

THE
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OF GREAT BRITAIN

Established 1931

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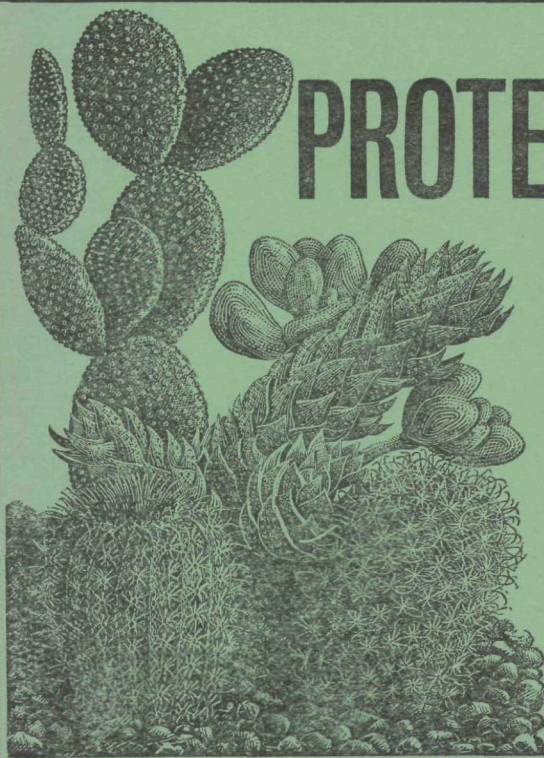
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EDITORIAL

It is with sincere and deep regret that we report the death on 5th December 1964 of Anna Geyer the wife of our good friend Dr. Geyer of Barrydale, South Africa.

Mrs. Geyer accompanied her husband on his many expeditions and had done so until recently.

Her peaceful passing brought her relief after four months of intense suffering, and is only in small measure eased by the sympathy and kindly thoughts extended to Dr. Geyer. Mere words are inadequate at a time of such sadness but the Society has written to Dr. Geyer expressing our feelings and our true sympathy.

Mr. J. M. Marshall has been forced to resign the Secretaryship of the North London Branch as his firm has moved his department to the north and he has had to go with it. We record our thanks to Mr. Marshall and we wish him well in his new habitat.

We are glad to report that Mr. D. J. Elliott has agreed to fill the vacancy caused by Mr. Marshall's resignation and we are pleased to welcome him and to wish him every success.

Our congratulations are due to Mr. and Mrs. R. H. I. Read on the birth of a daughter.

In this issue you will find an article by Mr. Eric Jennison, Secretary of the Northern Counties Branch on the subject of Plastic Pots. The improvement in manufacture and the willingness of the manufacturers to incorporate the requirements of users has increased the interest in this type of container. At the same time Members have shown sufficient interest to make experiments and the article by Mr. Jennison gives his conclusions.

As a furtherance of this interest, and with the assistance of Mr. Jennison, we are in touch with one manufacturer and hope to be able to make a report, to our Members' advantage, in due course.

The past year also brought a valuable suggestion, with a concrete contribution, from another member of the Northern Counties Branch. We were happy to receive from Mr. W. I. Acton, B.Sc., A.M.C.T., scripts for a series to be entitled 'Beginners' Corner'. We had originally planned to commence the series with this issue but are extremely disappointed that it has not proved possible to do so. We feel that a series such as this requires adequate and good illustration and that our present format does not offer the best form. This is now being worked upon and we trust that the result will justify the delay by greatly improved presentation and the avoidance of the type of pitfall which so often accompanies the rushing of a project.

Whilst so involved with the Northern Counties Branch we have been asked to say that their 1965 meetings will be held at the Social Service Centre, Whitley Bay at 7.30 p.m. on the third Monday of each month from April to November inclusive and on 13th December. Members able to attend will be welcomed.

Many of our Members, we feel, enjoy visiting other gardens even though their owners do not specialise in succulents. The Gardeners' Sunday Organisation, which published 'Gardens Open to the Public' in 1964, has informed us that its 1965 booklet will be published in March. The title has been changed to 'Gardens to Visit'. It will again contain a list of gardens open to the public, with brief descriptions, arranged chronologically and geographically and has a county index. The information can be of great assistance and will help to increase the enjoyment of planning such visits by those able to do so as well as helping a cause which this Society prefers to assist.

Continued on page 2

CACTUS CULTURAL NOTES

By A. BOARDER

This year brings another mile-stone to me regarding my growing of cacti. It is now sixty years since I got my first plant and it is still alive and apparently in good health. As a specimen *Echinopsis* it would never win a prize but it has a warm spot in my regard. Although the lower part is gnarled and browned, the top part is growing and healthy. I also have the descendants of two of my first *Mammillarias* obtained at the same time. They are *M. gracilis* (two varieties), and *M. elongata*. I have never obtained any fresh specimens of these plants and those I have now are from off-sets from the originals. In those early days I knew no one who grew cacti and so had no opportunities of exchanging views or yet getting any information on how to grow them. They just had the ordinary plant treatment and the fact that they survived speaks well of their hardiness.

It was not until 1922, that I found another cactus enthusiast living a few miles from me. He was the late Mr. Green of Ruislip, who had a fine collection. He used to go to Belgium to buy plants and when they arrived I would go over and help him to pot them up. This was a great thrill to me as I was handling fine specimens the like I had not seen before. He also encouraged me to try raising them from seed and it was with some of the seeds he gave me that I made my first experiments at seed raising. It was not long before I was obtaining very good results and from that time my main interest with the hobby has been to raise as many different kinds as possible. At the present time out of about a thousand plants in my collection there are not more than half a dozen which I have not grown from seed myself.

With all the varied directions as to growing these plants available today, it seems incredible that I was able to keep my plants alive in those early years as I appeared to have grown them against all the present day rules. I am sure of one thing and that is, I grow my plants today no better than I did years ago, perhaps not as well, as there is no doubt that the more one collects the worse off are the majority of the plants as far as cultivation is concerned. The long winter's rest was unknown then, but the plants had very little water during cold weather. I used ordinary garden soil for potting and all the modern ingredients which go into the John Innes composts were an unknown quantity.

My first effort at heating a greenhouse was with an old Beatrice stove. This had a large sheet of corrugated iron suspended over the top to spread the heat and as far as I remember it functioned quite well. My next was a small blue flame heater which gave me some trouble and was not as efficient as the present day ones. I then bought a second-hand oil heater with water pipes incorporated. This was an improvement but it had a white flame and was not too powerful. However, I managed to construct some shelves directly over the pipes and had bottomless frames on top in which I raised many seedlings. It was with seedlings raised under these conditions that I won many prizes for cacti raised from seed in the years 1932 to 1939.

My next adventure with heating was when Mrs. V. Higgins gave me an old stove boiler and pipes. I had this during the war years and found it worse than hard labour trying to keep it alight with the only material I could get; that was the bark from tree logs from a local yard. Many a time during winter months I had come home from duty soon after 10 p.m., to find that the stove had gone out. I would then have to re-light it in the dark, and often rain or snow. Obviously the stove could not be made up for the night and left before it had burnt up very brightly, and so it would be about 11.30 p.m., before I could get to bed. Then I was often early turn the next morning, which meant getting up at 4.30 a.m.

I then changed to oil and electricity. My new greenhouse, built soon after the war, had electric cable heating, and as long as there were no power cuts it was all right. However, I found that I could not rely on this form of heating alone and so bought another oil lamp with water pipes above. This acted well until the bad winter of 1962-63, when owing to power cuts I lost many plants. I then bought a monster blue flame lamp from Bryant of Bristol. This has functioned perfectly and I have more warmth in the house most of the time than I had before. The blue flame lamp does not smell and gives out splendid heat. When full on it burns about five gallons of paraffin a week, a bit expensive, but worth it to keep all the plants safe.

EDITORIAL—Continued from page 1

The booklet can be ordered from the organiser, Mrs. K. Collett of White Witches, Claygate Road, Dorking, Surrey, or after publication through the bookstalls of W. H. Smith & Son Ltd., at 1s. 3d., post free.

The Gardeners' Sunday Organisation for the public opening of private gardens is a joint effort by The Gardeners' Royal Benevolent Society and The Royal Gardeners' Orphan Fund.

Unlike many other folk our attentions are occupied throughout most of the twelve months in every year but a New Year does concentrate our thoughts to the beginnings of new growth. With this first issue of 1965 it is our wish that the year will realise for you some cherished ambitions, with a minimum of disappointments, and the good health to enjoy, or endure, what Dame Nature has to mete out.

This heater has double water pipes above and a fume pipe over these pipes. The hot air leaves the pipe at each end. Thinking I could extend the range of heat over a greater length of my twenty foot greenhouse, I bought a roll of Polyglaze, 42 inches wide. I cut this in half and rolled it into two pipes 42 inches long. These were joined with Sellotape and then added to the length of the copper pipe taking the fumes from the lamp. This spread the warmth to over nine feet instead of about two and a half. The added pipes were attached to the copper ones with more Sellotape. Now I could feel the warmth coming from all along, and from the ends of these added tubes and was well pleased with the experiment. However, this was not the end of the story. I found that condensation was dripping from the ends of the tubes and so I placed a pound jam jar under each end. I found that I catch at least a pint of water every 24 hours. The great advantage is that instead of always having my inside glass running with water, it now keeps almost completely dry.

It is obvious that I have kept the atmosphere in the greenhouse much drier than it ever was before and instead of often finding fruits on plants going mouldy, they now remain quite dry.

I started repotting many of my plants towards the end of December and shall continue as and when I get the time until they are all finished. I would prefer to repot in March or April, but there are so many to do and there will be so many more jobs to do in the garden later on, that I am obliged to repot early in an effort to get them all done. I see that the soil is just crumbly moist and then the pots will not need any watering for some time. I have never been able to find the right size pot for some of my plants. When moving a plant from a four inch pot I could not find one just that little bit bigger that I wanted. I had to use a five inch pot which not only looked a bit too large but took up too much valuable space. I then measured up my four inch pots and found that that was almost the outside measurement. I enquired at a local shop and found that no four and a half inch pots were stocked. However, I found that their four inch pots were that size inside and so they made the exact size I had been looking for for many years, giving me the size between a four and a five inch pot.

I still use a rubbing of Paradichlorbenzine round every pot when repotting. I find scarcely any trace of root-bug in any of my pots. Much of this is due to the treatment but also I know that it is because I do not like to leave any plant in the same pot for more than two years. About eighteen months is the maximum time in my opinion, and young, fairly quick growing seedlings will get a move sooner than that. I do not always remove every scrap of the old soil, but I examine the old soil and if it looks good I do not remove all of it but only the top and any which appears stale.

My *Mammillaria plumosa* flowered in December. This plant is one of the mound type, not with individual heads. There are at least a hundred distinct heads on the plant and only a few of them flowered. I first saw the buds in the first week of December and they opened soon after. The flower is not very imposing, being almost tube shaped and a creamy-white. My *Zygocactus truncatus* flowered very well indeed all over Christmas, and still has many flowers and more buds to come. This is on January 7th when I am writing these notes. This plant was placed out in the garden and forgotten until the beginning of October. When replaced in the greenhouse it was hung up from the roof. There is no doubt that the outside treatment has encouraged the plant to flower well. I shall repot it into J.I. compost No. 2, as soon as it has finished flowering. Once the spring arrives the plant will be put outside once again for the summer.

I have been looking over my *Coryphanthas* and find that some of them have never flowered as yet. I have about a couple of dozen different species and usually manage to flower seven or eight of them. Some are extremely slow to flower as most of the plants are about 16 years old from seed. I have never flowered either *C. runyon* or *C. macromeris*. These two are caespitose plants; they seem quite healthy but never a sign of a flower bud.

I have most of my specimen *Mammillarias* all along one length and end of my greenhouse. This is 20 feet long and the end is 9 feet wide. The staging is about three feet wide and the pots are packed as close together as possible. If one is placed in a larger pot it cannot go back in its old position and a rearrangement is necessary. On the other side of the house are the *Lithops* and all the other genera of cacti which I collect. I must say that at this time of the year the *Lobivias*, *Notocactus*, *Gymnocalyciums*, etc., look very drab, whereas the *Mammillarias* are a grand sight especially when the sun shines. It is then that the lovely colourful spines shine up like brass. Added to this there are some still with flowers, *M. picta* is one, and very many still have rings of red fruits on them. I have no doubts whatever as to why these Mams. are my favourite plants, as no other genus can look so very attractive and have such varied shapes and colours as the Mams. Their spines alone vary from white, through gold to brown, then to reds and even to blacks. Some spines are short and stout, whilst others are hair-like or imitate feathers. For anyone who can appreciate the beauty of such plants the genus *Mammillaria* is the best one without any doubt. Many other kinds have larger and more spectacular flowers, but few have the following coloured fruits in such abundance as these plants.

I think I have mentioned in previous articles that I have a spare gallon tank for paraffin which feeds my lamp by siphoning. Some time ago I had to go to Manchester to an aquarist's festival for four days. I wanted to try to keep my lamp going for that time without attention. I therefore added another gallon tank and fitted a tube to the existing spare. I lit the lamp and set the siphons running and the lamp was still burning well, five days after when I returned.

One of the most sweetly scented flowers among the *Mammillarias* is that of *M. camptotricha*. The scent reminds me of the flowers of a lime tree. Besides the usual yellow spined plant I have one with pure white spines, but yet the plant has the same twisted spines which give the name 'bird's nest cactus'. Then I have *M. albescens*, rather similar but without the twisted spines. There is another one in my collection which appears to be a cross between *M. camptotricha* and *M. albescens*. All of these types are caespitose and soon make a good group. It seems strange that some *Mammillarias* keep simple or single always whilst others always make groups. However, I find that as some of the simple ones grow older they divide at the tops and become two, three or four headed. The *M. parkinsonii* kinds will always do this, but the same formation can appear on old plants of *M. rhodantha*, *M. potosina*, *M. ebenacantha* and a few others. With most of these types as the number of heads increase on the plant so do the number of flowers also increase. Each head will have its complete rings of flowers every year.

As fresh growth is noticed on any of your cacti make sure that the plants are watered adequately. Once this growth starts it is imperative that enough water is given on all suitable occasions. Make sure than you give water which is enough to thoroughly wet all the soil in the pot. If you have repotted a plant and only left a very small area at the top of the pot for watering, it is practically impossible to give enough water at one time to enable it to soak all the soil in the pot. Under such circumstances it is essential to go over all pots again and so make sure that the plant is getting sufficient water. Small pots will need watering every day during fine weather. It is probable that the small pot of soil would dry out in less than a day even if there was no plant in the pot, but adding the use of the water by the plant to the ordinary evaporation, it can be realised that plenty of water is needed by a growing plant during warm weather.

Do not be afraid to give plenty of fresh air to your plants. On all fair days see that the windows are open well, and if there is no frost likely some air can be left on all night. Clean the glass of the greenhouse thoroughly. I find the best and easiest way is to tie a plastic hose on the top of a rubber-type squeegee, and then with a slight jet running, the tool can be worked down the glass on the outside of the house and so wash all dirt away with little trouble.

CULTIVATION OF SUCCULENTS

By Mrs. M. STILLWELL

As I write these notes in January, I realize how lucky we are up to now with the weather. It has been possible to keep the greenhouse up to between 45° and 50° at most times, and the succulents look in much better condition than when the temperatures are allowed to drop down into the 30's. Most have been kept dry for safety, except the winter growers, which are watered only when they show signs of needing it. I had a number of plants in flower at Christmas, including *Fenestraria aurantiaca*, *Conophytum ficiforme*, *Trichodiadema densum*, several *Faucarias* and *Glottiphyllums* and a large plant of *Cerochlamys pachyphylla* full of the large showy mauve flowers. There were, of course, several *Gibbaeums* in flower, and several others in bud. *Antegibbaeum fissoides* is full of big fat buds, and should make a nice show later on. The *Stapeliads* appreciate extra warmth in the winter, it stops them shrivelling too badly and also helps to prevent the dreaded black-rot, which is usually brought about by cold damp conditions. The *Euphorbias* also keep in better shape, and *Crassulas* and *Kalanchoes* are not so likely to drop their bottom leaves. I have always felt that the chief aim in the winter, is to keep the conditions as dry as possible, but with a certain amount of ventilation, to prevent the air becoming stagnant. One important thing is to have a concrete floor, and good foundations to the walls, so that the damp cannot rise. I am personally not in favour of lining the house with polythene, I feel that it makes the atmosphere too heavy. I like my plants to be able to breathe in any air that comes through the eaves of the roof, and other nooks and crannies. I do not open many windows during the winter, but I do know that a certain amount of air always gets into my greenhouses without, and I have no wish to obstruct it with polythene, I would rather put on a little extra heat than blot out any of the light, which is poor enough during the winter.

In January, one begins to look forward to the spring, and to the great repotting operations. I feel it is a mistake to start repotting too soon. The plants are at their lowest ebb during the winter, and therefore if disturbed or broken up, they may shrivel badly and often fail to recover. Wait until the plant shows signs of just starting into growth, and that is the best time to repot, and it should not look back. With the South African succulents, try and find out the month in the year when growth commences, and make a note of it, and then just watch your plants as this time comes round. It is a good guide to when to repot. Such things as *Lithops* and *Argyrodermas* should be ready about May, while *Conophytums* and *Pleispilos* prefer to wait until about the end of June or beginning of July, when you can remove a lot of the old dead growths from the base. The small mimicry plants can be left undisturbed for several years, and are often better just potted on without any root disturbance. Last year I took a number of *Argyrodermas* from a large pan, in which they had been for several years, in fact quite six or seven to my knowledge, and potted them up into individual pots. They all resented the move and shrivelled badly, but the new pair of leaves grew through the centre when the appropriate time came round, and they should be back to normal this season.

With cacti it is usually possible to repot the whole lot in the spring, without any coming to harm, but with some of the rarer succulents I would suggest you play safe and if they look healthy leave them alone.

One plant that seems to make plenty of growth during the late autumn and winter, is *Cheiridopsis peculiaris*, a very interesting plant to watch, with its two different shaped growths. It must be kept quite dry during the resting period, when the united pair of leaves form a papery skin. Water very carefully from the base. Most South African succulents will tell you themselves when they need water, it is not possible to state the exact times, it depends on conditions, treatment and where they are grown. It is something one learns with experience. I always advise every collector to learn all he can about his plants, by studying every book available to him on the subject. Take one particular plant at a time, and look it up in each book, and really find out all you can about it. Make notes, or better still, a card index, stating habitat, where you obtained it, its resting period, repotting time, and when it flowered. If you have any really difficult plants, this can be a tremendous help, to have a very quick reference when in any doubt. This of course refers mainly to the choicer plants that have probably taken you years to track down, and those which you would no doubt find great difficulty in replacing. There is no need to bother about the ordinary common succulents, which in many cases almost grow themselves.

The outer leaves of the *Lithops* should be drying up now, and you should be able to see the new bodies inside. They will not need any water until about the end of April or beginning of May. Be careful if you remove the old pair of leaves when dried right up, it is so easy to break off a whole head, if this does happen, it is possible to reroot it, but it does take time.

About April it is a good time to break up some of the larger growing *Stapeliads*, you will find they will bloom much better on the new growth. You can always use the old stems for cuttings, they come in handy on 'exchange' nights, and for raising branch funds. Should you find mealy bug at the roots, remove all the soil, and clean them with a brush dipped in surgical spirit. I find this cleans them up quicker than anything else I have tried. I always wash them well afterwards in warm soapy water, and finish off with a good rinse under the tap. If you lay them out on blotting paper afterwards, it absorbs all the excess water, and the roots soon dry, and are ready for repotting. Never pot up wet, as the roots tend to clog together, and stop the soil from being evenly distributed among the roots. I always put about half an inch of sedge peat at the bottom of the pots for *Stapeliads*, so that it retains a certain amount of moisture at the base of the roots, particularly as I grow mine up on a shelf, where of course they dry out quicker. They are all watered from the base, and the soil consists mainly of three parts. One of John Innes No. 2, one of very sharp sand, and one of sedge peat. I do add a little extra hoof and horn, or perhaps John Innes base, as the peat and sand have no feeding properties. I am not in favour of liquid feeding for *Stapeliads*, as it makes them too lush and rampant, and these are the ones that succumb in the winter. You will be surprised at the beautiful markings that develop on some of the *Huernias* when grown in full sunlight, added to this you will have a true to type specimen, that you can be sure will not suffer with black rot, etc., during the winter, as it has a really tough outer skin that will resist all this. Never mind if your plant does not measure a foot across, aim at a small healthy one, that will live to show you its flowers again next year.

Aloes and *Agaves* can be among some of the first to be repotted. If some of the larger ones have got too leggy, by the dropping of the bottom leaves, do not hesitate to behead them. They will soon root up, and be as good as ever. If you wish to keep the base it may throw up some offsets, or better still why not plant it out in the garden when all danger of frost is past. Be careful when handling *Agaves*, they have some very sharp thorns or spines which can cause some very deep scratches. They make a tremendous amount of roots in the course of a year, and do want repotting annually, when most of the old roots should be removed, particularly those which come away easily. Both *Aloes* and *Agaves* like plenty of water during the summer. I find they do better in semi shade under the staging, where they have more room, and the tips of the leaves are not so likely to get damaged.

Do not forget to include the greenhouse in your annual spring clean. Try and examine every pot for pests and disease, not forgetting to have a look underneath, where mealy bugs often congregate. Wash over the shelves and staging with hot water to which has been added a strong dose of either Jeyes fluid or Dettol. Include the floor and walls as well. Give the windows an extra good clean inside and out, all those buds just forming need every bit of light they can get early in the season. Just to be on the safe side give two applications of Malathion at fortnightly intervals.

If you make up your own compost do look round for some really good loam, it varies so from place to place, and that is why many of the ready mixed cactus potting composts do not come up to the expected standard. It must be a good open mixture that allows the water to drain away freely. When you purchase your mixture, pot up a test pot without a plant, and see how it reacts. If the soil looks dusty and the water just sits on the top, add a good proportion of sharp sand until you get it the right consistency. It is very annoying to find your mistakes when you come to water for the first time afterwards. I am always in favour of keeping the potting shed separate from the actual greenhouse, so that no pests can find their way into your new compost and also so that no old compost and dirty pots are left about the greenhouse to cause equal trouble. Cleanliness is the main aim when growing cacti and succulents and a little extra care pays very big dividends.

MAMMILLARIAS I HAVE GROWN (*continued*)

By A. BOARDER

The letter 'U' has now been reached in my series.

M. uncinata is a rather unique plant as it is one of the very few with an open appearance, similar to *M. magnimamma*, which has strongly hooked spines; I have had a plant of this species for many years and find it rather slow growing.

M. uncinata, var. *biuncinata* is a type with extra hooked spines and is similar to the foregoing plant in outward appearance.

M. uncinata var. *rubrispina* is I believe just a name given to one of the species with reddish spines. I do not consider that this is sufficient to bear a varietal name. One could make no end of such varieties by giving one to each of the *Mams.* with either a longer or more highly coloured spine. Also the colour of the flower is sometimes used as an excuse for a varietal name.

M. umbrina is a handsome plant and one I only raised from seed during the past few years. I like it very much. It resembles *M. mazatalensis*.

M. vagaspina is a plant of the open type, like *M. Magnimamma*, and it grows and flowers quite well with me.

M. vaupelii is a great favourite of mine. It is a simple type with many short, close-set spines and has a general appearance of *M. discolor*. My plant from seed was a long time before it flowered and it does not flower as easily as many other species.

M. vaupelii var. *flavispina* is a type I raised from seed in 1947, but so far it does not look so very different from the ordinary species.

M. vetula is a plant I had given to me years ago under this name, but I am sure that it is wrongly named. I consider it to be just a type of *M. gracilis*.

M. viereckii is a grand plant which never fails to flower well each year. The flower is also sweetly scented. It makes a thickened root-stock and with its very thin spines is most attractive. I have two distinct types, one has brownish spines and the other has white ones. The former I had from seed in 1946, under the variety of *brunispina*.

M. viperina is another uncommon species and one which I have found very slow growing. I raised my first plant from seed from de Laet, in 1931.

M. viridis was also from seed in 1928, and this is given by Craig as a variety of *M. praelii*. My plant bears no resemblance to *M. praelii*.

M. vocultii is a new *Mam.* for me and as I have only young seedlings I am unable to give any description of the plant. It is not included in Craig. It may be a new discovery but again like many others it may be a new name for a plant I had many years ago.

M. velthuisiana is another new kind for me. I sowed some seed last year and the resultant seedlings are not as yet large enough to be able to say with certainty whether the name is for a fresh plant for me or not.

I find that in my collection I have a number of *Mammillarias* with just a number which was given by the person who discovered the plant. This can be very confusing as I have found that in some cases the person who has supplied me with the seed under a certain number has later denied all knowledge of having had such a number. Then there is the problem of different collectors in the field giving numbers and then later on one never seems able to find out whether the plant has had a name given to it or not. Still it is all very interesting and as long as a plant is different from any other in the collection and grows and flowers well, I do not intend to lose any sleep over whether it has a correct name or not.

Your Editor is particularly desirous of obtaining two copies of Part I of Volume 14. One of these is required by Mr. Gordon Rowley. Any reader with a copy to spare is asked to make his offer to the Editor.

On page 10 you will find Mr. Read's report on the PUG Portable Pest Control Unit. The price of all models is, as from 1st March, £9. The makers are offering it to our Members at £8 until 1st April 1965, less 10 per cent discount. The address is Pug Products Ltd., 44 Old Bond Street, London, W.1.

Proposed English translation of 'Die Cactaceae' (see page 19 November 1964 issue), Micro Methods Ltd., have informed us that the original publishers of the German edition have now agreed to extend the pre-publication period to 30th June 1965.

PLASTIC PLANT POTS AND THE CACTOPHILE

By ERIC L. JENNISON, *Secretary, Northern Counties Branch*

I have in recent issues of our Journal noted a number of references to plastic pots. The remarks made in these references have never stated a majority viewpoint in favour of the plastic pot. It is therefore with this point in mind that I offer fellow members this contribution on the subject. In an endeavour to put a clear case forward I shall put to you both the points for, and the points against the use of plastic pots. This article is based on practical experience as less than 1 per cent of my collection of some 700 plus plants is growing in containers not manufactured from a plastic material.

My own experiences with plastic pots commenced with the purchase of one dozen 3 in. 'Polypots' back in 1956/57.

At this time the plastic pot was very new and the cactophile who purchased them as homes for his plants was looked upon as an irresponsible person placing his plants well and truly on the road to ruin. Regrettably, even today, because of the lack of personal adaptability to the methods of cultivation in a non-porous container, many people still are in a similar frame of mind. It is my belief that any new idea should be entitled to a fair trial so I used these pots to house a small part of my collection. Eight were used to pot up some shrub-like *Crassulas* (*pulverulenta*, *tetragona*, etc.) and the other four were used to house some *Mammillarias* which formed part of an order recently delivered. The rest of the order was of course put into clay pots.

The young *Mammillarias* were grown for a year alongside the rest of the order.

At the end of their first full year in the greenhouse the difference was quite remarkable. Those in the plastic pots were about an inch taller and far more healthier looking than their counterparts in clay pots. No losses had resulted from any plastic pot so I decided to go further ahead with them.

The change over from clay to plastic pots was done gradually, the usual practice being to purchase 50 at a time so as to stagger the work and the cost. By autumn 1959 almost every one of my plants large enough for pots up to four inches, was growing in one made of plastic. I did try the five and six inch sizes for the larger plants but found that they were structurally weak. Many a pot split wide open through the pressure of my thumbs firming home the compost. May I say at once that this weakness has been rectified and at the time of writing I have *opuntias*, *cereus* and *epiphytes* growing in these size pots.

Two materials are generally used for the manufacture of plastic pots, these are Polythene and Styrene. Polythene is very flexible and a pot manufactured from this material cannot be broken no matter how many times it is bounced on the greenhouse floor. The choice of colours in polythene is more restricted. Styrene is a more brittle plastic but it does give a little under pressure which is more than can be expected of a clay pot, and in practical use fewer breakages are experienced than with clay pots. Styrene pots are available in a far larger range of colours.

The hardest item to tackle is the choice of pot to adopt. A collection of plants housed in one standard design and size of pot looks most attractive, but the pots in each size should be of the same design, otherwise the result can be most unsightly. In my own collection for example I use 2 in. Seaforth, 2½ in., 3 in. and 4 in. Polypots and 5 in. Ledapots for the less tall cacti such as *Mammillarias* and *Ferocactus*. 5 in. and 6 in. Polypots are used for the taller growing plants only. This keeps a balance of design which is far more pleasing to the eye. Having made these two points I would now like to follow on with a review of the points in favour of plastic pots.

1. Plastic pots are approximately one-twentieth the weight of their clay counterparts. The weight loading of the greenhouse shelves and staging is thus greatly reduced. For the person who enjoys showing his or her plants this is of great advantage as far less weight has to be carried from the greenhouse to the Show and back.

2. Plastic pots have thinner walls than clay pots and more plants can be housed on the shelves or staging.

3. Plastic pots in their many colours are most pleasing to the eye and if the colours are used to the full they can assist in displaying a collection to the greatest advantage. To the photographer in colour they are most photogenic. The point is sometimes made 'I want to see a collection of plants not pots'. To this I would reply with a remark that is often made when we stage up at local flower shows. 'Don't they look nice and the coloured pots make them look most attractive.' This remark, usually made by some old dear does sum the matter up, the pots display the plants and not the plants the pots.

4. The plastic pot does not get into the filthy condition common to clay pots. The well known pre-show scrub down becomes a thing of the past, and all that is required is a quick wipe over once with a damp cloth. Rather like a certain well-known TV advert says, and in this case it is a fact.

5. With the plastic pot breakages are less frequent. If pots manufactured from polythene are used breakages are nil, should styrene pots be in use it will be found that in many cases the pots will stand a limited amount of punishment before breaking as they are slightly flexible. In any case they will accept more rough handling than a clay pot.

6. Plastic pots do not absorb moisture or food from the compost which they hold. Less time is spent in watering and less watering also means less leeching out of the compost. The root formation of a plant in a plastic pot is never so concentrated around the outer wall of the pot as is found with clay pots. This is because the plastic pot does not absorb the nutrient salts from the compost and therefore the plant roots do not have to press against the pot wall to absorb food. When the wall of the clay pot absorbs food or nutrient salts from the compost, the centre of the pot becomes leached out or void of any food and the plant roots do not feed in this area. With the plastic pot the roots thrive in the full volume of compost as the nutrient salts are distributed evenly. With less watering smaller quantities of calcium carbonate are fed into the compost and none is absorbed into the pot. As a result the plant is not poisoned by a compost with an alkaline content beyond pH 7, (neutral). It is useless mixing a compost with an ideal pH value of perhaps 6 and then increasing it regularly during the growing season with water with a high lime content. In certain areas the lime content of water is very high and repotting is advisable each year just to keep the pH value of the compost down. In these areas the use of the plastic pot can make this task a bi-annual event.

7. Plastic pots will not support the growth of mould or bacteria, they are easily cleaned and sterilised. A good wash in very hot water to which has been added some detergent brings them up again as good as new.

8. Plants growing in plastic pots are easily transplanted, if any difficulty is found in removing a plant from the pot just soak it well in water and it will then simply slide out. Less root damage occurs during repotting as the root formation in a plastic pot does not tend to hug the side of the pot.

9. Like all pots, plastic pots have to be stored. In this again their lightness and design permit large quantities to be stored on shelves which would only carry a few clay pots.

10. Providing that plenty of drainage holes are present in the base of the pot the use of gravel or broken brick or drainage can be ceased, providing that a suitable compost is prepared to cover the individual needs of the plants to be potted. This even applies to species such as *Ariocarpus*, *Astrophytum capricorne*, etc. The space previously used for the drainage material can now be used to contain the compost with all the important nutrient salts needed by the plant for food.

Having given you my version of the points which make the plastic pot the ideal pot for the cactophile I will now endeavour to detail the points which appear to be disadvantages when first attempts are made to grow cacti in them. Many of these are closely linked with the advantages and I will endeavour to give the remedy to the disadvantages wherever possible.

1. You, the grower, who, having used clay pots in the past expect to pick up a plastic pot and carry on with your old practices. The clay pot permitted a greater latitude of cultivation (easy going, easy growing) with less emphasis on careful watering and special composts. If you intend to change over to plastic pots you must be prepared to review your cultivation practices. Should you be prepared to do so the plastic pot will be labour saving and present no difficulties.

2. Composts must be made up to a rigid formula, no more slap-happy a handful of this and a handful of that until it feels suitable. My answer to the problem is to use a mixture based on coarse Bedfordshire sand and leafmould with charcoal and a little bonemeal added. The sand and leafmould are mixed 60 per cent to 40 per cent for species such as *Ariocarpus*, 50 per cent to 50 per cent for the average easy growing varieties and 40 per cent to 60 per cent for *Epiphytes* and species such as *Heliocereus*, *Aporocactus*, etc. Calcium should be added for those plants for which it is recommended.

3. Watering is a practice which has to be greatly reduced. I find that in a hot summer spell of the sort of which we dream, plants in 2½ in. pots require water every two to three days and plants in pots of 3 in. and over every week. In typical British summer weather, with the odd wet or dull day along with the sunny ones, watering of the 2½ in. pots becomes a weekly job and the 3 in. and over size usually go for ten to twelve days. This is, of course, providing that the compost in the pot is thoroughly soaked through at each watering. Never water a plant if you have any doubt about the fact that it requires water. It is not possible to tap a plastic pot and listen for the ring in the way that one can a clay pot. The method with plastic pots is easier still. The weight of a pot of dry compost is about half that of a pot of wet compost and my practice is to take a random sampling of some half a dozen or more pots from a shelf and feel the weight of them. It is so easy to tell by the weight if water is required. If only a few plants are grown there is no reason why they should not receive individual attention.

As winter approaches water should be withheld from plants in plastic pots two weeks earlier than one would for the same variety if it were being grown in a clay pot. This gives the compost a better chance to dry out as one should remember that the plastic pot is not absorbing any moisture in the way that a clay pot will. **Never** be tempted to give water to plants in 3 in. pots and over during those few days Indian Summer which we often get about late October. This period should be used to get the plants really dried out ready for the cold winter months ahead.

I feel certain that it is in the preparation of plants in plastic pots for the winter than many people fail and then, of course, it is the pot that takes the blame.

4. Sizes in plastic pots do not conform, in the larger sizes, with clay pots. Some manufacturers produce their pots a quarter or half inch larger across the rim and we are offered sizes such as $4\frac{1}{4}$ in., $5\frac{1}{2}$ in., $6\frac{3}{4}$ in. and $6\frac{1}{2}$ in. These sizes often do not meet the requirements of show schedules. This is a fault that can easily be rectified by altering Society and Branch show schedules to suit these odd sizes. It simply means that a plant in a pot not exceeding 6 in. becomes a plant in a pot not exceeding $6\frac{1}{2}$ in. My own main complaint with reference to size is the lack of a range of half pots. A number of manufacturers turn out a $5\frac{1}{2}$ in. half pot in a clay colour only. I received an excellent sample of this type of pot from the Polypot people but much as I like the design I shall not be placing an order for these pots simply because of the lack of an assorted colour range. My hopes now rest on the probability that as plastic pots become more and more popular, some manufacturer will put on the market a range of half pots in assorted colours.

5. Colour fading does occur with some shades of plastic pots but this can be both a disadvantage and an advantage. If the plants are moved about regularly, say for exhibiting or whilst searching for pests, the fading will be even and one will finish up with pots of a different colour. This occurs most frequently with the red shades I find, and the results are usually quite pleasing to the eye. One instance of colour fading always stays in my memory. A lady who inspected our Branch display and sales stand at a local flower show decided to make a purchase. She knew just which plant she required and pointed it out asking for it to be made available in a pot of that lovely red colour that a plant was in on the display stand. The plant was produced but in a new pot and this was refused, even when it was explained that the pot on display was one which was some three years old and had faded. To make a sale the pots were exchanged and the lady got the pot of her choice. After all, as she said, it had to be that colour and no other as it was to be the only plant on the windowsill and that pot was the perfect match to her curtains.

6. This is the last fault which I have to mention and it covers the growth of green algae on the surface of the soil nearest to the pot. This only occurs in the lighter transparent pots when the compost is left soaking full of water for days or weeks on end. With cacti regular watering, when required only, will prevent this growth. Should one intend to keep epiphytes and *Aporocactus* stood in water in plastic pots the use of the darker shades will prevent its formation.

