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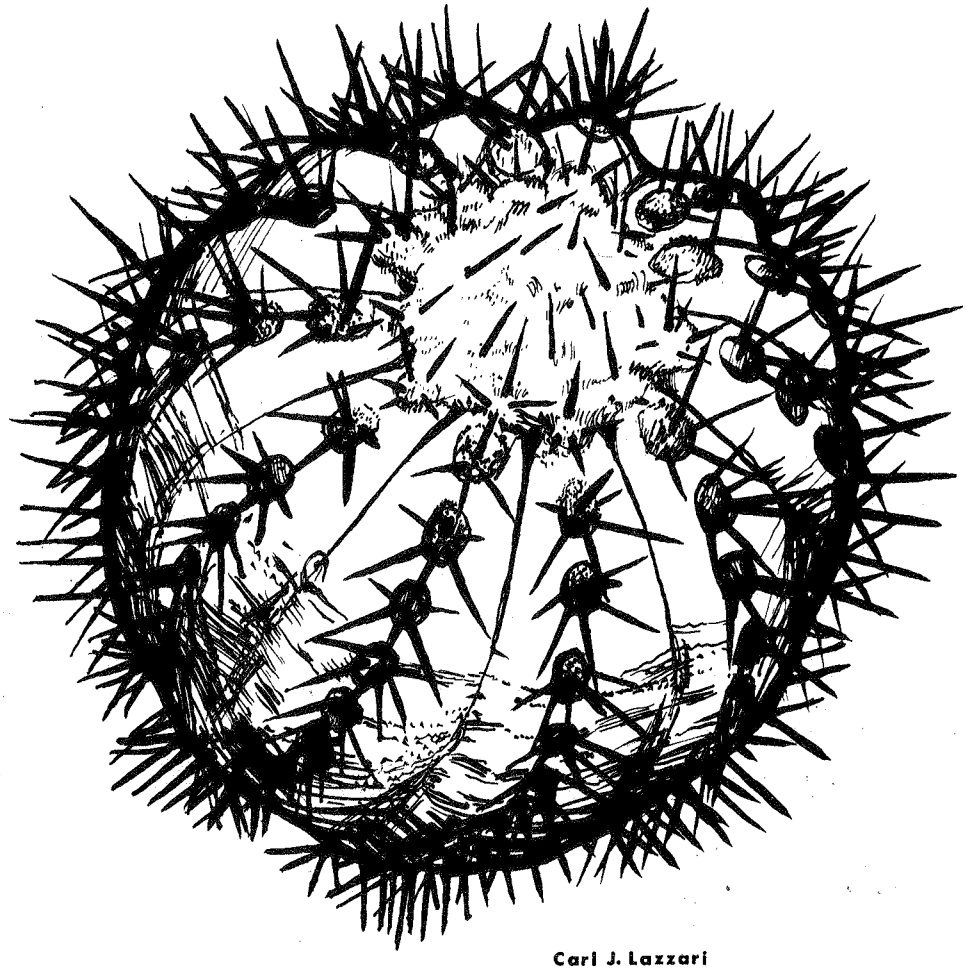


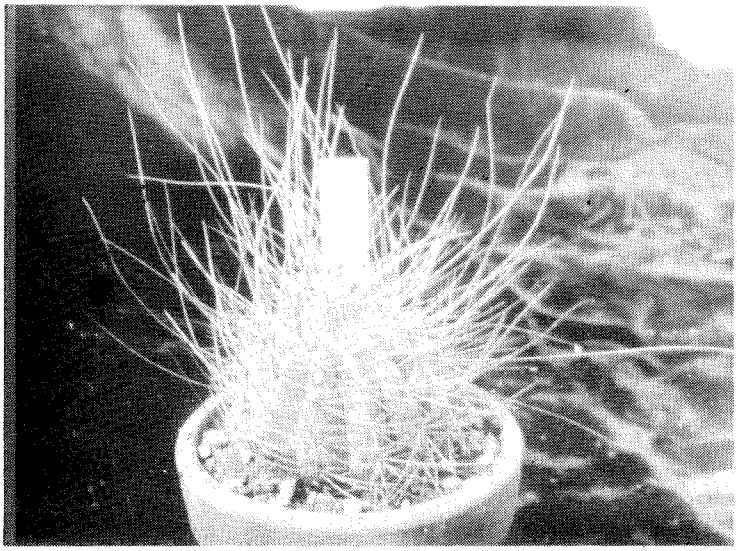
Carl J. Lazzari

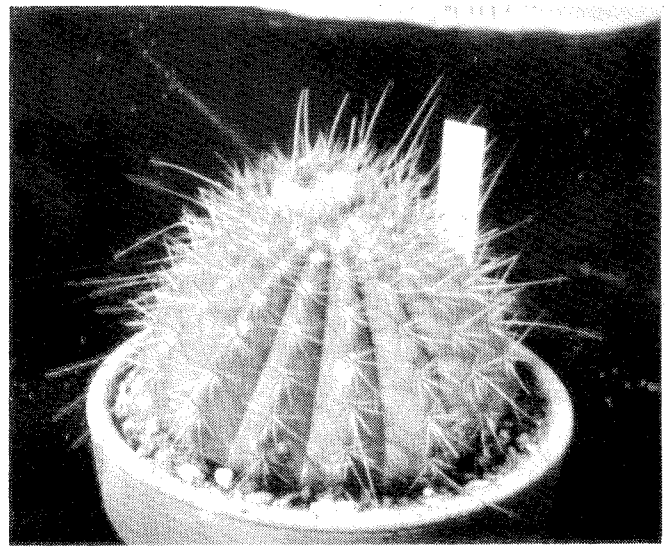
COPIAPOA

LEMBKEI

Imported plant in the artist's collection

actual size





CEPHALOCEREUS BREVICYLINDRICUS n.n. (Photos.H.Middleditch)

Two plants of Cephalocereus brevicylindricus n.n. observed in the Jardin Exotique, Monaco, in June 1967. The shorter spined variety has just started to develop a cephalium.

A NEW BRAZILIAN : Cephalocereus brevicylindricus n.n.

by B.Eller, Switzerland.

In spring 1967 Mr.Uebelmann, Switzerland, imported some fine brand new Cephalocerei from Brazil. Quite astonishing were the two new species C. brevicylindricus and C.aureus showing an unusual shape of the body, and have the cephaliums on plants some inches high. C.brevicylindricus is a plant of ceroid form with about 10 - 15 ribs forming a body of a light green colour. The spines, up to half an inch long, are of a fine yellow and the whole body is cone shaped. My largest plant is four inches in diameter at the base and as high. The plant tapers and is one inch diameter at the top. This conical shape of the plant is unusual and in addition, the plant shows a cephalium of whitish hairs mingled with yellow bristles. The cephalium is about one inch wide and three inches long and goes down one side of the plant.

