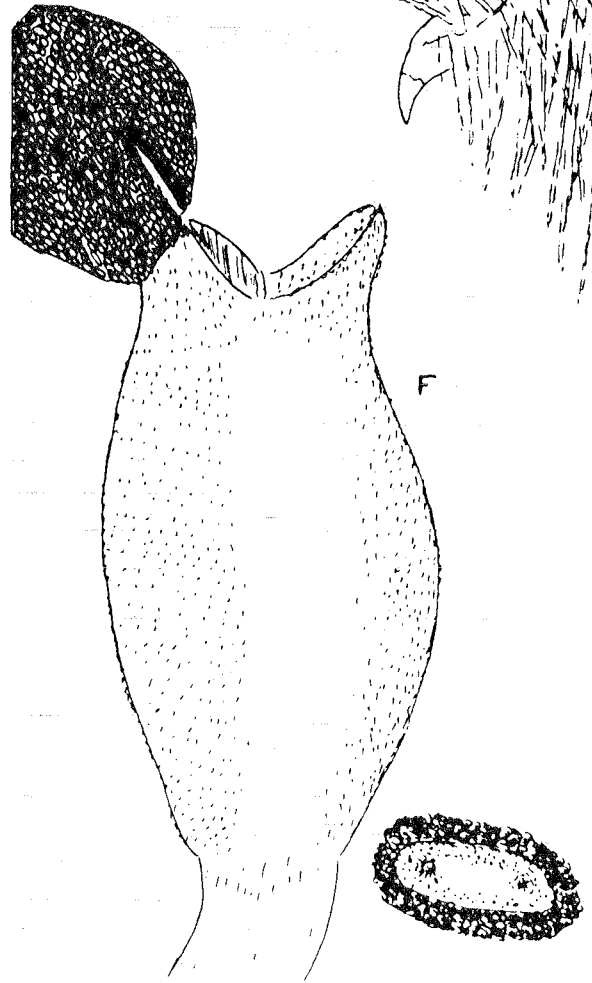
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E



F



G

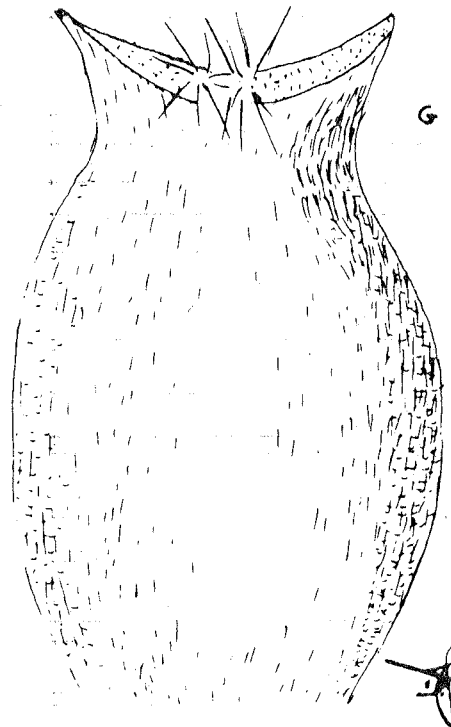


Figure C. The two outer layers of the seed coat are the testa and the tegma. The testa consists of hard, usually well rounded cells often laid down in lines. The cell contains resins giving the dark brown to black colouration and also the impervious nature to the testa. The tegma is usually light brown and acts as a lining to contain the embryo. On germination the tegma often slides partially out of the testa with the seedling and may remain as a light brown patch until it is eventually discarded.

Figure D. This is an Echinocereus seedling. Once moisture enters the seed, the embryo expands. Each cell takes in water prior to division and this causes the seed coat to burst at its weakest part. The first break is behind the hilum where the testa cells seem to be thin and small. Sometimes - but not always - the seed also splits up a row of testa cells.

Figure E. The seed has now germinated, the radicle (the elementary root) has emerged from the seed and the root tip is starting to point downwards into the growing medium. The root hairs are gathering nutrients and moisture to supply the hundreds of multiplying cells. The old seed case is being pushed off by the developing cotyledons and the hilum is about to drop away.

Figure F. The body of the seedling is now anchored by the developing root. The seed case is being discarded and the green colouration of the stem is increasing. The two cotyledons are now visible and form the only two leaves most cacti have in their lifetime.

Figure G. The plant body fattens and becomes a deeper green, even brownish green. Shortly the first areoles are produced at the growing point and are laid down in a spiral formation so establishing the characteristic shape of a cactus plant.