I hope that this article will perhaps assist some member who has attempted the cultivation of cacti and other succulents in plastic pots and not had very satisfactory results. If care is taken there is no reason why any plant that can be grown in a clay pot cannot be grown in a plastic one. Please remember that it is the watering and the composts that one should watch. As an example I have *Lithops* and *Conophytums* thriving in a 50 per cent to 50 per cent compost and they have only been watered three times this year (1964), all look healthy and many of them have flowered. In concluding may I say that any member who is in the Newcastle area at any time and would like to call and visit my collection is most welcome to do so. It is always most pleasant to meet other members and discuss cultivation problems.

NOTES ON CRASSULA HELMSII

By J. E. KIRBY

Since my paper '*Crassula helmsii* in Britain' appeared in the pages of this Journal in February 1964, I have been corresponding with Miss R. Mason of the Botany Division, Department of Scientific and Industrial Research, Christchurch, New Zealand. Miss Mason, whose interest in aquatic plants has given her some acquaintance with *Crassula helmsii* in the field, writes:—

'*Crassula helmsii* can hardly be called a spray halophyte although Dr. Allan's* remarks might suggest it. Presumably Dr. Allan based his statement mainly on personal observation, as there is nothing previously published, and little on herbarium labels that indicates habitat. When I have seen the plant (on six occasions) it has been growing on damp ground, on sand or shingle at the edge of coastal lagoons where it would be subject to inundation; in salt marsh of an estuary; or in conditions that could be described as swampy. I associate it my mind, with damp conditions that could at times become much wetter and should not be at all surprised if it survived fairly long periods under water. If on rocks and cliffs I should expect it to be where there is a fairly constant seepage of water.

Information about the plant is meagre and it would be premature to assume that it could not grow permanently submerged in water even if it did not then flower. If the species had its origin in Australia, it may have found that the entire range of ecological conditions to which it was adapted was not present on the West Coast. Although there

are many waters there, they are mostly peaty lakes, ponds and dams, often in fertile, or swift and strong rivers and creeks. Several water plants widespread and abundant are absent or rare on the coast.

Crassula helmsii does not require saline conditions. It has been found several miles from the sea, well protected by bush from even the fiercest salt-laden winds.

Its distribution in New Zealand is restricted but is slightly greater than is indicated by Allan, stretching over two degrees of latitude (about 140 miles along the coast), and in fact it could be still greater as practically no collecting has been done for a further degree of latitude in the lowlands to the south.

Specimens on which Kirk based the species are in the Dominion Museum, Wellington, and also, I understand from Dr. R. C. Cooper of the Auckland Institute and Museum, there is further material of those gatherings in the Auckland Museum.'

It is obvious from Miss Mason's letter, that a considerable amount of research must be carried out before an accurate account of the distribution and habitat of *Crassula helmsii* in New Zealand is possible. Her observations however, do throw a considerable amount of light on to the conditions under which it occurs in South Island, New Zealand, and is a valuable contribution to our knowledge of this plant.

The ability of *Crassula helmsii* to thrive under diverse conditions was well illustrated when it grew and flowered in a cold greenhouse. In June 1963, a small cutting was inserted into a seven inch pan filled with John Innes No. 1 potting compost. It was not long before it took root, and being supplied with a liberal amount of water, grew steadily. Growth continued right through the winter, and although subjected to several degrees of frost, took no harm.

By spring, its rather thin and straggly stems had reached the sides of the pan; then, as the day temperatures grew higher, watering was reduced. This had a most pleasing effect. Branches appeared at many of the nodes, and new growth was much stronger. The foliage became a bright green, and the stems flesh coloured. By September 1964, the pan was completely filled, and healthy branches were trailing down the sides. A considerable number of flowers were produced during the summer, commencing in June, and continuing through until autumn. Unfortunately they were very insignificant, whitish in colour, and only about 3 millimeters across. They occur at the tips of the shoots, on short petioles, which elongate as the fruit matures.

In view of the ease with which this hardy *Crassula* can be grown, and its sprawling nature, it is hardly likely that it will be grown by succulent plant enthusiasts. Anyone making a study of the genus *Crassula* may consider it worth their while however, as it is a good illustration of the diversity of form within this most interesting genus.

Acknowledgement:—I would like to thank Miss Mason for allowing me to incorporate her letter into these notes.

*Allan, H. H. (1961) *Flora of New Zealand* 1

PRELIMINARY REPORT ON 'PUG' PEST CONTROL UNIT

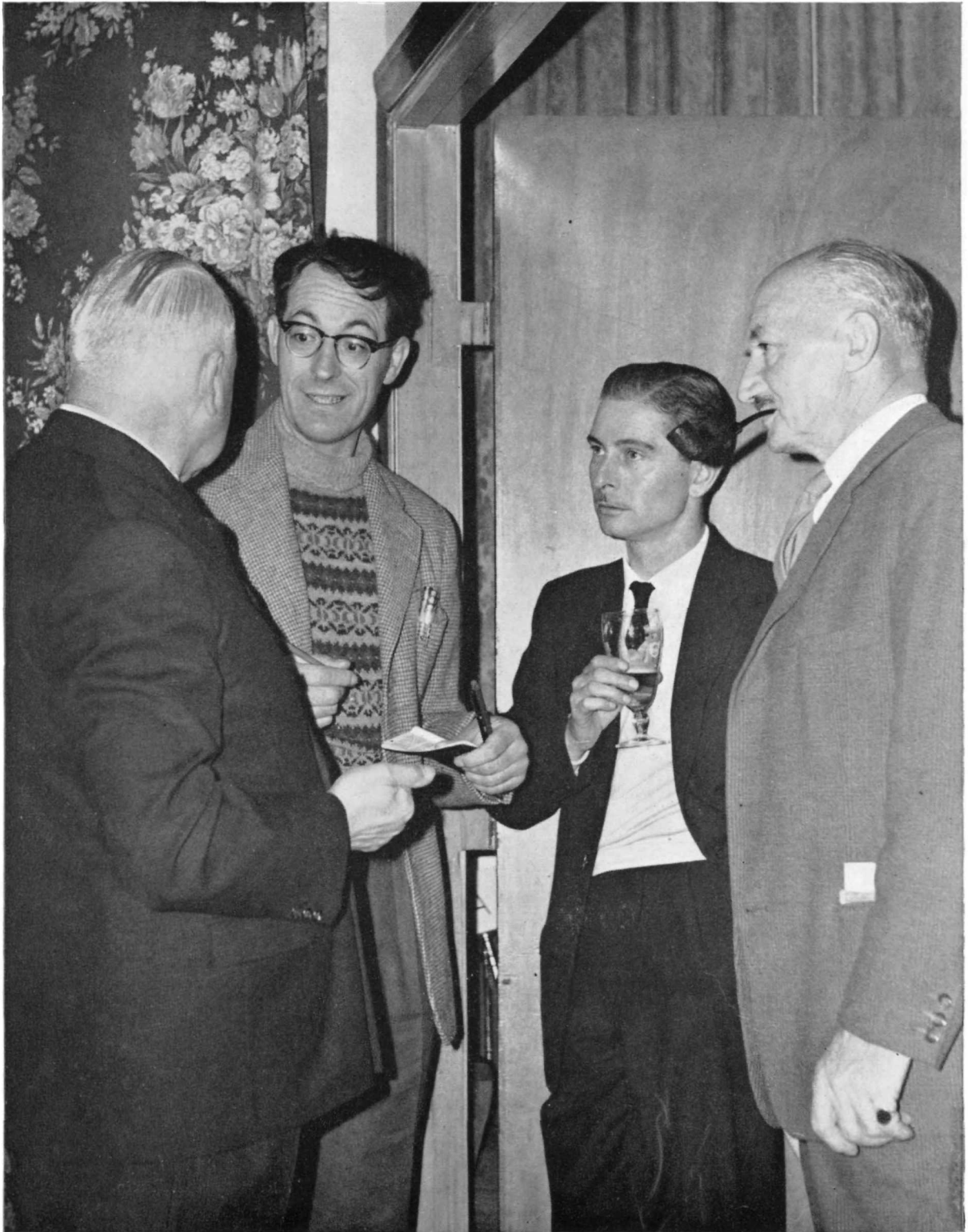
COVERING PERIOD 1st MAY - 30th SEPTEMBER 1964

The 'Pug' Pest Control Unit was sent to the Cactus & Succulent Society of Great Britain for trial and it was agreed by that society's Council that the trial should be conducted in the greenhouse of one of its Council members—Mr. R. H. I. Read, F.Z.S., F.R.H.S., of Cheam, Surrey.

The greenhouse concerned was 23 ft. by 8 ft. 6 in. by 7 ft. 6 in. and held a wide range of plants including begonias, chrysanthemums, fuchsias, pelargoniums, an azalea indica and various bulbs including amaryllis, haemanthus and *valotta purpurea*. There were also young seedlings of *dianthus heddiwigii* and *salvia* 'Blaze of Fire'. The aforementioned plants were in addition to the main content of the greenhouse which consisted of a wide range of cacti and succulent plants including a small number of the *crassulaceae*.

The unit was installed and started into operation on 1st May and in the early stages of the trial was switched on by a time switch at 11 p.m. and off at 3 a.m. every other day, the action of the unit consisted in heating up a glass container of 'pesticide' which then reduced the powder to a liquid which was in turn vapourised into the atmosphere of the greenhouse, the heater on the unit being controlled by a pre-set, built-in thermostat.

At the start of the trial there was a small outbreak of green-fly and some black-fly both of which were beginning to attack the young chrysanthemum cuttings, this outbreak was brought under control within one week and there has been no further sign of any of the following pests during the whole five months of the trial:—Black, green or white-fly or ants. During the summer months when all the ventilators and the door were left open all day some of the larger insects such as flies, wasps and bees did, of course, make their entry, but when the house was shut down for the night a considerable number of dead bodies of these larger insects were to be found the following morning.



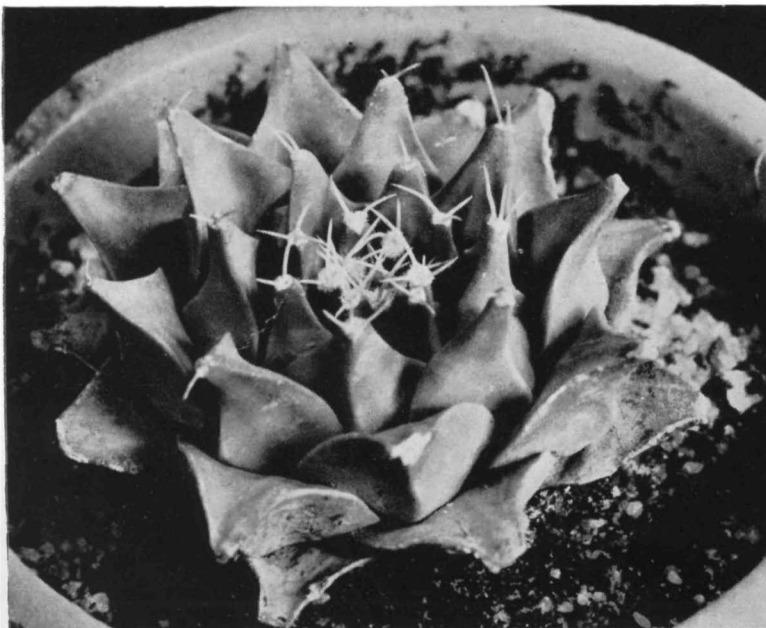
At the Annual Dinner (left to right Mr. E. W. Young, Mr. Gordon Rowley, Mr. D. V. Brewerton and the Chairman)

Photo by James Heathcote

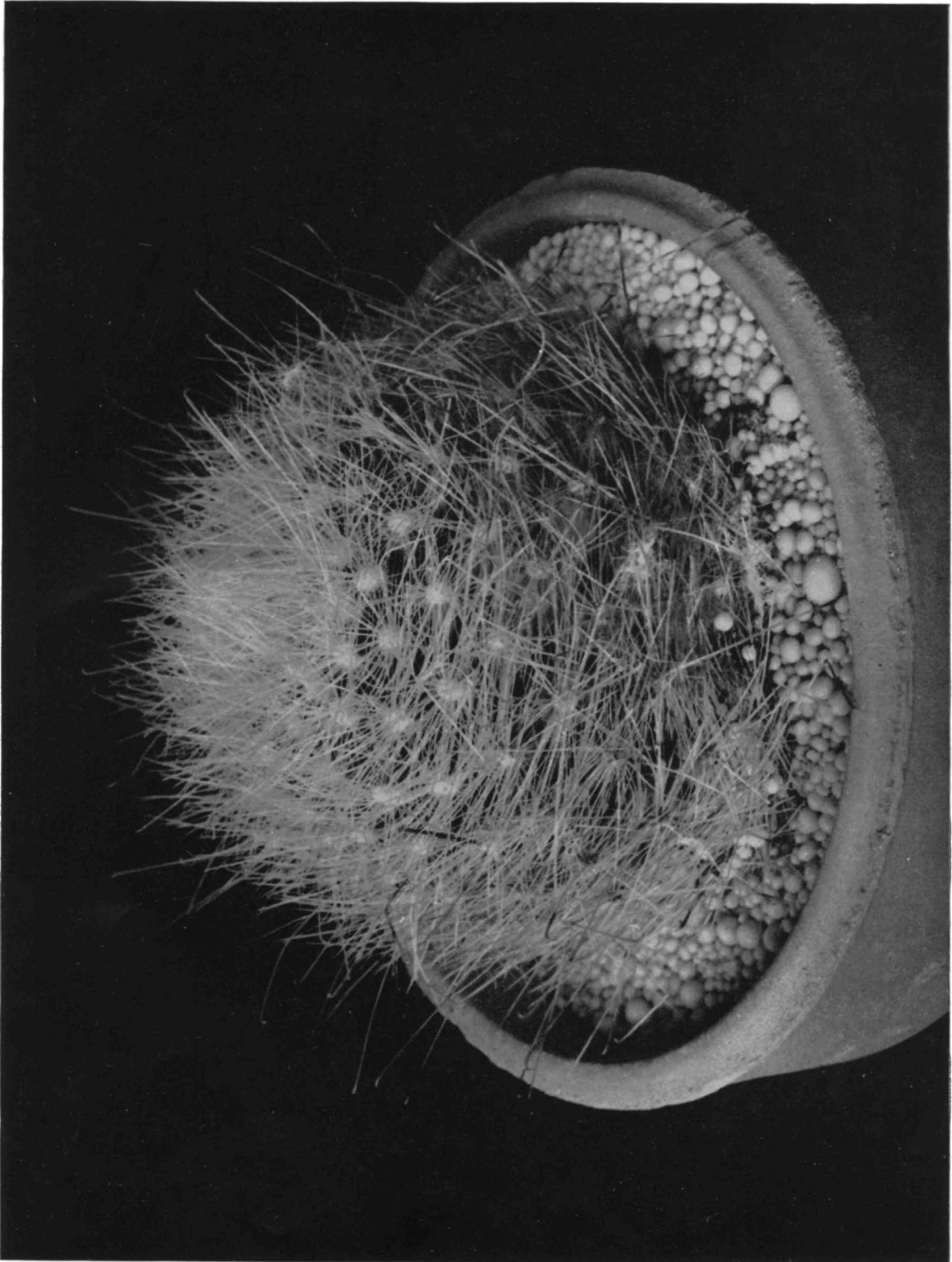


North Staffs Branch (left to right
Lindsay Jackson, Elijah Mottram,
Cyril Jackson and Roy Mottram)

Photo by courtesy
Staffordshire Sentinel Newspapers Ltd.)



Obregonia denegrii
Miss Margaret J. Martin



Miss Margaret J. Martin

Mamillopsis senilis



Pelecyphora valdezianus

Miss Margaret J. Martin

No cactus or succulent plants appear to have suffered in any way from using the 'pesticide', the only damage being to the salvia seedlings which started shedding their leaves until removed from the house. The unit is not however recommended for use with seedlings or members of the crassulaceae although none of the latter appear to have been affected during the period of the trial.

From the middle of July until the end of the trial the timing of the unit was altered so that whilst it still started at 11 p.m. it did not switch off until 7.30 a.m. giving an 8½ hour run. Also, instead of operating every other day as heretofore, the unit was now used on Thursday, Friday and Saturday nights and then not used again until the following Thursday.

The effect on Mealy Bug was not as successful in this first trial as had been hoped, in fairness it must be said that many mealy bugs were found dead but the control of them was by no means complete. The manufacturers are still experimenting however, and hope that in the near future a suitable formula will be found which will combat this particular insect more effectively.

During the period of the trial a sulphur based tablet was developed which could be used in addition to the standard 'Pesticide'. This has been found to be efficient in the control of red-spider mite and it was interesting to observe that the current years' growth on such plants as *Chamaecereus silvestrii*, *Echinofossulocactus tricuspidatus*, and *Setiechinopsis mirabilis* was perfectly clean for the first time in three seasons. The sulphur based tablets are also claimed to be effective against fungus diseases but it is considered too early at this stage to comment on this aspect.

It is hoped that the manufacturers will allow the Society to continue with the trial and that at a later date a more favourable report on mealy bug control may be given.

The unit is obtainable from Pug Products Ltd., 44 Old Bond Street, London, W.1, and is available in two models priced at £8 and £8 10s. for the Standard and De Luxe models respectively. The price includes for unlimited pesticide and sulphur tablets within the first year and subsequently similar supplies are obtainable for 30s. per annum.

CACTI FROM MEXICO

By MARGARET J. MARTIN

To many of us Mexico is where *Mammillarias* come from, but it is also the home of many of the choicest, or at least most expensive, cacti in our collections. In a previous article I dealt with the *Ariocarpus* which are, of course, found in that country. Here I am going to mention a few of the many other desirable cacti found in the deserts of Mexico.

Taking them in alphabetical order there are the *Astrophytum*s, in particular that rather elusive plant *A. asterias*. This can be grown from seed but the greatest difficulty seems to be in obtaining undamaged seed. The seedlings grow very slowly but will flower when an inch across, the yellow flower completely hiding the plant.

The next plant we come to is unfortunately almost unobtainable (I believe due to flooding of the habitat). *Aztekium ritterii* is said to occur on vertical shale cliffs. The flat topped plant is fawnish-green and the pale pink flowers are produced freely in cultivation.

The *Echinocereus* is a large genus, widely spread over Mexico and the U.S.A. The 'subinermis' group, which includes that choice species *E. knippelianus* is Mexican in origin. It is a dark green plant with very inconspicuous spines. It is very slow growing and so far my specimen has neither branched nor flowered.

Epithelantha micromeris is usually seen as an imported plant but it can be grown successfully from seed. The seedlings are slow growing but perfect replicas of the adult plant. The *Epithelantha* are spherical and completely covered in short white spines, some specimens offset freely. The small pale pink flowers are found at the top of the plant.

On a less exalted plane, the *Heliocereus* are found in central Mexico. These have been hybridized with *Epiphyllum*s and many a red *Epiphyllum* flower owes its bluish sheen to *H. speciosus*.

Leuchtenbergia principis is another choice plant which can be grown from seed. The seedlings are miniature editions of the mature cactus but unfortunately only large specimens bear the scented yellow flowers. The thickened stem of the plant bears a head of long tubercles which distinguish it from all other cacti.

Mamillopsis senilis comes from the mountains of Mexico where it is covered with snow in the winter. In cultivation it needs extremely good drainage if it is not to rot. The plant is almost spherical and is covered with beautiful white spines.

Oreogonia denegrii is related to *Leuchtenbergia* but the tubercles are much shorter and a purplish brown in colour. It is a small slow growing plant and needs very good drainage.

The *Pelecyphora* are also very slow growing plants with beautiful, freely produced, violet flowers. *P. valdezianus* is a tiny plant covered in short white spines. It flowers in February. The summer flowering *P. asseliformis* is bigger and has much larger tubercles and is not so closely covered in spines. *P. pseudopectinata* does not appear to be in cultivation.

One of the easiest of imported plants to cultivate is *Strombocactus disciformis*. The plant body is flattish and grey-green in colour with very few spines which are on the new growth. This plant flowers continuously throughout the summer, the colour being very pale yellow. Occasionally one sees in catalogues other species of *Strombocactus*. These species have been removed to the genus *Toumeyia*. These are usually very small plants.

Long ago I bought a '*Strombocactus minima*'. This is a tiny plant covered with dense white spines and is summer flowering. The flowers are deep violet and very similar to a *Pelecyphora* or *Encephalocarpus*. Although the plant is undoubtedly a *Toumeyia* it does not fit the description of any of the plants described in the various cactus books. One day I hope to identify it.

I have mentioned only the plants I have grown myself, that does not mean that there are not plenty more interesting plants from Mexico. Doubtless some fortunate member has a *Navajoa* and there are probably still more exciting plants waiting to be discovered.

From Richard Russell in San Diego

Mr. Russell kindly sent us this extract from *The National Observer* (published by Dow Jones, & Co.) dated 5th October 1964.

'On the Desert Landscape, Cactus-Nappers at Work.

Bootleggers of cactus are making a serious dent in Arizona's most distinctive natural resource. W. T. Mendenhall, state entomologist, says dozens of persons are illegally removing cacti from the desert and selling them for landscaping.

Cactus is protected by law on the State and Federal lands, which comprise more than 75 per cent of Arizona. But Mr. Mendenhall says his small department has neither funds nor manpower to track down the bootleggers who raid vast tracts of public domain. Illegal dealers are threatening to make some species extinct. Already the coveted night blooming *cereus*, which blossoms one night each year, is getting hard to find. And the more brazen dealers take cacti where they find them, ruining the roadside scenery.

There is a legal procedure for removing cactus from privately owned lands, such as a ranch. With written permission from the rancher, Mr. Mendenhall's department must issue a permit to transport cactus. But many dealers don't bother to get a permit, and some who do harvest the cactus from locations other than that listed on the permit.—James E. Cook, *Tucson*.'

MIMICRY IN THE MESEMBRYANTHEMACEAE

By B. FEARN, B.Sc.

Mimicry refers to a deceptive resemblance of an animal (the term including insects, crustacea and the like) (the mimic) to a 'model'; the model is another species of animal which is either distasteful or protected by some other means such as powerful weapons of offence or defence, and which is therefore avoided by the majority of potential predators. The mimic itself is in fact palatable and without defensive weapons, but is avoided by predators because of certain visible characteristics in which it resembles or suggests the model: in other words it is a sheep in a wolf's clothing.

This simple form of mimicry is called *Batesian* and was first expounded by Bates in 1862.

Another more or less clearly defined form of mimicry occurs when two or more organisms which are distasteful to predators resemble one another and thereby derive collective advantage, in that a predator has only to 'learn' to avoid one pattern which will then suffice to protect all the other species which have it instead of a separate pattern for each species. The numbers of individuals of each species in the association which must be sacrificed in order to 'educate' or 'condition' the predator to reject or avoid the common pattern will therefore be proportionately less.

This is known as *Mullerian mimicry* and was first described by Müller in 1897. These are two extreme examples of mimicry which of course integrate in nature.

These two definitions are not fundamentally different from the deceptive resemblance of a fly to a bee or wasp, that of a leaf insect to a green leaf, or of a plant resembling bird droppings or stones. It is important to realise that

one need demonstrate only a very slight advantage derived from a resemblance, for this to have some degree of survival value.

The mimetic hypothesis has been attacked and refuted many times, and many fantastic claims for and against it have been made, but there is no doubt that mimetic adaptations do play some part in the preservation of a species from extinction. A great deal has been written about mimicry in general and botanically special reference has been made in this connection to certain *Aizoaceae*, in particular the stemless forms of the *Mesembryanthemaceae*. Of these the most sophisticated mimetic forms are found in the genus *Lithops*.

The name *Lithops* is derived from the Greek words *Lithos*—a stone, and *ops*—a face. The name was given to these plants by N. E. Brown in 1922 'and account of their resemblance in colour and appearance to the stones and pebbles they grew among'. Burchell in his 'Travels in the interior of Southern Africa' (London 1822-24) describes in the following words the discovery of the first plant *L. turbiniformis*. Originally described as *Mesembryanthemum turbiniformis* by Haworth, which a century later became the first described member of Brown's genus *Lithops*. 'On picking up from the stoney ground, what was supposed a curiously shaped pebble, it proved to be a plant, but in colour and appearance bore the closest resemblance to the stones between which it was growing'. The discovery was made in 1811 at Zand Vlei, in the Prieska district of South Africa. More than 100 years elapsed before this plant was rediscovered in 1918 by Dr. Pole Evans in more or less the same locality—after he had searched a whole week for it.

The second species *L. pseudotruncatella* was first described by Berger in 1908 and the next *L. lesliei* was discovered in 1912. During the period 1920-33 large numbers of species were discovered in South and South West Africa, largely as a result of arduous journeys made by Kurt Dinter. At the present time there are some 86 known species and varieties.

Kurt Dinter has said that a knowledge of the country is a 'must' before looking for species of *Lithops* as these plants are perhaps the most difficult of all to find in the field. In the dry season one walks on these plants without seeing them.

It is difficult for even a practised eye to find *L. pseudotruncatella* in the dry period—indeed practically an impossibility for the novice. Professor Nel and several other botanists, who particularly wanted this plant, had come to Lichtenstein and were taken by Herr Ernst Rusch to a hill where there was a large number of these plants. Although the men crept around on all fours they did not find a single specimen. Even when Herr Rusch described a circle with his stick round one, they still could not see the plant!

One day Rusch asked an acquaintance who owned much land in the same district: 'Are there any plants like these on your farm?' to which his neighbour replied 'You are trying to trap me, you mean these stones there'. On another occasion a farmer was sent some plants with the same question—his answer was 'We have not got such fruits on our trees'.

Stemless mimetic plants grow generally in extremely arid areas with less than 5 inches of rain per year. Loss of water by evaporation must be reduced and so a spherical shape with a corresponding minimal surface area has been evolved. There is a danger that such a plant looks so succulent (i.e. contains at least 95 per cent water) that it will be eaten, but this is obviated by masquerading as inedible pebbles.

Lithops are found growing in many varied types of habitats e.g. white and pink quartz and quartzite, ironstone, red sandstone, grey slate, etc., *L. gracildelineata* has a widespread distribution and usually occurs amongst quartzite chips of pink or grey—but the composition of the mineral in different localities can vary from almost pure white through yellow and grey to light pink to brick-red to deep red (Jacobsen Vol. III). Presumably seedlings are produced with a complete range of colour variants in a given habitat and plants with the wrong colour for that habitat are removed by either birds or animals—as only one different race *L. gracildelineata* var. *waldronae* has been established for this species. This would not be so if all the other variants bred true (De Boer et Boom).

How is the epidermis adapted in the genus *Lithops*? There are considerable incrustations of calcium oxalate crystals in the cuticle, which cause the basic dull grey-green to whitish-grey colour of the epidermis. The contents of the epidermis cells are important as it is these that give the plant its varied colouration. There are many colour-bearing structures or chromoplasts which are rarely met with in normal foliage leaves, but which do occur in some other South African succulent species—notably Liliaceous monocotyledons such as *Aloe*, *Gasteria*, *Haworthia* and *Astraloba*. The chromoplasts are often found in two forms with regard to size and colour and the distribution of these gives the surface its distinctive patterns. The cell layer below the epidermis often contains a red colouring matter in solution in the cell sap, (Anthocyanin). Also below the epidermis layer are some especially large cells, or idioblasts, filled with tannin; when seen from above these look like dull blueish lustrous dots—they almost look like grease-spots on paper.

The epidermis can be likened to a brush stroke on an artist's canvas—not made up of a single colour, but con-

sisting of many separate pigments which together give the overall impression of a single colour. The predominance of any one of them can change the overall colouration. So it is with the *Lithops* epidermis.

Here then is a brief insight into some of the structural causes of the colouration which serve to mimic the soil on which the plants grow. The question that remains to be answered is whether this has any significant role in the preservation of the species—in fact preservation from what?

It has been established with regard to *Lithops* that animals which hunt their food with their eyes, such as birds (bustards) and probably also baboons, often find the plants and destroy large quantities of them. It has been suggested that goats and antelopes also find and eat such plants, but this has been refuted as principally they find food by sense of smell and then of course mimicry is useless. The antagonists say that animals probably see things quite differently to human eyes—but does this matter very much? After all the quality of light being reflected from the surface of the ground and the surface of the plant must be similarly constituted, since the two things look more or less identical. These similar or identical rays must produce in other eyes similar or identical light sensations, even when the quality of sensation is completely different from those of human visual reception. If the animal can sort out and differentiate between the light being reflected from the plant and that from the ground, only then can the animal 'discover' the plant. Admittedly when one plant has been found it is easier to find another one and so memory can play some part in locating these plants. Until someone can produce experimental evidence to the contrary the differentiation between the light produced by the ground and that produced by the plant will be about the same for human and animal eyes.

The case could fall down if the animal could use light not on the visual spectrum—i.e., ultra-violet or infra-red. If this were so the plants would either reflect or absorb more at these wavelengths than the stones and could therefore be used in finding the plants. There would then be no need for the mimicry as this only works on the visual part of the spectrum. We can therefore surmise that the animal can only detect light in the visual part of the spectrum for in addition the structure of its eye is basically similar to the human one, particularly so in the baboon.

It must be remembered that *Lithops* and other Aizoaceae are particularly difficult to find in the dry season, but the situation changes somewhat during the short rainy season. The plant body swells and so is more easily seen. The plants also flower at this time, although the colour is only either white or yellow, but this does make them more conspicuous at this time. In addition the flowers are open in the daytime but in other genera (e.g. *Conophytum*) there are some night flowering species. Presumably the animals have other more plentiful or palatable sources of food in the rainy season as these plants are rather conspicuous at this time and hence more easy to find. The rainy season is only short, often only two months long, and on occasion there is no rain at all for several years in succession.

The mimetic hypothesis concerning these plants has been long in dispute and doubtless will continue to be argued for and against in the future. It seems not unreasonable to surmise that more plants will escape detection if they resemble the surroundings than if they stand out in contrast to them, and to this extent it seems impossible to completely refute the mimetic hypothesis.

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REPORTS OF MEETINGS

7th July 1964. Composts. A Discussion led by Mr. W. F. Maddams

Mr. Maddams began by quoting Marsden who, after remarking in his book 'A lot of nonsense has been written about composts', attempts a rational analysis of the subject. However, many cactus growers were of the opinion that Marsden had added to the confusion with his multiplicity of composts.

Mr. Maddams suggested that the functions of a compost were fourfold. To mechanically support the plant, to make water available, to enable the roots to breathe, and to supply the other nutrients required for growth. Of these, nitrogen, phosphorus and potash are needed in quantity, magnesium and sulphur in moderate amounts, and iron, copper, manganese, boron and zinc in trace amounts. These are all taken up by the plant in solution and it is

therefore important that a compost remains moist enough for this process to occur readily; however, it must not become waterlogged with a consequent loss of aeration.

The factors involved in making up a compost suitable for pot grown plants were studied carefully at the John Innes Horticultural Institute nearly thirty years ago. These were a series of recommendations, both as to the composition of composts and the quality of the materials used in their preparation. Mr. Maddams showed diagrammatically the compositions of the various J.I. formulations, and stressed that a compost could only be as good as specified by exercising considerable care in the selection of ingredients.

Mr. Maddams then considered briefly the special requirements of a cactus compost. General experience had shown that John Innes Composts Nos. 1 or 2 were satisfactory after extra sharp sand had been added to improve the drainage. There was a good deal of evidence to suggest that cacti needed ample phosphorus and potash but small amounts of nitrogen only; the position with regard to the trace elements was less clear.

The speaker then turned to the no-soil composts, which had come greatly into favour of late. This was undoubtedly because many of the so-called John Innes composts were unreliable and far from uniform. In large measure, this could be traced to the loam used in them. A survey of four hundred loam samples in East Anglia had shown that only three met the J.I. criteria. Mr. Maddams passed round samples of a well known cactus compost, based on the J.I. formula, as purchased during successive years, to show the marked difference. The pioneering work on no-soil composts had been done at the University of California since 1940, and a mix comprising 75 per cent sand and 25 per cent peat had been found to yield excellent results when suitable nutrients were added. Several commercial forms of this were now available in Great Britain; Mr. Maddams had experimented extensively with those marketed by the Eclipse Peat Co. and by Lindsey and Kesteven on behalf of J. Arthur Bower, and had a definite preference for the latter. Mixing in the fertiliser had not proved difficult; perhaps the only disadvantage of this type of compost was the difficulty in wetting it once it had dried out.

In the ensuing discussion there were various comments on the ample root growth in peaty composts, and on the various types of peat available; Irish and Scottish peat were both recommended. Mr. Boarder said that he had grown cacti in all the media that had become popular from time to time during the past sixty years and had found them all satisfactory providing that they were well drained and could supply ample nutrients. The manufacturer of the samples of cactus compost circulated earlier had asked him to provide them with a new formula, and this was now under test. He added that both with the conventional composts and those of the no-soil type, if the plants made healthy growth the added fertiliser would be exhausted in one season and repotting would be necessary. Mr. Maddams commented that although he saw no reason why feeding should not replace repotting annually, simply because they had outgrown their existing containers.

Mr. Maddams asked for comments from those who had experimented with potash and phosphorus feeds; various people had tried them, but there was not sufficient evidence to allow firm conclusions to be drawn about possible beneficial effects. The speaker suggested that, although there was no evidence to show that the J.I. base fertiliser was unsuitable for supplementary feeding, in our present state of knowledge it was safer to use a high potash/phosphorus material, such as Phostrogen or Compure K.

These points led to a discussion on the possible difference in requirements of cacti in cultivation and in their native habitat, particularly with regard to water and to nutrients. The acidity of the no-soil type of compost was queried and Mr. Maddams pointed out that our knowledge of pH values of soils from Mexico, Lower California and other regions was rather sketchy. It had been shown that plants native to regions with alkaline soils respond favourably to cultivation in an acid compost.

11th August 1964. Preparing Plants for Show

Four Members, with varying experiences of showing, gave their idea of rules for success and pitfalls to avoid.

Mr. Collings first discussed points related to the plants used for competitive work. They must be healthy and of reasonable size for the species in question. Imported plants that have had a check and have subsequently grown to a bad shape are not suitable for showing. Dirty plants should be cleaned up. The *Espositoa* species and *Cephalocereus senilis* gradually darken from the base in all but the very cleanest atmospheres, but their look can be improved by cleaning with toilet soap, followed by a good rinse.

With regard to presentation, the speaker cautioned against dirty, lime encrusted pots and suggested that top dressing with gravel improved the appearance, although he did not like to leave it there permanently. For staging groups of plants, put the tall ones at the back and match up the colours.

Mrs. Watts covered a number of points ancillary to but not mentioned by Mr. Collings. It was most essential to ensure the absence of pests on the plants being shown; a thorough inspection was a necessity. If gravel was not used to top dress the compost, the surface should be lightly turned over and any algae growths removed. All labels

should be clean and legible and, in a group, the plants should match for size.

The transport of plants posed problems, but no insuperable ones. Damage in transit was avoidable by careful packing and crumpled newspaper was very useful for wedging pots in boxes. Where a group of plants was being shown it would not, in general, be possible to work out the best arrangement in the show hall, due to lack of time and space. Consequently, the sensible arrangement was to have a prior rehearsal and draw up a plan. With groups of plants the value of trailing types for hiding pots was often overlooked.

Mr. Read cautioned would-be exhibitors to make certain that they knew into what Classes plants of certain genera should go. Completion of the entry form in good time would avoid a last minute panic on this and other matters. It was of course, axiomatic that in a well kept greenhouse a great deal of preparation would be unnecessary; showing was one criterion for deciding how far one fell short of this ideal in practice. The speaker said that he did all his preparational work during the weekend prior to the show.

Mrs. Sharman began by remarking that she would not be so bold as to bracket herself with the three previous speakers as she was comparatively inexperienced at show work, at least as far as the Great Britain Society was concerned. For cleaning up pots she had found a watering can fitted with a sprinkler as good as anything although she could say, without undue exaggeration, that her plants usually required little attention in this direction. She acquiesced with many of the comments of the previous speakers.

In the ensuing discussion a number of speakers made interesting and useful points. Mr. Dale suggested that a clean up of pots was an unnecessary labour; it was simpler to tip the plant out of the old pot and put it into a clean one a day or two before the show. One should learn by experience and take due note of the judge's comments. Mr. S. W. Young was also of this opinion and said that, whatever one's personal opinions, it was silly to do something which the judge was known to dislike. Noting that a proportion of the points was awarded for trueness to type, he asked how it was possible to say that plants grown from seed were true to type; surely imported plants alone could be acceptable and he felt that there was a bias against these.

Mr. Boarder commented on this point. He had nothing against imported plants, but it was the exception to find these in good growing condition and undamaged. They lost many points on this count. He conceded that judges do have opinions, but these are usually of a minor character; they are usually very experienced and work on this basis. He said that, other things being equal, he would make a decision on small details. Apart from the cleanliness of pots, already mentioned, he looked for plants that matched, in groups of three or six, and matching of the labels was also taken into consideration.