Three weeks after I put this plant in a usual soil mixture in my greenhouse it showed new life and some days later two reddish berries $\frac{1}{2}$ inch long and about 1/3 inch thick were pushed out of the cephalium, I got 430 seeds from these berries. But the surprises went on - two other weeks later two flower buds peeped out of the hairy cephalium, and now the real trouble started! A telephone call to Mr.Uebelmann brought the answer; not yet flowered in Europe, doesn't know exactly shape and colour of flower, interested in pictures. In the meantime the colour of the flower-buds could be recognized as a fair greenish yellow. Colour and cephalium indicated that it might be a night-blooming species. I stood by in the greenhouse, camera and flashlight ready, and waited to see what would happen. At 6 p.m. a quick extending growth of the flower buds began and at 8 p.m. the flowers, now $\frac{1}{2}$ inch long above the cephalium, started to open. At 1 a.m. next day the miracle was

completed, the flowers had opened, pictures were taken and my bed was waiting for me. The flowers, ½ inch in diameter, had closed by 9 a.m.

As the flower buds appeared I expected a typical Cephalocereus-flower but I must say the flowers are quite similar to those of Melocacti. Perhaps C. brevicylindricus and C.aureus, which is quite similar in appearance and flowering, could form the missing link between Cephalocereus and Melocactus, but the scientists have to decide finally.

C.brevicylindricus flowered several times more before the growing season was over.

I find these new Cephalocerei are easy plants to grow and could be placed among Notocacti or Gymnocalyciums. Only one thing you have to observe, Brazilean cacti like plenty of water and a real damp climate in the growing season and generally a little bit warmer than other South American cacti. These new Cephalocerei are really unusual plants with no spectacular flowers but having them brings a lot of cactus growers delight.

NEW CACTI and OTHER INTERESTING PLANTS IN the BOTANIC GARDENS at LINZ

Lecture given by Stefan Schatzl, Superintendent of the Gardens.
Reported in the November 1967 Newsletter of the G.O. K.
Translated by J. Heyworth.

In their expedition to Brazil, Horst and Ritter followed in general in the steps of Professor Werdermann, who made many discoveries more than thirty years ago and which lead to his writing his book 'Brazil and its Columnar Cacti'. Horst and Ritter sent over not only the Werdermann discoveries but also new globular Cerei. This again caused the Botanic garden at Linz to depart from the principle of amassing a collection of South American globular cacti only.

Previous exceptions were the 'blue'Pilocereus glaucescens and the similar Pilosocereus glaucochrous. On his journey Professor Werdermann found a single specimen of Pilosocereus aurisetus. Amongst the imported plants at Herr Uebelmann's nursery, Herr Schatzl discovered a specimen of a single offshoot with a bud. He acquired it and after three days the bud brought forth a remarkable blossom, because in its original habitat fertilisation is achieved by bats.

Cephalocereus polyanthus, I to 1½ metres high, bearing long bristles at the base and strong yellow thorns in the upper part of the stem, is represented in Linz by three specimens, which have all bloomed. The flowers are small and consequently distinguishable from other Cephalocereus by the peculiarities of the flower and seed. Backeberg separated these off and gave them the family name Micranthocereus. Although contested by several authors, the division appears to be justifiable.

Cephalocereus densilanatus and C. brevicylindricus are more or less globular cerei. The plants become only 15 - 20 cms high and the flowers are extraordinarily small, flowering at night. They open only briefly. Whether these two types are related to Micranthocereus or belong to this genus can unfortunately not be clarified, because no seeds of the latter are available for comparison purposes. With us, C.densilatus and C. brevicylindricus are thriving in the open ground (= free root run? H.M.) Dr. Simo in Bad Schallerbach had his sixth flower on October 13th in open ground but in the Botanic garden there was only one.

Our Arequipa weingartiana comes from Peru and North Chile. This year that truly reluctant flowerer, Submatucana ritteri, blossomed for the first time. The disputed genus Submatucana, distinguished by its bright green body and magnificent red zygomorphic flowers, is the link between Matucana and Arequipa. This year the Matucana from Perus have flowered in profusion. Seedlings of Matucana are extraordinarily variable in their early stages, but with increasing age achieve a reasonable uniformity in form and spination.

Dr. Simo presented to the Botanical garden a rare plant from Ecuador, Seticereus icosagonus, which had never flowered. With us it produced six flowers this year. One seldom finds in cultivation Cleistocactus wendlandiorum. The plant in the Botanic gardens has flowered in profusion

this year; the markedly pipe-like orange coloured blossoms formed on the whole length of the stem. A plant imported as Thrixanthocereus could not belong to this genus as it neither had a cephalium nor showed the characteristic spikes at the foot of the stem. This year it flowered, with flowers violet-lilac colour emanating vertically from the body. The plant is a hybrid, a cross between Cleistocactus strausii and Denmoza erythrocephala.

In 1938 there came from Brazil the plant described as Parodia gummifera, remarkable for its dirty olive green epidermis, the ribs divided into tubercles and the heavily adorned areoles which stand at the tip of the tubercles. It really could not be a Parodia since Parodias are not found in Brazil. Now Parodia gummifera is the newly discovered HU 141; the crowning glory of this discovery by Herr Schatzl could be regarded as the already famous HU 106 on which the ribs, of course, are not divided into humps.

In literature HU 106 has again been compared with Astrophytum, because on superficial observation there seem to be certain similarities with Astrophytum myrrostigma. In new shoots, however, HU 106 does not show its characteristic silver green covering. Moreover the epidermis exhibits tiny lumpy unevennesses, whose upper parts die off and form the covering mentioned above. The largest of the three plants in the Botanical garden was, on its arrival in Europe, covered with a dry scab on the bottom half of its main stem. This dry coating, however, flourishes only in a damp climate. The original contention that these plants were found in a completely dry habitat cannot be correct. Buining has moreover recently confirmed that HU 106 was discovered in a rather damper locality. Our present plants have unfortunately not yet flowered.

Eriocactus magnificus has also flowered again this year. The great yellow silky shining flowers, the numerous stamens and the strong, yellow, twisted stigma are remarkable. The fruit is thickly covered with wool and bristles and eventually breaks open at the base. Eriocactus claviceps (HU 16 from Rio Grande do Sul) is similar to Eriocactus schumannianus but resembles E. leninghausii more closely in its development. The flowers are self-fertile, that is, they form fruit and seed without pollination from an external source. Krainz and Buxbaum do not acknowledge Eriocactus and classify these plants as Notocactus. Friedrich Ritter considers this genus to be valid, a view shared by the lecturer.

Of the new plants which were very productive were our previous year's imports of the genus Notocactus. There seems to be a close relationship between Notocactus horstii, purpureus and herterii. The Notocactus horstii with beautiful red-orange flowers is self-fertilising. Notocactus buiningii differs distinctively from the remaining Notocacti although it has not bloomed for us yet.

A few years ago a plant was imported by Uebelmann under the number HU 5 about which the collector remarked; "Gymnocalycium with big yellow blossom, which is bare." It soon became apparent that on account of the character of the body and associated features this Gymnocalycium was strikingly like a Notocactus, then the flower came very woolly, 12 cm. dia, self-sterile. Later HU 5 was classified as Notocactus linkeanus, N. cerasignibbus, N. Horstii, the correct name being Notocactus crassigibbus. This type which comes from Brazil has the biggest Notocactus blooms - here they measured 12 cms across. Under the name Notocactus horstii HU 9 plants were received whose flowers were not as big as N. crassigibbus.