A close study of the seed can aid the classification of cacti as seed shape, colour, and seed coat texture all tend to differ slightly - more particularly as between one genus and another. Another aid to identification is the size, shape and position of the hilum. This varies so much that it is probably the most important clue one has in seed identification.

In classifying cacti (or any other plants for that matter) all characteristics should be taken into account - body and spine habit, roots, flowers, fruit and seeds, without either undue emphasis or neglect of any one aspect. The absence of this balance in the formulation of his classification is the prime reason for many authorities non-acceptance of the Backeberg system of classification.

Very little information has appeared in English regarding seed characteristics of South American cacti; we should be very pleased to hear from any of our readers who have been able to examine any seed from South American cacti under the microscope - H.M.

1969 CONTINENTAL CACTUS TOUR

Following our tour to the Riviera in 1967, requests have been received for a further Tour for 1969. It is suggested that a Tour might be arranged to take in Heidelberg, Stuttgart, Linz, Prague and Dresden, lasting fifteen days, to take place in the latter half of June 1969.

Provisional estimates would suggest a cost of about £56 per head (London back to London) based on taking an English coach across the Channel and stopping the first and last Saturday nights across the Channel.

The estimated cost will, of course, cover transport, accommodation and three meals per day.

For further information or to make a provisional booking, write to:-

H. Middleditch, 5 Lyons Avenue, Hetton le Hole, Co. Durham.

SEED RAISING

..... from R. Carter.

I read the comments by E.B. Thomson on seed raising (The Chileans No.8 p.17) and found them very interesting. My own green house is heated by electrical tubular heaters thermostatically controlled at 45°F, so I have to have a separate propagator for my seeds.

I agree that seeds should be sown in January or early February if possible, but why only keep them growing for twelve months? In the past I have kept my seedlings growing for two years without any apparent detriment. I agree that placing the pots in polythene bags is a big advantage, keeping the soil uniformly moist as it does. What I would like to know is the percentage germination of seed and at what temperature.

In my own case I had a temperature of 130°F when my thermostat jammed in my propagator over a period of two days and rather than do damage, the amount of seed which germinated during that period was little short of astonishing. Of 106 batches of seed sown on the 25/1/68, on the 10/2/68 seventy seven batches had germinated, quite a few of these being South American species.

I feel that the statements one often reads about maintaining a temperature of 75° to 80°F could possibly be open to question. In my case I maintain a temperature of 80° to 90°F for a period of six weeks when I then drop it down to 65° to 70°F as if seeds have not germinated by this time there is very little possibility later - possibly one or two, but no more.

My seed compost is 50% peat and 50% potting grit, to which a dusting of J.I. Base fertiliser is added and a dusting of ground chalk. I seldom get any damping off although I take no special precautions against it.

Sowing early in the year, I do not cover my seed pots as in my opinion the sunlight here is not strong enough to do damage, although later on they will be covered with several thicknesses of newspaper.

FRAILEAS by F. Guldemont

(From the Dodonaeus Journal for January - February 1965.

Translated by Miss J. Sleeman.)

Here indeed is a genus which disappears progressively from collections. Must we look for the cause in their small stature, in the ease of cultivation, or in their length of life being too short? At least one cannot say that these miniatures are ugly or awkward. Perhaps they must give way to new species of Chileans or to unknown Parodias?

This genus is found in Brazil, Uruguay, Argentine, Paraguay, just inside Bolivia and in Colombia. Instead of begrudging it its small stature, should we not be pleased about it, for otherwise, why should Blossfeldias be cultivated, which are even more insignificant and, as compared with Fraileas, almost devoid of spines?

One perhaps begrudges Fraileas attaining their adult stature too quickly, which implies half expecting the appearance of damage or signs of senility when there is no question of a premature death for the plant. Without wishing to deny the correctness of some of these reproaches, I believe that we are largely responsible for this premature demise in cultivation - for example, in a compost too moist and too rich in manure. It is also often necessary to blame grafting on stocks of too great a vigour such as *Trichocereus macrogonus* or *T. spachianus* or a too robust *Echinopsis*. Is it not a sin 'against nature' to cultivate in one year a plant of 4 cm. diameter when in natural

growth this stature is not attained before 3, 4, 5, or even 6 years? Those who wish to vastly accelerate the passage of time must well accept all the consequences and carry the responsibility.

Therefore, I consider it preferable to cultivate all these species on their own roots and to add to the usual compost, an equal quantity of Rhine sand. This will result in more normal growth and allow the spines time for their normal development, the areoles will be more closely packed and the polished green and bare epidermis of a forced plant will give way to a normal cactus.