In reply to a comment by Mr. S. W. Young that it would be useful to have details of interesting and unusual plants written out on a card placed by the plants, Mrs. Stillwell was in agreement but these cards should not be added until the judging was complete. She was all in favour of knowing as much as possible about one's plants. Mr. Maddams commented on some points relating to the showing of seedlings, particularly those in the two year old class. It was important to get these moving early in their second year so that they had a good period of growth prior to the show. They should be given particular attention from the early spring, and it was as well to have a good idea, well in advance, of which seedlings from a batch were likely to be needed for competitive work.

1st September 1964. 'Continental Trip' Mr. C. F. Innes

Mr. Innes said that he would provide a travelogue comprising a few verbal details of his trip, to provide background material, and a considerable number of colour transparencies. The first port of call was Holland, and a number of slides of the collections of Messrs. Buining and Bonefass, and of Edelman's nursery, showed the comprehensiveness and fine condition of these collections.

Mr. Innes then moved on to Spain, to Blanes, Costa Brava, where Senor F. Riviere de Caralt has his famous gardens at Pinya de Rosa. Not unexpectedly, there were many shots of the extensive stands of *Opuntia* species, often in flower or fruit, which brought home to all present the attractive qualities of these plants when grown under favourable conditions. There were also shots of fine specimens of *Agaves* and columnar *Cerei* at Pinya de Rosa.

In his introductory remarks to the slides taken at the home of Msr. Marnier-Lapostolle, at Les Cèdres, near Nice, Mr. Innes said that this was the most extensive collection of cacti and other succulents in Europe. The owner had a penchant for collecting rare species ten at a time and would leave no stone unturned to this end. The colour transparencies showed how effectively he had pursued this policy, many of the plants shown being of a size and quality seldom if ever seen in Great Britain. Transparencies of Msr. Mariner-Lapostolle's fine collection of *Bromeliads*, unusual specimen trees and orchids were also shown.

In response to enthusiastic requests Mr. Innes rounded off the evening with shots of his own collection. Needless to say, many of these featured hybrid *Epiphyllums*, including one with a pure yellow flower. The varieties Kismet, Sunset and Calypso were much admired, as were shots of *Pseudorhipsalis macrantha* and *Hibiscus trionum*.



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SOCIETY NEWS

1965	Subject	Lecturer	Table Show
Feb. 16th	Annual General Meeting		
March 17th (Wednesday)	Art of Watering Succulent Plants	Mr. E. W. Macdonald	One Mammillaria
April 21st (Wednesday)	Epiphyllum hybrids	Mr. F. R. McQuown	One Epiphyte
May 5th (Wednesday)	Seed Raising Discussion	—	Two year old seedlings

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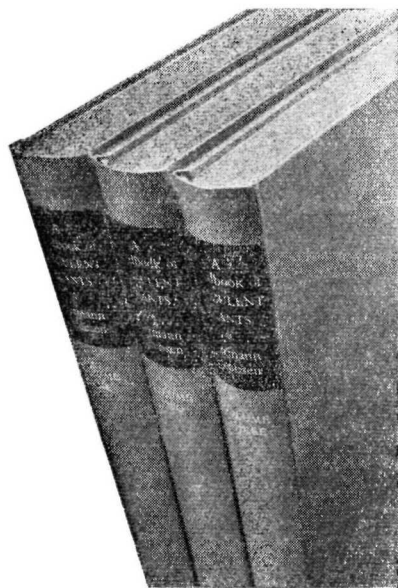
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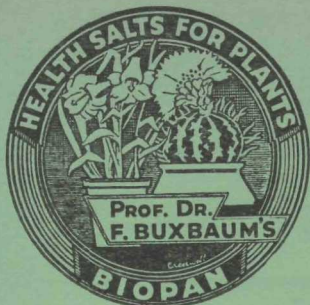
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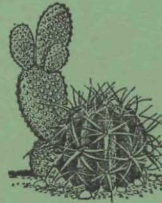
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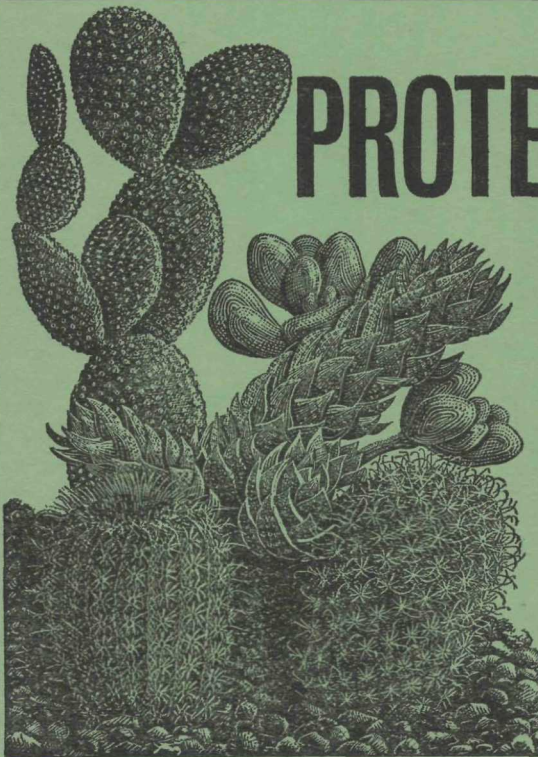
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EDITORIAL

As a result of the Annual General Meeting and the subsequent Council Meeting all the retiring Officers and Council Members have been re-elected.

We are proud, once again, to have Mrs. Shurly as our President and two such worthy cactophiles as Mr. Boarder and Mr. Collings as our Vice-Presidents. We are fortunate, too, that Mr. Walden and Mr. Young are able to continue their long runs as Honorary Secretary and Honorary Treasurer respectively. Certain pruning has, however, taken place in the work carried out by Mr. Young and he is now able to concentrate on the work of Treasurer unencumbered by loosely connected, but vital, jobs not strictly within the purview of that office. One result is that Mr. D. J. Elliott has taken over the duties of Honorary Membership Secretary to keep the records of our full Members. As from now Mr. Young will receive cash from all sources and none will be sent to the Honorary Editor.

A similar reorganisation has been carried out with the work of the Honorary Editor and, in future, the Journals of Subscribing Members (as compared with full Members) will be sent out by Mr. S. W. I. Young from 9 Ewhurst Close, Cheam, Surrey.

We regret to announce that through ill-health Mr. J. Billing of The Quarry, Grove Road, Bladon, Oxford, has had to discontinue his business advertised in our last issue. Mr. Billing regrets that he will be unable to be of service to Members who may be ordering against his lists but the orders of his doctor were quite definite. We take this opportunity of expressing to Mr. Billing our sincere sympathy and good wishes.

Our thanks, and those of Mr. Gordon Rowley, are expressed to Mr. K. H. Walden for responding to our request for Part I of Vol. 14. One more copy is still required and if any Member can help please write to the Editor.

The Essex Branch has decided to open its Class 35 at its Annual Show to all Branches of the Society and to other interested organisations except commercial growers.

The Class is for 'A display of cacti and/or other succulents to fill a space two feet by two feet'. The Class carries a trophy in the form of a Challenge Shield.

The Show is to be held in The Thompson Rooms, Ilford High Street, Ilford, Essex, on Saturday 29th May 1965. Schedules and Entry Forms (6d. per entry) are obtainable from the Honorary Secretary of the Branch (see Society page).

Since our February issue the last of the Ninth Edition of our Booklet, 'How to Grow Cacti and Succulents' has been sold. It is almost incredible that a publication which grew out of a suggestion for a pamphlet should have sold 80,000 copies. There was no question that it was a model booklet which had everything but coloured plates. Its enormous success has been used to benefit all our Members by the extension of the free seed issue and the maintenance and increase of services to Members, including keeping the annual subscription at the 1947 level. A further edition has been considered most seriously but the slender but consistent demand is inadequate to justify the capital outlay on a further 10,000, the minimum printing worth while.

CACTUS CULTURAL NOTES

By A. BOARDER

Any plants needed for exhibiting at the Summer Show should be placed to one part of the greenhouse so that they can receive special attention. A few points may be gained by the exhibitor if the plants are clean and the pots have had some attention. Some of the white spined or hairy types may need a good clean up and may even be in need of a shampoo. This has been described before and any member will be able to tell if such a plant can do with this general clean up. The pots should not be neglected but this does not mean that they should be smeared with red ochre. This would come off on the hands of a judge and he might not take kindly to such treatment. Make sure that the top of the soil is in good condition. Nothing looks worse than a foul top soil. All weeds and moss should be removed and it is a good plan to exchange the top half inch or so for some fresh. The addition of granite chips can be done if desired but do not use coloured ones.

Whilst on the colour question I must say that I am not in favour of multi-coloured plastic pots for exhibition work. Plastic pots are very good in their way but if a number of plants are shown in different coloured pots the effect can be ghastly. If all the plastic pots in an exhibit are of the same colour, especially if of a dull hue, no harm will be done. On the other hand if a large collection of plants is shown in many different coloured pots, then in my opinion the whole collection looks like something out of a doll's house and should never appear in a specialist exhibition.

At many of the Society's shows in the past it has been noticeable that very few new exhibitors are to be found. I know that it is the opinion of many newcomers to the hobby that they have little chance of winning in a class if some of the older and more experienced exhibitors are showing in the same class. I hear many such statements and it is not easy to do much about it. In the past the Committee has asked if there are any classes which the members would like incorporated in the schedule. When any such class has been allocated it has been found that only one or two members exhibit in that class.

Some members think that the more experienced exhibitors should be banned from exhibiting. I do not share this view as surely the Society wishes to put on as good a show as possible for the sake of the general public at the hall as for the actual members. The Committee has therefore tried to make a fresh schedule this year so that many of the newer members will have a good chance of winning. A class has been provided for a number of plants in which an expert grower can compete. Then a smaller class will be for the ordinary grower and another smaller one for the beginner. In the large class of, say, nine plants, the prize money will be bigger than in the following smaller class, of say six plants. Then the third class for three plants will be less than for the six plants. Anyone exhibiting in the largest class cannot show in either of the smaller classes and anyone showing in the middle class cannot show in the third class.

The classes for three *Cereus*, etc., which rarely had more than two exhibitors will be cut out and so these can be shown in the larger group. According to the success of this new idea the future schedules will be drawn up. I do hope that as many members as possible will exhibit if it is only in one class. A good display of plants at the show will often encourage fresh people to join the Society. It is also anticipated that the Mammillaria Society will be putting on an exhibition of Mams. at the Summer Show and so there will probably be many viewers of our show who are not members.

Many members have told me that they are not very successful at flowering their *Epiphyllums*. I have also seen many of these plants in various collections which do not flower as well as they should do. To be able to flower these handsome specimens well, one must understand how they flower. Each one appears at an areole and once an areole has flowered it will never do so again. Therefore if a stem has borne a number of flowers one year it is useless to allow it to crowd up the plant afterwards. All old stems must be cut out. This will allow fresh ones to grow and they will be the ones which will flower the best the following season. No stem need be left on the plant after it is three years old and even a year old one which has carried many flowers is not as likely to flower well on that particular stem the next year.

I do not suggest that it is only the new growth which flowers, but I have noticed that the older the stem the more yellow and discoloured does it become. Also if too many old stems are allowed to remain on the plant, then fewer new stems will be formed. Once a plant has flowered well it can be repotted. I would do this every year or at the most every two years. These plants are rather heavy feeders and so need something good in which to grow. It will be found that the John Innes potting compost, No. 2, will be found quite suitable. Even with this nourishing compost it is still a good plan to give a little added fertilisers when the plant is in prominent bud. The John Innes liquid fertiliser is quite good for this purpose. However, any of the recognised fertilisers can be used but take care that it is not over-done as the soil can become over-charged with this and the plant can suffer.

When the repotting is being done the plant can be well pruned. Cut out all yellowing or weakly stems and also any which have flowered well. When the plant has been repotted it can be stood out of doors if it has been in a

greenhouse with other cacti. These plants do not require the strong sunshine which the more prickly, globular cacti need. The unshaded greenhouse is no place in which to grow the *Epiphyllums*. If it is not possible to place such plants outside then see that they are given plenty of shade during the hottest part of the year. It may have been noticed that these plants will flower very well in a window. This is because they are not subjected to such intense heat as may occur in a greenhouse.

The *Zygocactus* can be treated in the same way and a Summer out of doors will often assist in the production of many flowers the following Winter. Another of the type is the genus *Schlumbergera*, which can have the same treatment. The type of house which suits these epiphytes best is known as a stove house. Here the temperature is fairly high but it is well shaded and kept quite moist. Under these conditions the plants will make vigorous growth and give the maximum amount of flowers.

During the Summer months it is quite probable that you will have the opportunity of visiting other members' collections. I wonder which type you will prove to be? There are so many different types and I find it very interesting to try to discover which one is visiting. The first type will enter the greenhouse and look all around without saying a word. You know instinctively that he is looking for something. Silence for some minutes then he gives a quick sigh of relief and points to one of your plants. He has found it at last. It is a plant which is smaller than the one he has. This is his moment of success and he does not lose any time in telling you that his plant is bigger than yours. It does not matter that in your collection there are probably dozens of plants which are much better than his, all he has eyes for is your small plant which may be a year old seedling.

Then there is the meddling type. This one is distinguished by repeatedly picking up plants and usually putting them back, either in the wrong position, or with the label facing the wrong way. This is very annoying to the owner but he is usually too polite to say so. Next we have the label picker, who cannot be content with reading the label whilst it is still in the pot but has to pick it up and then put it back wrongly.

The next type is the trouble seeker, any plant in the collection which looks a little sad is the only one to attract his attention. You are told gloomily that such a one is on its way out, but never gives any advice as to its treatment. If by any chance a mealy bug is spotted, then the visitor makes much of his discovery. Another type is the cadger. He finds one of your most rare plants and tells you that he has been looking for such a plant for years and has never been able to get hold of one. Would any of the off-sets grow if they were taken off? Informing you that it would do the plant good to split it up. Then there is the rarity who is often a youngster. He whips off a seed pod or an off-set when your back is turned and is then in a hurry to depart.

From all this it may be thought that there are no good visitors. This is far from the case as most real cactus enthusiasts are very careful in one's greenhouse and would never think of doing anything they would not like done in their own greenhouse. If you do want a sample of light-fingered work, just get a school party of children about thirteen years of age to visit your collection. My first and last one departed with a fine pocket microscope, a camel hair brush, a new pencil and various seed pods. I got over the loss but my wife has not done so to this day. The trouble started when one of them wanted to go the lavatory. Within minutes they all wanted to go and were soon trooping up and down our stairs in an endless procession.

Once you have plenty of flowers out on your plants make sure that many seed pods will be formed later on. This can be done by pollinating the flowers with a camel hair brush. It may not be intended to raise any plants from the seeds as if so there could be a number of hybrids among the seedlings. The idea of the pollination is to ensure that there will be many colourful seed pods on the plants to make a good show all the winter.

You may find that it is necessary to shade part of the greenhouse during the hotter parts of the year. I know that this is a debatable point but I have had *Mammillarias* scorched by the sun and now add some 'summer cloud' shading to the glass which is closest to the plants. It may be possible to so arrange the plants so that the more tender ones are shaded by large plants.

The question of spraying may arise during a warm spell. I consider that this is a good plan and often do this in the evening after a hot day. I like to use a fine syringe and give a good spraying to practically all my plants. The greenhouse is then shut up for the night. I feel sure that the plants appreciate this treatment very much.

If you are going away on holiday for a week or two there is no need to worry about the plants. They can take care of themselves better than most plants and are not likely to come to any harm if left to themselves. It may be more dangerous to allow a well-meaning neighbour to water the plants for you as it is almost certain that you will find that they have been over-watered when you return. The windows can be left open during June, July, August and the first half of September. It is far safer to leave plenty of air on than to go away and leave the house shut up. Any cacti or other succulents left in the house will also be all right without attention.

Towards the end of May it may be necessary to prick out any cacti seedlings which were raised in the early part of the year. A good mixture to prick out in is the John Innes seed compost to which has been added to each bushel an ounce and half of hoof and horn grist and threequarters of an ounce of sulphate of potash.

CULTIVATION OF SUCCULENTS

By Mrs. M. STILLWELL

Having come through a fairly mild winter, we look forward to another successful growing season. The short unexpected warm spell in early March, which brought our plants quickly to life, was unfortunately short lived. Many of the newly formed buds seem slow to develop, and some seem almost at a standstill, but with the promise of things to come. Make sure you have a colour film handy when the flowers finally open. It not only makes a good record, but gives joy to many others, when you can show them during the long winter months. It also proves that you really can flower some of those tricky ones that often elude your friends. If you are planning to photograph your plants it is something that should not be hurried. Choose a time when you can spend an hour without fear of interruption, especially if taking them outdoors, and the plant will oblige and open its flowers in the morning when I think the light is at its best, and the shadows not too harsh. I always prefer a black background, as you then have nothing else to distract your attention, such as stones, or other plants in the background. The attention can then be focused solely on the plant in question. I find this is a great help when using them for illustrating a talk. Make quite sure if using a close up lens that you have the correct distance from the plant to the camera lens that is specified. One inch either way can make a lot of difference between a sharp and a fuzzy picture. It is possible to make up a kind of wire frame, to the exact measurements from the camera to the plant, but I always measure mine with a small ruler. I also remove the labels and enter the names and the date in a small book as I take them. It is so annoying after you have photographed a plant to find perhaps it has been wrongly named. I always write the name on the transparency frame, where it can always be easily altered if it proves to be wrong.

My *Pleiospilos nellii* formed two buds this year, and one opened just before Easter, and remained so every day for about two weeks. I gave it a little water when the bud was well above the body of the plant. It will be kept dry after flowering until about July as with the other *Pleiospilos*. *Cheiridopsis peculiaris* was also out at the same time. This little gem of a plant I always water sparingly from the base. If grown in the sun its leaves turn a delicate shade of mauve. *Cheiridopsis crassa* had two very large flowers out two weeks before. I feel the latter plant only flowers freely if the plant is a number of years old.

I have repotted nearly all the *Stapeliads* and taken out any unhealthy growth and all old stems that are past their prime. If I find any root bug I remove all the soil and brush the roots with surgical spirit. Plastic pots suit these plants, providing you can regulate the water. It is so easy to get the pot waterlogged without realizing it and the stems will rot off. It is safer to water from the base.

This has been a wonderful year for flowers on the *Gibbaeums*. I do not think I have ever had so many in flower before and not just the odd flower but a bud on almost every head. These include *G. pubescens*, *album*, *perviride*, *pilosulum*, *velutinum*, *molle*, *shandii*, *heathii*, *fissoides*, etc. Can this be the result of last year's wonderful summer when the plants were really ripened off. I will admit that most of them are well established plants, and a number of years old. They have always been great favourites of mine as so many flower during the winter and spring and are therefore perhaps more appreciated when other flowers are scarce. Many are very easily grown from seed, and are always very pleasing to the eye whether in flower or not. They should be kept rather on the dry side, to bring out the beauty of their colouring and firmness of the bodies. If forced or overwatered, they become entirely ruined, and out of character.

Those people who cannot provide a sunny greenhouse for their plants would be well advised to collect some of the choicer slow growing *Haworthias*. They appreciate some shade and are reasonably easy to grow and can form a very interesting collection, especially if you are lucky enough to obtain some of the gems of the species, such as *truncata*, *maughani*, *setata*, *limifolia*, *bolusii*, etc. Many of the commoner ones increase rapidly, but if you lack space, they can always be broken up every few years, starting again with a single head and passing the others on to your friends. They should be repotted in the late summer when they make their new set of roots. A lot of the old ones can then be removed as you will find they have dried up and are no longer of any use to the plant. During the resting period many close up in the form of a bud, others may shrivel, but they soon return to normal in the spring when regular watering is resumed. There are numerous varieties of *Haworthia margaritifera* which are fairly easy to obtain and can make a good basis to a collection. The spotted pointed leaves, if well grown, can be really beautiful. Do not stand too close together as the tips of the leaves bruise very easily and turn brown. If you are taking these plants to a show, wrap each in several sheets of newspaper to assure that it does not touch its neighbour. The small white flowers are rather insignificant but the true beauty is in the plants themselves.

Do make sure, if you are going on holiday, to leave plenty of windows open in the greenhouse, it is so easy to get scorch in a tightly closed house. A good current of air is the most important thing. Most plants are quite safe

to leave without water while on holiday, but you must ensure that the temperatures in the house do not get too overpowering. It is now possible to have windows that will open automatically installed in the greenhouse, but if you have a large house, this could prove costly. I prefer, for the summer months, my wire netting frames, which replace some of the larger panes of glass, which are removable. If using this method, make sure that they are placed in such a position so as not to get a direct draught by having two openings directly opposite one another.

Mitrophyllums, *Conophyllums* and *Monilarias* are now going to rest for the summer. The first two are enveloped in a papery outer covering, while the *Monilarias* leaves turn yellow and die off. The same applies to *Ruschia pygmaea* which, during the summer months, would appear to be quite dead to the beginner.

Try planting some of your *Echeverias* out in the garden for the summer months. Prepare a well drained bed by digging in your old potting compost, and perhaps some sharp sand if the ground is very heavy, and a dressing of bonemeal well worked in. For a number of years, I have had a row of *Echeveria secunda* in a border in front of the greenhouse. They are planted out in late May or the beginning of June, according to the weather, after spending the winter in large enamel bowls under the staging in the greenhouse. They receive no water during this time, and in consequence several rows of the bottom leaves die off. When I plant them out again, these are removed, together with the numerous young ones that have formed round each plant. They soon make fine plants again and all flower well. If we get a really wet season, they get really large. I take them up again at the end of October. The *gibbiflora metallica* kinds also do well outside. If you have any succulents in the greenhouse that are not looking too well and are not responding to treatment, try putting them outside for the summer. The natural elements will often give them a new lease of life. If you are one of those people who grow your plants indoors on the window sill, do try and arrange a little table outside for the summer and give your plants a treat. You will be surprised at the difference in their growth and appearance, and they may even flower for you. If they are on a table, they can be easily lifted indoors if the weather gets too bad, as plants grown indoors may be somewhat softer in texture than those grown in a greenhouse, and may suffer damage in a severe storm.

Whether we have a small collection on a window sill, or a large one in a greenhouse, there is always that air of expectancy and excitement at the coming of each new spring, and may this year be as good as last for everyone.

A copy of 'How to Grow Beautiful House Plants' by Thomas H. Everett of New York Botanical Garden (a Fawcett Book) has been received. It is, of course, intended largely for growers of 'house plants' and provides much interesting information on rather more aspects than usual. Only five of the 112 pages are devoted to succulents and the approach caters more for the American viewpoint than the English, but generally the advice is sound. It can be obtained through Frederick Muller Ltd. of Ludgate House, 110 Fleet Street, London, E.C.4. priced 5s., presumably plus postage. The absence of an index is, however, rather irritating.

LISTS RECEIVED:

Worfield Gardens: Spring List, 1965, cacti and other succulents.

W. Greenaway: Special list of imported *Echinocactanae*.

Blandford Press Ltd.: Spring and Summer List, 1965, including section on succulents.

REPORTS:

We are happy to receive encouraging reports from the North Surrey and Northern Counties Branches.

JOURNAL BINDER: A self-binder, capable of holding four years' Journals, finished in green cloth with gilt lettering on the spine, is available, price 12s., post free to members.

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All the above obtainable from E. W. Young, 35 Castle Drive, Redbridge, Ilford, Essex.

MAMMILLARIAS I HAVE GROWN (*continued*)

By A. BOARDER

The letter 'W' has now been reached in this series.

M. wagneriana, is given by Craig as a variety of *M. obscura*. My plant has far less tortuous spines and does not bear much resemblance to it. The plant flowers well and appears to be of easy growth. *M. waltheri*, is an open type of plant which so far with me has remained simple. It is stated to be a variety of *M. hemisphaerica*.

M. webbiana is quite a new Mam. for me as I only raised some from seed a year or two ago. It is of the open type and bears some resemblance to *M. mystax*.

M. werdermannii is a Mam. I have had for many years and I can never be sure whether it is a true species or a variety of *M. hahniana*. I have another Mam. which is supposed to be *M. hahniana* v. *werdermannii* and the two plants are different.

M. wesseriana is another rather new species for me and so far I am unable to give a full description. Many Mams. can vary a great deal from the seedling stage to that of an adult plant.

M. wiesingeri is a very handsome plant. A simple type and one which is making a fine specimen. It never fails to flower and produce plenty of seed.

M. wildii, was one of my first cacti which I obtained in 1905. I am sure that my present plant is a direct descendant of that original plant. Incidentally it cost me 3d. then.

M. wildii v. *rosea* only differs from the above by having a pink flower. Whether this is sufficient to create a variety I do not know.

M. winteraie, is a fine open type plant which bears quite a large flower. It also has very large seed pods for a Mam. It resembles *M. zahniana* in size of flower almost, but is pinkish instead of yellow.

M. woburnensis is a plant I have had for many years but it seems to be mixed up at times with *M. chapinensis*. I have also had a very different plant from seed which was supposed to be *M. woburnensis*. It makes quite a group and flowers fairly easily.

M. woodsii is a very pretty plant with plenty of white hair and spines. It appears to remain simple and looks attractive when the magenta coloured flowers come out in rings around the top of the plant. This plant looks like a *M. hahniana* without the long white hairs.

M. wuthauiana is another new Mam. to me. I have raised some seedlings of this plant but they are too small to be able to say at present whether they are very different to some of my other Mammillarias.

M. wrightii and *M. wilcoxia* are two which have been difficult for me. Over the past years I have tried to raise plants from seed of these species but have been unsuccessful. The seed seems difficult to come by and then has not germinated well for me.

REPORT OF MEETING

13th October, 1964, Mr. A. Boarder: Lithops

In a talk largely devoted to the cultivation of *Lithops*, Mr. Boarder began with a few remarks on the ecology of the genus. All the species are native to South or South West Africa. One or two occur very infrequently and are limited to a small area. Since the various species are found over a wide area it is not surprising that they grow in very different types of soil such as broken quartz, nearly pure sand, fairly rich loam and chalky soil. Despite these ecological differences the majority of them seem quite happy with an ordinary porous compost when grown in this country.

Mr. Boarder said that it is not difficult to raise a good collection of *Lithops* species from seed. Some will flower when three years old, whereas others will require appreciably longer. Again, there are differences in the time it takes to get a good clump of heads, since some species divide only slowly. For this reason one should not break up a good clump.

The seed, the viability of which did not appear to vary greatly with age, at least for a few years, is always small and should not be buried when sowing. If artificial heat is available it is convenient to sow in February at a temperature of 70°F. when, on average, germination will occur after six to twelve days. The pans containing the seed should be covered with pieces of glass only until the seedlings appear; if humid conditions are maintained for too long damping off will occur. However, the pans must still be shaded and butter muslin is very useful for this job. The seedlings should not be overwatered and a mist spray is ideal. There are differing views about the best time for pricking out, but Mr. Boarder considers May to be ideal from a February sowing. It is then possible to get plants at least half an inch across when a year old. They should not be given the complete rest required by adult plants until they are two years old.

Turning to the cultivation of older plants, Mr. Boarder noted that they are relatively cold resistant and will stand temperatures just below freezing point if quite dry at the roots as, of course, they should be at the time when such temperatures are likely to occur. It is not possible to give an overall date for the re-commencement of watering, since the growing periods of various species differ considerably. Those with the white flowers finish resting the earlier and flower correspondingly earlier. The plants in the *L. pseudotruncatella* group will probably require water from the end of April and will bloom in July. Some of the species with yellow flowers may not require water before the end of June. The golden rule is to start watering when the old heads have almost dried up. Watering should not be stopped *immediately* after flowering as this will hinder the development of seed pods.

The growing conditions in general and the watering in particular should not be such as to force them out of character. One or two species such as *L. aucampiae*, have large heads, but the heads should be small with most species. Repotting is not usually necessary more frequently than every other year unless the plant has grown out of its pot. When done it should be soon after growth has recommenced. It is possible to defer repotting for several years but in these circumstances root mealy is more likely to occur.

10th November, 1964—Photographing Cacti. Miss M. J. Martin and Mr. P. R. Chapman.

Mr. Chapman opened the joint contribution saying that his would be the task of outlining the techniques of photography after which Miss Martin would illustrate these ideas by reference to a series of colour transparencies, some of which would pinpoint common faults.

Dealing first with cameras Mr. Chapman noted that these are of four types. The simplest is the box camera and it is quite possible to obtain good results with a cheap camera of this type providing that its limitations are realised. The second type is the folding model, usually of the 35 mm category. Some may be quite elaborate and a big price range is encountered. The single lens reflex system is also widely used and has advantages for close-up photography. The fourth type, providing the easiest and cheapest means for serious work, is the plate camera; most of these have a double extension system. Whichever type is used a firm support, usually a tripod of one sort or another, is a necessity.

Most people will only be concerned with photography in normal daylight conditions which, of course, can be very variable. It is important to be patient and wait for the correct light conditions. Those wishing to photograph plants on the show bench will find that a flash source is a necessity and this approach also provides a valuable method for photographing plants indoors, under deliberately controlled light conditions.

For close-up photography, supplementary lenses are frequently used with the cheaper type of camera. These are supplied with powers of one, two and three dioptries, enabling work to be done at successively shorter distances. Tables of focal distances are supplied with them but these are only approximate and a check should be made by imaging on to a ground glass screen sited at a position occupied by the film. For cameras other than of the single lens reflex type the distance between the plant and the camera lens will have to be measured fairly carefully to fix the position of optimum focus.

Turning to films for colour photography Mr. Chapman said that these are available in several types of colour reversal film of which Agfa and Kodachrome are, perhaps, the best known. None is completely equivalent, in so far as they all bring out differing colours to varying extents. For colour work the latitude in exposure is not great and an exposure meter proves to be a great help. For black and white work the medium speed FP3 is quite satisfactory.

Mr. Chapman criticised the average plant photograph on the ground that it is often spoiled by inadequate attention to background. For colour work a neutral background, such as a blue linen cloth, is admirable, but the best results in black and white are obtained with a black background. The choice of camera aperture presents less of a problem in photographing cacti than in normal work. Because of their rigidity it is possible to use a comparatively long exposure with a correspondingly small aperture and so obtain a greater depth of focus.

Mr. Chapman concluded his talk by discussing the technique of indoor photography, using the flash technique for colour work and floodlight lamps with black and white film. This enables controlled conditions to be realised and it is then possible to obtain uniform and completely predictable results. For colour photography, using small apertures, the use of several consecutive flashes is a very satisfactory, but infrequently used method.

Miss Martin effectively demonstrated various points made by Mr. Chapman with the help of a series of carefully chosen slides. These showed clearly useful techniques such as the masking of colour transparencies to cut out undesirable background and directed flash to provide a dark background. The danger of harsh shadows appearing in flash photography was also effectively demonstrated.

SMALL OPUNTIAS

By G. G. LEIGHTON-BOYCE

Over the last few years I have been gathering together a representative group of such of the small *Opuntioideae* as are generally available in this country. In so many amateur collections, these tend to be poorly represented, if at all, apart from the occasional venerable exhibition plant; and this lack of interest has, of course, come to be reflected among the majority of professional growers. This seems to me to be a pity, because although few of the really small species can be persuaded to flower, even in the South of England, they can claim to their credit a very high level of variability in shape of spine, in arrangement of spines, in shape of stem segments and particularly in their colour. There is a complete range from near-black through purples and reds and on into greens and browns and from there to many shades of grey, several of these being sometimes combined on the same plant by the difference between new and old growth. For a suburban dweller such as myself there is also the practical attraction that if one is content with small specimens (from rooted cuttings and seed) it is possible to house a reasonable cross-section of the entire range (say, about thirty species) in a single small cold frame. A good many are, if not really hardy, pretty tough—provided they can be kept from the damp in the winter.

Of course, many people may have been discouraged by being unable to find much variability in their plants of this kind. There are two obvious reasons—one, that they provide the wrong environment for the plants; two, that they have too many that are in fact (whatever the labels say) only varieties of the same species, if not merely divergent forms of one variety.

On environment, I can only say that open air (and with it some wind) is in my view almost as important as sun. To take a very common example, grow an *Opuntia fragilis* in a dampish 'Epiphyllum' sort of greenhouse and the spines will only be measurable in millimetres. Put it out in the open, and the new growth will have spines almost as many centimetres long as the old were millimetres; and the difference in colouration is just as impressive. Many of the less common species, particularly those from South America, are slow growers by almost any—well, not quite *Ariocarpus*—standards. There is a considerable need for care in persuading them to root satisfactorily, in fact if any amateur in this country tells you that he does not bother with *Opuntias* because they are too easy, the probability is that he has never had any, except stunted forms of plants which grow naturally to bush size at least.

On the problem of too many labels for the same plant, there is a distinction to be made between the numerous synonyms which we have inherited from enthusiastic (and possibly jealous?) 19th century botanists (these are mostly sorted out in later reference books—the best I know on small *Opuntioideae* being Backeberg's *Die Cactaceae*, first volume) and the apparently haphazard attribution of names by some growers and dealers. The former are proper names enough for most purposes, even though botanically superseded, but the latter names can be rather a nuisance. *Opuntia fragilis* (Nutt.) Haw. has to my limited knowledge been passed around in England in the last ten years as *ovata*, *sphaerica*, *corrugata* and *teres* rather more often than under its own name. All four names have been botanically described and apply to quite different plants from *fragilis*—and not all so easy to propagate. Personally, so long as a grower or dealer lets me have a good, clean plant, I would never question his right to call it what he will. After all, he would not, I suppose, sell so many as Blogg's *Opuntia* No. 1.

The identification of species of small *Opuntioideae* is certainly difficult. Like removing cobwebs from *M. bocasana*, it takes time, and one is never quite sure one has finished. In one awkward case, I wrote out a full description of the appearance of the rather poor specimen which was all I had. That description went into a drawer and stayed there forgotten, until about a year later when I had done another careful description of the same plant as I then saw it (now a rather more vigorous little thing). The comparison of the two descriptions was a salutary lesson, because nearly all the external characteristics which had suggested one species had been modified to a stage which suggested another! Well I did say they were variable. The absence of a flower is not in this field a complete bar to identification except in a minority of cases. The best known example that occurs to me among common species concerns *Op. salmiana*, a cylindrical, straggling plant which grows rather too tall to be regarded as small in this context. Whereas true *salmiana* has a yellowish flower, the variety *spegazzinii* has a whiter flower with a dull red rib on the petals, and the variety *albiflora* is near to pure white. These three are hard to tell apart without a flower, though I am told it can be done.

It would be very convenient for taxonomists if the plants really grew in only three shapes of stem segment (cylindrical, globular and flat) but in fact there are innumerable variations in between, as well as between smooth and warty surfaces on whatever shape the segment is. All sorts of metaphors have been dragged in to the rescue; discs, spheres, clubs, eggs, cones, potatoes (a bit confusing this, when some of the plants have tuberous roots, but it conveys the right hint of amorphousness). One can build up a group of whatever shape takes one's fancy or pick a few of each, or work on the basis of country of origin. The *Tephrocacti* are admittedly in rather short supply now-

days, which is a pity, as they include some of the oddest looking of all and some of them come from as far away as Patagonia. Rarer still, at present are the *Micropuntiae*—no doubt, there are some further miniatures still to be found. Whether that be so or not in North and Central America, at least in South America the *Tephrocactus* hunting grounds are far from exhausted. Even Backeberg's monumental work required amendments and additions in the few years between publication of the first and of the last volume.

But there are still things to be done with even the commonest specimens from the florist's stock. How many pads have you grown on *Op. microdasys albispina* without a single red blemish appearing between areoles? And have you compared your success with growing its sub-variety *albida* (the one with hairier glochids)? Variability of form is as notable in this well-known group as elsewhere. Apart from certain crosses between *rufida* and *microdasys* and between *rufida* and the larger *herrfeldtii* (in which the flat stem segment has almost a circular outline), there is a quite vigorous cristate form of *microdasys* with undulating edges to the segments. I am indebted to K. H. Walden for drawing my attention to a monstrous form in which the stem segments grow vertically and are extremely elongated and cylindrical in shape, even when grown in full sun—a form to which I would suggest that the name *albispina cylindrica* might appropriately be given, but I suspect that it is already covered by *a. monstrosa*. It has one very desirable characteristic which I have not seen noted in the literature, namely, that if you brush a finger along the plant the glochids do not attach themselves to you! The areoles are far closer together than in the normal form of the variety, which can of course be made to grow elongated and staggling if it is kept without sufficient sun, but such unfortunate specimens will gradually revert to normal new growth if given a better situation and I have never seen one which was consistently cylindrical, like the form described above.