Take next the case of N. arachnites - in spite of it flowering no seeds could be collected. However, Herr Schatzl extricated some seeds from amongst the areole wool and these proved by comparison that N. arachnites is not identical to N. crassigibbus. Notocactus uebelmannianus HU 78 was already showing its red flowers. We also have N. tenuicylindricus HU 34, a small cerioid Notocactus, whose fleshy roots sometimes produce offshoots. The plants are 2-3 cm dia, 6 -7 cm high, with flowers 5 - 6 cm dia - sometimes several open all at once.

A renowned and well known species is Notocactus scopa. The new importations show the unusually wide variability of this species. There are many more varieties and forms than have been described previously. On one and the same plant were blossoms some with the typical violet stigma and some with a yellow stigma. In the same section belongs HU 26 N.sucineus (sucineus =

amber coloured on account of the spine colour). This plant is self-fertilising.

Various plants of N.ottonis were shown, the very prolific blooming N.ottonis v. paraguayensis, ottonis v. tenuispinus, and megapotamicus. According to F.Ritter N.megapotamicus is a valid species from Rio Grande do Sul. Its stigma is bright red.

Notocactus pantonoensis is now correctly named N.arechavaletai. According to Professor Buxbaum, Malacocarpus (Wigginsia) belongs with the genus Notocactus. Now there is already a Malacocarpus arechavaletai. If one adds Malacocarpus to Notocactus there are accordingly two entirely different species under the same name of N.arechavaletai. Confusion like the Tower of Babel!

The richly flowering and much sought after N.paucispinus HU 57 is now correctly named Notocactus acutus. A plant was imported and grown under the three names HU 21 Malacocarpus leucanthus, HU 15 M.brasiliensis and HU 21a M.horsti juvenaliensis. It is not only very beautiful, easily cultivated and of small size, but appears very striking because on the pistil there are no branches to the stigma, but the stigma is in the form of a pentagon. The fruit develops in the beautiful white fluffy top and is small and round and dry. Whether it is a Malacocarpus is doubtful - the habit of this plant resembles above everything else a Parodia.

Notocactus are to be recommended to cactus lovers. They are like Gymnocalycium in ease of cultivation, are more reliable for flowering and give pleasure by their beautiful large - mostly yellow - blooms and also through their beautiful body shape and the variety of their spine formation.

Messrs Rausch and Markus brought from North Argentina and Bolivia some beautiful Lobivias, of which L.larabei, Lobivia sp. R 160 collected near Allemannia, the wonderful red-flowering L.caespitosa, L.nigrostoma with orange-red blooms with a dark throat (similar to L.jajoiana) and those called Lobivia sp. Jujuy with flowers in all shades of white, yellow and pink. A 'Lobivia' collected in the region of Alemannia proved after flowering to be Echinopsis aurea v. fallax.

It can be observed from Parodia ayopayana that this species takes a special place amongst the Parodias. Similar to Islaya, the fruits are strikingly extended, only here and there does one find a fruit not elongated. But only the latter contain seeds, the elongated fruits are quite without seed. From the Rausch-Markus expedition came a Parodia, which from now on bears the name Parodia malyana in honour of Ing Maly of Vienna.

That one cannot attribute any less importance to the fruit is shown by observations of the Gymnocalycium saglione - zegarrae - pflanzii and marquezii group. G.marquezii v. argentinense has reddish, juicy fruits which open across when ripening, whilst all others empty their seeds lengthways: the flower has numerous stamens and a multi-branched stigma. G.langunillasense and zegarrae are scarcely distinguishable in their flowers, the fruits become white on ripening and are drier than G.saglione, open up sideways and the seeds come out of the pod under pressure. Gymnocalycium mazanense has bluish, smallish fruits, as have the closely allied G.glaucum and G.nidulans - which has a big white tuberous root like G.glaucum. A.G.pflanzii imported this year flowered a beautiful pinkish-red and the flower petals are remarkably fringed. Surely some of the names in this Gymno-group are superfluous, applying to mere forms and not species.

Under the field number HU 79 was brought a beautiful example of G.denudatum with high, steep ribs. The one such plant does not bloom white as we expected, but pink ! The frequently misnamed G.fleischerianum is now amongst the original plants; they are quite variable. Plants imported as G.spec. L. Col. were later grown as G.vatteri; now they go under the name G. ochoterenai v. polygonum. To this group belongs G.kozelskyanum described by Dr.Schutz, Brunn, about whose description there seems to be some doubt. G. mazanense v. ferox is "G.spec. de Andalgala".

Finally, Copiapoa hypogaea and Copiapoa barquitensis were compared. The flowers are identical and the localities where they are found lie scarcely 50 kilometers apart. Do we have one name too many?

THE REMARKABLE GENUS DISCOCACTUS

GERHART FRANK

Translated by K.Wood-Allum from "Kakteen u.a.S." May 1964

One hot evening in July as I paid a quick visit to the greenhouse in which my collection is housed during the summer, an overpoweringly sweetfragrance assailed my nostrils. I could not believe my eyes, for my large imported specimen of DISCOCACTUS ALTEOLENS bore two fully open snowy white flowers which were giving off this intense scent. There had been absolutely no sign of them in the woolly crown of the plant the day before. How had this come about?

In the following weeks I was able to observe the somewhat unusual development of the flower precisely. The buds, with their long and slender stalks develop initially at a fairly normal rate in the woolly crown of the plant. Then for a few days they make no more growth prior to their emergence, as though they are gathering strength. At this stage they are about 4 c.m. long. They then reach the fully open stage, which involves further growth of 4 c.m. within twelve hours. The flowers begin to open around dusk and stay open until around midnight. Then the narrow outer projecting petals droop on to the receptacle, the corolla closes, becomes flaccid and by the early hours of the morning has withered. What strikes one most about the Discocactus flower is its long slender pedicel and the outer petals which stand out from it, spread along the whole of its visible length. Also, we must not forget its intense and pleasant fragrance. The flower itself is long with a very short style which, together with its stigma, lies well below the circle of stamens. The inside of the narrow calyx is covered along its whole length with large drops of nectar. Quite obviously the reproductive structure of the flower is designed so that it is pollinated by moths which have a long proboscis.

Until quite recently Discocacti were only known to grow on the Brasilian coast, on the Matto Grosso near Cuyaba and in norther Paraguay. Since none were imported for decades and the plants are somewhat tender, they were scarcely any examples to be found in European collections. When I received a report by Father Hammerschmid for our magazine[1] on a collecting expedition, I was electrified by an accompanying photograph of a little Indian girl holding a large flat cactus plant in flower. The flowers were unmistakably typical Discocactus flowers. Father Hammerschmid's account confirmed my suspicions for he mentioned white scented nocturnal flowers. In his report these plants were described as 'Malacocarpus macracanthus?' Father Hammerschmid discovered two different species in eastern Bolivia, to the west of the known habitat on the Matto Grosso in Brazil. Meanwhile I was able to identify them as Discocactus alteolens, discovered in San Cyrilo and D.heptacanthus, discovered on the ore-bearing mountain of Mutun. Prof. Cardenas has also confirmed these.