Those who will inevitably wish to graft would do well to choose some accommodating stocks such as, for example, an *Echinopsis* or a *Trichocereus spachianus* more or less weakly growing and of small size, or a *Harrisia jusbertii* and to degraft the plants after one year in order to assure them of a normal lifespan. And why not plant all the *Frailea* species in a bowl wherein one covers the soil with a bed of fine gravel which will prevent excessive desiccation of the surface and which will excuse spraying as often, so that it will have the enormous advantage of retarding the progressive alkalinisation of the compost greatly dreaded by the *Fraileas* which much prefer a slightly acid soil. (One presumes from this that the author's water supply is of an alkaline nature - H.M.)

It may be necessary to seek the causes of the craze for Chilean species in their difficulty of procurement, in their floriferousness and in all the problems of nomenclature which occur with them. One understands very well that some people like to resolve all the unknowns of literature, by comparison and analysis.

If such is indeed their objective, I invite them to the similar interest of the *Fraileas*. If they have been known since the last century (*Echinocactus gracillimus*, Monv ex. Lem. 1839), then *Neoporteria subgibbosa* has also - since 1831. There are constantly described new species of *Neochilenia* and of *Pyrrhocactus* but likewise more new *Fraileas* are discovered as, for example, *Frailea uhligiana* from which is arising the controversy over the differentiation from *Frailea chiquitana*. And what do the specialists of the genus *Parodia* think of the problem of nomenclature raised by *Frailea alacriportana* and *Parodia alacriportana*? Is it by chance that the two species come from southern Brazil? The *Parodia alacriportana* is one of the four species of the genus originating from Brazil (*Parodia alacriportana*, *brasiliensis*, *gummifera* and *brevihamata*) and the *Frailea alacriportana* is one of the two species of *Frailea* originating from the same region (*Frailea asterioides* and *F. alacriportana*).

These questions adequately demonstrate that there remain plenty of problems to solve; each genus has its own features which add to the beauty of our plants, the attraction of seeking them, and the pleasure of studying them.

SOME COMMENTS ON FRAILEA

..... from John Donald.

I like the article by Flor. Guldemont which is basically sound.

The occurrence of *F. colombiana* at Dagua in Colombia has not, in fact, been substantiated. Paul Hutchinson searched the area very thoroughly and came to the conclusion that it was unlikely that a *Frailea* could have been found there - it just wasn't *Frailea* country. Werdermann must be mistaken; at the time he was studying the *Mammillaria* from Sogamosa and also Paraguayan plants as well. It is possible that the habitat labels may have been muddled - similar to the reputed Bolivian habitat for the Uruguayan *Gymno. guerkeanum* !

An alternative is that the *Frailea* were collected in Paraguay before the *Mammillaria* were collected from Sogamosa in Colombia and the whole lot sent to Werdermann from the railhead

at Dagua in Colombia. *F. colombiana* is virtually indistinguishable from the *F. pumilis* forms recently collected in Paraguay!

Fraileas are really no less long lived than a number of other small species like *Rebutias*. They do not like lime very much and if you have to water with hard water, then annual repotting is a good idea. They like to crowd themselves and best results come from growing several plants in a single pan or half pot. Leaf mould and grit is the ideal compost for them.

Given plenty of sunshine, the flowers do open on all species, but some species are rather more reluctant, particularly those which have been in cultivation for a number of generations. New imports seem to flower more easily.

Frailea alacriportana and *Parodia alacriportana* are two quite separate plants and no confusion should arise since they are totally unlike, but whether *F. alacriportana* is any different from *F. gracillima* is another matter. I believe Flor. Guldemont is perhaps confusing *F. uhligiana* with *F. pullispina* - the former plant is again quite distinct and unlike any other *Frailea* - but *F. pullispina* Bkbg is identical with *F. chiquitana* Card.

The smallest *Frailea* is now *F. asperispina*, smaller than some *Blossfeldias*!

FRAILEAS

..... comments on M. Guldemont's article by E. W. Putnam.

I am a lover of this small genus of small plants myself and I fully agree with Flor Guldemont's cultural advice. In a gardening journal recently Mr. Len Jeffries, a Surrey cactophile, suggested that *Fraileas* grew best in shade and he went so far as to imply that they would not flower unless kept in the shade. I could not agree with these remarks my plants grow quite unshaded and flower freely.

I have no data on the life-span of *Fraileas*: my plants seem just as long lived as any others among my captive cacti, but perhaps my entire collection is far too young to draw any conclusions yet.