WILL KING CACTUS (ARIZONA) LOSE HIS THRONE?

We were interested to read in a copy of the 'San Diego Union' (kindly sent by Richard Russell of San Diego) of the deep concern felt in Arizona over the threat to the very existence of the Saguaro.

As the newspaper says 'Is the Saguaro, the King of the Cactus, about to lose his Throne by Default?'

Then another reference turned up (although contributed by an American—Larry W. Mitch of the North Dakota University at Fargo) in 'Spine' the official bulletin of The Cactus and Succulent Society of Australia. The concern had certainly spread.

Briefly the case is this. A mysterious disease has struck the plants in the Saguaro National Monument area. If the present rate of mortality persists it is calculated that by the end of the century it will be gone from this area. Yet in other places it flourishes!

The University of Arizona, in the heart of the area, is strenuously leading a number of studies in an attempt to solve the problem. To date the answer has been elusive.

In a sixty acre forest under present study there were 1,400 Saguaros in 1940. Today there are nine hundred. One in six is dying of the disease in every year.

Just as though this is not enough the decimation is assisted by theft, rodents, cattle and the weather. In the areas of Phoenix and Tucson housing development is an additional hazard.

Many newcomers dig up the plants, ignorant of the State law, many of which are found too big to carry away and are then left to rot.

Overgrazing of cattle accounts for many of the seedling plants and the rodents assist ably. As the newspaper says 'Even under ideal conditions a young Saguaro can have as rough a time growing up as a cottontail rabbit in fox country'.

Naturally the plant grows slowly and although the seed germinates in about five days it takes at least eight to ten years to achieve six inches. In twenty five years it may have attained four feet and it will be another fifteen to twenty years before it bears its creamy-white flowers. It will start to produce arms at 75 years of age. At its century it will be about twenty to twenty-five feet tall.

If the Saguaro perishes American Indians will lose a source of food they have used for a thousand years. A valuable tourist attraction will be gone and the State of Arizona will lose its State Flower.

NOTICES: 'Gardens to Visit' notified in our last issue, is now available. It can be obtained direct from Mrs. K. Collett, White Witches, Claygate Road, Dorking, Surrey, at 1s. 3d. post free, or from any bookstall of W. H. Smith & Sons Ltd. for 1s.

UNUSUAL CACTI

By Miss MARGARET J. MARTIN

In previous articles, I have described some of the rarities found in Mexico, a country rich in cacti, but this does not mean that there are not many choice plants in other areas of the American continent and in this article I am going to describe some of these.

The deserts of the South Western U.S.A. supply one of the most attractive plants in my greenhouse, *Echinomastus maddockellii*. This is a spherical plant covered in silvery white spines. Other members of this genus are *E. durangensis* and *E. unguispinus*. They are slow growing plants and should have a porous soil and a dry winter's rest.

On a much smaller scale, Texas and New Mexico have given us another delightful plant, *Escobaria tuberculosa*. This is a cylindrical plant which is covered with dense white spines. The flowers are carried on the top of the stem and are pinkish in colour. The flowers are followed by long red berries. The plant is probably at its most attractive when bearing fruit. Another beautiful cactus is *E. chaffegi* which is even more attractively spined than *E. tuberculosa*. The flowers are very similar and it likewise flowers when very small. Both these plants are very prone to rot and need excellent drainage.

Most of us are familiar with the Mexican *Echinocactus grusonii* which grows easily from seed and although slow growing is always an attractive golden spined plant. Unfortunately the chances of flowering it are almost nil, for only large plants will bloom and they need a brilliantly sunny summer. This applies to most of the species of *Echinocactus*, with one exception, *E. horizonthalonius*. This is a small spherical plant which can easily be flowered in cultivation. Although it lacks the glamorous colouring of its famous relative, *E. horizonthalonius* with its thick, strongly curved, spines, is an attractive plant. The flowers are pink. This *Echinocactus* is native to Texas, New Mexico and Arizona. It is not as easy to cultivate as other members of this genus and should be watered with great caution. It is usually obtained as an imported specimen.

Neobesseya missouriensis is a small cactus that is not frequently seen. It is quite widely distributed in the U.S.A.—W. Dakota, Montana, Colorado, Kansas and Oklahoma. It is a spherical, clump-forming plant with large yellowish flowers.

One of the rarer cacti is *Utahia sileri* from Utah. This is a solitary globular plant with stout spines and small yellow flowers. This cactus was originally listed in Haage's catalogue as early as 1902. It then disappeared until 1931 when fortunately it was re-discovered.

A widely distributed cactus is *Pediocactus simpsonii* which is found in Kansas, New Mexico, Nevada, Washington, Idaho and Montana. *P. simpsonii* is a globular plant. My own specimen was solitary but Borg states that clusters are formed. The central spines are reddish brown and the small flowers are pink.

Neoporteria are becoming much more common in the catalogues than they were a few years ago. These natives of the mountains of Argentina and Chile may be grown quite easily from seed. The plant body tends to be cylindrical and the pink or yellow flowers are formed at the top of the plant. One of the choicest species is *N. napina* which has a long thick tap root.

Cacti with large turnip-like roots are not uncommon. These roots are used for the storage of water. A plant with such roots usually comes from a region of extreme aridity and needs careful cultivation. Many of them are also extremely slow growing and are frequently grafted. Perhaps the most famous of these plants is *Opuntia clavarioides*. This *Opuntia* is exceedingly slow growing on its own roots but grows quite freely when grafted on *Trichocereus*. As a grafted plant it flowers in cultivation but so far I have not heard of it flowering on its own roots. The flowers are yellowish. Grafting also seems to increase the degree of fasciation. The plants comes from Chile.

The *Peniocereus* also have thick fleshy roots with slender stems carrying minute spines. The large white flowers are nocturnal and often sweetly scented. *P. greggii* is said to have a root weighing up to 25 lb. It is a native of Northern Mexico and Arizona. My own specimen of *P. maculatus* grows quite easily on its own roots. The greenish-grey stem is blotched with dark green and at the moment is about 18 inches long. On the last repotting there was not much sign of a tap root but doubtless it is young as these plants go and has plenty of time to remedy this deficiency.

Although my *Peniocereus* grows rapidly on its own roots my *Wilcoxia poseelgeri* is so slow that it is going to be grafted in the spring (written in January). This plant has a tuberous root and slender closely spined stems. The flowers are a purplish pink colour. It is found in southern Texas and Mexico.

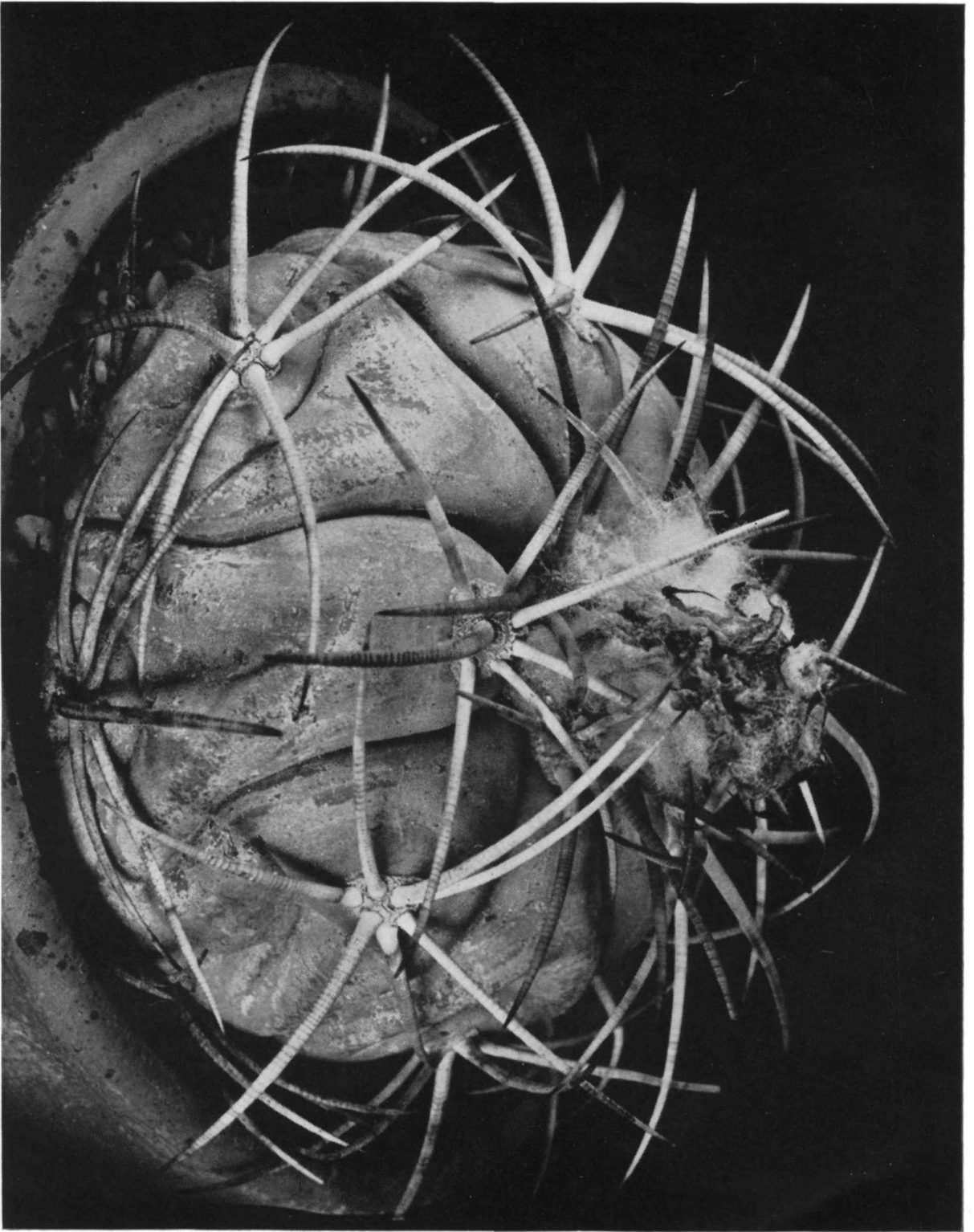
This is a short list of some of the rarer cacti found outside Mexico. There are doubtless many others all of which are well worth growing.



Miss Margaret J. Martin

Utahia silesii

Echinocactus horizontalis



Miss Margaret J. Martin



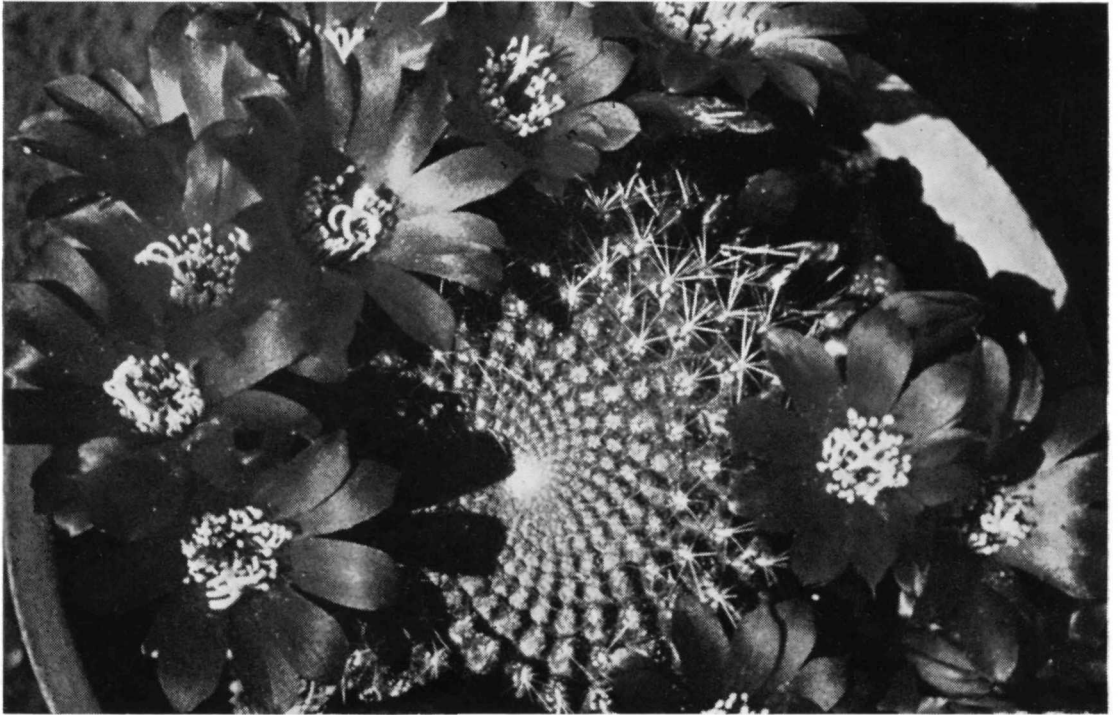
Rebutia calliantha var. *krainziana* f. *brevisetata* (Backbg) Buin. et Don.

J. D. Donald



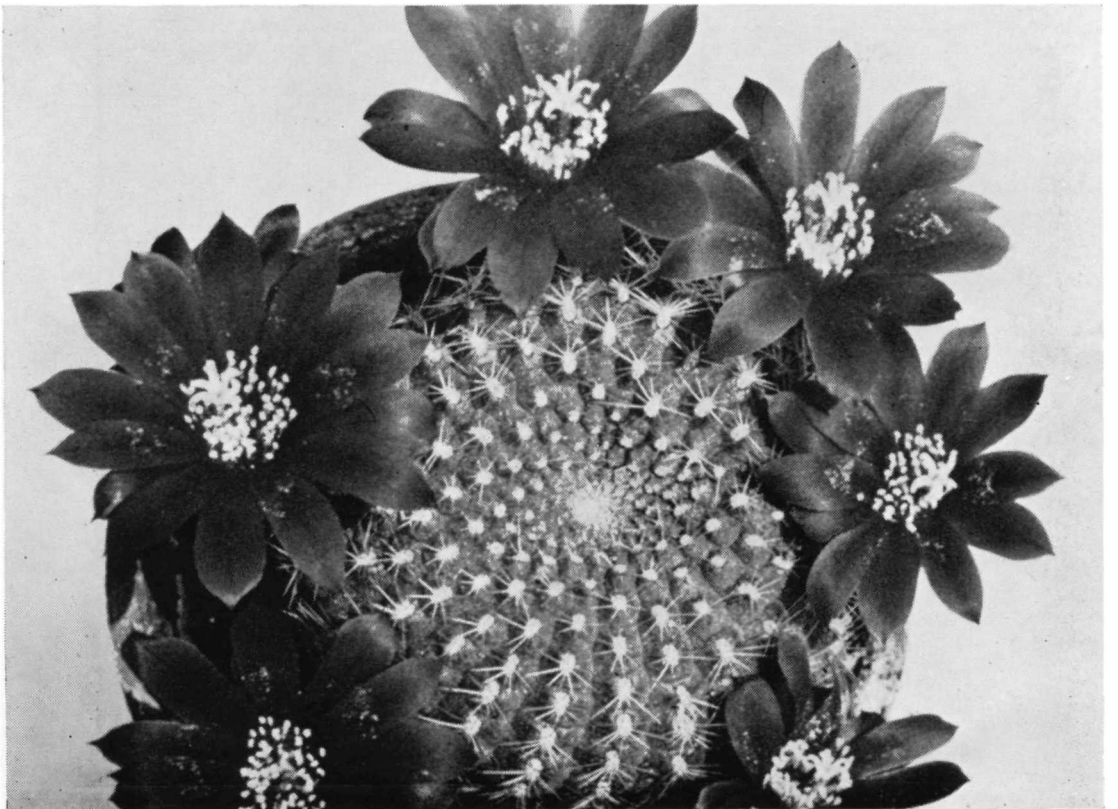
Rebutia ritteri var. *nigricans* f. *hahniana*, Buin. et Don.

J. D. Donald



Rebutia calliantha var. *beryllioides*, Buin. et Don.

J. D. Donald



Rebutia calliantha var. *beryllioides*, Buin. et Don.

J. D. Donald

REVISION OF THE GENUS *REBUTIA* K.SCHUMANN

A. F. BUINING and J. D. DONALD

Part II of the lecture given by Burgermaster A. F. H. Buining to the Cactus and Succulent Society of Great Britain in London jointly with the London Branch of the National Cactus and Succulent Society.

I can only give you a brief outline of the proposals that Mr. Donald and myself have made to try and create a little order and sense into the chaotic classification that exists for this fascinating and intriguing group of S. American Cactaceae. Our proposals, including the evidence justifying our changes in nomenclature, are published in full in the next volume of *Sukkulentenkunde*, which we hope will appear in the Autumn in time for the Vienna Congress. (*Sukkulentenkunde* VII/VIII, March 1963, pp. 96-107, Ed.) I would like at this stage to stress that we made these proposals two years ago and since then we have had time to reflect and examine fresh evidence, particularly from imported plants and seeds collected by my old friend, Friedrich Ritter. We are still satisfied that our basic ideas are correct but we must make one or two modifications to put right some omissions and some slight taxonomic errors due to our misinterpretation of the correct procedure of applying the International Code for Botanical Nomenclature 1961 for priority of name and rank. Believe me, this Code is fraught with difficulties and even experts (let alone amateurs like ourselves) cannot always agree how to apply it! However, my good friend, Dr. B. K. Boom, of the I.V.T., Wageningen, has very carefully vetted our proposals and we are extremely grateful to him for his expert opinion and very helpful suggestions.

Our proposals are based on both geographical distribution and morphological studies of the group taken as a whole rather than as individual genera and species, and the differential analysis of the data collected has suggested that there is no justification for the provision of several discreet genera to characterise the group but that there should be a single genus -*Rebutia* with a much broader diagnosis than the original one given by Professor Karl Schumann. The single genus will contain two sub-genera, *Rebutia* and *Aylostera*, each of which will be divided into a number of sections which are in themselves roughly equivalent to the old separate genera, except of course in rank. This means that, if you agree with us, you ought now to call all of these plants *Rebutia* this, that or the other, rather than *Rebutia* X, *Aylostera* Y, *Mediolobivia* Z, etc., but there is no compulsion to do so; the old names are perfectly acceptable, after all changing a name does not change the plant!

REBUTIA K. Schumann amend. Buining et Donald.

DESCRIPTION OF THE GENUS

Plants relatively small, flattened globose to globose or cylindrical, simple or somewhat caespitose, offsets without adventitious roots; ribs scarcely distinguishable, spiralled or vertically directed, mostly resolved into small round or hexagonal tubercles; areoles round to oval in the centre of the tubercle, felted, initially without spines; spines always straight, never hooked, bristly, adpressed or outstanding, often pectinate; flowers funnel-form rarely campanulate, arising only from the sides or base of the plant, never from the crown; flower tube narrow, sometimes very short and then broader, with scales on the outer side, scale axils naked to woolly and even bristly; seeds small, from 1.5 mm to 2 mm large, black or brown, shiny or dull, cap formed.

Habitat: S. America in the eastern Andes between 1500-5000 M above sea level from N.W. Argentine to S. Bolivia.

The genus *Rebutia* K.Sch. should be divided into two sub-genera:—

1. Subgenus *Rebutia* with *Rebutia minuscula* K.Sch. as the type species.
2. Subgenus *Aylostera* with *Echinocactus pseudominusculus* Speg. as the type species.

The subgenus *Rebutia* we define as follows:—

Flower tube, style and filaments do not grow together (coalesce); scale axils naked or with hairs, yet without bristles; flower tube relatively broad.

It should be divided into three sections:—

1. *Sectio Rebutia*.

'Flores infundibuliformes, fertiles a se ipsis, axillae squamanum in ovario tuboque glabrae vel subglabrae, interdum cum pilosis sed semper sine setis; tubis latior; corpus globosus vel applanatus.'

Flowers funnel form, self fertile; scale axils on pericarp and receptacle naked or almost naked, sometimes hairy, but always without bristles; receptacle broad; body globose or applanate.

2. *Sectio Setirebutia*. Buin. et Don.

'Flores infundibuliformes, steriles a se ipsis; axillae squamanum in ovario tuboque pilosae; corpus globosus.'

Flowers funnel form, self sterile; scale axils on receptacle and pericarp hairy; body globose.

3. *Sectio Cyliandrebutia*. Buin. et Don.

'Flores campanulati; corpus cylindricus ± violaceo-pictus.'

Flowers campanulate; body cylindrical, more or less violet tinted.

The subgenus *Aylostera* (Speg.) Buin. et Don. is distinguished by the following characteristics:—

The flower tube, style and filaments are completely or partly fused together; scale axils with hairs or bristles; flower tube relatively narrow.

The subgenus is divided into the three following sections:—

1. *Sectio Aylostera*.

'Flores steriles vel fertiles a se ipsis; axillae squamanum in ovario tuboque pilosae setaceaeque; corpus globosus vel applanatus'.

Flowers self sterile; scale axils on pericarp and receptacle with hairs and bristles; body globose or applanate.

2. *Sectio Digitorebutia*. Buin. et Don.

'Flores steriles a se ipsis; axillae squamanum in ovario tuboque pilosae; corpus brevi-cylindricus, saepe lilacino pictus'.

Flowers self sterile; scale axils on the pericarp and receptacle hairy; body short, cylindrical, often lilac tinted.

3. *Sectio Mediorebutia*. Buin. et Don.

'Flores steriles a se ipsis; axillae squamanum in ovario tuboque non nullis pilis brevissimis obsitis; corpus globosus vel applanatus.'

Flowers self sterile; scale axils on pericarp and receptacle with few very short hairs; body globose or applanate.

KEY

A Receptacle, style and filaments not fused together; scale axils naked or hairy but lacking bristles; flower tube relatively broad.

Subgenus Rebutia

B Flower funnel form; body globose to applanate.

C Scale axils naked or almost naked; flowers self fertile; body globose or applanate up to 6 cm high and broad.

Sectio Rebutia

CC Scale axils hairy; flower self sterile; body globose.

Sectio Setirebutia

BB Flower campanulate; body very cylindrical, more or less violet tinted.

Sectio Cyliandrebutia

AA Receptacle, style and filaments partly or wholly fused together; scale axils hairy and bristly, or bristly; receptacle relatively narrow.

Subgenus Aylostera

D Scale axils with hairs and bristles; flower self fertile; body globose to applanate.

Sectio Aylostera

DD Scale axils with hairs (often only a few); flowers self sterile; body applanate to globose to short cylindrical.

E Body short cylindrical, small, often lilac tinted, seeds brown.

Sectio Digitorebutia

EE Body more applanate to globose; relatively large, up to 6 cm high and 10 cm broad, not or rarely lilac tinted; seeds black.

Sectio Mediorebutia

REVIEW OF SPECIES, VARIETIES AND FORMS

I. *Sectio Rebutia*

1. *Rebutia minuscula* K. Schumann in *Monatsschrift für Kakteenfreunde* V (1895), p. 102. Type species of Section.

1. var. *minuscula*.

1. f. *minuscula*.

2. f. *violaciflora* (Backbg.) Buin. et Don.

(Syn. *Rebutia violaciflora* Backeberg in *B.f.K.* (1935), p. 8.

(Syn. *Rebutia carminea*. Buining in *Succulenta* 23 (1941), p. 27.

3. f. *knuthiana* (Backbg.) Buin. et Don.

Syn. *Rebutia knuthiana* Backeberg in *Kaktus ABC* (1935), Op. 416.

2. var. *grandiflora* (Backbg.) Marshall et Bock *Cactaceae* (1941), p. 124.

Syn. *Rebutia grandiflora* Backberg in *Kaktus ABC* (1935), p. 416.

2. *Rebutia senilis* Backeberg in *Kakteenfreund I* (1932), p. 123.
1. var. *senilis*.
 1. f. *senilis*.
Syn. *Rebutia senilis* var. *aurescens* Backeberg in *Kaktus ABC* (1935), p. 416.
Rebutia senilis var. *cana* Backbg.
 2. f. *lilacino-rosea* (Backbg.) Buin. et Don.
Syn. *Rebutia senilis* var. *lilacino-rosea* Backeberg in *Kaktus ABC* (1935), p. 416.
 3. f. *stuemeri* (Backbg.) Buin. et Don.
Syn. *Rebutia senilis* var. *stuemeri* Backeberg in *Kakteenfreund I* (1932), p. 131.
 2. var. *iseliniana* Krainz in *Schweizer Garten* (1946), p. 284.
 1. f. *iseliniana*.
 2. f. *chrysacantha* (Backbg.) Buin. et Don. comb. nov.
Syn. *Rebutia chrysacantha* Backeberg. *Kaktus ABC* (1935), p. 416.
 3. f. *elegans* (Backbg.) Buin. et Don. comb. nov.
Syn. *Rebutia xanthocarpa* var. *elegans* Backeberg in *C. and S. J. Amer.* 23 (1951), p. 83.
 4. f. *kesselringiana* (Bew.) Buin. et Don. comb. nov.
Syn. *Rebutia senilis* var. *kesselringiana* Beyerling in *Sukkulentenkunde I* (1947), p. 9.
3. *Rebutia xanthocarpa* Backeberg in *Kakteenfreund I* (1932), p. 131.
1. f. *xanthocarpa*.
Syn. *Rebutia xanthocarpa* var. *luteirosea* Backeberg *Cact. and Succ. J. Amer.* 23 (1951), p. 83.
 2. f. *citricarpa* (Fric. ex Backeberg) Buin. et Don.
Syn. *Rebutia xanthocarpa* var. *citricarpa* Fric. ex Backbg. *Cact. and Succ. J. Amer.* 23 (1951), p. 83.
 3. f. *dasyphrissa* (Werd.) Buin. et Don.
Syn. *Rebutia dasyphrissa* Werdermann *Blüh. Kakt. u.a. Sukk. Pfl. Plate 103* (1935).
Syn. *Rebutia xanthocarpa* v. *coerulescens* Backeberg *Descr. Cact. No.* (1956), p. 31.
 4. f. *salmonea* (Backeberg) Buin. et Don.
Syn. *Rebutia xanthocarpa* var. *salmonea* Backeberg *Cact. and Succ. J. Amer.* 23 (1951), p. 83.
 5. f. *violaciflora* (Backeberg) Buin. et Don.
Syn. *Rebutia xanthocarpa* var. *violaciflora* Backeberg *Descr. Cact. Nov.* (1956), p. 31.
- II. **Sectio Setirebutia.** Buin. et Don.
4. *Rebutia aureiflora* Backeberg in *Kakteenfreund I* (1932), p. 124. Type species of Section.
1. var. *aureiflora*.
 1. f. *aureiflora*.
Syn. *Mediolobivia aureiflora* var. *albiseta* Backeberg *B.f.K.* 1934 (2).
Mediolobivia aureiflora subvar. *leucolutes* Backeberg *Descr. Cact. Nov.* (1956), p. 30.
Mediolobivia aureiflora subvar. *lilacinostoma* Backeberg *Descr. Cact. Nov.* (1956), p. 30.
Mediolobivia boedekeriana Backeberg *B.f.K.* 1934 (2).
Mediolobivia duursmaiana Backeberg *B.f.K.* 1934 (9).
 2. f. *rubelliflora* (Backbg.) Buin. et Don.
Syn. *Mediolobivia rubelliflora* Backeberg *Kaktus ABC* (1935), p. 415.
 3. f. *rubriflora* (Backeberg) Buin. et Don.
Syn. *Mediolobivia rubriflora* Backeberg in *Kaktus ABC* (1935), p. 415.
Rebutia blossfeldii Werdermann in *Redde Repert.* 39 (1936).
Mediolobivia blossfeldii var. *compactiflora* Wessner in *Kakteenkde.* (1940), p. 32.
Mediolobivia blossfeldii var. *nigrilongiseta* Wessner in *Kakteenkde.* (1940), p. 32.
Mediolobivia kesselringiana Cullmann in *Sukkulentenkunde II* (1948), p. 26.
 4. f. *sarothroides* (Werd.) Buin. et Don.
Syn. *Rebutia sarothroides* Werdermann in *Blüh. Kakt. u.a. Sukk. Pfl. Plate 106*, (1936).
 2. var. *elegans* (Backeberg) Buin. et Don.
Syn. *Mediolobivia elegans* Backeberg *B.f.K.* 1934 (9).
Syn. *Mediolobivia elegans* var. *gracilis* Backeberg.
- III. **Sectio Cylindrorebutia.** Buin. et Don.
5. *Rebutia einsteinii* Fric in *Moellers Deutsch. Gärtnerzeitung* 63 (1931), p. 23 and 267. Type species of Section.
1. var. *einsteinii*.
 1. f. *einsteinii*.

2. *f. schmiedcheniana* (Köhler) Buin. et Don.
Syn. *Lobivia schmiedcheniana* Köhler in Beitr. Sukkulantenkunde und-pflege (1939), p. 37.
 2. var. *columnaris* (Wessner) Buin. et Don.
 1. *f. columnaris*.
Syn. *Lobivia columnaris* Wessner in Beitr. Sukkulantenkunde und-pflege (1940), p. 3.
 2. *f. karreri* (Backbg.) Buin. et Don. comb. nov.
Syn. *Mediolobivia schmiedcheniana* var. *karreri* Backeberg in Descr. Cact. Nov. (1956), p. 30.
 3. var. *conoidea* (Wessner) Buin. et Don.
Syn. *Lobivia conoidea* Wessner in Beitr. Sukkulantenkunde und-pflege (1940), p. 0.
 4. var. *rubroviridis* (Backeberg) Buin. et Don.
Syn. *Mediolobivia schmiedcheniana* var. *rubroviridis* Backeberg in Descr. Cact. Nov. (1956), p. 30.
 5. var. *steineckeii* (Backeberg) Buin. et Don.
Syn. *Mediolobivia schmiedcheniana* var. *steineckeii* Backeberg in Descr. Cact. Nov. (1956), p. 30.
 6. *Rebutia aurantida* (Wessner) Buin. et Don.
 1. *f. aurantida*.
Syn. *Lobivia aurantida* Wessner in Kakt. u.a. Sukk. 9 (1937), p. 130, 207.
Syn. *Mediolobivia aurantida* var. *flaviflora* Backeberg in Descr. Cact. Nov. (1956), p. 31.
 2. *f. gracilis* (Wessner) Buin. et Don.
Syn. *Lobivia aurantida* var. *gracilis* Wessner in Kakt. u.a. Sukk. 9 (1937), p. 130.
- IV. **Sectio Aylostera.** Buin. et Don.
7. *Rebutia albiflora*. Ritter et Buining in Taxon XII i (1963), p. 29.
 8. *Rebutia albipilosa*. Ritter in Taxon XII i (1963), p. 28.
 9. *Rebutia deminuta* (Weber) Britton et Rose in Cactaceae Vol. 3. p. 48, (1922).
Syn. *Echinopsis deminuta* Weber in Bull. Mus. Hist. Nat. Paris (1904), p. 386.
 1. *f. deminuta*.
 2. *f. pseudominuscula* (Speg.) Buin. et Don.
Syn. *Echinocactus pseudominusculus* Spegazzini in Anal. Mus. Nac. Buenos Aires 3 (1905), p. 488.
(Type species of the Section).
 10. *Rebutia fiebrigii* (Gürke) Britton et Rose in Cactaceae Vol. 3, p. 46, (1922).
Syn. *Echinocactus fiebrigii* Gürke in Notiz. B.G. 4 (1905) p. 183.
 1. *f. fiebrigii*.
 2. *f. densiseta* Cullmann in Sukk. 6 (1957), p. 25.
 11. *Rebutia muscula*. Ritter et Thiele in Taxon XII i (1963), p. 29.
 12. *Rebutia pseudodeminuta* Backeberg in Kakteenfreund II (1933), p. 7.
 1. *f. pseudodeminuta*.
Syn. *Rebutia pseudodeminuta* var. *schumanniana* Backeberg in Kakteenfreund II (1933), p. 7.
 2. *f. albiseta* (Backeberg) Buin. et Don.
Syn. *Aylostera pseudodeminuta* var. *albiseta* Backeberg in C. and S. J. Amer. 23, (1951), p. 82.
 3. *f. grandiflora* (Backbg.) Buin. et Don.
Syn. *Aylostera pseudodeminuta* var. *grandiflora* Backeberg C. and S. J. Amer. 23, (1951), p. 82.
 4. *f. schneideriana* (Backbg.) Buin. et Don.
Syn. *Aylostera pseudodeminuta* var. *schneideriana* Backeberg C. and S. J. Amer. 23, (1951), p. 82.
 5. *f. rubriflamentosa*. Buin. et Don. 'A typo filamentis purpureis differt'.
 13. *Rebutia kupperiana*. Boedeker in Monatsschr. DKG (1932), pp. 276, 277.
 14. *Rebutia pulvinosa*. Ritter in Tazon XII i (1963), p. 29.
 15. *Rebutia rubiginosa*. Ritter in Taxon XII i (1963), p. 29.
 16. *Rebutia spegazziniana* Backeberg in Kakteenfreund II, 1933, p. 6.
Syn. *Rebutia spegazziniana* var. *atroviridis* Backeberg in C. and S. J. Amer. 23 (1951), p. 82.
 17. *Rebutia spinosissima* Backeberg in B.f.K. (1935), 8.
 18. *Rebutia steinmannii* (Solms-Laubach) Britton and Rose in Cactaceae, Vol. 3, p. 47 (1922).
Syn. *Echinocactus steinmannii* Solms in Bot. Zeitschr. 55, p. 133 (1907).
 19. *Rebutia tuberosa*. Ritter in Taxon XII i (1963), p. 29.
- V. **Sectio Digitorebutia.** Buin. et Don.
20. *Rebutia brachyantha* (Wessner) Buin. et Don.
Syn. *Lobivia brachyantha* Wessner in K. u.a. S. (1937), p. 207.

21. *Rebutia costata* (Werdermann) in Notizbl. Berlin 12 (1934), p. 225.
1. *f. costata*.
 2. *f. eucalipstana* (Backbg.) Buin. et Don.
Syn. *Lobivia eucalipstana* Backeberg in Kaktus ABC (1935), p. 414.
 3. *f. pilifera* Buin. et Don.
'A typo costis subacutis, spinis luteolis, flore purpureo, tubo brevior differt'.
(Note: does not equal *Mediolobivia ritteri* var. *pilifera* Backbg.)
22. *Rebutia euanthema* (Backbg.) Buin. et Don.
Syn. *Lobivia euanthema* Backeberg B.f.K. 1934 (2).
1. *f. euanthema*.
 2. *f. fricii* (Backeberg) Buin. et Don.
Syn. *Mediolobivia euanthema* var. *fricii* Backeberg in Descr. Cact. Nov. 1956, p. 30.
 3. *f. neopygmaea* (Backbg.) Buin. et Don.
Syn. *Mediolobivia neopygmaea* Backeberg in Descr. Cact. Nov. 1956, p. 30.
 4. *f. oculata* (Werdermann) Buin. et Don.
Syn. *Rebutia oculata* Werdermann in Blüh. Kakt. u.a. Sukk. Pfl., Plate 99, (1935).
23. *Rebutia haagei* Fric et Schelle in Kaktusar 1930, p. 180. (Type species of Section).
24. *Rebutia pygmaea* (R. E. Fries) Britton and Rose in Cactaceae, Vol. 3, p. 47, (1922).
Syn. *Echinopsis pygmaea* R. E. Fries in Nov. Act. Soc. Sci. Upsala 4, 1/1 (1905), p. 120.
1. *f. pygmaea*.
Syn. *Lobivia digitiformis* Backeberg in Kaktus ABC (1935), p. 414.
Syn. *Lobivia neohaageana* Backeberg in Kaktus ABC (1935), p. 415.
Syn. *Lobivia orurensis* Backeberg in Kaktus ABC (1935), p. 415.
Syn. *Lobivia pectinata* Backeberg in Kaktus ABC (1935), p. 416.
 2. *f. atrovirens* (Backeberg) Buin. et Don.
Syn. *Lobivia atrovirens* Backeberg in Kaktus ABC (1935), p. 414.
 3. *f. flavovirens* (Backbg.) Buin. et Don.
Syn. *Mediolobivia haagei* var. *flavovirens* Backeberg in C. and S. J. Amer. 23, (1951), p. 82.
 4. *f. fauxiana* (Backbg.) Buin. et Don.
Syn. *Mediolobivia fauxiana* Backeberg. Descr. Cact. Nov. (1956), p. 31.
 5. *f. haefneriana* (Cullmann) Buin. et Don.
Syn. *Mediolobivia haefneriana* Cullmann in K.u.a.S. VI 1955, p. 1191
 6. *f. noesteinmannii* (Backbg.) Buin. et Don. comb. nov.
Syn. *Mediolobivia pectinata* var. *noesteinmannii* Backeberg in Descr. Cact. Nov. (1956), p. 30.
25. *Rebutia ritteri* (Wessner) Buin. et Don.
Syn. *Lobivia ritteri* Wessner in Beitr. zur Sukkulenteenkde unde-pflege, (1938), p.3.
1. var. *ritteri*
Syn. *Mediolobivia ritteri* var. *pilifera* Backeberg in Die Cactaceae 3 (1959), p. 1518.
 2. var. *nigricans* (Wessner) Buin. et Don.
Syn. *Lobivia nigricans* Wessner Beitr. zur Sukkulenteenkde unde-pflege (1938), p. 51.
 1. *f. nigricans*.
 2. *f. peterseimii* Buin. et Don.
Differs from the type species in having longer non-pectinate, yellow to coppery coloured spines and a larger, purple-red flower with a greater extent of fusion within the flower tube.
'Differt a typo spinis longioribus non pectinatis cupreato-luteis vel luteis, flore, purpureo, parte tubi adnata longiore'.
 3. *f. hahniana* Buin. et Don.
Differs from the type in having a larger body and more prominent tubercles, dark grown spines, and an orange-red short tubed flower with 3-4 extent of fusion in the flower tube.
'Differt a typo corpore maiore, tuberculis maioribus, spinis atro-brunneis, flore aurantiaco, tubo brevissimo parte adnata 3-4 mm'.