In the late autumn of 1962 Father Hammerschmid sent me several young plants as well as a specimen D. alteolens of 20 c.m. diameter and a D.heptacanthus of flowering size, namely 10 c.m. diameter. I should mention at this point that Discocacti only flower when the woolly crown has developed. There is a parallel here to MELOCACTUS which will also only flower when the cephalium has formed, but with this genus the plant body then stops growing and the only development is the elongation of the cephalium. The genus Discocactus on the other hand develops its cephalium and therefore the ability to flower when it is half its maximum size and then, whilst the cephalium barely increases in size, the body of the plant grows considerably.

Having received these tender plants so late on in the year, I was at first somewhat at a loss as to how I should treat them since my collection was to be overwintered in cool conditions. A friend who has a large orchid house, kindly offered me a suitable place to overwinter the plants. We placed them in an expanded polystyrene bowl on top of the heating pipes close to the glass in the orchid house. There, together with the orchids, they were frequently sprayed with water all winter. This treatment was justified by our success for even during the winter all the plants including the two old specimens formed huge rootballs and plumped up nicely. Then during the main growing season, from July to the beginning of September the two big plants produced an inexhaustible supply of their peculiarly beautiful and strongly scented flowers. During the hottest

weeks in summer when the other cacti had almost stopped growing the Discocacti showed their greatest growthrate. They flowered only in hot weather. If fully developed buds were overtaken by a sudden cool spell with temperatures around or below 20 C. they remained unopen above the woolly crown. Finally they withered without opening. Artificial pollination with pollen from other genera produced no fruit, equally unsuccessful were numerous attempts to cross pollinate D. alteolens with D. heptacanthus. Because of the deep-set position of the stigma and the narrow calyx I was not convinced that pollination with a thin paintbrush would succeed so I always slit the calyx so that I could reach the stigma from the side. Unfortunately however, as I said, I had no success.

According to reports from Father Hammerschmid, Discocacti produce large white seedpods which partly protrude from the woolly crown of the plant. They contain between 20 and 30 relatively large, black and knobbly seeds which, if sown fresh, germinate readily and produce large spherical seedlings which soon grow into strong little plants.

All species of Discocactus are tropical plants whose habitat is the hottest regions of South America. In the collection therefore they are very tender and should be kept in the warmest part of the greenhouse in winter. A nightly drop in temperature or a short cold spell should do them less harm than for example several weeks at between 5°C. and 10°C. Seedlings of Discocactus raised from seed here in Austria seem, like seedlings of Melocactus, to be less tender.

I would not recommend the genus Discocactus to the beginner but the experienced cactophile will derive great pleasure from growing these rare tropical plants, and from their large and remarkable flowers, especially if he has a greenhouse.

(1) German Cactus Society Magazine. pp 13; 131; 150 (1962)

Melocactus grow not only on the Caribbean Islands, but along the north coast of South America, through Colombia and into Peru as far south as the latitude of Matucana (see map, Chileans No.8), also through north-east Brazil as far south as Rio de Janeiro (see map, Chileans No.7). It would seem that the Discocactus almost complete the encirclement of the Amazon basin, perhaps without overlapping the Melocactus habitat - H.M.

FURTHER THOUGHTS ON GRAFTING

..... from E.W.Barnes

Our member in New Zealand who was interested in the cultivation of grafted plants (P.Beeston in Chileans No.8) may like to hear of my own experiences in this field.

I graft many seedlings of rarities when they are between 24 hours and three months old on to thin triangular shoots of Epiphyllum hybrids. After three months they are regrafted on to Trichocereus. This way I can have plants 1" in dia. within a few months from seed. If they are placed near the glass they make sound growth and produce strong spines.

The species I am able to graft at 24 hours old are Fraileas, Copiapoas, and a few Rebutias, etc. I leave the seed-case still attached to the plant as removing it sometimes damages its growing point. Of course it is best to wait a few more days before trying to graft - there is more chance of success. But I have grafted quite a few at 24 hours old, the trick is not to squeeze the seedlings when cutting the root off.

If I have no epiphytic stocks available, I wait until the seedlings are three or more months old and then graft onto Myrtillocactus geometrizans. But as the union of the two plants is very small I find that it is usually necessary to regraft when the seedling is about 1" in diameter. I use mostly Trichocereus spachianus for this last graft. Or alternatively I degraft them and root them down.

I have some seedlings from 1967 sowings which are grafted and which I will keep growing until the end of November. I find that seedling grafts done later in the year have a habit of 'drying off' during the winter. But if the growing season is extended a little, the grafts stay intact. You may wonder why I go to this trouble, instead of waiting until the following spring to graft. Well, the stocks are still turgid even in autumn and will unite with the seedlings, which I keep growing a little anyway throughout their first winter.

In spring, even when growth starts, I have found it hard to make successful grafts before the end of April as the stocks are still too dry. If seed has to be sown in the autumn, the gains by grafting it at that time are twofold. Firstly, the grafted seedlings are immune to damping off as compared with those in the seed pans which are overwintered on their own roots. Secondly and obviously they attain a reasonable size quicker than those which are grafted in the following spring.

I use Trichocereus spachianus a great deal, but the autumn and early spring flowering species do poorly with me when grafted on this stock.

I have quite a number of epiphytes, consequently the winter temperature in my greenhouse is rather high. This encourages quite a few xerophytic cacti to grow and T.spachianus suffers very badly as it cannot grow and thus replace the sap that the scion is drawing from it. Small seedlings don't seem to affect this stock, however, but once they have reached - say - 1" in diameter quite a number start to punish the stock in winter.

Myrtillocereus geometrizans I find is an excellent stock for seedlings. Tiny Blossfeldia offsets unite particularly well with this stock - but I find that with Blossfeldia the time of grafting is important. They seem to take better in the autumn than at any other time of year (this is the rainy season in their habitat - H.M.)

Many of the seedlings I graft have just been removed from epiphytic stocks. I find such seedlings are so juicy and their tissues are so embryonic that they 'take' on almost anything. This prevents a fair comparison being made of their affinity for various scions.

However, I have grafted seedlings of Matucana intertexta on the following stocks for comparison:- Trichocereus macrogonus, T.spachianus, Eriocereus jusbertii, Trichocercus pachanoi, C.peruvianus. Strange to say, by far the best seedlings after a season's growth, in form, spinage and colour, were those grafted on C.peruvianus. They were also the largest, with T.pachanoi and T.macrogonus almost as large. But as might be expected, the grafts made on T.macrogonus were bloated, with widely spaced areoles. I can't understand why this should happen, as seedlings on other stocks were bigger, but in most cases showed no signs of bloating.