My only grafted *Frailea* is *Fr. castanea*, which in fact came to me by the kind offices of M. Guldemont. This plant (grafted on *Trich. spachianus*) has retained the characteristic dark bronze colour, though it has grown at a surprising rate and flowered profusely in 1967, producing about 120 large, lustrous black seeds which I have distributed to interested friends.

Anyone interested in *Fraileas* is invited to get in touch with the leader of the *Frailea* robin (see last page) who would like to improve his own sparse acquaintance with - and knowledge of - this genus.

COLLECTOR'S CORNER

..... from K. Halstead.

You will be interested to hear that I succeeded in flowering *N. nidus* at the beginning of January this year and there are still a number of buds to open (March).

..... from R. Zahra, Malta.

All my plants of *Neoporteria* (sensu stricta) started to grow in March this year and some are going to flower as well. *Neoporteria villosa* has flowered for the first time this year - this is three years from being sown as seed. The three plants are between 1½" and 2" in diameter and one plant produced only one flower, the other produced 32. At one time there were 8 flowers open on this plant. Other plants that are going to flower are *N. senilis* and *N. cephalophora*. I have observed that the *Neochilenia* (or *Nichelia*) flower much later - in June or July.

My *Cephalocereus palmeri* has produced flowers from a long pseudo-cephalium down the side of the plant. With continued growth of the plant the pseudo-cephalium continues to lengthen; as the wool persists for about four years it will grow progressively longer. I have flowered a number of *Cleistocacti* successfully and I know collectors who have flowered *Espostoas* and *Haageocerei* but I have not been able to observe these plants in flower myself.

..... from Mrs. E. Pye, Oamaru, New Zealand.

Espostoas will grow cephalia here and will flower: *Cleistocactus ritterii* will grow a pseudo-cephalium and *Seticereus icosagonus* produces one in gold. My pride and joy is *Bolivocereus samaipatanus*, that stood all winter outside, kept its bud wool, and bloomed next spring. It goes on and on all summer only easing when the winter comes, but the little brown tufts stay firm until the spring flowering.

..... from B. Eller, Switzerland.

Some days ago I got the first flowers on my *Notocactus buiningii*. This plant is a very fine new import from Brazil. Mr. Uebelmann got only about 30 plants of it last year and even his best friends could not have more than one plant. *N. buiningii* is in appearance related to the *herterii-mammulosus* group. The epidermis is a little more yellow and the spines up to 3cm long. The spines are brown at the base and have a dark yellow tip. The flowers are typical for the genus, 5 cm dia. with a red stigma.

You wrote to me about your *cephalocereus* cutting with a cephalium. I hope that you are luckier than Mr. Uebelmann with his import of 200 cuttings of *Cephalocereus dybowskii*, all with cephalium. Some weeks after their arrival they all but 30 had rotted off. I think the best way would be to graft the cutting on to a stout *Cereus jamacaru*, one of the best grafting stocks for cereioid forms.

..... from A. Bates, Stoke on Trent.

I am very proud of my *Borzicactus aurivillus* which bloomed for the first time in 1966. I have had this plant for about fifteen years from a seedling and it is now over 12" high with several offsets.

..... from R. G. Green, Baildon.

I have just obtained five varieties of *Tephrocactus* seeds. I would like some suggestions upon methods of obtaining some germination. So far I have been singularly unlucky with this genus.

ON SAFARI

From the G.O.K. Newsletter for January 1968.

"How nice that Herr Walter Rausch has found time to visit us (Vienna Branch) straight before the start of his third expedition which will naturally lead him to the Lobivia habitat. We were able to give him our good wishes for his journey, in the success of which we are all eventually interested. It has always been realised how important Herr Rausch is for us, be it on account of the authentic plant specimens which he makes available for us or the rich harvest of colour slides, or we think of the many open questions of nomenclature - to which only the scientifically interested research in habitat can find the answer.

From the G.O.K. Newsletter for October 1967.

'The highlight of the Branch meeting was the report of the expedition of the American botanist Dr. Edward F. Anderson who in the year 1966 led an exploratory expedition of his university to Ecuador and the Galapagos Islands. Dr. Anderson is a member of our Society (Austrian Cactus Society) - thanks to this exclusive pleasure we have been able to get to know the flora and fauna of that famous isolated island world whose cactus landscape has not the least similarity to the sources of the usual cactus countries.