VI. Sectio *Mediorebutia*.

26. *Rebutia marsoneri* Werdermann in Kakteenkunde, (1937), p. 2.
1. *f. marsoneri*.

2. *f. sieperdaiana* (Buin) Buin. et Don.
Syn. *Rebutia sieperdaiana* Buining in Succulenta 23 (1941), p. 15.
27. *Rebutia calliantha* Bowerunge in Sukkulentenkunde II (1948), p. 25.
(Type species of section).
1. var. *calliantha*.
 1. *f. calliantha*.
 2. *f. hyalacantha* (Backbg.) Buin. et Don.
Syn. *Rebutia senilis* var. *hyalacantha* Backeberg in Kakteenfreund (1932), p. 131.
Rebutia Wessneriana Bowerunge in Sukkulentenkunde II (1948), p. 24.
Rebutia hyalacantha (Backeberg) Backeberg in Die Cactaceae III (1959), p. 1551 is invalid. (Part III 3rd pt. I.O.B.N. 1961).
 2. var. *krainziana* (Kesselring) Buin. et Don.
Syn. *Rebutia krainziana* Kesselring in Sukkulentenkunde II, (1948), p. 23.
 1. *f. krainziana*.
 2. *f. breviseta* (Backbg.) Buin. et Don. comb. nov.
Syn. *Rebutia senilis* var. *breviseta* Backeberg in Kaktus ABC (1935), p. 416.
 3. var. *beryllioides* Buin. et Don.
Differs from the type in its bright green, flattened body, yellow to gold-brown, somewhat shorter and fewer spines and its scarlet flower. This variety grows in the most southerly of the group.
'Differt a typo corpore nitido-viride applanatiore, spinis brevioribus minoribus pallide luteis vel aureo-brunneis, flore coccineo'.
 4. var. *kariusiana* (Wessner) Buin. et Don. comb. nov.
Syn. *Rebutia kariusiana* Wessner in Kakt. u.a. Sukk., 14 (1963), 149.
- Note: All Buin. et Don. references are Sukk. VII/VIII (March 1963), p. 96-107, except those given as comb. nov. here.

Notes:

Rebutia senilis var. *schieliana* Bowerunge in Kakt. u. and Sukk. VIII, July, 1957, 105-6, is synonymous with *Rebutia* BK5. The plant is extremely variable in appearance, particularly the second generation of seedlings derived from the original plant. It is possible that the plants known as BK5 are hybrids and therefore have not been included in the lists of species, varieties and forms pertinent to the genus.

Rebutia graciliflora Backeberg in Descr. Cact. nov. (et comb. nov.) III, 1963, is not included also, as seedlings offered as this plant by the trade are again rather variable, many of which appear to be very close to, if not identical with *Rebutia xanthocarpa* f. *salmonea*.

Rebutia permutata Backeberg and *Rebutia permutata* var. *gokrausei* Backeberg in Descr. Cact. nov. (et comb. nov.) III, 1963, are not included until full evaluation of these plants has been finished. They are very close to the complex *Rebutia calliantha* group in Sectio Mediorebutia 21.1.1, 2, 3, at best it would seem that their proper category should be forma.

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July 20th	Focus on Succulents	Mrs. S. G. Sharman	One Lithops
Aug. 10th	Visit to Pinya de Rosa	Mr. Gordon Rowley	One Cristate Cactus
Sept. 2nd (Thursday)	(SHOW) Views on pollination	Members	One Cristate Succulent
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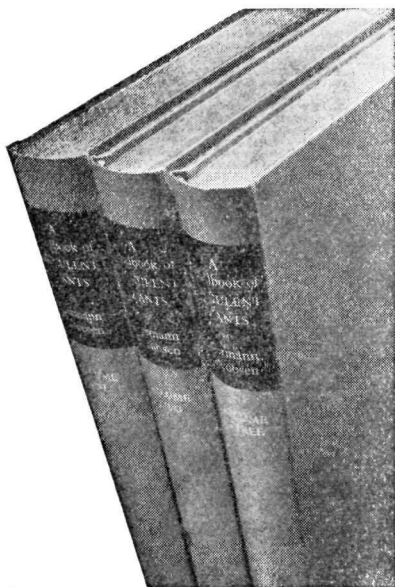
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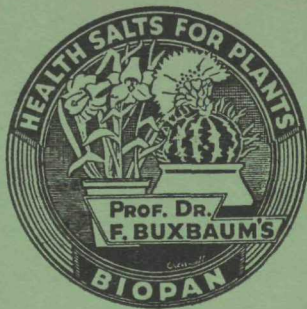
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CACTUS
 AND SUCCULENT
JOURNAL
 OF GREAT BRITAIN

Established 1931

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AUGUST, 1965

No. 3

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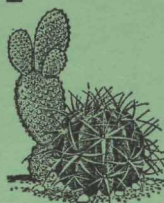
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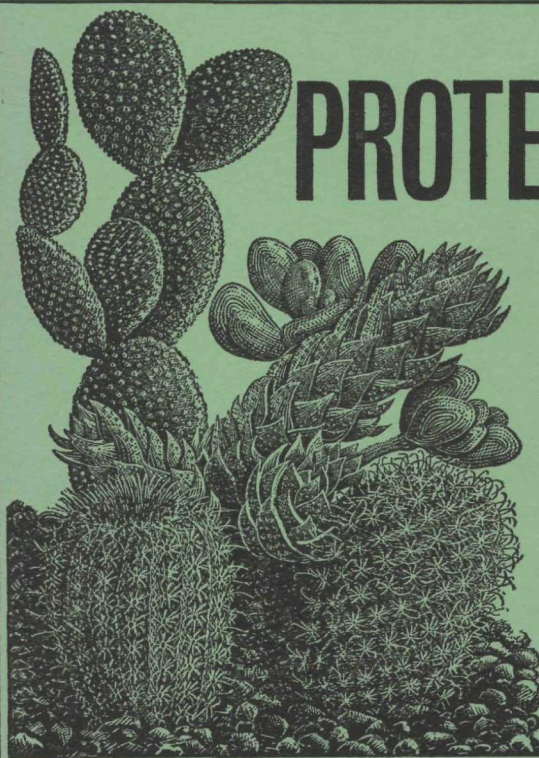
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EDITORIAL

This issue sees the completion of the Notes so kindly prepared by Mr. J. D. Donald arising from the lecture given by Burgemaster A. F. H. Buining to a joint meeting of Society members and members of the London Branch of the National Cactus & Succulent Society at the Royal Horticultural Hall. We are grateful to Mr. Donald for the care and attention devoted to the task and for the material it has placed at our disposal.

It also brings the conclusion of Mr. Boarder's marathon contribution 'Mammillarias I have Grown' which has provoked a lot of thought and not a little envy among Mammillaria enthusiasts. Readers might spare just a thought for the painstaking care with which Mr. Boarder has recorded his experiences with these plants over so many years.

We are pleased to publish an article from Dr. Paul Schmidt of Heidelberg which may well stimulate comments and possible replies from among our readers. We shall be pleased to publish a selection of these even if we are unable to reproduce them all. Please address them to the Editor.

As we go to print we learn that the date of this year's Annual Dinner has been fixed for 13th November. The venue is, as previously, at the Shaftesbury Hotel but this year is in the Windsor Room. We regret that we are unable to give final and full details at this juncture but we hope to be able to include an application form in time for inclusion with this issue. At this moment the after dinner entertainment is unconfirmed but Mr. E. W. Young hopes to rival the last two years. The Dinner is still not enjoyed by as many people as it should be as those who have taken advantage of it will readily confirm. This may well be the last time that you will be able to take advantage of the excellence of Mr. Young's planning as he intends that this year shall be his last on this particular job. Please do your best for your own sake.

Your Editor has been, for quite a long time, seeking a copy of Nel's 'Lithops' but without avail. If any reader is able to help will you please contact him giving details. The binding condition is not material so long as the volume is complete.

CACTUS CULTURAL NOTES

By A. BOARDER

The experiment with new Classes for cacti at the Summer Show of the Society was quite successful. The only class which was not well supported was that for three cacti. One would have thought that this was the Class in which more members were likely to exhibit. It was with the sole intention of encouraging such members who had small collections that this Class was introduced. However, perhaps at the next Show we shall have a better response. The quality of the plants was very good and it was grand to see so many in flower. The group put up by the only branch competing was a very fine effort and contained many fine plants in flower. It is always pleasing to me to find plenty of cacti in flower at these shows. It is not only an indication of good growing but it is an eye opener to many visitors.

I am always coming across people who say that they have never seen a cactus in flower. This is quite strange to consider when one is so familiar with hundreds of cacti which flower every year without fail. My old plant of *Echinopsis* which I have had so many years, 60 in all, flowered again this year. It had only two flowers but they were every bit as good as the ones it produced many years ago. One is inclined to wonder how old some of the large imported cactus plants are, as it is probable that many of them do not get the watering that my plant has had.

Another strange thing which often happens is that someone will call to see my plants and say that they never knew that there was a cactus society. Some of these people say they have been growing cacti for many years and one wonders why it is that the hobby has not become more well known. I suppose that as a whole it is not advertised enough. Occasionally one comes across an article in a local newspaper which tells of a cactus which has flowered in a cottage window as if it were one of the seven wonders of the world.

The flowering of many of the genera of cacti is often unusual when one considers where the flowers are produced. It certainly seems that once a flower has formed at an areole or axil no more flowers will ever appear at the same spot. I was once taken to task for making this observation and have been shown two *Mammillarias* which have produced two flowers at the same axil. However, my point was that once a flower or flowers had appeared there no more would come there another year. The production of two flowers at an areole is just a freak and will not be found very often.

It seems strange that some cacti flower right at the growing centre whilst in others flowers are produced much lower down. The *Rebutias* mostly flower near the base of the plant but still flower the following year above the ring which flowered the previous year. The *Aylosteras* will flower well up the sides of the plant, *Aylostera fiebrigii* is one in point, as flowers appear well up the sides. *Lobivias* are also plants which can show flowers from about half way up the plant and rarely near the top growing centre. The *Echinopsis* are rather similar but generally form their flowers up towards the top of the plant but not at the growing centre. I find that with this genus it is the areoles of two years of age which flower.

The *Mammillarias* flower at an axil and not at an areole as do most cacti. Again it will be noticed that they flower near the top of the plant usually on an areole which was formed the previous year. I have never seen a *Mammillaria* flower well down the plant much lower than it had flowered before. It can be noticed that the more new growth a *Mammillaria* makes each year the more flowers are likely to be produced the following season. If I see flowers on a *Mammillaria* right in the growing centre I suspect that that particular plant did not make any new growth the previous season.

The *Parodias* always flower right at the growing centre for me and I have never had one which has flowered anywhere else. The *Echinofossulocactus* also flower with me right at the very top and so close together in the growing centre that it is often almost impossible for the flowers to open properly because of the surrounding spines. The *Notocactus* also flower near the top of the plant but most of them appear to flower on the growth made the previous year. Another genus with the same manner of flowering is the *Malacocarpus*. These always flower at the growing centre with me and the buds appear from a bunch of wool.

Astrophytums always flower at the growing centre and a healthy plant can produce a flower from every areole as it appears at the top of the plant. I have never seen an *Astrophytum* flower anywhere on the plant apart from the top. Another genus which flowers near the top is *Thelocactus* which can often find difficulty in opening the flowers fully because of the strong spines round the buds. The *Acanthocalyciums* flower at the top of the plant but not right in the growing centre. I usually get several buds forming in a ring at the top of the plant but they do not always all open.

Plants of the cereus family can show a flower at almost any spot on the plant except where the growth has become very hardened and bark-like. The climbing types especially can throw out a flower bud anywhere along a yard long shoot and I have never found them flower on the current season's growth. The *Echinocereus* also appear to flower only on rather mature growth. I have flowered several quite small *Echinocereus* of the types like *E. okloho-*

mensis; *E. websterianus*, etc., but the types similar to *E. procumbens* usually flower for me about half way along a stem, often at a spot where the stem has been able to obtain plenty of sunshine the previous season. It will be noticed that these plants rarely if ever flower from an areole on the under side of a stem.

The *Coryphanthas* also only flower at the very top of the plant and a plant can produce several flowers right in the growing centre. Again I have never had a *Coryphantha* flower anywhere but at that point. The *Escobarias* and *Neoporteria* I have flowered have all done so at the growing centre. *Epiphyllums* can flower at any areole which has not flowered before but usually well up on the stem with most species but one or two will send out a flower bud right down near the base, the large white types will usually do this. *Zygocactus* always flower from the ends of the stems as will *Schlumbergera*. Several other cacti only flower at the growing tip, including *Lophophora*; *Epithelantha*; *Frailea*; *Ariocarpus*; *Cochemia*; and *Neolloydia*; whilst those which flower at the top of the plant but not right in the growing centre are *Echinocactus*; *Ferocactus*; *Mamillopsis* and *Melocactus*.

The large genus of *Opuntias* can flower at any of the areoles on the newer growths and it is unusual to find flowers on very old wood. Other genera which can flower at almost any point of the stem are *Aporocactus*; *Chamaecereus*; *Rhipsalis* and similar types.

From the above it can be seen that with the majority of cacti it is only on fairly new growth that is made that flowers can be expected. The important finding then is that to obtain plenty of flowers the plants must be encouraged to make as much new growth as possible every year. The reason why so many people say that their cacti never flower is that the plants have been kept in the same pot of soil for many years. They probably have no healthy roots and are rarely watered enough during the growing season.

It will be noticed that sometimes a flower bud will form on a plant late in the season and never open that year. This late bud may not open the following season but now and then this can happen. I have an *Echinocereus lowryi* which formed a bud last autumn but it failed to open. I expected that it would just dry up but was surprised to find that the flower did eventually open in June. Many new growers are thrilled when they see what appears to be a flower bud on their opuntia but disappointment will often follow when it turns out to be only a fresh pad forming.

I have had many seed pods form on my *Lobivias* this year but on some plants the flowers have just fallen without forming one. I do try to pollinate the flowers when I can but even this will not always produce a seed pod. My *Astrophytums* only set seed pods for me when I am able to use the pollen from another plant of a similar species. The development of seed pods on cacti do not run to a similar pattern. On some of the *Mammillarias* the pods will not appear until the year after flowering but this is often because the plant has flowered very late in the season. The *Astrophytums* can have a seed pod very soon after flowering and what is more this pod can burst within about a month of the flower opening. The seeds are large and shaped like a cowrie shell, which gives the seed the appearance of being quite empty. There is a small white tongue-like projection to each seed which will often prevent the seeds from falling out for some time.

I find that practically all the cacti seed pods hold their seeds for a time once the pod has split. They are not like the *Euphorbias* which usually burst and shed the seeds all over the greenhouse. Most of the cacti seed pods can burst and yet hold their seeds as so many are embedded in a jam-like substance and it is no easy task to clean the seeds from this matter. The *Echinocereus* are ones which give great difficulty when the seeds have to be cleaned from the pod. One of the most difficult kinds to gather is the *Parodias*, as the seed pods almost always break when one tries to pull them off and half the seeds are left behind. As these seeds are mostly very small it is difficult to gather them. I find that with these plants and with the *Rebutias* it is better to hold the plant to one side and place a teaspoon under the pod before attempting to remove it.

On a wet day it may be a good idea to check up on some of the labels as it is possible that a few of them may have become rather unreadable. I find that the 'T' shaped celluloid ones are excellent and will last for years. If a pencil is used on them it is possible to rub this out if necessary when a new name can be substituted. This changing of names will become a considerable chore if some of the experts have their way. I think that before many years have passed most of the existing species will have been placed in a new genus by themselves and genera will become as common as species are today. It appears that some people will make a fresh genus if a plant has a few less hairs on the flower tube than another similar type. How this can constitute a different genus is beyond me, but then I am only a grower not a plant ecologist. I remember that when I grew my plants many years ago there were about twenty-one genera under Schumann, then Britton and Rose made about one hundred and twenty-four. Others have taken a hand and the number of genera for cacti today has become so vast that I sometimes come across one which I have never heard of before. Not that all of the new genera have been recognised officially, but it is all very confusing. There is one very important factor however and that is that I enjoy growing my plants under whatever name the name changers like to give them. As Shakespeare said in 'Romeo and Juliet', 'A rose by any other name would

smell as sweet'. This is as true today and I would advise any new member to the hobby to continue to grow his plants and get pleasure from them no matter what name he has them under. I once heard a member say, 'It doesn't matter what name you bury them under'. The main interest lies in growing and flowering your plants and I am sure that you will get as much pleasure in this way as the purists who might just as well keep a collection of labels with different names on and who fail to see any beauty in a plant without a name or a wrong one.

By the time this journal reaches you the summer will be passing and any plants which require repotting should be moved without delay. I know that this is strange advice for me to give as I am usually too busy to make a start at repotting any of my plants until late autumn. I was even repotting all my *Mammillarias* well into December. I would have preferred to have done this task earlier but the plants do not appear to have suffered in any way, they have grown well this year and have flowered as well as ever.

Keep watering your plants as long as the weather keeps warm and make sure that when you do water a plant enough is given so that all the soil in the pot may be well damped. I find that with seed pans it is important to make certain that they are watered adequately as it is possible to spray these well but then find that the water has only penetrated about half an inch into the soil. With a dry seed pan it is better to stand it in a small saucer and put some water in so that the pan can soak up all the water and none should run out when the pan is lifted. One can come across some small shallow plastic dishes in self-service stores in which chops and steaks have been offered. These are very useful in the greenhouse as most have a fluted bottom and are ideal for standing a pot in with a plant which has no roots. The pot should be filled to within an inch and a half of the top and some sharp sand on top of this. Once the base of the rootless plant has dried well some water can be added to the tray. It will be found that the water below will encourage the plant to send out fresh roots much more quickly than if the plant had not been so treated. I was given a *M. lenta* which had been imported. It had no roots and was so dried up that there was no sign of green, yet it is now growing well with the above treatment.

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We are very pleased to announce that with the co-operation of C. F. Bause Limited a Tenth Edition of our Booklet "How To Grow Cacti & Succulents" is now being printed.

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CULTIVATION OF SUCCULENTS

By Mrs. M. STILLWELL

To date this has been a wonderful year for flowers on our plants. If we have to thank last year's glorious summer for these results, it will be interesting to see what next year brings forth, after the very disappointing weather that we are experiencing at the present time. At the Windsor Show this year we had more flowers on our plants than ever before, due secondly to the cold spell in the late spring when all the buds stood still for several weeks, when normally most of them are all finished by July, and it is a little too early for the *Mesembs*.

Owing to the lack of sunshine this year, the plants have needed far less water, especially those which I have transferred to plastic pots, which retain the moisture far longer. During the summer my greenhouses get plenty of fresh air day and night, as the windows are always open, and also the large panes of glass are removed at intervals, leaving just the wire netting in the openings. This also lets in a certain amount of damp air when it rains, which I think is also beneficial to the plants. Cacti and succulents do respond better if watered with rain water only, but I am afraid mine are mostly watered with tap water, as I have not the convenience for collecting sufficient rain water. During dull weather, it is often safer to give the plants a light spraying in the evening, rather than soak the pot, if it is going to take a long time to dry out.

Many of the bilobe *Conophytums* were ready for watering at the beginning of July, when the new bodies were pushing through the old papery skins. This is the time to repot, if you think they need it, but they are often better left undisturbed for several years. I have just repotted all the *Ceropegias* and am always surprised at the large amount of thick roots many of them make. These like a fair amount of water during the growing season, and therefore appreciate plastic pots. These are members of the *Asclepiadaceae* family and should therefore be treated in a similar way to *Stapeliads*, using the same type of compost. *Ceropegia sandersonii* should be a must in any collection with its most attractive green and white umbrella flowers. *C. haygarthii* is another uncommon one with a very beautiful flower, well worth looking out for. The small leaved trailing ones, I prefer to grow wound round and round on the top of a pan, when you can pinch out all the unwanted growth, and so keep the plant compact, without yards hanging over the side of the pot. Grown in this way the smaller flowers are also seen to a better advantage, as they all stand upright on top of the pot. The stems also root into the ground at intervals and as a result the plant develops much larger leaves and is far more attractive to the eye. The large tubers of *C. woodii* are often used as stock for grafting some of the choicer *Stapeliads*, etc. I have one or two nice little seedlings of the rather rare *Edithcolea grandis*, which is found in Tanganyika. It is related to the *Carallumas* and is said to have very large flowers, but I have never yet been able to get one through the winter, as they do need a lot of extra warmth. I shall keep them in the propagator this winter and hope for the best. If you are lucky enough to have a *Diplocyatha ciliata*, put it up near to the glass and give it plenty of water, you will find it grows quite quickly, and will reward you with a number of those beautiful white flowers during the season. It must be kept dry during the winter when it is not in active growth, or it may lose its roots and rot off. Another little plant that can sometimes be very temperamental is *Crassula corallina*. Mine is flowering at the present time, and looks better than it has done for years. It is always watered from the base, and resembles white coral. It is a favourite plant for mealy bug, and the white markings make a good camouflage.

Haworthias should be watered sparingly from June to September, when they make very little growth on top, but are busy below the soil making a new set of roots. They should be repotted about the beginning of September and you will find that most of the old roots will come away quite easily, leaving the new white roots around the base of the plant. It is often a good thing to remove the bottom row of leaves to let the new roots grow down. *Haworthias* are the ideal plants for those people who have not got a greenhouse, as they do not require a sunny position, in fact they will grow and flower quite well on a window sill. The commoner kinds multiply freely, and can always be divided and passed on to friends, as there is not much point in having a very large pan of a plant that is of no particular value. I like to keep one rosette of the ordinary *cuspidata* types as a representation of the species. When judging shows it does help to be familiar with as many of the plants as possible, and from experience to know those which are easy and those which are difficult to grow. I have small pots of most of the commoner succulents as it also helps beginners who often visit me to have a look round and to check up on the names of their plants.

My *Scelotium anatomicum* had over 50 flowers out on it during the spring, delicate creamy yellow, completely hiding the plant. All species of *Scelotium* contain 'mesembrine' a drug relative of cocaine. The Hottentots used to collect the green parts of the plant, dry it and use it as snuff. There are a number of varieties of *Scelotiums*, I have two quite different. One has a very straggling growth with quite a small flower, while the other grows short and very compact and with a large flower which lasts for well over a week.

My *Cheiridopsis peculiaris* is now resting and in the closed up state, after flowering around Easter time. The flower opened daily for 5 weeks, which seemed unbelievable, and seemed to get bigger and bigger each week.

Cheiridopsis meyeri is also still resting, but usually starts to grow at the same time as the *Conophytums*, in fact I keep mine with the *Conophytums* and it gets near enough the same treatment. The outer leaves dry up to a papery skin in the same way, and it should not be watered until it shows signs of growth. Most of the *Mesemb*s tell you themselves when they need to be watered. It is something that comes with experience, as you get to know your plants. The *Argyrodermas* are looking very fine this year, I removed the old leaves from the base a little earlier than usual this year, before they got too dry and hard, but it must be done with care as it is so easy to break off a head. I find *Argyrodermas* are better if kept on the dry side and only watered when the bodies show a slight tendency to shrivel. There is then no danger of them splitting and they will also flower much better. Do not repot unless it is really necessary as too much root disturbance causes them to shrivel.

Why is it that so few people enter the table shows? I always enjoy seeing other people's plants, one can learn so much from their successes and also from their failures. Surely those people who have to come straight from the office could get a handyman to construct for them a small wooden case with a carrying handle, to take a five inch pot. If the pot is smaller, it can always be packed round with newspaper to stop it moving. Think of the pleasure you are giving to all those new members and those with smaller collections. It gives them something to aim for and does form a topic of conversation, especially if the plants concerned are those which are the subject of the evening's lecture. How much nicer it is to see the real thing instead of a slide, which often gives a false impression. Do not worry if your plant is not a prize winner, bring it along to the table show and let us all see it and enjoy it. If you have a plant in your greenhouse with lovely flowers on it, or of special interest to you, don't be selfish and keep it to yourself, bring it along to the meeting and show it to your friends. I am always ready at the meetings to give any help I can with regard to naming and cultivation and I am quite sure that Mr. Boarder feels the same but it is difficult for us to try and identify a plant just from a verbal description. It is a good idea at all meetings, branches included, to have a problem table, where members can place any plants that they wish some advice on and at a given time during the evening one or two of the Society officials could endeavour to help them with their queries. I am sure it would form the basis of a good discussion, and be of great help to everyone. Every day, whether beginners or so called experts, we can always learn something new about our plants, that is part of the attraction of the hobby. If you have any useful tips do let us know about them, also any experiments you may have made with the cultivation. If you have any very rare plants which you are in danger of losing why not do as Mr. Denton always advocated and pass a piece on to a friend who you know is a good grower, with the understanding that should yours die, you would like a small cutting back. I have found this pays great dividends and is often the saving of many a rare plant as it has two chances under different conditions, instead of one. This can apply particularly to imported plants, some people have a knack of really getting these plants moving, while others just watch them fade away. It is a good idea to give away cuttings of *Stapeliads* as everyone gets a few casualties with these in the winter and it is so nice to be able to get a piece back and perhaps to be able to return the compliment.

Having a female *Euphorbia obesa* and no male, I decided to pollinate it with *Euphorbia dentonii* which was a hybrid believed to have *obesa* as one of its parents, and I am pleased to say it has set seed. It will be interesting to see the type of seedlings that will result, although it is not a good thing to encourage too many hybrids.

Publications received:

Blandford Press Ltd., 167 High Holborn, London, W.C.1. Complete catalogue of books including the customary section on succulents.

W. Uebelmann, 5610 Wohlen (Schweiz), Wilerzelgstrasse 18. Plant List 1956/66.

Fablothene Division, Commercial Plastics Ltd., Berkeley Square House, Berkeley Square, London, W.1. Illustrated booklet on Fablothene, Polythene and Fabloglaze PVC for garden and greenhouse.

Reprints from American Journal of Botany,

Vol. 50, No. 7, August, 1963—A revision of *Ariocarpus* (Cactaceae). III. Formal Taxonomy of the subgenus *Roseocactus*.

Vol. 51, No. 2, February, 1964—A revision of *Ariocarpus* (Cactaceae). IV. Formal Taxonomy of the subgenus *Ariocarpus*.

MAMMILLARIAS I HAVE GROWN (*continued*)

By A. BOARDER

Having reached the letter 'W' in my last article I would like to start this continuation with the letter 'X', but but I have never been able to obtain seeds of *M. xanthina*, and so this is the only letter in the alphabet I have no Mammillaria beginning with it.

M. yaquensis, a terror of a plant is ever there was one. It makes numerous off-sets which break off at the slightest touch, coupled with this it is covered with long, wicked hooks which appear to leap out and attack one if it is approached. When a hook gets a grip the off-set is pulled off and refuses to let go and more hooks take hold. If anyone grows this one, he should make sure that it is kept in a place where it is not where it can attack.

M. yucatanensis is a fine plant I raised from seed some years ago and flowers well.

M. zahniiana, I grew from seed from Mr. Shurly in 1933. It is one of the finest flowering mams., but outwardly it looks like many other open type mams. It flowers with a large yellow flower almost like the flower of a *dolichothele*.

M. zapilotense is new to me as I have only raised some seedlings this year. The seed was from Kaktimex.

M. zapilotensis is a variety of *M. guerreronis*, but may be found under the first name.

M. zeigleri was raised from seed in 1961, from Winter's seed and is something like a *M. centricirrha* at the moment but may flower very differently.

M. zeilmanniana is one of the most floriferous mams. there are, and a year old seedling can flower. When it gets established with a bunch of off-sets it can be very attractive as each off-set can flower. There are some with varied coloured flowers and some are double.

M. zephyranthoides was raised by me in 1935, from Winter's seed and is a handsome plant now.

M. zeyeriana is somewhat like *M. melanocentra* and was raised from seed in 1932 from Haage's seed.

M. zucatecasensis was from Winter's seed in 1955, and I have had another lot of seed named *M. yucatanensis* which I believe is a miss-spelling of *M. yucatanensis*.

M. zuccariniana, I raised from seed in 1937, and was from seed sent to me from California. The plant is of an open type so like so many other mams., but flowers differently from any other.

This completes my list of Mammillarias I have grown except for a number which have come to me as seed with just a number and no name. Whether I shall ever be able to name them is problematical as on further enquiries from some of the suppliers I have been informed that they do not know any plant under that particular number. It is probable that in the near future I shall buy a new named seed and then find that I already have the plant under one of my numbers.

Members will be interested to learn that we have received the latest distribution list of the International Succulent Institute Inc.

To those who are unfamiliar with the service given by this organisation, the Secretary of which is Mr. J. W. Dodson of 921 Murchison Drive, Millbrae, California, a few details may be helpful. Plants are selected from the list and the order sent to the Secretary. To avoid having to make many small shipments by the Institute and the bother of currency regulations by the orderer, the plants are sent, ready packed for each order, in a bulk despatch to the representative in Great Britain and the invoice in the relevant currency to the orderer. Remittance is then made to the representative here in our currency.

This organisation had the approval of the late Mr. Shurly who occasionally purchased plants through it, we understand without complaint.

The list is short but interesting. It contains the following cacti:

Ariocarpus scapharostus	Borzicactus madisoniorum
Copiapoa humilis	Cryptocereus anthonyanus
Discocactus macranthus	Mammillaria manancitracantha
Pachycereus pringlei	Parodia comarapana
Rhypsalis cribrata	

There are twenty-seven other succulents including the dwarf *Aloe bakeri*, *Dudleya stolonifera* and *Gasteria batesiana*.

If any member is interested in obtaining a list please write to the representative for Great Britain, Mr. N. E. Wilbraham, 178 Black Road, Macclesfield, Cheshire.

COLUMNAR CEREI

By MARGARET J. MARTIN

Very few of us have the space to do full justice to many columnar *Cerei* but no collection is complete without a few representatives of these plants. If chosen carefully they will not take over the greenhouse and their attractive forms and spines make a good background for the globular cacti.

Anyone who has bought and sown a packet of mixed cactus seed will inevitably have a good collection of *Cereus peruvianus* or *C. jamacaru*. Even if these plants are not wanted in the collection they can be very useful. Young specimens make good grafting stock and quite often a monstrose plant turns up amongst the seedlings. For permanent inclusion in the greenhouse the smaller growing *C. coeruleus* is a better species. This has an attractive blue skin and black spines.

Nyctocereus serpentinus is one of the few *Cerei* that will flower when young. They need to be about two feet tall and, as the plant grows exceedingly rapidly, flowering size is soon reached. At about this height the plant will need some support. I tried to train my own specimen horizontally along the roof but as the growing point turns up towards the light this was not a success. After a while I gave up and cut the stem into six inch lengths for grafting stock. *N. serpentinus* is excellent for this job and although one may not approve of this practice it is a convenient method for dealing with a newly purchased plant which arrives in a very dried up condition.

The most favoured plants for grafting are, of course, the *Trichocereus*. Many of these species are attractive plants in their own right and well worth including in a collection. *Trichocereus* produce large white flowers but most species need to be at least a foot high and *Trichocereus* are quite slow growing. *T. spachianus*, *T. pachanoi* and *T. bridgesii* are considered to be among the best species for grafting. *T. strigonus* with its beautiful orange spines and the stout spined *T. thelagonus* are particularly fine specimens.

Among the most beautifully spined *Cerei* are the *Haageocereus* with their red, orange and golden spines. When buying *Haageocereus* it is best to select them personally as the intensity of spine colouring often varies from specimen to specimen.

Oreocereus are slow growing and hardy, if kept dry during the winter. *O. trollii*, the 'Old Man of the Andes', is covered in white wool. *O. celsianus*, *O. fossulatus* and *O. ritterii* are also white spined plants. The latter is a somewhat faster grower than the other species.

An exceedingly slow growing plant is *Carnegiea gigantea*. My own specimen is a six inch column and it must be at least ten years old. Eventually these plants branch but one is unlikely to live long enough to see one's own seedlings reach that size.

Cephalocereus are also slow growing plants which make large specimens in their native state. They need careful cultivation as they are apt to succumb to cold or excess moisture. The best known is *C. senilis* with its long white hair. A less woolly species is *C. palmerii* which makes a pretty bluish column.

Stetsonia coryne is a very handsome plant. This greyish-green cactus has prominent white areoles and long black and white spines. It is a native of Argentina and is said to be hardy.

Among the more recently introduced plants is the beautiful *Trianthocereus senilis*. This is a slow growing columnar plant covered in silvery spines.

The plants mentioned in this article are only a small selection from the many *Cerei* on the market. Most of these plants are at their best when they are still smallish. Once their wool and spines become dingy it is a good idea to behead the plant and re-root the top. The base will probably send out offshoots which can be removed and established on their own roots.

The North Staffs Branch recently took a party of thirty-seven members and friends (in ten cars) to visit collections in South Staffs on the idea of Mr. Kelly and family of Albrighton, Wolverhampton, who also supplied tea on the return.

This idea is a good one, which other Branches have also discovered, and leads to nothing but advantage to all concerned.

THE I.O.S. IN CATANIA

By L. E. NEWTON

The Eighth Biennial Congress of the I.O.S. was held in the eighteenth century town of Catania at the invitation of the Italian members. Catania is a coastal town on the island of Sicily, and lies at the foot of Mount Etna, Europe's largest active volcano. Lectures and private sessions were held in the Botanical Institute of Catania University. After the official opening on 27th April, members enjoyed a varied assortment of activities until the closing dinner on the evening of 2nd May.

The start of the Congress was saddened by an accident to Professor André Guillaumin of Paris. He fell in the hotel on the first night, breaking his hip and cutting his head. At the age of 80 such a mishap is most unwelcome and the I.O.S. members appreciated very much the prompt action of Mr. Marnier-Lapostolle, who arranged for Prof. Guillaumin to be flown back to Paris for treatment.

At the first of the private sessions Prof. Concetto Distefano (Italy) was elected Congress Chairman. One item of private business was the election of new members. Nine candidates were accepted, including one new British member, Mr. David Hunt, a botanist at the Kew Herbarium. The Treasurer's Report showed a healthy financial position and it was agreed to send a substantial donation to the World Wildlife Fund in support of their latest project, a native flora reserve in Kenya.

Two excursions were arranged, on which we were able to sample the excitement of finding succulents in the wild. Sicily is the home of several members of the Crassulaceae and the excursions included visits to habitat localities. In addition, visits were arranged to see the collections of Prof. Distefano and Dr. Cesare Gasperini. The Distefano collection is housed in the botanical garden of the Botanical Institute, and includes a number of very old plants. Most are growing in the open, though a Perspex roof has recently been built to protect the plants from winter rain. Dr. Gasperini's collection is in a greenhouse and a large frame on the roof of the block of flats in which he lives.

Lectures were presented by several members and the following is a summary of these.

P. R. O. Bally (Switzerland). '*Euphorbia decidua* Bally et Leach—a succulent caught in mid-evolution'.

This species grows in South Central Africa. The plant consists of an underground caudex from which flowers arise in the dry season and deciduous stems arise in the wet season. Succulence is a highly specialised form of adaptation to environment. It has long been considered that such highly specialised forms cannot become adapted to later environmental changes to produce another kind of specialised form. Several features of *E. decidua*, however, indicate that it is in the process of evolving from a stem succulent to a geophyte (a plant with perennial underground parts and annually produced deciduous aerial shoots), and this has been possible because the environmental changes have been very slow.