All the plants were grown in the same plastic seedtray so that there would be little probability of some receiving more water, sun, etc. The tray was placed on a high shelf as near to the glass as possible, with no shade at any time. (New Zealand members note this is latitude 54° with constant industrial haze - H.M.) At the time of writing, the two remaining plants of Matucana intertexta grafted on to T.spachianus have almost exhausted their stocks.

I use Eriocereus to a great extent as stocks for one year old seedlings. I have at present a few hundred seedlings of Eriocereus bonplandii and E.guelichii, some of which will be large enough to use for stocks at about eighteen months old. I have in the past used Echinopsis hybrid as seedling stocks. They are without doubt one of the best stocks for their purpose but they have their drawbacks. The angles of the ribs must be cut well back to discourage offsets, also to prevent moisture collecting around the seedling - so that all the cellular body outside the vascular bundle slopes sharply downwards.

Echinopsis stock is short lived but as it is only used for a few months this is of no consequence. I have found that if all the areoles are removed from the stock there is less chance of offsets forming - at least for a month or two. I had quite a lot of trouble at first with this stock as, if the top isn't removed carefully, and the vascular core examined properly, there is the chance of leaving the growing point intact. As it restarts growth, it will push off the grafted seedling. On the other hand, if one sets it too far down, the vascular core is enormous compared with that of the seedling, making it unsuitable as a seedling stock.

I use Eriocereus justbertii whenever I can for Neoporterianae as this never seems to shrivel in the winter. Also it has a large vascular core making it suitable for most globular cacti. It doesn't shrink during the uniting period (when the rubber bands are in position) as T.pachanoi sometimes does if it is used early in the spring. Excessive pressure sometimes caused rot in pachanoi during spring, but as the warmer weather came along, this vanished.

I had noticed that T. pachanoi tries to grow in winter I had put this down to the excess heat in my greenhouse but after reading the article by H. Middleditch about grafting (Chileans No.8) I have changed my view'.

I find that T. pachanoi produces offsets freely which sap the strength of the stock. The slower growing the scion, the more they seem to offset. I agree with the comment that Eriocereus stock very seldom produce offsets. It is a pity that they are so slender, but as they are so vigorous I use them quite a lot. I remove the scions when they become 'top heavy' and either regraft onto T.lamprochlorus etc. or root them down.

I have no real preference for one single species as a stock. I think that a globular yellow spined cactus looks terrible perched on top of a dark green short spined stock. Most grafts can be made to look more 'natural' if an effort is made to combine body colour and spine formation of stock and scion, e.g. Neochilenia reichei grafted on to C.pachanoi or E.justbertii.

AN INTRODUCTION TO COPIAPOA

..... by H. Middleditch

It is not many years ago that Copiapoa were one of those genera that I used to skip over in plant lists and nurseries with the momentary thought - "awkward, to be avoided". How wrong can one be? Not only do they appear to present no particular difficulty of cultivation, but they seem to be as tolerant as any other species of erratic winter temperatures, drips from the roof, indifferent soil, irregular watering, mealy bugs, mice and snails.

Copiapoa exhibit an interesting variety of body and spine form which not only enhances any collection - be it large or small - but facilitates identification. At one extreme we have a coarse-tubercled species like C. wagenknechtii with a few stiff stout spines on each tubercle and at the other extreme the outstanding C.krainziana with a body almost completely obscured by a mass of long, flexible glassy-white and slightly wavy spines. In between comes the curving spines of C.cinerascens in an orange-brown colour and rather crowded in the centre of the crown: the short, straight, fine, jet-black spines of C.echinatus and the long, smooth straight spines of C.streptocaulon with the spreading, overlapping, radial spines nearly as long and stout as the central.

As with spines, so with bodies. The prominent, steep sided tubercles of C.montana contrast with the more flattened, larger tubercles of C.wagenknechtii. Neither of these species exhibit distinct ribs, such as the shallow ones on C.echinoides and the deeper ones on C.grandiflora. Areoles range from the large white felted areoles of C.streptocaulon, through the cream (almost pale orange) of C.lembckei, to the almost insignificant areoles on C.wagenknechtii.

Body colour, too, shows a wide range, from the deep coppery purple-violet of C.cuprea to the grassy green of C.rubriflora. In between we find the reddish violet of C.tenuissima - reminiscent of Neochilenia esmeraldana - and the deep purple green of C.totoralensis and C.krainziana, similar to many other Chilean Neoporterianae. Somewhat uncommon is the chocolate coloured body of C.hypogaea. Rather intriguing is the semi-waxy matt 'bloom' which appears on the body of some plants - C.echinoides, montana, carrizalensis, etc., - which is found under a hand-microscope to be a mass of very fine raised dots.

This coating is far better developed in plants grown in habitat, probably as a form of protection against the dehydrating effects of sun and wind during the dry summer months. Copiapoa inhabit the coastal mist zone of the northern half of Chile and are found along the coast from Los Villos (not far north of Valparaiso) right to the border of Peru. During the winter months the coastal fog -

the Garua - covers much of this coastline and for some miles inland, around the rocky cliffs and hillsides and up the barren valleys. It protects these plants from the weak winter sun and provides a very modest supply of moisture - almost the only supply available to these plants. Those in the southern end of this habitat might have one or two winter showers, those in the north rather less mist. But during the hot, dry, cloudless summer, there is no protection from the sun other than the waxy coating.

In cultivation, Copiapoa are not subject to this cycle, although it would be interesting to know the effects of providing some modest warmth and water in winter coupled with a dry summer next to the glass.

All species of Copiapoa produce a cushion of downy wool from the areoles in the crown, of a length and extent varying between species. This is lost after one or two seasons. Like Malaco-carpus, all Copiapoa produce their flowers from this wool cushion in the crown, with very short tubes. The flower is wide opening, containing a large number of stamens almost filling the interior of the flower. The petals, stamens, anthers and stigma are yellow, with the one exception of C. rubriflora, which has a red flower. The flower tube itself is devoid of wool, with but two exceptions: C.tenuissima, which has some woolly hairs in the scale axils of the tube, and C.solaris (syn.Pilocopiapoa solaris Ritter) which has a coat of fine felted wool over the flower tube and fruit similar to the felted wool in a typical areole.

The feature which differentiates Copiapoa from other genera is the ovary of the flower being buried in the very woolly crown so that it is virtually invisible; coupled with this is the very short flower which appears to have almost no tube. However, it appears that Britton and Rose did not publish a Latin diagnosis of this genus when they erected it in 1922 so one presumes that its validity could be questioned.

Most of the plants which we now class as Copiapoa were originally published as Echinocactus or another of the older wide-embracing genera. These were mainly collected in trips to or from the early non-Spanish mining properties near Copiapo or the central region of Santiago - Valparaiso. It seems quite probable that many of these early finds were collected on trips ranging well away from the mining centres, but were attributed to the 'vicinity' of the named places. It will be appreciated that at that time there were considerable areas of land both north and south of Copiapo without any named or mapped landmarks and few - if any - mines. Later in the century named landmarks increased and collectors could use these for reference. This has contributed to some of the difficulty which now exists in matching recent finds with the description and location given by the earlier collectors.