'The lecture made us familiar with the changing landscapes of Ecuador. It took us from the tropical forests and the sand and stony deserts of the lower regions through a precipitous valley of the Andes to the capital Quito in the interior of the country (at about 10,000 feet altitude). The ostentatious baroque buildings of this old city derive from the time of the Spanish colonial ascendancy. Attractive pictures of the life of the native Indians were followed by photographs of the places where cacti are found - *Opuntia*, *Pilocereus tweedyanus*, *Borzicactus aequatorialis* and the only globular plant, Ecuador's *Melocactus peruvianus*. *Opuntia* predominate also in the landscape of the Galapagos islands whose scale of vegetation ranges from the mangrove jungle of the biggest island to the absolutely bare stone desert. The smallest islands often consist of a volcanic cone whose silhouette rises out of an improbably blue sea. Darwin finches nest in the *Opuntia* thicket and fertilise the blossoms.

Opuntias have grown probably into the biggest cacti in the world - a one metre trunk. *Opuntias* grow on lava cliffs and on ground of volcanic ash. Of other species on the islands there are *Brachycereus* and *Jasminocereus* with a distinctively different annual cycle. The lecture was charmingly illustrated with photographs of animals which live in this exotic world; giant lizards and giant tortoises, flamingoes and dolphins!

We are also informed that Mhr. Van Vliet of Scheveningen, Holland, is now out in Brazil and that Mhr. Buining left for another trip to Brazil in April this year.

FROM THE SEED EXCHANGE

If any of our readers have any plants which set seed this year, which they do not require, I should like to ask you to post it off to me. The Seed Exchange can then offer it to any of our subscribers. This service will enable you to exchange seed with many subscribers whom you would not normally have a chance to meet.

We must make a charge of 4d. per packet of seed sold, this charge being intended to cover postage and packing and the cost of running the seed exchange.

Even if you do not require seed, but have some to spare, please send it off to me; we can then supply Members who wish to grow from seed but have none of their own - or of the species which interest them.

If you can send me any seed, please packet each species separately and indicate on each packet (or by a slip in each packet) the genera and species where known; if you are doubtful of the validity of the plant name, please let me know. I can supply suitable seed packets if required to bona fide enquirers who have seed to spare. Please give adequate protection to seed sent by post, such as two layers of corrugated cardboard.

If you do not have any seed for the exchange but would like to acquire some, drop me a line for a list of species currently available. These will be named as supplied; please bear in mind that there is always the possibility of cross-pollination in a greenhouse, unknown to our seed donors.

E.W. Barnes

(All P.O.'s and cheques for seeds should be made payable to "E.W. Barnes" as this will minimise administrative expenses in connection with the seed exchange - H.M.)

ANNUAL REPORT & ACCOUNTS 1967 - 68

Our Treasurer reports as follows:-

<u>Income</u>	£. s. d	<u>Expenditure</u>	£. s. d
Subscriptions 1967/68	78.13.10	Printing of Bulletins and Year Book	104. 6. 6
Year Books, Back Numbers	34. 4.10	Postage, Stationery, & Cheque charges	13. 6.11
Sales of plants	48. 7. 7	Plant purchases	27. 0. 9
Donations	6. 0		
Bank Interest	1. 0. 1		
Subscriptions 1968-69 received in advance	9. 7. 3		
	171.19. 7		144.14. 2
B/Fwd from last accounts	9. 6. 6	C/Fwd to next account	36.11.11
	181. 6. 1		181. 6. 1

Owing to an influx of new subscriptions just before our year end, together with additional sales of the Year book and back numbers also at this time, our financial position is vastly better than was anticipated when we felt obliged to revise our subscription rates and the charge for back numbers. The additional cash in hand will be used to increase the number of illustrations in the Journal after making allowance for increased postal and other costs.

The suggestions put forward in the readership survey for a new name for 'The Chileans' were all very welcome. However, as it seems that there is a clear majority for retaining the present name, we shall do so.

I should like to place on record the valuable assistance which I have enjoyed throughout the year from our Hon. Officers, from our contributors, and (not the least) our translators, without whom the production of this Journal would not be possible.

H. Middleditch

- P.1. for *N. horstii* v. *juvenalisformis* read v. *juvenaliformis*.
for *Sanda Catherina* read *Santa Catherina*.
- P.5. for *Sulcorebutia canequeralii* read *S. caniqueralii*
- P.6 for *S. kreugeri* read *S. kruegerii*.
-

Study Groups

- Epiphytes A.J.S. McMillan, 5 Oakfield Road, Bristol 8.
- Lobivia R.E. Hollingsbee, 46 Markland Road, Dover, Kent.
- Neopterianae H. Middleditch.
- Notocactinae K.H. Halstead, Little Firtrees, Wellington Close,
Dibden Purlieu, Southampton.

The Chileans Annual Subscription 10/6.

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