Dr. B. K. Boom (Holland). 'Cultivation and Taxonomy'.

The proliferation of new species in recent years is largely due to the brevity of original descriptions of older species. When few members of a group were known the descriptions were sufficiently diagnostic without much detail. They usually failed to describe the variability met in the field, and newly collected plants which cannot be matched with any published description are given new names. Extensive field work is necessary to solve most taxonomic problems, but this is impossible unless one is working in the area for a long time. Studies of variation in cultivation and breeding tests, can, however, show relationships between species and the results of such studies can often provide evidence for reducing the number of species. Dr. Boom reported on the work which he and Dr. de Boer had carried out on the genus *Lithops*. Controlled breeding, using imported plants, had shown that some 'species' were merely geographical variants of other species. (See Vol. 26, pp. 32-34 of this Journal.)

Dr. H. Friedrich (Austria). 'Do *Mammillaria* species have succulent leaves?'

The podaria, or tubercles, of *Mammillarias* and related genera are usually regarded as enlarged leaf bases, so that one can almost describe these plants as leaf-succulents. Dr. Friedrich contended, however, that the podarium is a combination of leaf base abaxially (below) and laterally, and stem tissue adaxially (above). Some of the well known anatomical work of Prof. Boke of Oklahoma was quoted in support of this view.

L. F. Vatrican and **M. Kroenlein** (Monaco). 'Some novelties at the Jardin Exotique'.

Like many Cactophiles in Britain, the Continental growers are attracted by the South American cacti collected during recent years. The range in form and colours of the spines is sufficient to earn greenhouse space for most of the novelties. Now that these plants are beginning to flower in cultivation they are proving themselves to be even more desirable. The newer South American cacti are clearly destined for greater popularity.

Dr. C. Gasperini (Italy). 'Rare plants and flowers'.

This was another slide lecture, showing flowers on many of the plants which we saw in Dr. Gasperini's collection. The collection includes plants of many families, but Dr. Gasperini is particularly interested in the Mesembryanthemaceae and the slides showed several choice species in flower.

W. Hoffmann (Germany). 'Tasks for field-research with cacti'.

Plants collected for trade purposes are always from rich areas only, so that collections do not represent the total geographic range of the plants. Many such plants are considered later to be new species, but insufficient data are recorded at the time of collection for a detailed account of the plants to be published. Mr. Hoffmann urged that scientific collectors should visit the areas ignored by the trade collectors, so that more information can be gathered. Mr. Hoffmann has made three collecting trips to Peru, Bolivia and Paraguay for the University of Heidelberg and showed us a number of habitat photographs to illustrate particular problems awaiting solution by the field botanist.

Prof. M. Cardenas (Bolivia). 'Bolivian cacti'.

At the last Congress, in Vienna, we were pleased to welcome Prof. Cardenas as the first American member to attend an I.O.S. Congress. For the present Congress he had sent some slides showing Bolivian cacti in habitat conditions.

Prof. C. Distefano (Italy). 'Plants in the Distefano collection'.

Like Dr. Gasperini's slides, those shown by Prof. Distefano complemented our visit to the collection by showing the plants in flower at other times of the year. Prof. Distefano is establishing a reputation for producing something spectacular for the I.O.S. Congresses. Participants at the Vienna Congress 2 years ago well remember the slide of a fascinating branch on a *Pereskia grandiflora* tree, followed by a close-up of a cristate flower on the same branch. This year's *pièce de résistance* was a series of views of *Machaerocereus eruca* ('The Creeping Devil') flowering for the first time in Europe.

J. Marnier-Lapostolle (France). 'Rare Plants'.

With the world's finest private botanical garden Mr. Marnier has little difficulty in producing something unusual and interesting. We saw choice plants in many families. Particularly noteworthy were the *Lithocaulon* plants (Asclepiadaceae) and the fascinating variety of flower forms in the genus *Ceropegia* (Asclepiadaceae).

The civic reception, a visit to the Grand Opera House and several sumptuous feasts diluted the series of lectures and business meetings throughout the week. Participants are grateful to Prof. Distefano and his hard-working assistant Antonino d'Urso for organising the Catania Congress with such success, and to the Sicilian Region for the wonderful hospitality during this memorable week.

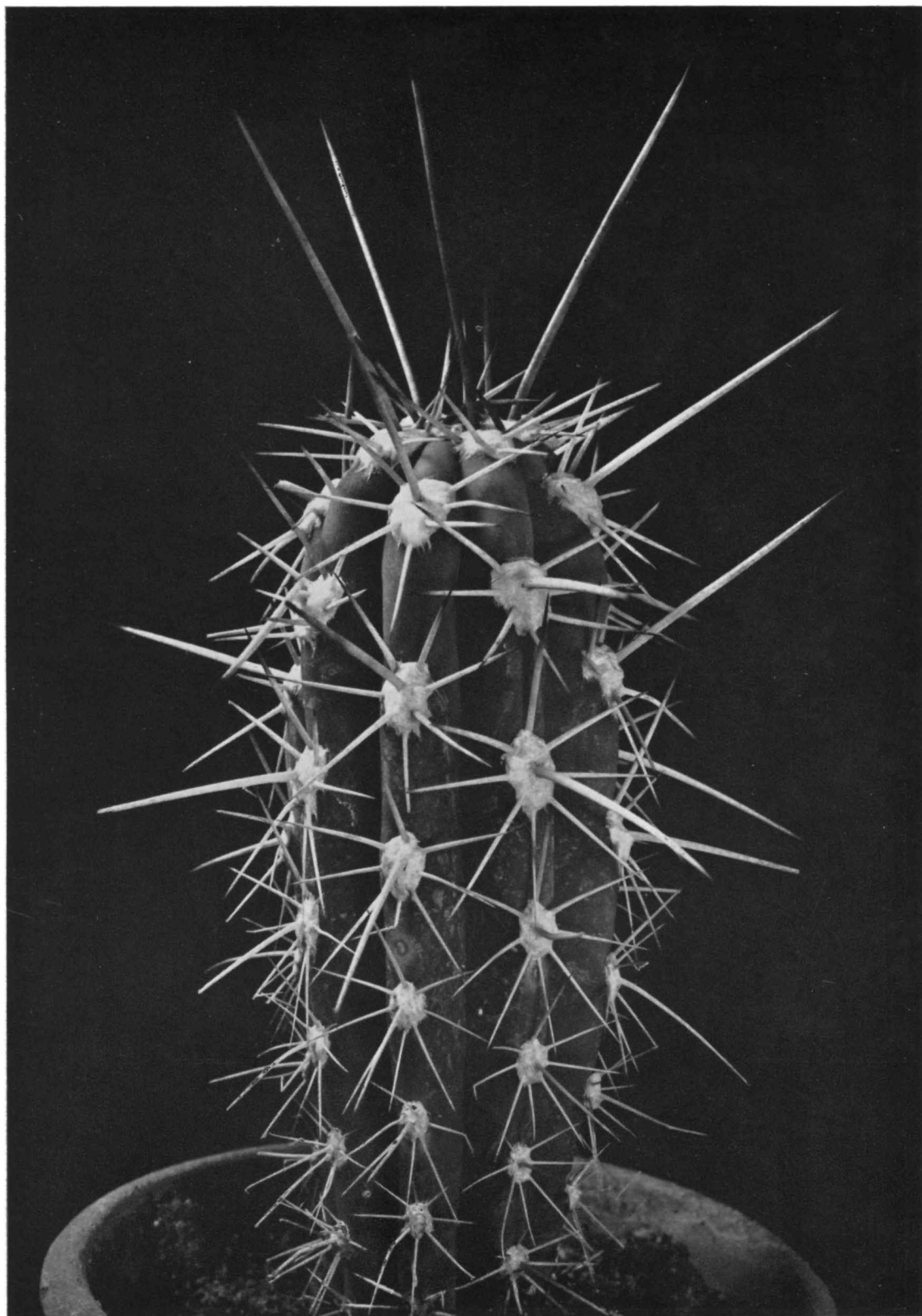
Photographs (p.53) from colour transparencies.

Two views in the Distefano Collection.

Top: (left to right) Dr. S. Volak (Czechoslovakia), Prof. C. Distefano (Italy), Dr. E. Priessnitz (Austria), Prof. J. A. Huber (Germany).

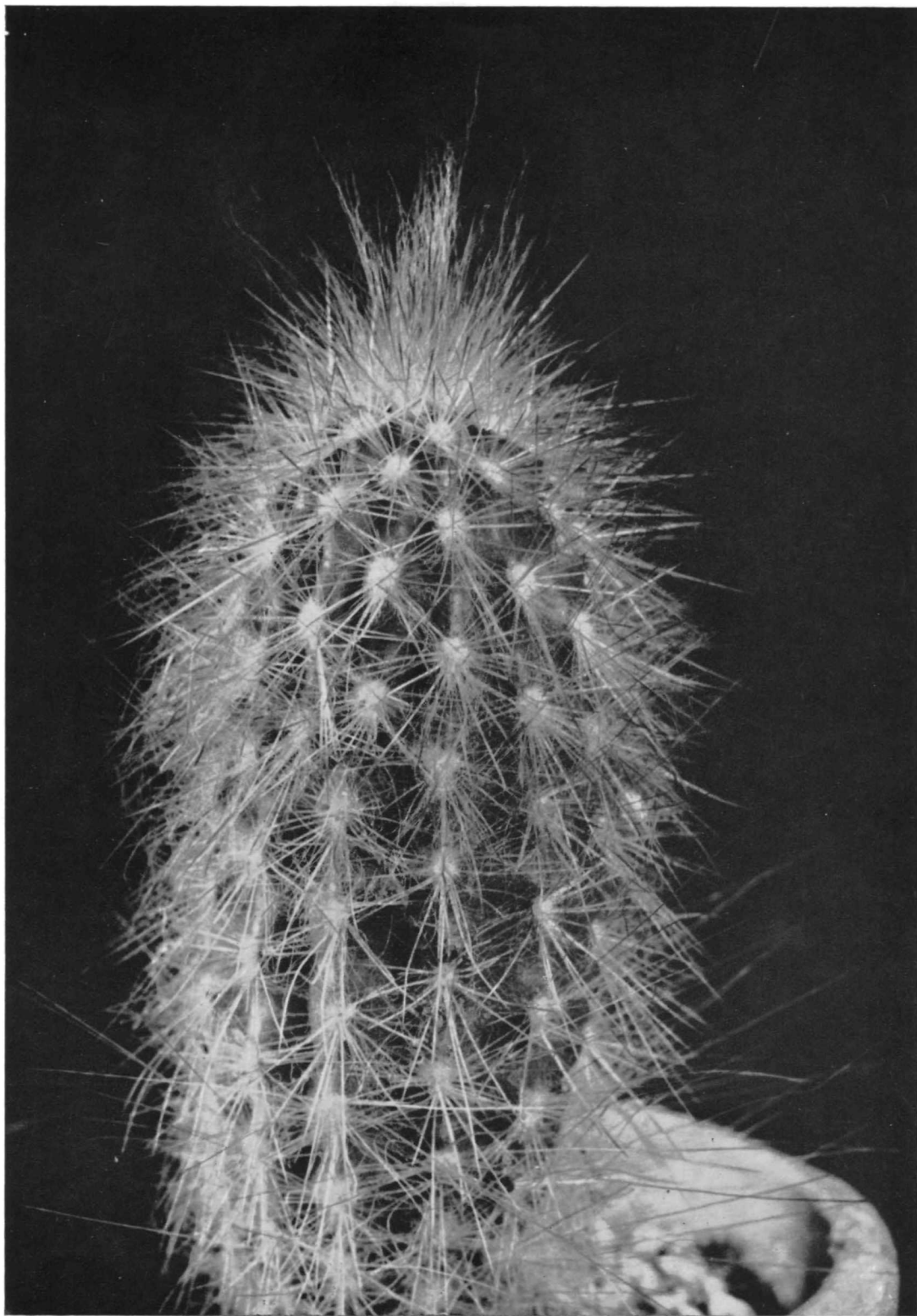
Bottom: Dr. H. Friedrich (Austria), Prof. of Botany, Catania (Non-member), Mr. J. Marnier-Lapostolle (France), Reporter, Dr. C. Gasperini (Italy), Mr. J. A. Janse (Holland), Mr. F. Riviere de Caralt (Spain). *Bending:* Mr. L. Vatrican (Monaco—I.O.S. President).





Stetsonia coryne.

Miss M. J. Martin.



Trixanthocereus senilis.

Miss M. J. Martin.



Rebutia albipilosa Ritter.
Specimen in habitat.

F. Ritter.

REVISION OF THE GENUS REBUTIA

Part III of the lecture given by Burgemaster A. F. H. Buining and J. D. Donald.

The following plants originally described as *Rebutia* by Cardenas properly belong to the separate genus *Sulcorebutia*.

- Sulcorebutia arenacea* (Card.) Ritter in Nat. C. et S. J. 16 (1961), 81. (1).
 Syn. *Rebutia arenacea* Cardenas in C. et S. J. Amer. 23 (1951), 94.
- Sulcorebutia candiae* (Card.) Buin et Don. in Sukkulantenkunde VII/VIII, (1963), 104. (2).
 Syn. *Rebutia candiae* Cardenas in C. et S. J. Amer. 33 (1961), 112.
- Sulcorebutia canigeralii* (Card.) Buin. et Don. comb. nov.
 Syn. *Rebutia canigeralii* Cardenas in C. & S. J. Amer. 36 (1964), 26-7.
- Sulcorebutia glomeriseta* (Card.) Ritter in loc.cit. (1).
 Syn. *Rebutia glomeriseta* Cardenas in C. et S. J. Amer. 23, (1951), 95.
- Sulcorebutia kruegeri* (Card.) Ritter in loc.cit. (1).
 Syn. *Rebutia kruegeri* Cardenas in Cactus Fr. (1958), 260-261.
- Sulcorebutia memesesii* (Card.) Buin. et Don. in loc.cit. (2).
 Syn. *Rebutia memesesii* Cardenas in C. et S. J. Amer. 33 (1961), 113.
- Sulcorebutia taratensis* (Card.) Buin. et Don. comb. nov.
 Syn. *Rebutia taratensis* Cardenas in Cact. Succ. J. Amer. 36 (1964), 26.
- Sulcorebutia tiraquensis* (Card.) Ritter in loc.cit. (1).
 Syn. *Rebutia tiraquensis* Cardenas in Cactus Fr. (1958), 257, 258.
- Sulcorebutia totorensis* (Card.) Ritter in loc.cit. (1).
 Syn. *Rebutia totorensis* Cardenas in Cactus Fr. (1958), 259, 260.
- Other plants belong to *Sulcorebutia* are:
- Sulcorebutia lepida* Ritter in Nat. C. S. J. 17, (1962), 13.
- Sulcorebutia mentosa* Ritter in Succulenta 43 (1964), 102.
- Sulcorebutia steinbachii* (Werd.) Backeberg in C. et S. J. G.B. 13, (1951), 96.
 Syn. *Rebutia steinbachii* Werdermann in Notizbl. Bot. Gart. u. Mus. 11, (1931), 268.
- Sulcorebutia tarabucoensis* Rausch in Kakt. u.a. Sukk. 15 (1964), 92.
- Sulcorebutia tiraquensis* var. *electracantha* Backbg. in Descr. Cact. Nov. III (1963), 14.
- Sulcorebutia verticillacantha* Ritter in Nat. C. Et S. J. 17, (1962), 13.
- Sulcorebutia verticillacantha* var. *verticosior* Ritter loc.cit.

NEW REBUTIAS DESCRIBED BY RITTER, contributed by J. D. DONALD

1. *Rebutia tuberosa* (subg. *Aylosteria*) Ritter.

In Taxon, XII (1963), 28. corpus haemisphaericum, valde proliferans, viride, 2-4 cm diam., radice rapacea: costae in tubercula 2-4 mm alta solutae: areolae, 1.5-3 mm longae, 1-1.5 mm latae, albae: spinae tenuiter aciculares, 2-5 mm longa, luteo-brunneae, rectae, radiales 4-12, centrales 1 vel plures: flores 3.5 cm longae, 2.5 cm diam.: ovarium 2 mm diam., albolanatum, interdum setis albis nonnullis obsitum: tubus floralis infundibuliformis, 7 mm longis, albo-lanatus, haud setosus: tepala 13-14 mm longa, 4-5 mm lata, cinnabarina: stamina biseriata, 6-7 mm longa, pallida viridia: stylus 18 mm longus, 8 mm tubo florali adnatus, stigmatibus 6, palide viridibus: fructus et semina ignota. Habitat: Unter Challamarca, Prov. Süd-Cinti, Chuquisaca, Bolivia, in 2600 m Höhe. Gesammelt als FR 770.

- Body:** Dark green epidermis; forms a multi-headed clump from a single turnip-like bulbous rootstock; individual heads hemispherical, 2-4 cm thick with a somewhat depressed and spiny crown.
- Ribs:** 13 or more readily discernible strongly resolved into tubercles; tubercles crowded together about 2-4 mm high.
- Areoles:** About 3-4 mm apart, white felted, 1.5-3 mm long by 1-1.5 mm broad, raised upon the tubercles.
- Spines:** Straight, fine and needle-like, yellowish brown to brownish grey; radials mostly 4-12 in number and from 2 mm to more than 5 mm long, mostly laterally directed; centrals one or more, colour similar to, and can be either longer or shorter than, the radials.
- Flower:** 3.5 cm long by 2.5 cm wide open; scentless. This observation based only upon examination of a single flower.

- Pericarp*: Greenish brown, 2.5 mm long, 2 mm broad with a few very slim, green 1-2 mm long scales, with white woolly flock and sometimes a soft light long bristle in the scale axils. The style is connate with the receptacle for about 8 mm above the pericarp and the tube is only 1.5 mm thick along this distance.
- Nectary*: Rudimentary funnel form, 1 mm long, open 1 mm wide above, whitish in colour, no nectar observed.
- Receptacle*: Funnel form, 7 mm long and opening to 4 mm, pale violet inside, on upper part very pale; pale reddish brown on outside with a few 2-3 mm long scales, similarly coloured with a small quantity of white flock but no bristles in the scale axils.
- Filaments*: Very pale green, upright, the lower ca. 6 mm long; the upper ca. 7 mm long; insertion absent from the uppermost 3 mm of the receptacle wall, except for a ring on the corolla.
- Style*: Free portion 18 mm long, pale green, with 6 light green, clenched and blunt stigma lobes, 1 mm long, exerted beyond the anthers.
- Perianth*: Vermilion (Din 6164 Farbe 7 E), outspread, almost spatulate, 13-14 mm long, 4-5 mm broad, narrower at base, upper part short, tipped, somewhat notched. The outermost segments pale violet on the dorsal surface, somewhat narrower than the inner segments and resolve into the receptacle scales.
- Fruit and Seed*: Unknown.
- Habitat*: Mountain ranges on the lower Rio Challamarca at about 2060 m Prov. Cinti Dept. Chuquisaca, Bolivia.
- Systematics*: Belongs to the subgenus *Aylostera*, related to *R. rubiginosa* Ritter from the same locality. Hybrids between them not found.
- Holotype*: In the Botanical Museum and Herbarium, Utrecht.
This species was found by me in May, 1958 and has my number FR 770.
2. *Rebutia rubiginosa* (subg. *Aylostera*) Ritter.
In Taxon, XII (1963), 29. a *R. tuberosa* Ritter (of speciem praecedentem 1) recedit: corpore applanato, parce proliferante: areolis brunneis: spinis rubiginosis, 3-6 mm longis, radialibus 12, centralibus 4: flore 3 cm longo: ovario setis rubiginosis obsito: tubo florali 4-5 mm longo, tepalis 17-18 mm longis, 3-4 mm latis: staminibus 4-6 mm longis, coccineis. Habitat: Unter Challamarca (wie oben) 2800 m: Gesammelt als FR 767.
- Body*: Barrel-shaped with depressed crown, about 2-3 cm thick; epidermis dark green; single or only sparingly sprouting, with a rather large, soft and often forked rootstock.
- Ribs*: Completely resolved into rounded tubercles, 2-3 mm broad and high.
- Areoles*: Brownish, oval, raised above the tubercle, ca. 2 mm long and about 2 mm apart.
- Spines*: All evenly rust coloured, becoming in age grey, mostly straight, fine needle-like, radials ca. 12 from 3-6 cm long; about 4 centrals, hardly longer and thicker than the radials.
- Flowers*: Laterally placed, opening at dawn for several days, closing at night; scentless; ca. 3 cm long and opening to 2.75 cm wide; observations based upon a single bloom.
- Pericarp*: Olive green ca. 4 mm long and 3 mm broad, with a few 1-2 mm long, very narrow flesh-coloured to green scales, bearing a small quantity of white wool flock and fine, soft, ca. 4 mm long, rust coloured bristles in the scale axils. Style connate with the receptacle wall for 8 mm above the pericarp, this part of the receptacle is tubular and only 2 mm thick.
- Receptacle*: 4-5 mm long, funnel form opening 4 mm wide, interior almost carmine, exterior pale olive brown with sparse but similar scaling as for the pericarp and broader scales.
- Filaments*: Carmine, lower deeper coloured, upper paler; the lowest 4 mm long; the uppermost 6 mm; upright. Insertion over the lower half of the receptacle wall and on the corolla. Anthers light yellow, all at equal height. Pollen golden yellow.
- Style*: Light green, 17 mm long, of which 2 mm are the 6, light green, blunt, somewhat clenched stigma lobes, exerted beyond the anthers.
- Perianth*: Wide opening; segments, 16-18 mm long; 3-4 mm broad, almost spatulate, broadest at three-quarter length, very narrow at base, upper part short tipped and often on the margins somewhat indented. Colour intense vermilion. (Din 6164 Farbe 7 F); the outermost segments with a somewhat greenish midstripe, resolve into the receptacle scales.
- Fruit and Seed*: Unknown.
- Habitat*: Mountains by the Rio Challamarca at ca. 2800 m Prov. S. Cinti, Dept. of Chuguisaca, Bolivia.

Systematics: Belongs to the subgenus *Aylostera*; related to *R. tuberosa* Ritter and other yet to be described S. Bolivian rebutias.

Holotype: Botanical Museum and Herbarium, Utrecht.

This species was found by me in May, 1958 and has my number FR 767.

3. *Rebutia albipilosa* (subg. *Aylostera*) Ritter.

In Taxon, XII (1963), 29. corpus haemisphaericum, dein longius, parce proliferans, atroviride, 4-5 cm diam., radice rapacea: costae in tubercula 2-4 mm diam., 2 mm alta solutae, interdum 21-25, spiralliter volutae: areolae orbiculares vel ovaes, albae, 1-2 mm diam: spinae 25-35, capillaceae, molles, albae, plerumque curvatae, 10-15 mm longae, centrales (si absint) subfortiores, 2-4 cm longae, apice rubro-brunneae: flores 35-45 mm longae, 25-30 mm diam.: ovarium oblongoideum, albo-lanatum et albo-setaceum: tubus floralis 7 mm longus, albolanatus, haud setosus: tepala 9-15 mm longa, 2-6 mm lata, spatulacea, aurantica vel rubra: stamina 7-8 mm longa, alba: stylus 15 mm longus, basi tubo florali connatus, stigmatibus 4-5, albis: fructus 6-9 mm longus, 5-7 mm latus, viride-ruber: semina 1.2 mm longa, 0.8 mm lata, opaca, atra, verruculosa. Habitat: Narvaëz, Dept. Tarija, Bolivia. Gesammelt als FR 754.

Body: Epidermis dark green; hemispherical, older plants elongated and becoming cereoid resembling a candle; very soft fleshed, 4-5 cm thick with a deeply depressed crown, mostly spineless in older plants; sprouting somewhat at the base; lacking the tuberous rootstock.

Ribs: Completely or almost resolved into round or longish oval tubercles from 2-4 mm long and broad and about 2 mm high; sometimes about 21-25 spiralled ribs discernible.

Areoles: White, round or short oval, 1-2 mm long, 3-4 mm apart, in culture often less than 1 mm long, raised above the tubercle surface.

Spines: Hair-fine, white, glistening, soft, standing out from the body, often bent; in strong sun, less fine and more straight with the centrals reddish brown tipped, ca. 2-4 cm long, about 35 in number, the lower radials very fine, the remainder somewhat stronger, but still hair-like; in less sun all spines equally fine like delicate woolly hair; radials and centrals not separated, 25-30 in number, up to 1-2.5 cm long, the lower the shorter.

Flowers: Laterally placed, opening in the mornings and closing late mid-day, open for several days; scentless; 3.5-4.5 cm long opening to 2.5-3 cm wide. Observations based upon 2 flowers from different specimens from the type locality.

Pericarp: 7 mm long, 3 mm thick, narrowing above to 1.25-2 mm thick; greenish red brown, shiny with a few tiny white areoles with a small quantity of very short woolly flock, with in addition up to 10 white, soft, 5-7 mm long bristles, in the thickness of the fine wool; with hair-fine, greenish tipped, 1-2 mm long scales; the lower two-thirds of the pericarp almost areole free. Style connate with receptacle wall for 15 mm.

Nectary: Almost cup-shaped; whitish; 2 mm long open 1.5 mm above, often with nectar.

Receptacle: Funnel form, ca. 7 mm. long, 4 mm wide at top; interior whitish; exterior reddish brown with a few, somewhat outstanding, reddish 4 mm long by 1 mm broad, pointed scales with naked axils.

Filaments: White, 0.75 cm. long, upright, all about equal length; insertion over entire receptacle wall from base to corolla. Anthers small, roundish and lemon yellow in colour.

Style: White, the free part 1.5-1.75 cm long, of which 4-5 mm are the 4 white blunt outspreading stigma lobes, extended either beyond, or level with, the anthers.

Petals: Wide opening, spatulate, narrowed at base, broadest at threequarter length, ends short tipped or rounded and somewhat indented with outspread 'teeth'; 9-15 mm long, 2-6 mm broad, orange red to 'capuchin cross' red fading to yellowish red. Scarcely any transition to receptacle scales.

Fruit: 6-9 mm long, 5-7 mm broad, lower part broader than upper, dark greenish red, with a few greenish triangular, 0.33-0.5 mm long scales containing tiny white flock and a few soft white bristles in the scale axils.

Seed: Ca. 1.2 mm long by 0.8 mm broad by 0.6 mm thick; cap-shaped; dorsal surface only a little strongly arched; testa dull black, with fine, flattened, somewhat rippled coalescing tubercles. Hylum white, partly basal or over whole seed base.

Habitat: Narvaëz. Prov. O'Conner, Dept. Tarija, Boliva.

Systematics: Belongs to subgenus *Aylostera* and is related to *R. fiebrigii* Br. and R. and *R. muscula* Ritter.

Holotype: In the Museum and Herbarium, Utrecht.

The species was discovered by me in April, 1959 and has my number FR 754.

REFLECTIONS ON AREOLE AND AXIL OF MAMMILLARIA

By Dr. PAUL SCHMIDT

Generally speaking, one may say that accounts of blossoms and branches shooting from areoles of *Mammillaria* have met with interest but not with perplexity. Nevertheless such accounts are truly exciting. Two vegetation points on one nipple; moreover, the valence of these points is different. Isn't that extraordinary? It appears comprehensible only if one presumes that this species of plants is undergoing a phylogenetic change. However, adopting this theory the following explanations suggest themselves:

Disregarding the causes, let us assume that most *Mammillarias* began to grow more elongated and tapering nipples. The stream of sap on its way to the tip of the nipple finally met with so much resistance that it sought a new and shorter way to the surface pushing up diagonally to the basis of the nipple where it formed a new vegetation point. Since then this proximal vegetation point has remained active; it is here that blossoms and branches appear. The distal vegetation point on the tip of the nipple is no longer active. Only if the way to the proximal point is blocked up or if the pressure of the sap owing to particularly favourable conditions is unusually strong does the distal vegetation point take up action again. However, blossoms will be smaller because of the weaker sap pressure as compared to the pressure in the axil. It is a well-known fact that ageing fruit trees, strawberry plants, etc. grow ever smaller blossoms and fruits. Maybe the *Mammillaria* blossom growing out of the areole is a phenomenon that may be observed under culture conditions only as a consequence of overfeeding?

Let me cite from 'Meine Kakteen' by Prof. E. Werdermann and H. Socnik, page 168, regarding *Lophophora*: 'the delicately pink blossoms appear at short intervals throughout the summer, soon followed by pale pink fruits which are similar to those of *Mammillaria*, also breaking through during the last phase of maturation only.'

These words do not mean anything else but that the fruits are genuine *Mammillaria* fruits. But we know that a tree bearing acorns is an oak-tree, a tree bearing plums a plum-tree, etc., etc. And a cactus bearing *Mammillaria* fruits cannot be anything else but a *Mammillaria*. *Lophophora* is a *Mammillaria*. Why then does it not produce flowers from the axils? The answer is: because it has none. It has not taken part in the negative development of the other *Mammillarias*. Its nipples have remained short and blunt, the stream of sap probably has never had any trouble reaching the areoles. For many years I have already suspected *Anhalonium* to be a *Mammillaria*, but only two and a half years ago I decided to put my theory to a test by cross-breeding them. It is a well-known fact that *Mammillarias* hybridize easily. Consequently I hybridized 'mammillaria lophophora' with *M. zeilmanniana*, with *M. bocasana* and with *M. rhodantha*. Because of their similarity I also used *Turbincarpi*. I have seedlings of *Lophophora* x *T. schwarzii* and *Lophophora* x *T. pseudomakrohele*. Almost always *Lophophora* was the mother plant. In spite of its different-looking fruit I also used *Disciformis*. The result: the germinating time was not prolonged, there was no chlorosis. Only my two experiments with *Stromb. disc.* ♀ x *Lophophora* ♂ showed chlorosis; the vice versa experiments resulted in healthy, well growing seedlings. Most of the small plants I grafted on to *schickendantzii*. They show a strong tendency towards branching which might be inherited from *Lophophora*. The branches grow from the areoles, from where we may also expect the blossoms to appear. The forms and colours of the bodies and spines of all hybrids are very interesting and often surprising.

On page 62 Mrs. Stillwell pays tribute to the species *Trichocaulon* as "among the aristocrats of the Stapeliads", not being easy of cultivation but of great interest too the seriojs grower.

We learn from the current issue of the Journal of the Cactus and Succulent Society of New South Wales that natives from the habitat area shred members of this species and eat the liquorice-tasting shreds to clear their throats of phlegm.

If they were easier to grow in this country one might well imagine that some lecturers might suggest *Trichocaulons* for Table Shows.

We are always interested in the economic uses of Succulent plants and we add this one to our collection.

SHOW RESULTS—15th and 16th June, 1965

- Class 1. Nine Cacti (any genera). Three entries.
 1st R. H. I. Read. 2nd P. V. Collings. 3rd J. E. Taylor.
- Class 2. Six Cacti (any genera). Five Entries.
 1st S. W. Young. 2nd Mrs. M. Halford. 3rd R. F. R. Clark.
 Commended: C. Parker.
- Class 3. Three Cacti (any genera). Four Entries.
 1st J. W. Pilbeam. 2nd G. Leighton Boyce. 3rd Mrs. B. A. Baldry.
- Class 4. Three Cacti (any genera) for members who have not previously won a First in any Class. 8 Entries.
 1st K. Grantham. 2nd G. A. Page. 3rd Mrs. R. Oakley-Hill.
 Very highly commended: P. R. Harvey. Commended: G. Leighton Boyce.
- Class 5. Six Mammillarias. 4 Entries.
 1st Mrs. M. Halford. 2nd J. E. Taylor. 3rd J. W. Pilbeam.
 Highly commended: Mrs. B. Baldry.
- Class 6. Three Mammillarias. 7 Entries.
 1st W. F. Maddams. 2nd J. W. Pilbeam. 3rd R. H. I. Read.
 Very highly commended: Mrs. M. Halford. Highly commended: Mrs. B. A. Baldry.
- Class 7. Three Rebutias. 3 Entries.
 1st J. E. Taylor. 2nd R. H. I. Read. 3rd R. F. R. Clark.
- Class 8. Three Lobivias. 5 Entries.
 1st J. E. Taylor. 2nd J. W. Pilbeam. 3rd Mrs. J. A. Wells.
- Class 9. One Cactus and one other Succulent. 12 Entries.
 1st R. H. I. Read. 2nd Mrs. J. A. Wells. 3rd P. V. Collings.
 Highly commended: S. W. Young. Commended: Mrs. R. Oakley-Hill.
- Class 10. Cacti raised from seed by Exhibitor (sown on or after 1st January 1963). 2 Entries.
 1st W. F. Maddams. 2nd J. W. Pilbeam.
- Class 11. One Mammillaria bombycina. 7 Entries.
 1st J. E. Taylor. 2nd R. H. I. Read. 3rd W. F. Maddams.
 Very highly commended: Mrs. M. Halford. Highly commended: P. V. Collings.
- Class 12. Three Opuntias. 2 Entries.
 1st Mrs. J. A. Wells. 2nd G. Leighton Boyce.
- Class 13. Miniature Garden of Cacti or other Succulent Plants (not mixed) to cover space not larger than 18 in. x 18 in. 2 Entries.
 1st N. R. Clyne. 2nd Mrs. B. A. Baldry.
- Class 14. Three Agaves, Aloes and/or Gasterias. 2 Entries.
 1st Mrs. J. A. Wells. 2nd Mrs. M. Halford.
- Class 15. Three Succulents other than Cacti. 7 Entries.
 1st S. W. Young. 2nd R. H. I. Read. 3rd C. Parker.
 Highly commended: Mrs. M. Halford.
- Class 16. Three Succulents other than Cacti (for members who have not previously won a First in any Class). 2 Entries.
 1st K. Grantham. 2nd A. Boyles.
- Class 17. Four South African Succulents. 5 Entries.
 1st S. W. Young. 2nd Mrs. J. A. Wells. 3rd P. V. Collings.
 Highly commended: C. Parker.
- Class 18. Group of Cacti and/or other Succulents to cover space not larger than 3 ft. x 2 ft. 6 in. No Entries.
- Class 19. Three Cacti and/or Other Succulents (for Juniors under 18 years). 3 Entries.
 1st G. A. Page. 2nd P. R. Harvey. 3rd M. F. Turnbull.
- Class 20. Branch Exhibit. Group of Cacti and/or other Succulents to cover space not larger than 4 ft. x 2 ft. 6 in. One Entry.
 1st North Surrey Branch.
- S. J. Pullen Cup for Miniature Garden—N. R. Clyne.
 Sarah Cutler Memorial Cup for Specimen Mammillaria (M. bombycina)—J. E. Taylor.
 Amateur Gardening Bronze Medal—J. E. Taylor for 1st in Class 1 (Nine Cacti).
 Amateur Gardening Award of Merit. North Surrey Branch for Branch Exhibit. Class 20.
 Amateur Gardening Diploma—S. W. Young for 1st in Class 17. Four South African Succulents.
 Amateur Gardening Diploma—W. F. Maddams for 1st in Class 10. Cacti raised from seed.

REPORT OF MEETING, 19th January, 1965, Mrs. M. Stillwell Succulent Plants

Mrs. Stillwell brought home to her audience the wide range and attraction of succulent plants by means of many well chosen colour transparencies. Her accompanying comments gave interesting details of the plants; their points of merit and relevant cultural information.

The first group of slides featured *Echeverias*, *Crassulas* and allied genera. *Echeveria gibbiflora* var. *carunculata* is a particularly attractive plant but, because of its tendency to become leggy with age, the rosettes require beheading and re-rooting. Among the *Sedums*, *S. roseum* has leaves which colour beautifully in the late autumn and the yellow flowers have attractive pink bracts. *S. hintonii*, a little gem densely covered with white hairs is, unfortunately, not very common. Another plant in this category, a collector's piece, is *Cotyledon buchholziana*, with cylindrical stems and reddish scale-like leaves. Although a hybrid, *Kalanchoe kewensis* is worth growing for its attractive pink flowers, as is *Rochea pallida*. *Crassula deceptrix* is slow growing but attractive, with fleshy triangular shaped leaves. Among the *Kalanchoe* species shown were *K. granata*, with its red leaves, *K. pumila*, with dwarf farinose leaves and *K. manginii* with flowers resembling red Chinese lanterns.