It is not clear whether E.humilis Pfeiffer, published in 1837, can refer to the plant we now call C.humilis, so being the first recorded Copiapoa. Otherwise the earliest species of Copiapoa described were E.malletiana Lemaire; E.marginatus Salm-Dyck: E.cinerascens Salm Dyck, and E.echinoides Lemaire, all in 1845, following by E.bridgesii pfeiffer in 1847. In 1853 Labouret referred to E.pepinianus affinis Monville; however, Backeberg's Lexicon quotes C.pepiniana K. Sch non. Lemaire. In 1851 we have Echinocactus streptocaulon described by Hooker.

Later Dr.R.A.Phillipi, who was actively engaged in studying the flora and fauna of his native Chile, described E.humilis and E.cinerea, in 1860. These were from drier valleys of Chile north of Copiapo. Several other species were added until the very active collecting work of F.Ritter more or less doubled the number of Copiapoa species in a space of three or four years.

Copiapoa fortunately suffer very few problems of nomenclature. The change from juvenile to mature forms and the variation in the juvenile forms probably adds much to the interest of this distinctive genus.

We have received various comments on this article, which will appear in our next issue.

During the first round of our Copiapoa Robin, E.W.Bentley commented upon his plant of Copiapoa humilis, which exhibited small hard rose-coloured proturberances below each areole,

looking rather like a new tooth pushing through a gum.

Following this comment we hear from E.W.Barnes: 'I went out to the greenhouse to see what I could find on my C.humilis. Two of my plants of this species were without this feature, but a third plant, grown from I.T.S.S. seed as Copiapoa humilis form, has it. I was unable to find it on any other Copiapoas - I have about fifteen or so species, with a number of seedlings of others. In collected plants, as far as I was able to judge, this was not in evidence at all. The species observed were: desertorum, vallenarensis, barquitensis, and lembckei.

'However, I did find evidence of a 'tooth' on the following plants: Pyrrhocactus intermedius, Horridocactus pygmaeus, Neochilenia esmeraldana (two plants with, one without). Neochilenia malleolata (one plant without, one with). They seem to be rose coloured at first, later passing to the normal body colour of the plant and drying off somewhat in the process'.

Further observations from H.Middleditch: 'My Neochilenia malleolata - or rather the one with a body colour somewhat similar to N.esmeraldana and just a little more woolly in the areoles - also exhibits these small proturberances. I can see them fairly readily in the crown where they form a set of humps just like some Notocacti e.g. herteri. On close examination they seem to be barely 2 mm high and probably about ½mm thick where they merge into the shape and colour of the tubercle. I find them very difficult to distinguish due to their smallness and proximity to the areole.

I have also discovered some of these proturberances on a plant which I have labelled N.microsperma. This plant was kept fairly close to the south windows in the greenhouse for a year or two, where it maintained its dark colour of a purplish infused green,showing negligible signs of growth. Just for a trial I moved it to a more shaded location and give it a little winter moisture. It has now grown well, although it is probably rather too bright a green now and a little bloated. However, this has clearly exposed the horn coloured growth below each areole, a good 3 mm high and probably a good 1 mm thick where it merges into the tubercle.'

NO NEW NAME FOR THE OLD MAN CACTUS

..... by G.D.Rowley

"The Chileans" for January 1968 gave publicity to an article by Dr.B.K.Boom in Succulenta, July 1967, giving new combinations under Cephalophorus for Cephalocereus senilis and two other species. This followed Dr.Swart's acceptance of Cephalophorus Lem. in place of Cephalocereus Pfeiff. in the Index Nomina Genericorum. Unfortunately both these gentlemen committed a tactical error, as I have now been able to convince them after a lengthy correspondence, and a recantation is imminent. Lemaire did not publish a genus Cephalophorus in accordance with the current Code of Nomenclature; he suggested the name for either a genus or subgenus, but only provisionally. Even if his name were validly published, and were considered distinct from the earlier Cephalophora Cav., there would still be a good chance of being able to retain the well-known name Cephalocereus by conservation. Thus the change was hasty and ill-advised, and would be better quickly hushed up than further publicised'.

For those who want the full story with references and translations of Lemaire's lengthy latin texts, see the article by David Hunt shortly to appear in the periodical "Taxon". Meanwhile - please - no scramble to make new and useless combinations!

Well, that's a relief. Not that the genus Cephalocereus isn't sufficiently confusing as things are now. A quick run through the literature to hand suggests the following situation:-

Britton and Rose. Collective genus Cephalocereus embracing Pilocereus (Lem.)

Berger. Separated off Stephanocereus leucostele on account of terminal cephalium, through which the following year's growth continues.

Byles and Rowley. Established Pilosocereus to cover those plants (many previously in Pilocereus) which exhibit more lengthy hair on areoles in the flowering zone, surrounding the stem, but do not form a cephalium.

Backeberg. Separated off Neobuxbaumia - all Mexican - which show neither cephalium nor any change in the areoles in the flowering zone. Separated off C. blossfeldiorum.Werd. as Thrixanthocereus on account of the hairy flowers. Divided the remaining species in the genus amongst Cephalocereus, Coleocephalocereus, Austrocephalocereus, Haseltonia, Vatricania, Micranthocereus, (and other genera, from Mexico). These are accepted or not by various authorities in varying degrees.

F.R. NUMBERS

From Wolf Kinzel, Germany, we have received a very thorough list comparing all the differences between our own Year Book of FR numbers and a list prepared by Dr.Hilberath of the Bonn group of the D.K.G.

This comparison list has been examined by J.D.Donald, who comments: 'In many instances (of discrepancies between the two lists) the German version contains the original name as first encountered in the Ritter catalogues and they have not been subsequently brought up to date. Also, in many instances the additional names found in the English list are derived from the actual published descriptions of Ritter in various Journals other than German, hence they have not been picked up.

'There are a few entries in the German list missing from the English list. I have checked these against a list of amendments supplied by friends in Holland and can agree the following additions to the Year Book list':-

22a	Gymnocalycium guanchinense v. tinogastense.
50a.	Weingartia sp.
67a.	Cleistocactus tupizensis v. stramineus.
147a.	Haageocereus chryseus (= FR 585)
206.	Trichocereus nigripilus.
216.	Copiapoa intermedia.
239c.	Horridocactus sp.
239d.	Horridocactus sp.
334	Lobivia schieleana
334a.	Lobivia schieleana var.
334b.	Lobivia schielana var.
393	Eriocereus tephracanthus var. bolivianus
425	Notocactus submammulosus (not like FR 4)
479b.	Eulychnia floresiana v. pulliana
655a.	Neoporteria sociabilis v. napina.
766a.	Rebutia albiflora
1057	Copiapoa tocopillana
1063	Matucana crinifera v.
1069	Thrixanthocereus sp.
1072	Matucana formosa v. minor.
1145	Cleistocactus pseudostrausii.
1180	Gymnocalycium sp.
1182a.	Notocactus schumannianus

FURTHER COMMENTS ON NEWER NOTOCACTINAE

..... from J.D. Donald

Regarding the comments from E.W.Barnes (Newer Notocactinae, The Chileans No.8, Notocactus longispinus appears to mean different things to different people. I have two, one is a long spined form of E.leninghausii FR 1274a, the other is a long spined form of N.mammulosus or possibly of N.mueller-melchersii, as HU 94a. Neither look at all like my N.prolifera HU 4. I think however E.W.Barnes' plant must be HU 6 which is Wigginsia (Malacocarpus) longispinus and not the Noto. longispinus types going about.

N.acutus also means two different plants according to the source, the true one HU 57 comes from Uebelmann; however the firm of Uhlig have distributed another plant as N. acutus which is nearer to N.horstii than HU 57. Uebelmann's plant has fewer ribs (ca.7) and shorter red spines,

Uhlig's plant has many ribs and long reddish spines.

The whole question of N.tenuicylindricus HU 34, N.minimus or caespitosus HU 92 is very difficult. These two plants are quite distinct in themselves - HU 34 is a much larger plant than HU 92 at any time. There is certainly a school of thought which equates minimus and caespitosus - yet I have seen many plants of tenuicylindricus called caespitosus - who is right?

Considering the contribution from K.H. Halstead under the same heading, I find little difference in the structure of the flowers of P. bueneckeri, P. brevihamata, and other so-called Brazilian Parodias from Notocactus, apart from the colour of the style. The seeds have been studied by Buxbaum, Buining and Krainz and all assure me that they are very similar to the Notocactus line rather than the neighbouring Bolivian Parodias. Parodias are unlikely in Brazil unless they are relics of a much greater distribution of Parodia in the past. Their range is now essentially Northern Argentina and southern Bolivia.

The gritty leafmould compost is the best for Notocacti - it is acid enough for their natural requirements - yet it is not so open as the peat/grit composts so that it retains sufficient moisture to prevent root loss by excessive dryness. Notocacti also rest for a much shorter period than many cacti - slight watering in winter is beneficial.

The Schumann N. muricatus has been renamed N. bommeljei by D. van Vliet, regrettably the name is invalid as no Latin diagnosis nor deposition of type has been given. Even so, I believe the muricatus we all grow, apart from the new imports of the true Otto form, are hybrids in any case and not readily identified as the Schumann form.

GYMNOCALYCIUM

..... from R. Ginns.

"Regarding the note by E.W.Putnam on Gymnocalycium fruits in The Chileans No.8, both Borg and Byles' books are misleading in stating that the fruits of Gymnocalyciums are mostly red. However, I have seen Gymnos with red fruits; actually G.schickendantzii has a bright red fruit. Apart from that it depends on what we mean by 'red'. This year G.joosenianum had fruits of a deep reddish purple, although last year they only turned dark green. One other species, unfortunately I forget which, had a reddish tinge to the green. I fancy that we shall find more as the knowledge of fruits increases. But I do agree that most of the fruits I have seen are in shades of green.

Most of my flowering Gymnos can be induced to set seeds by cross-fertilisation which should not affect the character of the fruit. I don't record the crosses as I poke about indescriminately in all open flowers to make sure of a 'set'. Resulting seeds are passed on merely as Gymnocalycium hybrids; actually I fancy many of the Gyms. sent over from Holland as species are really hybrids".

..... from H. Middleditch.

"Following R.Ginns' letter, I now find my G.mihanovichii (Chileans No.8 p.18) fruits, which were tall and thin and green, having stayed that way for the months of October-January, began in February to fatten and shorten and turn a reddish colour.

In 'Succulenta' for April 1965 G.mihanovichii was illustrated, one plant with tall, thin, newly set fruit (and flowers) and another plant with fatter, shorter, fruit, one of which was split open ready to discharge its seeds.

Perhaps subscribers who have had red seed pods on their Gymnos could tell us whether other species follow the shortening and fattening and changing-colour routine, too.

..... from E.W.Putnam.

"In Vol.1. No.8, p.18, I remarked that as yet I had not seen red fruits on Gymnocalyciums. This is no longer true as I have been given a pinkish fruit from G.mihanovichii by Bob Hollingsbee and also, during February, I visited the South-East Kent Branch of the N.C.S.S., at Dover, and there saw a fine plant of G.joossensianum with a number of large, practically cylindrical fruits which were red or pink (the colour is not easily described, being a sort of muted red shading into a dusky pink). These fruits stood up vertically from upper areoles, like candles on a birthday cake.

Red fruits occur in the Gymnocalyciums of the "Chaco" group allied to G.damsii, of which the better-known species are G.mihanovichii, G.joossensianum, G.friedrichii (G.mihanovichii v. friedrichii) and G.marsoneri."

THE SLIDE LIBRARY

The Chileans now have over 140 slides in the slide library, including thirty copy slides taken in Chile. The majority of our slides are of Neoporterianae in various stages of bud (B) flower (F) and fruit (S). We should like to have a slide of each species in all three stages; from the list below it will be seen that we have few slides of plants in fruit.

Certain slides (mainly copies) are not really of good quality and will be replaced when better ones become available. If members have any surplus slides the Chileans would be pleased to welcome them; should the Treasurer report favourably, it will be possible for us to reopen our offer of 1/- per slide.

The Chileans would like to acknowledge the generous donation of slides during the past year from:- A.W.Craig, D.Lewis, H.Middleditch, J.W.Welsh, D.W.Whiteley, P.Beeston, Mrs.J.Hillmer.

One of these slides is extremely interesting, showing Parodia bueneckeri in fruit. I now notice (February) that my plant of this species has about a dozen buds which seem to be pointed and adpressed towards the centre of the plant. This occurrence I have not noted before with any other Notocactus or Parodia species.

The slides listed below are available to members of 'The Chileans' either singly or in sets. The only charge to be made is 2/- per set (in U.K.) to cover postage etc. When slides are required for a particular date, application should be made at least fourteen days beforehand. Slides should be returned to me within ten days of receipt.

Neoporterianae: Set No.1

aerocarpa v. fulva		fusca	B.F.
aspillagai	B.F.	glabrescens	B.F.
chilensis	F.	hankeana	B.F.S.
confinis	F.	hankeana v. taltalensis f. flaviflora	F.
curvispina	B.F.	heteracantha	F.
dubius		horridus	F.
ebenacantha	F.	imitans FR 499	F.
esmeraldana	F.	intermedia	B.F.S.
fiedlerianus			

Set No. 2

iquiquensis	F.S.	napina	B.F.
jussieui		napina v. lanigera	
krausii	F.	nigriscoparia	F.
lembckei		occulta	B.F.
malleolata		odierii	F.
marksianus	B.F.	paucicostata v. viridis	F.
mebbesii		pseudoreicheanus	F.
mitis (ex Andreae)		pygmaea	F.
multicolor	F.		