Mrs. Stillwell then turned to the *Mesembryanthemaceae*, giving extensive coverage to this extensive family. Slides of *Jensenobotrya lossouriana*, *Juttadinteria deserticola* gave the audience a chance to appreciate these little known species. There followed *Calamophyllum cylindricum*, which bears mauve flowers in February, *Scletium anatomicus* which flowers in spring and should go to rest at the end of the summer, *Cerochlamys pachyphylla*, which flowers at Christmas and *Cephalophyllum alstonii* whose leaves, a vivid red, are sparingly produced.

A series of slides covered the more popular genera of stemless *Mesembryanthemaceae*. Conophytums were represented by *C. ernianum*, with a long flower tube, *C. notabile*, which bears deep orange flowers early in July and *C. springbokense*, an easily flowered bilobe species. There were slides of many of the *Gibbaeum* species in flower; some such as *G. molle* and *G. viride* flower in January while others, including *G. album* are as late as April. *Argetum petrense* also bears its pink flowers at this latter time. *Pleiospilos* species covered included *P. bolusii*, *P. optatus* with large yellow flowers and *P. nelii*, which blooms in the spring. Mrs. Stillwell commended *Lapidaria margaretae*, which should be given the same treatment as *Argyroderma* species, *Herreanthus meyeri*, which has flowers lasting for a fortnight, *Cheiridopsis pillansii* and *Dinteranthus microsperma*, with pink flowers.

Mrs. Stillwell concluded her talk with slides and comments on a wide range of *Stapeliads*. Among the *Stapelia* species, *S. grandiflora*, with its large hairy flowers, *S. semota*, whose stems turn golden brown in the sun and *S. glanduliflora*, with choice small white flowers are particularly recommended. The *Carallumas* provide several interesting species; *C. lutea*, with yellow flowers and brown hairs on the edges of the petals, *C. parviflorum*, bearing tiny flowers along the stems and *C. buchardii*. *Huernia vogtsii* has the merit that it may be flowered one year from seed and *Huernia zebrina*, whose flowers have striped petals and centres like chocolate chips, is deservedly popular.

Trichocaulon species are among the aristocrats of the *Stapeliads*: they are not particularly easy of cultivation but are of great interest to the serious grower. *T. cactiforme*, with magenta flowers and *T. flavum*, with yellow flowers were shown as being representative of the genus.

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1965	Subject	Lecturer	Table Show
Sept. 2 (Thurs.)	(SHOW) Views on pollination.	Members	One cristate succulent.
Oct. 5	Conophytums.	Mr. B. Makin.	One Conophytum
Nov. 2	Newer S. American Cacti	Mr. W. F. Maddams	One Neoporteria
Dec. 7	Members' Slides	By invitation	—

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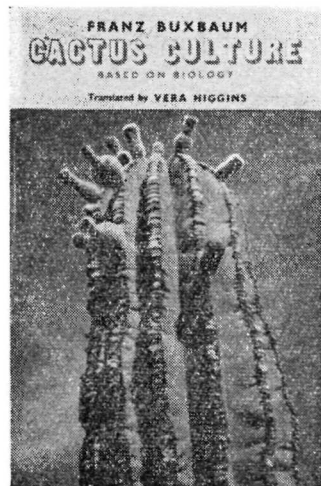
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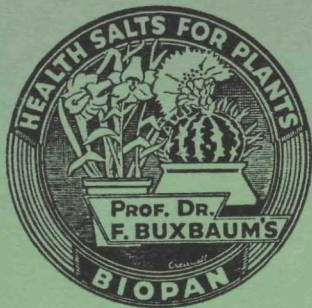
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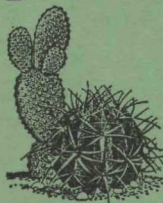
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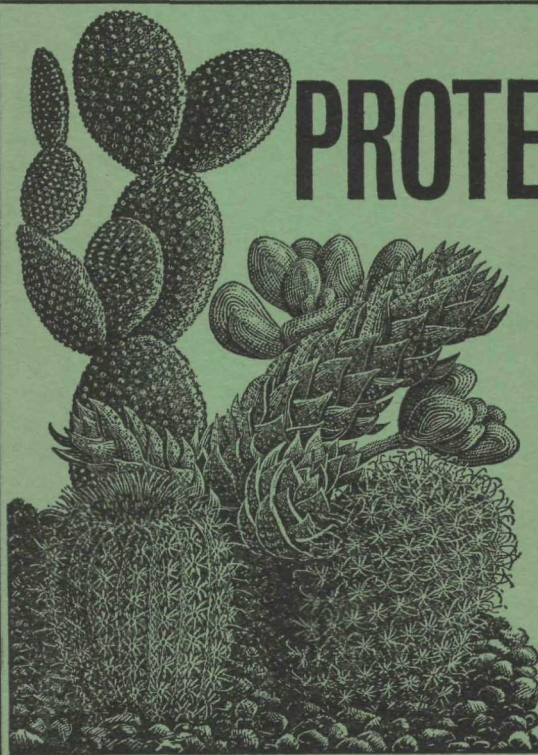
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THE
C A C T U S
AND SUCCULENT
J O U R N A L
OF GREAT BRITAIN

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EDITORIAL

We make no apology for including a further contribution from Mr. J. D. Donald which completes and extends his report on the lecture by Burgemaster A. F. H. Buining.

We thank him and Burgemaster Buining for the opportunity of publishing such valuable information and congratulate them on their excellent work.

On the other hand we do offer sincere apologies to Mrs. Stillwell for the unfortunate errors which occurred in the report of her talk published in the August Journal. We hasten to make correction (see page 73) to eradicate any question against Mrs. Stillwell's knowledge of succulent plants.

With this issue we come to the end of the 'Caretaker' period of editing following the death of the late Mr. Shurly and we are delighted to confirm that Mr. L. E. Newton will be assuming the responsibility as from the February 1966 issue. On page 73 will be found a few notes which will serve as an introduction for those who do not know our new Editor. Suffice it to say, perhaps, that no less an authority than Mr. Gordon Rowley regards him very highly.

In bidding an Editorial adieu our grateful thanks are extended to that small band of regular contributors both of articles and of photographs who have made the task so much easier and the two years of occupation of this Chair seem so much shorter a space of time. We are happy to have been of service to the Society and our members but it will be no great task to find alternative employment. Mr. Newton's talents and his widespread contacts in conjunction with the continued support of our regular contributors will bring a new liveliness to our pages. We wish him every success and feel a sense of satisfaction that Mr. Shurly's charge to keep the Journal going until a more permanent Editor be appointed, has been kept.

The February issue will be printed in a new format, each page will be in double columns and being on coated paper we will be able to place illustrations with the relevant textual references and not grouped together in the middle of the Journal. This, we feel sure, will bring satisfaction to many members.

We regret that our appeal (in our last issue) for a copy of Nel's 'Lithops' has not yielded one single reply. There must be one somewhere!

It is with some slight sense of shock that we realise that with the publication of this issue Christmas will be gone and the New Year established before our next issue. We take the opportunity, therefore, of extending to all our readers the sincere seasonal greetings of the Council of the Society with the hope that the new season will see the fulfilment of some, at least, of your hopes and aspirations.

CACTUS CULTURAL NOTES

by A. BOARDER

The treatment of most cacti during the winter months depends mainly on the place where they are kept. Those plants which are in a living room which may have a temperature of up to 65°F. for much of the time will need a different treatment from those kept in a greenhouse. The soil in the pots of those indoors can dry out fairly quickly and so the plants must have a little water now and again. It is not necessary to give enough to bring them into growth but just enough to prevent any from shrivelling.

It might be supposed that as they can go for long periods without water in their native habitats they can also do so when under cultivation here. However, it must be realised that in their native positions they have roots which may run down quite deeply into earth which can get at least a little moisture. Added to that is the probability of heavy dews which condense on the plants and the moisture runs down to the roots. If a plant is kept too dry all the winter in a warm room it is possible for all the fine, fibrous roots to be killed. These fine roots can soon grow again in the spring but if any of the main roots are dried up it is possible that they may rot when watering is commenced in the start of the growing season.

A watering of the indoor plants once a month is quite in order but this does not mean that if any cacti are kept indoors in a cold room the same treatment applies. The watering is only for the plants in the warm room. Others must be kept quite dry. In such a condition they can withstand a fair amount of cold and are not likely to come to any harm no matter how severe the winter is. Many of the indoor plants can get very dusty and so need a special clean up now and again. Some of the dust can be blown off but a better way is to wait for a bright morning and then stand them outside and give a good spraying. There are usually several days in every winter when there is a mild spell and this is the time for the clean up. To prevent too much water from entering the soil, the top can be covered with paper or polythene. After an hour or two in the fresh air the plants can be returned to the living room.

The cacti in the greenhouse will need different treatment. The maximum temperature to be aimed at in the normal greenhouse of cacti is 40°F. This is quite safe for all cacti with the exception of the *Zygocactus truncatus*. As this plant will be flowering during the winter it is necessary to see that the temperature for it does not drop much below 50°F. If the plant can be taken indoors for the winter it will save having to warm all the greenhouse just for one plant. I find that my plant which hangs up from the roof of the greenhouse can get by all right as what warmth there is in my greenhouse will rise there and so the plant is in the warmest place and comes to no harm. If it is intended to move one of these plants into the house it is better to do it before the flower buds are well advanced. A sudden move when these buds are of a good size may mean that many will drop.

As the temperature in the greenhouse may rarely rise above 50°F., most plants may require no water at all for the whole winter. Occasionally during most winters we get a mild spell and the temperature of the greenhouse can rise considerably. It is better to open the windows fairly wide to let much of this warmth escape than to be tempted to water just because the sun is shining. Although it can be quite warm one day the following one can be very dull and cold. It is probable that no cacti will need any water after October until the following February at the earliest.

Watch out for drips from the roof during rainy periods, as these drops can harm a plant and if on some types could cause rotting to set in. If a drip is located the outside of the roof should be examined. A good temporary stopping can be effected with Polyfil, as it can be worked into the crack easily and soon dries. If it is not possible to make a repair then any plant under a drip should be moved away.

The summer of 1965 has been anything but good and it will be interesting to see if this has any effect on the flowering of our plants next year. Most growers are inclined to think that because they have had more flowers one year than they had the previous one, it is because of the sunshine the year before. Many forget that their plants are getting older each year and many more come into flowering size and so naturally the number of flowers will be increased. I do not hold too great a belief that flowers are only produced after a hot summer as I have had seedling cacti in flower-bud late in the autumn of their first year of sowing.

I still see many peculiar references to cacti in papers and periodicals. One of the silliest which was shown to me recently was of a lady whose cactus plant flowered because she talked to it. I wonder what language it understood? How anyone can be foolish enough to believe such nonsense is beyond me, but when one considers the amazing beliefs and superstitions of some people it becomes more possible.

I have noticed that very many cactus growers are also interested in other forms of nature. A very large percentage of them keep fishes, either cold-water in ponds and tanks or tropicals. Also many are interested in breeding or keeping birds. In other words most naturalists are also keen on cacti or at least show great interest in them. As a boy I was very keen on all forms of natural history and at various times have bred birds, fishes and reptiles.

I suppose that the interest in cacti stems from the fact that these plants are so very different from most ordinary plants. The absence of leaves and the presence of spines makes them very peculiar and so gives them something attractive which other plants do not possess.

If we consider the peculiar shapes of many cacti we cannot but be curious as to how these plants came to become evolved. I think that they came by their odd formation through a process which I like to call, 'Survival by adaptation'. Certain plants were growing in an area which gradually became drier and hotter. Most plants died but a few which had less leaves managed to survive. Gradually these plants became able to exist with no leaves at all but to increase the surface area of soft skin to enable gases to be absorbed, they formed swollen bodies or stems. Over the passing of millions of years it is probable that only the plants without leaves survived and so thick, fleshy stemmed plants occupied this arid area. However, the fleshy stem was very liable to be eaten by browsing animals and so a form of protection in the shape of spines was evolved. These no doubt formed at the point on the plant which corresponded to the leaf joint of the original plant. This evolved into the areole, the feature which differentiates cacti from all other plants.

Flowers were also produced at these areoles as well as protective spines. One of the genera which appears to have moved very far away from the others is the *Mammillaria* which do not flower at the areoles but as far away as possible, in the axils, the spot between the tubercles. Also in the process of evolution the cotyledon changed its shape. Now we find that the *Opuntias* have distinct leaves on the cotyledon whereas on the *Mammillarias* these have disappeared. The gradual lessening of the cotyledon leaves is noticeable as one considers the other genera. Some have the tall cotyledon with shorter leaves than the *Opuntias* and as we come to the *Notocactus* we find that these are just small projections very different to the *Opuntias*.

Growing in the arid areas we now had many types of leafless plants and as the heat became more intense these plants had to adapt themselves further in order to survive. It was necessary to increase the area of skin exposed to the air but at the same time to protect as much of it as possible from the direct rays of the sun. We then find such plants as *Astrophytum myriostigma* with four sides. These sides increased the area of skin but at the same time presented a sloping surface to the sun by which some of its heat was reflected. From this shape we can trace the development to those plants which increased the number of sides or ridges so that whilst greatly increasing the skin exposed to the atmosphere smaller surfaces were getting the direct sun on them.

The *Echinopsis* increased their ridges to a dozen or more and others even more than that. The *Echinofossulocactus* is one which appears to have attained the greatest development of obtaining necessary gases and yet exposing less skin to the direct rays of the sun. In the first place they increased their ridges to upwards of 36 and even then the urge to provide more skin exposed to the air caused them to develop further. Instead of the straight ridges of most other cacti they formed wavy ridges which greatly increased the surface of the skin but at the same time formed such narrow ridges that so little skin was directly slanted towards the fierce rays of the sun.

The shapes of some of the spines causes some conjecture especially of those with strong hooks. It is hard to see these as a protection as many are so strong that they would tear off part of the plant before they would break or release their hold. It may be that this is a means of being distributed to other areas by catching in the coats of animals, but one still cannot understand how they dropped off. This adaptation by these plants must have taken millions of years to produce the types we have at the present time. Where many thousands of plants grew near to one another any one which adapted itself to the conditions survived and the others died. The plant which survived increased by seed or division and so formed the basis of a stock resistant to the arid conditions.

When we consider all the conditions which went into the formation of certain genera it is very strange that we are able to grow many of these plants under conditions which are almost exactly opposed to what they evolved under. That we do not always succeed in growing some kinds to perfection must not always be regarded as a failure as it is quite impossible for anyone to give all these plants the natural conditions which they prefer. The sun rarely shines here with the intensity with which it does in Mexico or in many of the other areas where cacti are found.

The small pots in which many of us are inclined to grow our plants must be just the opposite to what they prefer and get in their native positions. There the roots can have plenty of space in which to spread and are not confined to a couple of inches or so. The trouble with many of us is that we try to grow too many plants in a small area and so have to cramp the roots of the plants into small pots so that space can be found for them in the greenhouse.

It is always important to clean up all the cactus pots and soil at the beginning of the winter or at the end of the watering season. Once watering ceases all the pots should have attention. A small space should be cleared in the greenhouse and then the pots must be dealt with in turn. Remove each label and scrape off the top of the soil to a depth of not more than half an inch. Now look carefully round the base of the plant to make sure that there are no pests present. Any seen must be dealt with right away. Malathion will kill practically all cactus pests. Some paradichlorbenzine crystals can be placed near the plant. Although pests may not be killed by this it is certain that

they are repelled by it. Once the base of the plant has been cleaned up a little fresh soil can be added. The label should be inspected to see that it is in good condition and then returned. If the treated plant is placed in the cleared space it is possible to go over all the plants and none need be missed.

The ordering of seeds to sow in the coming spring will be an occupation for the winter months. It is a pity that we are not able to get the new catalogues early in the winter. By the time they arrive and seeds are ordered the time is rapidly passing and those growers who prefer to sow early are often disappointed. Some of the seeds I have wanted have not arrived until March or April. Whilst I do not suggest that this is too late to sow cactus seeds I myself like to get them in by the end of January. I find that it is much easier to maintain a steady temperature in the early days than later on when the sun has gained power.

Even when some of the seed catalogues do arrive the trouble is not ended. I feel that some of them are just repetitions of previous years and the kinds that I have ordered from some firms and never received, continue to grow each year. I think that numbers are repeated whether they are in stock or not. I usually find that the rare ones I require do not turn up but duplicates are sent of kinds of which I already have plenty. I would recommend all those members who have not tried growing cacti from seed to have a try. It is a most fascinating hobby and it is a very cheap way to increase one's collection. I have about a thousand adult plants which I have raised from seed apart from hundreds of seedlings coming along. Most cacti are no more trouble to raise from seed than many half-hardy subjects. A small propagating box can be made quite easily and heated with an electric lamp. A small thermostat can be bought from a tropical fish dealer for as little as 10s. and this will function quite adequately when only a low wattage is being used.

CULTIVATION OF SUCCULENTS

by Mrs. M. STILLWELL

By the time you are reading these notes, winter will be almost upon us. I trust none of you were caught out by those early frosts with inadequate heating. I always feel it is a good thing to have a max./min. thermometer at each end of a large greenhouse, where you can check the temperatures daily. You can see at a glance, the lowest figure recorded the previous night and therefore you know instantly whether you have sufficient heaters to maintain the temperature you are aiming at. I try to keep mine about 45°F. If you are relying on electricity you know at once if the temperature has gone very low, that either there has been a power failure, or your thermostat is not working properly. While electricity is the ideal method of heating with regards to labour saving, in the very cold weather I always use one or two Eltex oil heaters to be on the safe side. This not only safeguards you should the current fail but also halves the electricity bill, which is a big consideration in a particularly heavy winter. Do make sure if you are going to use oil heaters, that they are the proprietary brands, especially designed for greenhouse conditions, and not household appliances such as Valor type stoves, which in a greenhouse can often work up, and cover all your plants with a sooty film, which is often very difficult to remove without spoiling the plants. In the winter make quite sure that none of your precious plants are actually touching the glass. If you are very crowded and in doubt, tuck a few sheets of folded newspaper down between the plants and the glass. This also applies to plants grown indoors on the window sills and in conservatories. Newspaper, unlike polythene, absorbs moisture and condensation. Personally, I do not favour polythene lining for the greenhouse during the winter. While it may conserve the warmth it also restricts the air, which can enter through all the various nooks and crannies and our plants must be able to breath properly and not suffer from lack of oxygen, which soon gets used up with our various heaters. Finally there is always the danger of condensation, particularly with some of the rarer succulents that need all the clean dry air during the winter, with unrestricted sunshine, which is usually little enough in our climate.

I see no reason why a lot of the commoner succulents should not be repotted during the winter, when one usually has more spare time to devote to this big operation. If the roots look healthy, there is no need to disturb them too much, just pot on into a larger pot. Do not take cuttings until the spring as these may shrivel too much before rooting. I always hope I shall find time during the winter to completely relabel my plants with a uniform easy to read label. This always gives a collection a much smarter appearance but with all my winter commitments the days pass far too quickly.

I always look to the succulents to provide me with some flowers during the winter, particularly the *Gibbaeums*, which are usually at their best in mid-winter and early spring, several are often out for Christmas. Many of the

mesembs. go on flowering for me during the winter, and a particularly showy one is *Cerochlamys pachyphyllum*, with large mauve flowers, which last for weeks. *Trichadiemas*, *Crassulas*, *Sedums* and *Echeverias* also will in many cases, also oblige. Winter growing succulents must be watered with care, and then only when they show real signs of needing it. They are all fashioned to withstand drought and are prepared to exist on a minimum of water during our extra cold spells, which is just as well, particularly if you cannot maintain a good temperature to make sure that they will dry out in a reasonable time.

The *Argyrodermas* have done very well this year. At the time of writing they are well budded and there is a lovely white flowered one already out. They are often very difficult to identify as many of the bodies are similar in shape but with different coloured flowers. After flowering, they produce another small pair of leaves in the centre. As soon as these are well established the plants are ready to go to rest, as far as watering is concerned. It will probably be about next May before they need any more, when they have once more returned to a single body. *Argyrodermas* are rather slow to multiply and a small plant will often stay a single body for several years. They resent too much root disturbance. Limestone grit should be added to the compost which must be very open. They grow very well from seed and make nice size little plants in about two years. *Argyrodermas* look particularly attractive if grown several together in a large pan, surrounded with white pebbles and cornish grit.

The *Conophytums* have also been flowering well. With age, many of these plants no longer remain stemless. This happens particularly with some of the bilobes, when the stems will often become very woody and as a result, each year the bodies get a little smaller owing to insufficient nourishment passing up through the woody and often lifeless stems. This is the time to break up the cluster and start again from cuttings. Peel off all the old dead skins (one for each year tells you the age of the plant) and cut the woody stem back until you can see life in it, in fact almost back to the body of the plant. To root these I find the best method is to sift some sharp gritty compost, only use what is left in the sieve and discard the rest. Use a half pot and put some peat in the bottom of the pot to hold the moisture, and then your coarse compost on top. Plant your little bodies in a group, just touching one another. You will find as you water from the top it will run straight through and will be kept just damp enough by the peat at the bottom of the pot. This method also applies to imported *Conophytums*, which have scarcely any roots. Pot them up as they are if the roots look healthy but take off most of the dead skins. The best time to take *Conophytum* cuttings is, of course, at the beginning of their growing season, which is roughly July. It should not be done later than the first week in October, except in emergencies. It is always controversial whether to water *Conophytums* in the spring or whether to rest them right round until about July. Some think the long resting period induces them to flower better. I always give mine one good soak at the end of March and then no more until growth begins. I have the feeling that they shrivel just a little too much for comfort if kept dry for so many months. I have just been having a look around the greenhouse and was greeted with the really beautiful flowers of *Glottiphyllum suave*. These very large golden yellow flowers open in all weathers and, to me, have a perfume resembling mimosa. Others out at the present time are *erectiflora*, *nelli*, *neili* and *apiculatum*, all very easy to grow and a joy to see in flower, especially if grown nice and hard and compact, right from seedlings. Most of them set seed very readily and will make nice size plants in a year from seed but do get them out of the propagator before they start to get leggy.

At the start of the resting period do go round all the succulents and remove any dead leaves around the base of the plants and at the same time make sure that there are no stray mealy bugs or scale insects about. These can multiply at a tremendous rate if left on a plant through the winter. Just to make sure give one or two waterings with Malathion at intervals. To be on the safe side only water this on top of the pot and not directly on to the plant as some succulents resent it and can be badly marked. Water all the shingle with it to and the fumes will also help to dispose of any root bug, which often enters from the bottom of the pot. I often find a form of scale on the mesembs., such as *Titanopsis*, *Stomatiums*, *Faucarias*, etc., this usually appears first on the underside of the leaves and can quite easily go undetected if you do not pick up each plant and really examine it. I always make a point of removing them by hand, if they do appear I find that is the safest way, although perhaps rather tedious, but it only takes one or two left on a plant perhaps carefully concealed in the dead leaves or old bodies, where even sometimes insecticides do not penetrate to start up a colony which is very hard to get rid of. If you have a succulent showing signs of black rather sticky mould, have a good look at it, as it is usually caused by some sucking insect.

You will find that the *Haworthias* will need a little water during the winter to prevent too much shrivelling. They are always best if repotted in the early autumn, or late summer, when they make their new set of roots, they can also be given more sunshine for the winter, if we get any, but prefer semi-shade during the summer to keep their fresh green appearance. It is advisable to keep such plants as *H. truncata* on the dry side in the winter, but with experience you get to know the requirements of your own plants.

SHOW RESULTS—2nd and 3rd September, 1965

- Class 1. Nine Cacti (any genera). 4 Entries
 1st J. E. Taylor 2nd R. F. R. Clark 3rd R. H. I. Read
 Highly Commended: Mrs. M. F. Caswell
- Class 2. Six Cacti (any genera). 3 Entries
 1st W. F. Maddams 2nd Mrs. M. Halford 3rd Miss D. Cutler
- Class 3. Three Cacti (any genera). 5 Entries
 1st J. W. Pilbeam 2nd Mrs. J. A. Wells 3rd C. Parker
 Highly Commended: Mrs. B. Baldry
- Class 4. One Cactus and one other Succulent. 7 Entries
 1st R. H. I. Read 2nd S. W. Young 3rd Mrs. J. A. Wells
 Highly Commended: Mrs. M. Halford. Commended: J. W. Pilbeam
- Class 5. One Specimen Succulent. 5 Entries
 1st Mrs. T. Watt 2nd S. W. Young 3rd Mrs. J. A. Wells
 Highly Commended: R. H. I. Read
- Class 6. Three *Faucarias* and/or *Stomatiums*. 2 Entries
 1st Mrs. T. Watt 2nd Mrs. J. A. Wells
- Class 7. Six *Euphorbias*. 2 Entries
 1st S. W. Young 2nd Mrs. T. Watt
- Class 8. Three *Agaves*, *Aloes* and/or *Gasterias*. 2 Entries
 1st Mrs. J. A. Wells 3rd Mrs. M. Halford
- Class 9. Three *Haworthias*. 4 Entries
 1st Mrs. T. Watt 2nd R. H. I. Read 3rd Mrs. J. A. Wells
 Highly Commended: Mrs. M. Halford
- Class 10. Three *Echeverias* and/or *Cotyledons*. 5 Entries
 1st Mrs. T. Watt 2nd S. W. Young 3rd T. Paterson
- Class 11. Six Stemless *Mesembryanthemums*. 4 Entries
 1st K. H. Walden 2nd C. Parker 3rd R. F. R. Clark
- Class 12. Three Stemless *Mesembryanthemums* (for members who have not previously won a First in any Class).
 No Entries
- Class 13. Three Succulents other than Cacti. 4 Entries
 1st Mrs. J. A. Wells 2nd Mrs. M. Halford 3rd R. H. I. Read
- Class 14. Three Succulents other than Cacti (for members who have not previously won a First in any Class).
 1 Entry
 1st G. A. Page
- Class 15. Three *Stapeliads*. 4 Entries
 1st R. F. R. Clark 2nd Mrs. M. Halford 3rd Mrs. B. A. Baldry
 Highly Commended: Mrs. J. A. Wells
- Class 16. Three *Stapeliads* (excluding *Stapelias*). 3 Entries
 1st C. Parker 2nd Mrs. J. A. Wells 3rd Mrs. T. Watt
- Class 17. Six South African Succulents in pots not larger than 3½ in. inside diameter. 3 Entries
 1st Mrs. T. Watt 2nd Mrs. J. A. Wells 3rd C. Parker
- Class 18. Group of Cacti and/or other Succulents to cover table space not larger than 3 ft. by 2 ft. 6 in. 3 Entries.
 1st S. W. Young 2nd Mrs. M. F. Caswell 3rd A. Boyles
- Class 19. Three Cacti and/or other Succulents (for Juniors under 18 years). 2 Entries
 1st G. A. Page 2nd P. R. Harvey
- Class 20. Six *Lithops*. 5 Entries
 1st K. H. Walden 2nd Mrs. J. A. Wells 3rd C. Parker
 Highly Commended: R. F. R. Clark
- Class 21. Six *Conophytums*. 2 Entries
 1st C. Parker 2nd Mrs. J. A. Wells
- Sir William Lawrence Cup for Cacti—J. E. Taylor
 Evelyn Theobald Cup for Succulents—Mrs. J. A. Wells
 R. S. Farden Bowl for Groups of Cacti, etc.—S. W. Young

[continued on page 83

SUCCULENTS IN THE NATIONAL BOTANIC GARDENS, DUBLIN

by W. F. and B. MADDAMS

Collections of succulent plants in Botanic Gardens and similar institutions often prove disappointing; one frequently encounters plants indifferently grown, sadly misnamed and poorly displayed. We recently visited the National Botanic Gardens at Glasnevin, Dublin, which have a good sized greenhouse devoted to cacti and other succulents, and the above criticisms are certainly not justified in this instance. It may be mentioned, in passing, that, more generally, the quality and quantity of the plants in the Gardens is of a high standard, and since this display is a mere sixpenny bus ride from the centre of Dublin, anyone in the locality should make a point of paying a visit.

One of the most impressive parts of the succulent collection is encountered immediately upon entering the greenhouse. It comprises a large and varied group of stemless *mesembryanthemums*, with a particularly good selection of *Lithops*, skilfully set out among matching stones and pebbles. Among the less common species, we noted *L. de boerii*, *farinosa*, *francisci*, *geyeri*, *koelsmanii villetii* and *wernerii*. There are several large clumps of *Conophytums*, and those catching the eye include *C. compressum*, *elishae*, *flavum*, *laxipetalum*, *leviculum* (a choice miniature species), *obcordellum*, *pallidum* and *truncatellum*. Other genera well represented include *Cheiridopsis*, *Ebracteola*, *Faucaria*, *Glottiphyllum*, *Lampranthus* and *Pleiospilos*.

Among the *Cactaceae*, most genera are represented, some more fully than others. There is a good range of *Mammillaria*, though few of the plants are particularly large, and a small number are incorrectly named. Probably the most impressive species was a clump of *M. erectohamata* in flower, and *M. pilispina*, also in flower was attractive. Nearby, we noticed several *Parodia* species in good condition, with particularly colourful spines. Another South American plant to attract our attention was a good specimen of *Eulychnia saintpieana*. That neglected but worthwhile group, the miniature *Opuntias* are well represented, and it is a pity that a similar display has not been mounted at one of the Society's shows. We were also pleased to see a good representation of epiphytic species, particularly *Rhipsalis* in a variety of intriguing forms and *Hatiora salicornioides* with gay yellow flowers.

Turning to the other succulents, excluding the *Mesembryanthemaceae* we noted a varied selection of *Aloes* and *Gasterias*, in conditions which gave ample opportunity for vigorous growth. There were also a few *Agaves*, rather small in size, but we saw larger specimens housed elsewhere in the Gardens and it is regrettable these were not available for close inspection for the obvious reason that at some time previously, vandels had carved their initials on the leaves! Among the *Cotyledon* species, *C. delenilii*, with red-splashed rosettes and *C. milleriana*, caught our eye, as did *Kalanchoe schumacheri*, with its campanulate flower in a delicate salmon shade.

The above plants are set on conventional staging around the four sides of the greenhouse. The centre is occupied by a large and impressive bed in which are found a number of fine specimen plants, particularly columnar *Cerei* and *Euphorbias*. This arrangement allows of an ample root run, and gives head-room for taller growing species. Among the latter, a number of *Cerei* deserve mention. We were very impressed by *C. alacriportanus*, *C. forbesii*, *C. laetivirens*, *C. peruvianus* and *C. validus*. The doyen of the group is a seven-foot specimen of *C. pernambucensis*. There were also fine plants of *Espostoa lanata*, about four feet high, and of *Pilosocereus palmeri*, some three feet tall. Among the globular cacti, there were two good specimens of *Echinocactus grusonii*, each about one foot in diameter. These, of course, are not large in terms of those encountered in such places as the Jardin Exotique, but most of us would be proud to own them.

Perhaps the most impressive group in the centre bed is the *Euphorbias*, covering most of the typical forms of this varying genus. A large plant of *E. boejerii*, well in flower, presented an impenetrable thicket with its mass of thorny stems. In contrast, large specimens of the columnar *E. arborea* and *E. candelabrum* reached nine or ten feet in heights. Other notable species include *E. aphylla*, *dendroides*, *grandicornis*, *intisyi*, *ramipressa* and *triangularis*. Adjacent to these were several large *Opuntias*, and of these, *O. tomentosa* was particularly noteworthy. A number of colourful *Agave* species added contrast; these had spreads of up to two feet, the finest being *A. princeps*.

We can only surmise the conditions under which these plants are growing, but the indications are that they have a rather higher than average temperature during the winter. Some of the early flowering *Mammillaria* species were very well forward and this agrees with some comments we have had recently from Mr. F. K. Horwood at the University Botanic Gardens, Birmingham. At this latter collection a minimum winter temperature of about 55°F. is maintained, for the safe keeping of some tropical *Euphorbiaceae* and other delicate species, and under these conditions, many *Mammillarias* come into flower early in March. The collection at Glasnevin had clearly not gone on to a summer watering schedule at the time of our visit (early April) but the growth of the plants was such that it was, if anything, overdue. Our only possible criticism of this commendable collection is that we suspect the plants are grown in rather too arid conditions.

FROM RICHARD RUSSELL IN SAN DIEGO

Our good friend Richard Russell, always alert to provide us with stories from a different angle sends us this extract from *The San Diego Union* dated 12th September 1965 which we gratefully acknowledge.

'Lakeside Cactus Fruit Harvest On—by Bob Weaver.

A professional prickly pear picker picks fifty pecks of prickly pears a day. But it's a sticky job.

To protect against the stickers from the cactus plants where the pears grow, a picker wears special clothing.

His trousers are covered by a heavy canvas apron. Over his shirt he wears a heavy denim jacket, buttoned tightly at the wrists. His hands are covered by horsehide gloves.

Five of these pickers are busy harvesting prickly pears at the Maniscalco Prickly Pear Cactus Ranch near here (Lakeside). The fruit gathered during the six-week harvest is shipped to Los Angeles.

Leon Maniscalco, operator of the 14-acre ranch, says the main customers for the cactus fruit are Italian-Americans in the Los Angeles area.

His ranch—one of two commercial operations in the country—was started in 1921 at the site of the present El Capitan High School.

Eight years later it was moved about three miles west to its present location at 10270 Riverford Road

Maniscalco's father, Bernardo, got into the business as partner of Hugo Thumb, who had a 40-acre cactus ranch.

At that time Thumb was trying to develop cactus as a cattle feed.

The firm prospered when the pears were sold as table fruit.

'The Italians call them the 'Figs of India', said Maniscalco. 'But they came from North America.'

People who eat prickly pears cut off the outer skin and chill the fruit. Inside is a pulpy red meat which has a delicate taste combining the flavours of watermelon and berries.

It has seeds the size of those in muscat grapes.

The picker looks for fruit of good size with just a blush of light red on its green skin. The pretty-red-coloured prickly pears are past their prime, Maniscalco says. They're over ripe.

The picker uses a knife with a five-inch blade to cut the pear from the thorny leaf or pad. Then he puts it into a metal pail which is dumped into lug boxes.

The boxes are picked up by a crew on a truck and taken to a packing shed where five workmen prepare them for their trip to market.

The fruit is then dumped on to a conveyor belt which carries it into a peach de-fuzzer.

A de-fuzzer is a machine which uses horse hair brushes to knock the needles off the fruit. The operation also polishes the pears.

From the de-fuzzer, the fruit goes on to a series of rollers. Small pears fall through openings between the rollers.

The rollers send the fruit on to another conveyor belt where it is separated into boxes by size—small, medium, large, extra large and jumbo.

Maniscalco, who has been operating the ranch for the past five years himself, has 14 acres in cactus plants.

The rows of plants are thirty feet apart. Within a row, each plant is spaced eight feet from the next one.

A good plant will produce for fifteen years.

'But some of them live for seventy-five or a hundred years,' Maniscalco says.

The grower treats his cactus plants like orange trees in regard to watering and fertilization.

Although the demand for prickly pears has remained constant over the past forty years, Maniscalco says his operation may be doomed.

'It's not customers,' he said. 'Plenty of people eat the fruit. It's increasing labour costs and higher taxes. They tax the land like it was a subdivision,' he said."

JOURNAL BINDER: A self-binder, capable of holding four years' Journals, finished in green cloth with gilt lettering on the spine, is available, price 12s., post free to members.

LABELS: Triangular type, one which can be read without turning the head and stays in place when watering. White ivory, 4s. per 100, post free.

BLAZER BADGES: Obtainable on black or navy ground, 10s.

LAPEL BROOCH BADGES: New price 3s. 9d., post free.

All the above obtainable from E. W. Young, 35 Castle Drive, Redbridge, Ilford, Essex.

SOME DWARF OPPUNTIAS

by G. G. LEIGHTON-BOYCE

Opuntia lagopus, K. Schumann, 1903—*Tephrocactus lagopus* (K. Sch.) Badkbg. This is probably the least temperamental of the hairy cylindrical *Tephrocacti*, and therefore more suitable for the beginner than *O. floccosa*, although growth is very slow. The young specimen illustrated is growing on its own roots and has not yet started to branch. These attractive little plants, with bright green bodies covered with dense hair except at the growing point, where there are short cylindrical leaves of the same green soon fading and withering, form spreading groups or colonies high up in the Andes (cf the habitat photograph of the larger and less common *T. rauhii* in this Journal, October 1956). There are certain intermediate forms between *O. lagopus* and *O. floccosa* which are difficult to sort out, and varieties of both with different coloured hair, from pure white to golden brown. The specimen illustrated has off-white hair, turning slightly brownish. Whereas *O. floccosa* tends generally to have several short spines at most areoles which often do not show through the hair at all, *O. lagopus* usually has one long, rather transparent and extremely sharp spine at most areoles which protrudes some way beyond the hair. The specimen illustrated already has some spines over 2 cm. long.