Set No. 3

reichei	B.F.	Arequipa K 142	B.F.
rupicola	F.	Blossfeldia lilliputana	B.F.
scoparia		Copiapoa barquitensis	
senilis	F.	cinerea	
strausianus		haseltoniana	
taltalensis (Hutch)		hypogea	B.F.
tuberisulcata v. robusta	B.F.	montana	F.
villosa	F.	rubriflora	
wagenknechtii	B.F.	Matucana megalantha	F.
woutersiana	F.	spledica grandiflora	F.
		Parodia alacriportana	F.
		buneckeri	S.
		rubriflora	
		Pilosocereus sp.	
		Sulcorebutia sucrensis	B.F.

All slides are named as received; we should be pleased to hear if you feel any slides are not correctly named.

STOP PRESS ..... A.W. Craig

The Robin on photographing cacti has just completed its first round - it has been very well supported indeed and I would be pleased to hear from any other Members interested in participating in this Robin.

NEWS AND VIEWS

We have just heard, before going to Press, that Herr Uebelmann is expected back from Brazil about mid March and we can confidently expect a fair selection of newer Brazilian plants to be available from Su-ka-flor this year.

Wanted - Old Books and Journals on Cactaceae.

Dr.H.Vertogen of Hogeweg 67, Erembodegem, Belgium, is interested in acquiring old books, manuscripts and Journals dealing with cactus plants. Any subscribers who can offer books or assist in their acquisition are asked to contact the enquirer direct.

Seeds

We should like to acknowledge receipt of seed during the past year from R.Parsons, California; R. Zahra, Malta; and B.Eller, Switzerland.

If you still have surplus seeds on your hands or in your own plants, it will be given a welcome by our seed exchange organiser E.W.Barnes, 22 Coniston Grove, Ashton under Lyne, Lancashire. If you are interested in obtaining some inexpensive seed, send a S.A.E. to the above address with your enquiry.

COLLECTOR'S CORNER

..... from D.J.Lewis, Cardiff

'I have some slides taken in Frau Winter's nursery in June 1957. The spread of plants was fantastic, many still had Ritter's wire tags round the plant body. There were quite a few young people helping with the seeds and other work when I was there. Frau Winter's method of bringing Ritter's collected plants back to life was to half fill a large box with a gritty sand then top this with approximately two inches of peat (the peat was, I believe, sphagnum, not sedge). A young boy was then sent to Frau Winter's flat to collect a can of boiling water. The return journey may have taken ten minutes but the still very hot water was then transferred to a small hand sprayer and the plants soaked with the warm spray.

The action of the warm water was to soften the tissue and possibly reduce the natural waxy coating so allowing water to be absorbed through the body tissues, i.e. the stomatal openings.'

(We should be very pleased to hear of subscriber's own systems for encouraging imported plants to restart growth - H.M.)

SEED RAISING

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

Some readers may be interested in my methods of seed raising, if only to note the differences from those described in 'The Chileans' No.6.

I have experimented with different media for several years, including Buxbaum's brick dust, and have finally settled for Levington seedling compost which I use in a propagator consisting of a series of compartments $2\frac{1}{2}$" deep, the bottom standing in water, and the whole covered with a domed, plastic roof.

This means that the compost is definitely wet all the time, and one of the snags with the Levington composts, if they are kept wet, is that they grow the most prolific crop of assorted algae I have ever seen. I have checked this by giving the seedling compost in the propagator a good soak with Cheshunt compound solution before sowing the seeds.

I have noticed, in previous years, that a number of seeds bring their own fungi of various sorts, including damping off I suspect, with them. To counter this I gave all my seeds a thorough wash and soak in 2% Chloros (domestic bleach) for 10 - 15 mins. this year. The results have been satisfactory, and there has been no trace of any fungus, despite the damp conditions.

Most of the seeds that I grow are somewhat different from the desert types mentioned by other contributors, mostly hybrid Epiphyllums and Schlumbergeras which, being epiphytic, should appreciate damp conditions. To make a check on this, I put in some Mammillaria densispina and Parodia mutabilis left over from last year, and these have grown away very well. After three months they are nice little plants 3 - 4 mm. dia., the Parodias having done particularly well, some showing their second row of areoles, I have never seen such fast growth before. Some of the Epiphyllums are 2 cm. above the cotyledons, the Schlumbergeras 1 cm. some making their second pads. Also, some of the biggest fern prothalli I have seen and moss protonemas just starting throw up shoots.

SOME SEED RAISING PROBLEMS

..... from R. Davison

I was very interested to read the remarks on differences in seed colour and promptness of germination (The Chileans No.6 pp. 5 - 6) I have found a very definite tendency for light coloured seeds to germinate first, particularly with Echinocerei seed from my own plants.

I have again had quite a successful year with seedlings although I sowed rather late, but both a neighbour-collector and myself have had some of our seedlings from 1966 sowings stricken by a mystery disease which burns (?) the growing centre out of the plant and leaves it looking ash

grey and in extreme cases kills the growth of the plant altogether, causing it to produce offsets as though the top half of the plant had been cut off. Some seedlings received from D. Whiteley have also been attacked in this way. The only thing I've done differently this year is to leave the polythene lining in the greenhouse all summer and I can't really see how this could cause it.

(Having seen the seedlings in question, I can confirm that it is not red-spider damage and is hardly comparable to either scorch or cold spot; as our subscriber says, a mystery).

COLLECTING NEOPORTERIANAE

From New Zealand, Mrs.J.Hillmer tells 'The Chileans'; - 'The majority of my South American cacti are grafted plants with the exception of the Neoporterias which do quite well on their own roots and flower well. The Chileorebutias and many others I do not find satisfactory on their own roots; I have flowered Chileorebutia esmeraldana and it had had a large seed pot, in fact nearly as large as the plant itself. Neochilenia paucicostata v. viridis also flowered profusely and had many light red fruits'.

(I wonder, now, if these changed shape and colour in the same way as those noted in our No.8 bulletin?).

From J.D. Donald we have comments on 'Collecting Neoporterianae' in No.8 bulletin:-

'Regarding the query from E.W. Bentley about fruits of Neochilenia being initially dry, this refers to the whole fruit and not just the fruit walls which are and remain fleshy all the time in the Neoporteria groups. Nichelia (Neochilenia) fruits are dry from inception within the fleshy walls - Horridocactus and Neoporteria not so, but become dry on maturity.

Turning to the comment by H. Middleditch on 'Chileorebutia' saxifraga, this plant together with N.aricensis and N. residua were initially included by Ritter in his 'Chileorebutia' section on the basis of their dwarf nature and the similar seed retention in the fruit to other Chileorebutias. They do not resemble them in spination or body form otherwise. If you must have a separate name for this group, we should use the name Thelocephala Ito. The seeds in these fleshy pods can germinate before the fruit is detached.'

From D.W.Whiteley we are informed 'In the Chileans No.2 p.5 reference is made to Pyrrhocactus Salto de Agua. This is a contortion of the plant appearing first in seed lists from Uhlig, listed as U 141 Pyrrhocactus Salta de Ague, the seed being collected by Lembcke. This plant was first listed as Pyrrhocactus straussianus by Uhlig, in later lists however the name was changed to Pyrrhocactus atrispinosus, the name later being published by Backeberg'.