Opuntia andicola minor Hildm. is one of the smaller *Tephrocacti* with pointed conical stems branching multifariously with the branches rooting down vigorously to form a low, spreading clump. Old stems are sometimes overwhelmed by the newer stems and shrivel, making the spination appear denser than normal. Apart from the flat whitish outstanding spines about 2.5 cm long, one at each areole, there are up to four shorter weak spines, which on my specimen have a distinctly reddish tinge, often lying close to the stems. The stems are dark green, flushed purple near the areoles, and are only up to 1.5 cm thick and not much more than 2 cm long. The older areoles have a stiff brush of brownish yellow glochids up to 4 mm long. Backeberg has classified plants of this name as v. *gracillior* of *T. glomeratus* (his revision of *O. glomerata*, based on the original 1830 Haworth description), the larger bodied and longer spined *O. andicola* itself (Pfeiffer, 1837) becoming *O. v. andicola* of the same species. Cultivation is easy, but this small variety grows slower than the type. Apart from the other varieties of *O. glomerata*, there are several species very close to it and distinguishing them without a quantity of comparative material of similar age grown in similar conditions is difficult. The use of the name 'glomerata' by Britton and Rose and by Borg relates to the very different articulata species (including *diademata*, *turpinii*, etc.) and this has led some growers to prefer various other names.

Opuntia subinermis Backbg. There are several forms of this *Tephrocactus*, which generally has very few spines, horn coloured or whitish, but on the older areoles a stiff brush of long yellowish glochids. The spines stick out sideways from the stems, which are dark green when young, browning with age. The specimen illustrated is less upright in its growth than some, but I have seen others in which branches have drooped right to the ground under unfavourable conditions, rooted where they touched and grown up again better than the earlier growth—in effect, a case of the plant transplanting itself almost as well as the creeping *Platyopuntiae*. This specimen has one outstanding spine about 2 cm long in the upper areoles, which becomes more reflexed at the older, lower areoles and is associated with only two weaker spines, almost hair like. The newest areoles have some yellow hair and the spines have a reddish tinge which disappears as they grow. The stem segments have a diameter up to 2 cm and grow to at least twice that length. The plant is sometimes met with mistakenly labelled *O. moelleri*, which is a very different plant, near club shaped, with more elaborate spination, belonging to the *Corynopuntiae* (or *Clavatopuntiae*)—not a *Tephrocactus* at all.

Opuntia strobiliformis. Berger's name for it as a species in 1929, deriving from the Greek for a fir or pine cone. The branch on the rooted cutting illustrated shows how appropriate this is. First described by Spegazzini as a variety of what is now *Tephrocactus articulatus* or *O. articulata* (his *O. diademata inermis*). Backeberg transferred it to *Tephrocactus* under Berger's specific name. Castellanos made it a variety, his *O. glomerata inermis*. Backeberg subsequently established sufficient similarities to the rest of the very variable articulatus plants to bring it within that species. So *T. articulatus inermis* or (if you follow Rowley) *O. articulata inermis*, it is. A good specimen should have many branches, generally about four times as long as their diameter, which is 2 to 2.5 cm. Grown lush, it keeps greenish but tends to lose its cone-like look. With long dry periods and plenty of sun, the older branches go brownish grey and wrinkled, while new growth comes with a bluish tinge. Hair at the areoles white or grey, very short, with short brown glochids and no spines. The bubbles of sap exuding from the areoles are a habit it shares with some *Ferocacti*. The main snag in cultivation on its own roots is that the branches are very fragile in winter when the plant must be kept dry.

A form of *Opuntia diademata calva* Weber. Originally described by Lemaire as *O. calva* in 1839, then *Tephrocactus calvus* in 1868, this variety of what is now *T. articulatus* or *O. articulata* is virtually spineless, like the type of the species

(sometimes called *O. haageana*). *O. articulata calva* has longer glochids than the type, more white hair at the areoles and the humps on the stem segments are more pronounced. The segments are slightly smaller than the type, up to around 3.5 cm in both diameter and height, and their colour is a light greyish green with a reddish flush round the areoles. Considerable wrinkling occurs in winter and fragility is notable. Growth only seems to occur after a very hot spell. My plant has a single diminutive reflexed spine, white, not papery, at two areoles on its newest growth. It can be distinguished from *O. articulata oligacantha*, which has one or two flat papery spines in the upper areoles only, because that variety has stem segments generally longer than their diameter and the spines (generally grey) are up to at least a quarter of the segments' diameter in length and stand out from the stem, the colour of which is dark ashy grey. It seems likely that there is considerable variability within several of the eight varieties and the type of the species as now generally recognised.

I found here a species of cactus, described by Professor Henslow, under the name of *Opuntia Darwinii* . . . which was remarkable by the irritability of the stamens, when I inserted either a piece of stick or the end of my finger in the flower. The segments of the perianth also closed on the pistil, but more slowly than the stamens. Plants of this family, generally considered as tropical, occur in North America . . . in the same high latitude as here, namely, in both cases, in 47°—Charles Darwin on the coast of Patagonia (in 'The Voyage of the Beagle').

A curious low growing plant of which the mature growth is not elongated as in the illustration, but can become nearly globular. The tops are not tapered to a point as in many of the other clump forming *Tephrocactus* species. The spines although narrow are flattened in section and grow fairly upright and stiff, and on this specimen are up to 4 cm long. The body colour is reddish brown. It does not flower with me, but has proved resistant to low temperatures, as one would expect. I have not tried it in prolonged damp!

MR. L. E. NEWTON

Mr. Newton, in common with many of our prominent members, does not confine his membership to this Society alone. He thus has the advantage of being able to keep his finger on the pulse of succulent study in this country, and with a sight of most of the periodicals issued by kindred societies throughout the world, and his widespread contacts, benefit to our members cannot fail to accrue.

He has, by virtue of his domicile, been a very valuable member of our Essex Branch, the members of which have watched his development from an enthusiastic student with approval and admiration.

He is now one of the five British members of IOS and has widely travelled, visiting cactophiles all over Europe. He even has the distinction of penetrating the Iron Curtain into Czechoslovakia.

As I write these notes I am looking with approval at his photograph of part of the Opavo Municipal Collection.

Mr. Newton assists Mr. Gordon Rowley in editing the IOS Repertorium Plantarum Succulentarum which annually lists all new names in succulents.

His work as a lecturer, photographer, Editor of the Essex Succulent Review, member of the Mammillaria Society and his connection with the Succulent Plant Institute is well known and enjoyed by many far beyond the limits of this Society.

His professed speciality is the bibliography of succulents and to this end he has built up (in the words of Mr. Rowley) 'an outstandingly fine private library including all the current periodicals and many fine old and rare classics'.

His present appointment is Lecturer in Biology (Botany and Zoology) at the Erith Technical College.

By the time this appears in print he should be well on the way to completing his M.Sc. with a project on genetics and breeding systems in certain halophytic grasses.

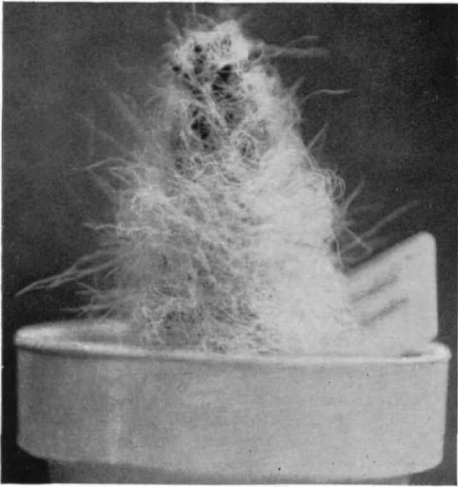
In addition to his technical qualifications Mr. Newton is well known for having ideas of his own and the courage to put them forward. I feel sure that he will be a worthy successor to the late Ernest Shurly and to Mrs. Higgins. With all those who have watched his advance I wish him well and congratulate the Society on its good fortune.

A.W.H.

On 11th September the North Staffs Branch staged its usual Display at the Newcastle Early Chrysanthemum and Horticultural Show. The judges were sufficiently pleased with the Display that they made a Gold Medal Award—the highest prize to be obtained for any non-competitive section.

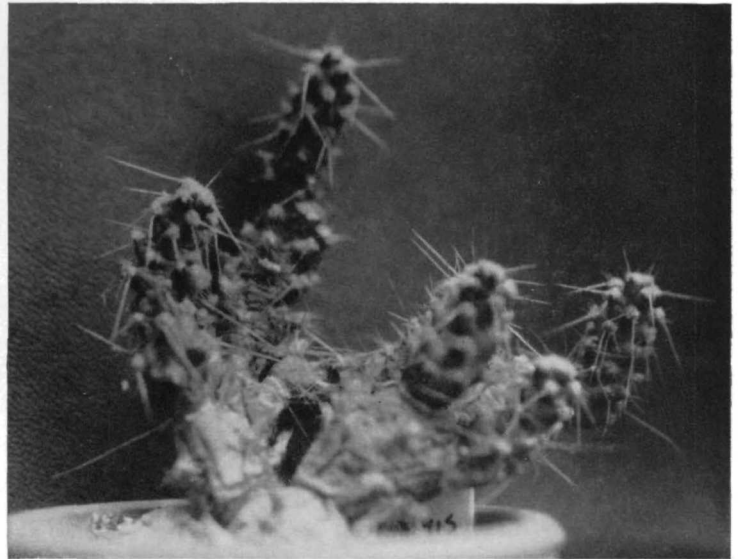
The Branch was also granted a competitive section and although restricted to four classes there were over seventy entries.

Pessimists please note what a small but active Branch can do. This Branch has also decided, for the benefit of members of the Mammillaria Society living in the vicinity, to devote the last half hour of its meetings to discussion on the genus.



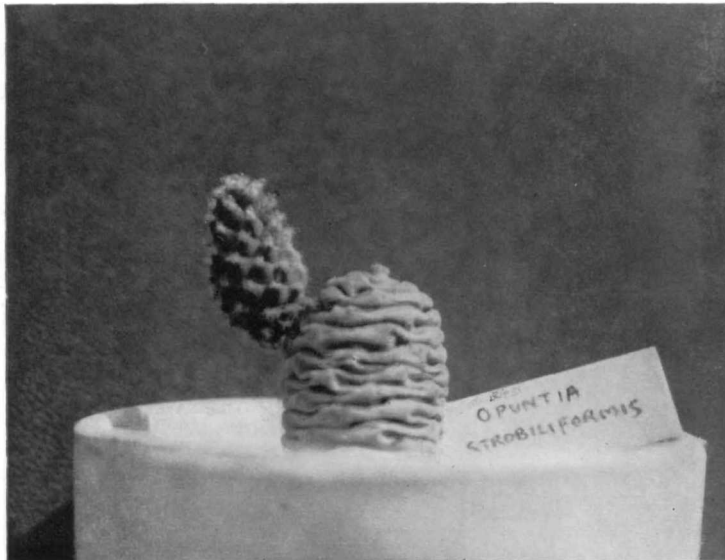
Opuntia lagopus

G. G. Leighton-Boyce



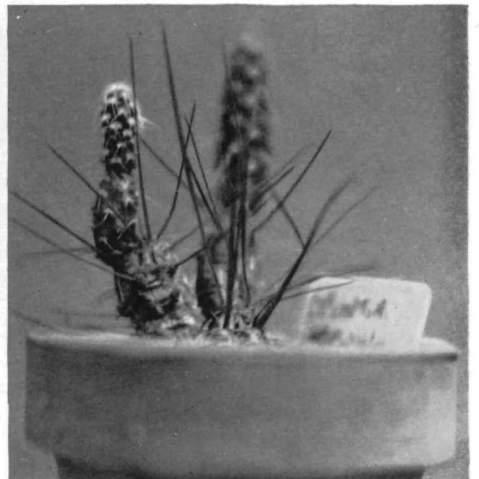
Opuntia subinermis

G. G. Leighton-Boyce



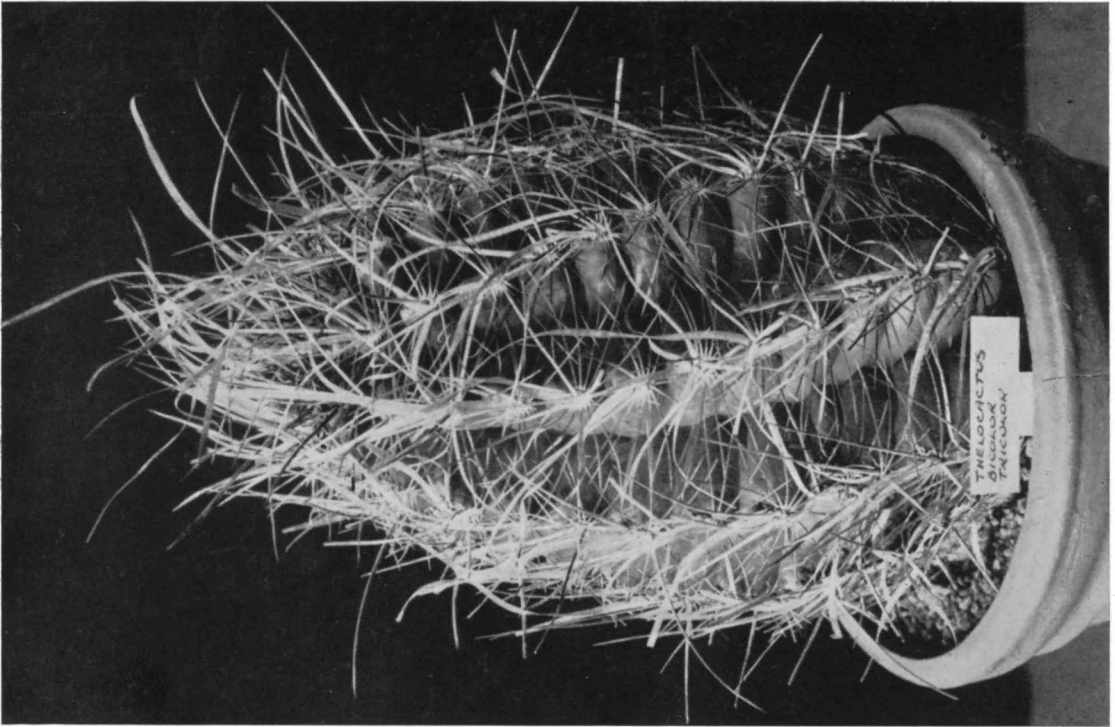
Opuntia strobiliformis

G. G. Leighton-Boyce



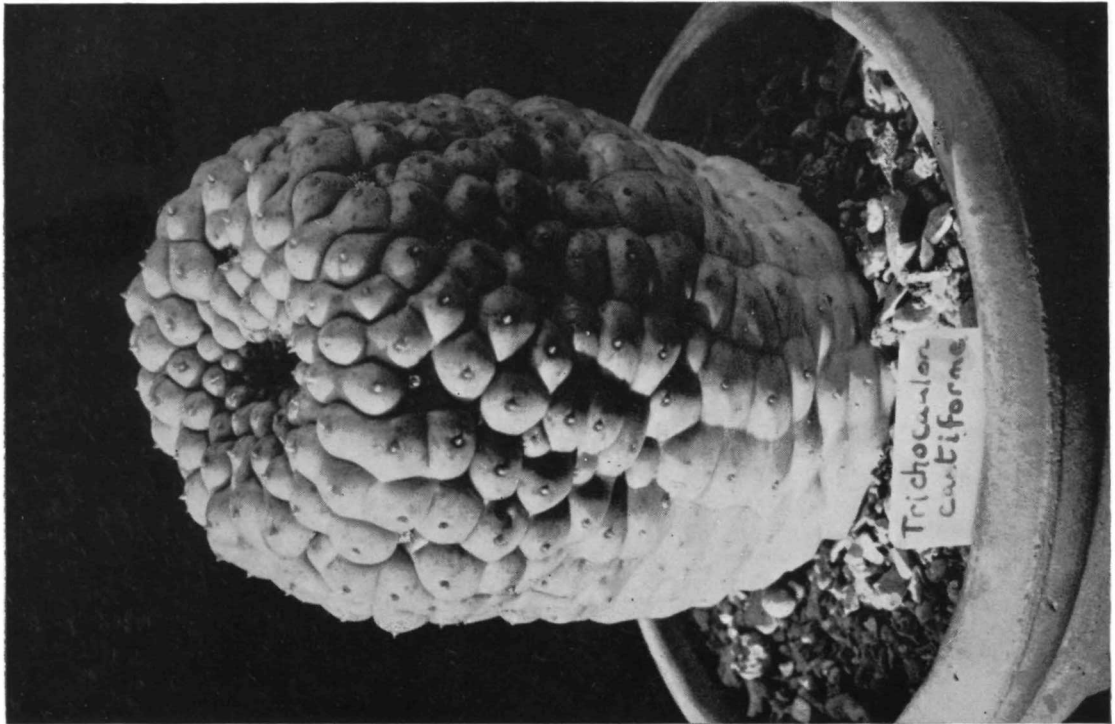
Opuntia darwinii

G. G. Leighton-Boyce



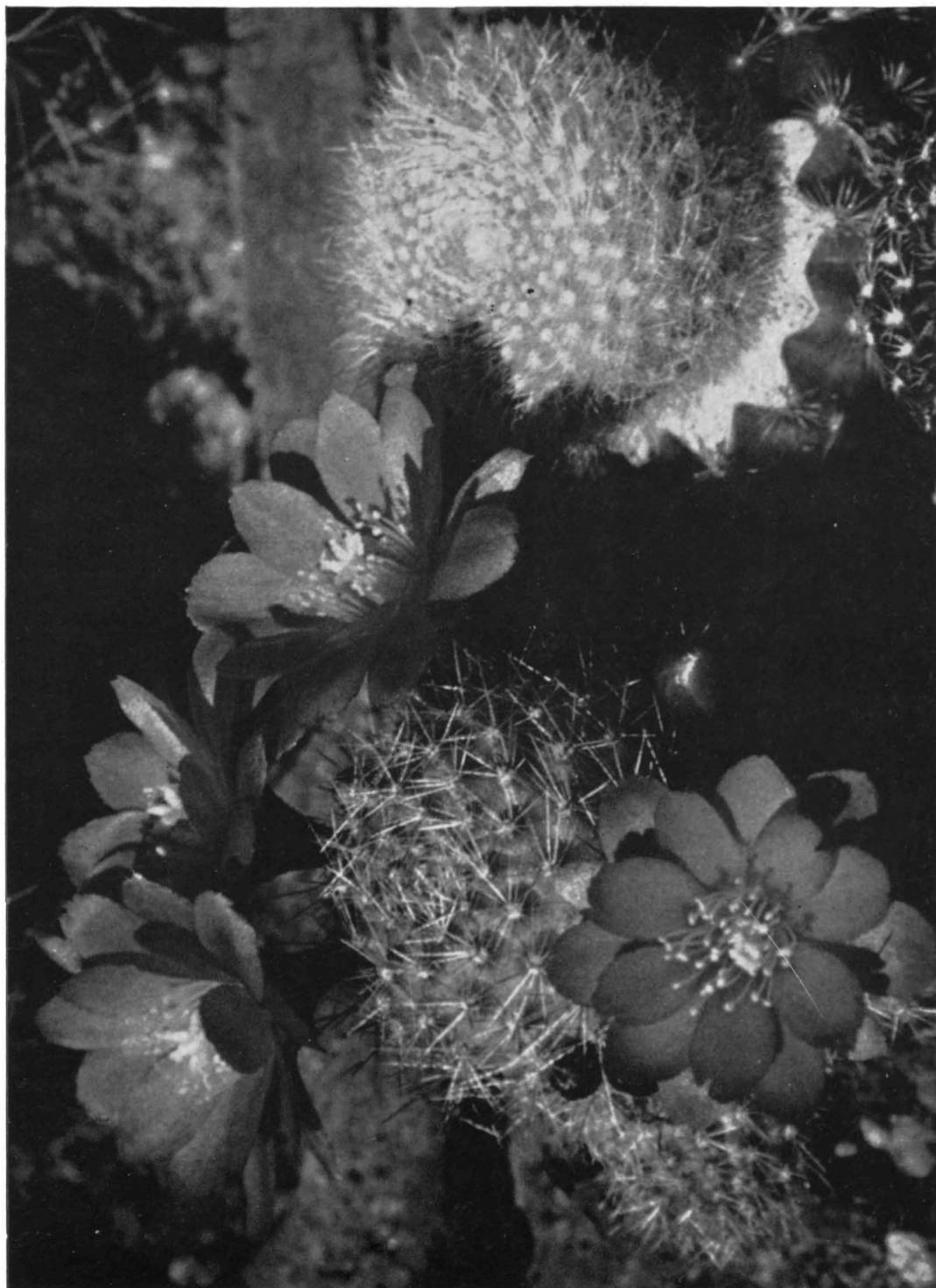
R. H. I. Read

Thelocactus bicolor tricolor



R. H. I. Read

Trichocaulon cactiforme



A. F. H. Buining

Rebutia muscula ritter



A. F. H. Buining

Rebutia pulvinosa Ritter

FURTHER NEW REBUTIAS

Continued by J. D. DONALD

Rebutia muscula Ritter and Thiele

Original latin diagnosis in Taxon XII, i, 28: 1963

4. *Rebutia muscula* (subj. *Aylostera*) Ritter and Thiele, sp. nova a *R. albipilosa* Ritter (cf. speciem praecedentem 3) recedit: corpore oblongo, viridi, 3-4 cm diam.; costis in tubercula valde distincta solutis; areolis valde remotis; spinis \pm 50, tenuioribus, 2-4 mm longis, rectis, omnibus similibus; tubo florali setis albis obsito; tepalis 20 mm longis, aurantiacis; staminibus biseriatis.

Habitat: wie *R. albipilosa*. Gesammelt als: FR 753.

The full description given below is translated from the original manuscript in German of E. Ritter.

- Body:** Green, hemispherical, later elongating, somewhat caespitose; individual heads 3-4 cm thick; with only fibrous roots.
- Ribs:** Resolved into slight four-cornered tubercles ca. 2 mm high; ribs not clearly countable, estimated at between 25-40 in number.
- Areoles:** Short oval, white felted, raised above the tubercle, 1-1½ mm long, about 2 mm apart from each other.
- Spines:** Very fine, straight, white, glistening, about 50, 2-4 mm long, those in the middle shortest, spread in all directions and all are about equally thin, soft, not prickly and covering the body like a white pelt. In culture only about 30 spines are observed. Radial and central spines indistinguishable from each other.
- Flower:** 3½ cm long, opening 3 cm wide lateral.
- Pericarp:** Green, with small scales with white woolly hairs and ca. 10 whitish bristles in the axils. Above the pericarp the receptacle is 3½ mm thick and style and receptacle coalesce for 7 mm.
- Nectary:** 2 mm long and open.
- Calyx:** Funnel form above nectary, about 6 mm long, opening about ½ cm wide, outside pale olive green, glistening, with green scales, minute woolly hairs and a few soft white bristles.
- Filaments:** Whitish, 7-8 mm long, in two series, inserted in pairs between the lower part of the calyx and the calyx walls and the corolla. Anthers light yellow.
- Perianth Segments:** Near spatulate, inner rather blunt and somewhat notched, light orange-red (Din 6164 5 E) about 2 cm long, ½ cm broad, outermost more pointed, all widely outspread.
- Fruit:** 5 mm diam., flattened globose, green-brown, with slit floral remains covering the pericarp.
- Seed:** About 1½ mm long, ¾ mm broad, ¾ mm thick, sack-shaped with arched dorsal surface. Testa black, semi-dull, with minute tubercles running into each other, large basal hilum, not raised, brown.
- Habitat:** Narvaez, Prov. O'Connor, Dept. Tarija, Bolivia—rare.
- Systematics:** Belongs to subgenus *Aylostera* and is related to *Rebutia albipilosa* Ritter.
- Holotype:**

This species was discovered by me in April 1958 and has my number FR 753.

Rebutia albiflora Ritter and Buining

Original latin diagnosis in Taxon XII, i, 29: 1963

5. *Rebutia albiflora* (subj. *Aylostera*) Ritter and Buining, sp. nova, a *R. albipilosa* Ritter (cf. speciem praecedentem 3) recedit: corpore globose, valde proliferante, 18-25 mm diam., costis in tubercula valde distincta solutis; areolis remotis, 0.5 mm longis, 0.25 mm diam., subluteolis, spinis rectis, 3-5 mm longis, radialibus \pm 15, centralibus 5, basi subbrunneis; floribus \pm 25 mm diam.; tubo florali proceriore, setis albis obsito; petalis 10-12 mm longis, 3-5 mm latis, acuminatis albis, linea mediana rosea; staminibus biseriatis; stylo 20 mm longo; fructu et seminibus multo minoribus.

Habitat: in einer Schlucht des Rio Pilaya, nordöstlich von Tarija, Bolivien. Gesammelt als: FR 766a.

The full description given below is derived from personal letters between F. Ritter and A. F. H. Buining, which it has been my privilege to consult and augmented by my own observations on imported plants.

- Body:** Bright green to green, globular or short cylindrical, freely caespitose with individual heads 18-25 mm diam., and up to 25 mm long; fibrous rooted.
- Ribs:** Resolved into vertical or spiralled rows of rounded small tubercles up to 1.5 mm in height, 12 or more rows discernible.

- Areoles:** Almost round and very small, ca. $\frac{1}{2}$ mm long and $\frac{1}{4}$ mm broad, not sunken into the tubercle, and filled with white to yellowish felt.
- Spines:** About 15 radials, white and hairfine, half radiating outwards from the areole, 3-5 mm long, the upper and lower only slightly shorter; centrals about 5, thin and long, up to 15 mm, erect, equally distributed white with somewhat brownish bases, fading with age.
- Flower:** 25 mm long by 25 mm wide, very slim tubed, white to rose-white in colour.
- Pericarp:** Round, 3 mm diam., with minute scales bearing a few white hairy bristles and small quantity of white wool in the axils.
- Receptacle:** Very thin up to 7 mm with base only 1.75 mm thick, pale rose to white, with scales and bristles as for pericarp. Style and filaments coalesce with the tube wall for the lower 5 mm.
- Nectary:** Open chamber $\pm \frac{3}{4}$ mm long with nectar.
- Filaments:** White in two series as with *R. pulvinosa*, anthers cream.
- Style:** Long, white up to 20 mm; 4-6 lobed stigma white, outspread or clenched, extended somewhat beyond anthers.
- Perianth segments:** \pm 10-12 mm long, 2-3.5 mm broad, spatulate or spatulate-acuminate, white or rose white with deeper rose mid-stripe terminating in a fine point.
- Fruit:** Very small 2.5-3 mm diam., deep rose or olive green berry with persistent floral remains and covered with white hairy bristles.
- Seeds:** Black, very small, faintly tuberculose, 0.3 mm and 0.4 mm with round white hilum.
- Habitat:** As with *R. pulvinosa* but higher up the gully in a sub-tropical climate. Furthest in hot zone of all *rebutias*.
- Systematics:** Belongs to the subgenus *Aylostera* and is related to *R. albipilosa* Ritter.
- Holotype:**

Collected by F. Ritter with number 766A.

Rebutia pulvinosa Ritter and Buining

Original latin diagnosis in Taxon XII, i, 29: 1963.

6. *Rebutia pulvinosa* (subg. *Aylostera*) Ritter and Buining, sp. nova, a *R. albipilosa* Ritter (cf. *speciem praecedentem* 3) recedit: corpore 2.5-3 cm diam., costis in tuberculos valde distinctos solutis; areolis 0.75-0.5 mm diam.; spinis minus tenuibus, radialibus 15-22, 1.5-3 mm longis, centralibus 6, fortioribus, brunneis; floribus 18 mm longis, 15 mm diam.; ovario globoso, 4 mm diam.; tubo florali \pm 10 mm longo, albo-setaceo; tepalis 7 mm longis, 3-4 mm latis, apice emarginatis, aurantiacis; staminibus biseriatis; stylo 13 mm longo; fructu et seminibus multo minoribus. Habitat: Wie *R. albiflora*. Gesammelt als: FR 766.

The full description given below is derived from personal letters between F. Ritter and A. F. H. Buining, which it has been my privilege to consult and augmented by my own observations on imported plants in the collection of Burgermaster A. F. H. Buining.

- Body:** Green, globose to short cylindrical, freely caespitose forming many headed clumps, individual heads 25-30 mm diameter and height; fibrous rooted.
- Ribs:** Resolved into vertical or slightly spiralled rows of four to six sided or rounded tubercles up to 2 mm in height, ca. 12 rows discernible.
- Areoles:** Oval about $\frac{3}{4}$ mm long and $\frac{1}{2}$ mm broad, not sunken into tubercle and filled with creamy white felt; superficially the areole may appear brownish due to the dark bases of the central spines.
- Spines:** Radials 15-22, very fine, white, surrounding the areole and radiating outwards, the upper and lower about $1\frac{1}{2}$ mm long and the laterals about 3 mm long; centrals about 6 occasionally more, somewhat stouter, white or brownish, base thickened and brown fading with age; all straight about 2 mm long.
- Flower:** Rather small, closed length 18 mm, open ca. 15 mm long and wide, orange in colour.
- Pericarp:** Round, 4 mm diam., green with minute scales with a few white hairy bristles and a very small quantity of white wool in their axils.
- Receptacle:** 10 mm long very slim only 2 mm thick immediately beyond pericarp, with scales and bristles as for pericarp; style and filaments coalesce with tube walls for 3 mm beyond pericarp when the floral tube widens to form the calyx up to 5 mm wide at corolla.
- Nectary:** Open chamber $\pm 1\frac{1}{2}$ mm long with nectar.
- Filaments:** White in two series up to 7 mm long, first series arising at the nectary, the second series from the tube walls from nectary to corolla; anthers yellow.

- Style:** Rather long 13 mm, white, free part 10 mm long beyond nectary with ca. 5 (6) stigma lobes outspread and slightly extended beyond anthers.
- Perianth**
Segements: Spatulate, often finely pointed, up to 7 mm long and with greatest breadth 4 mm; orange.
- Fruit:** Greenish berry 5 mm diam., flattened globose, with persistent floral remains.
- Seed:** Dull black, $\frac{3}{4}$ mm long by $\frac{1}{2}$ mm broad and thick, very finely flat tuberculate, with round white hilum slanted across base of seed.
- Habitat:** North-east of Dept. Tarija, Bolivia, in a lateral gully off the Rio Pilaya. Climatic conditions rather warmer than typical for *Rebutia*.
- Systematics:** Despite rather short solid axis (3 mm) in floral tube belongs to subgenus *Aylostera* and is related to *R. albigilosa* Ritter.

Holotype:

Plant collected by F. Ritter with number 766.

REVISION OF THE GENUS REBUTIA

by A. F. BUINING and J. D. DONALD

Additional Note

Since the preparation of these notes two further 'rebutias' have been described by Professor M. Cardenas. Studies on these plants again suggest to us that they also more properly belong to *Sulcorebutia* Backbg. rather than *Rebutia* K.Sch. sensu strictu, accordingly we propose the following new combinations:

Sulcorebutia glomerispina (Card.) Buin. et Don. comb. nov.

Syn. *Rebutia glomerispina* Cardenas in C et S. J. Amer. 36 (1964); 40-41.

Sulcorebutia tunariensis (Card.) Buin. et Don. comb. nov.

Syn. *Rebutia tunariensis* Cardenas in C. et S. J. Amer. 36 (1964); 38-40.

We appreciate the remarks made by Professor Cardenas in the *Cactus and Succulent Journal of America*, (36 (1964), p. 39,) concerning the proper place of *Sulcorebutia*, but it is our firm conviction that the resemblances to *Rebutia* are superficial only and do not represent a true affinity, but are more a case of parallel evolution. As far as we know no fertile hybrids of *Rebutia* and *Sulcorebutia* have been raised. Fruit and seed may be formed by such crossings but the seedlings if germination occurs rapidly succumb to chlorosis. On the other hand *Sulcorebutia* readily form hybrids with *Weingartia* and *Gymnocalcium* and also with *Chamaecereus*. *Rebutias*, as far as we know, do not form hybrids with plants of these genera. The *Chamaecereus-Sulcorebutia* hybrids formed from crossing *Sulcorebutia tiraquensis* ♂ with *Chamaecereus silvestrii* ♀ are very beautiful plants indeed.

The fruits and seeds of *Sulcorebutia* are far closer in all respects to those of *Weingartia* and some *Gymnocalcium*. If *Sulcorebutia* needs to be submerged within a more embracing genus, then we suggest *Weingartia* or with the latter into *Gymnocalcium* would be more appropriate than *Rebutia*.

TWO UNUSUAL FLOWERS

by W. I. ACTON

Although apparently not unknown, flowers are somewhat unusual on both *Frailea pumila* and *Parodia maassii*, at least in the northern part of the country (Lancashire). Both are in fact described by Borg. However, plants of both species in the author's collection flowered in the last week of July, unfortunately during my absence from home and I am indebted to my father for the following descriptions.

Frailea pumila is normally cleistogamous; that is the flowers are self fertile and set fruit without the flower opening. In fact this was the first plant to even produce petals in some six seasons, although two year old seedlings form seed pods containing fertile seed quite profusely. The plant which flowered was four years old from seed, about an inch across and one of three in a small pan. The flower itself was about half an inch across, pale lemon yellow in colour inside and opened only in the mid-day sun.

The other plant, *Parodia maassii*, is most un-*Parodia* like in its reluctance to flower. Borg describes a flower, but this is the first occasion that the author has known a flower in this country, although plants are grown by several of his friends. The flowering plant had been obtained six seasons ago as a small seedling and is now about 3 in. high by 2 in. across, being grown in a four inch pan to protect the long hooked spines. The flower was about 2 in. across, brick-red in colour with a darker mid-rib to the petals and opened daily for three days. The flower left a seed pod covered with pale brown wool and brown bristles, although it is as yet too early to see if it contains fertile seed.

It is quite possible that these flowers are by no means unusual in the south of the country due to the extra sun and generally milder climate, but this is the first occasion that the author has encountered them in more northern latitudes.

REPORTS OF MEETINGS

19th January 1965: Mrs. M. Stillwell—Succulent Plants

We must offer our sincere apologies to Mrs. Stillwell in particular and our members in general for the several errors which appeared in our original report of this meeting (page 62 of the August issue).

We cannot allow these errors to appear against Mrs. Stillwell's name as they will appear most obviously wrong to the serious students of the genera concerned.

The description of the collector's piece *Cotyledon buchholziana* should state that this plant has bright green leaves and pink tubular flowers.

Sclerium anatomicum which flowers in the spring rests in the late summer and winter.

It is the flowers of *Cephalophyllum alstonii* which are red and not the leaves, whilst the reference to the flowers of *Dinteranthus microsperma* should state that they are yellow.

The name of the last quoted *Caralluma* was misspelt and should read *C. burchardii*.

The description of *Huernia zebrina* flowers should state that they have a centre like a chocolate drop, also known as the 'lifebuoy' centre.

With reference to the *Trichocaulons*; *T. flavum* has yellow flowers, brown edged and small and *T. cactiforme* has small brown flowers.

17th March 1965: Mr. E. W. Macdonald—The Art of Watering Succulent Plants

Mr. Macdonald quickly got into his stride, in his inimitable and entertaining style, by remarking that he was asked about watering succulents more frequently than any other aspect of their culture and he had resolved to keep a record of this matter. During the six months covering one summer, the question was put to him two hundred and thirty-two times! The various queries in this direction illustrated forcibly the many popular misconceptions about the watering of this group of plants.

Mr. Macdonald emphasized that watering is both a science and an art. Looking at the matter in a logical way, one sees that the rate of assimilation of nutrients in aqueous solution is governed by a number of factors; the size of the plant in relation to the container, the use of clay or plastic pot, the rate of growth of the plant, the temperature and the atmospheric humidity. Hence it is evident that there can be no magic formula for watering. The need for water can be gauged from the state of the soil and the golden rule is to water when the soil becomes dry, providing that the plant is in active growth. Water should be given freely when required; it is the counsel of perfection to water from the base, to ensure thorough wetting, but this is seldom possible in practice.

One has to remember that a good many genera of succulent plants are not indigenous to the extreme desert regions. That they have often been treated as such is probably because many of the cacti discovered in the nineteenth century came from Mexico. To water an epiphyte as one would a *Ferocactus* is certainly not to be recommended. In general, it is not difficult to judge when a plant is in active growth and therefore in need of water. Some genera, such as *Adenium*, indicate clearly when they are going to rest by shedding their leaves. An exception to the rule to water when new growth appears is provided by the stemless mesembryanthemums. Here the new growth is nurtured by absorption of the old bodies and watering should not begin until these latter have just about disappeared.

In the past a lot of undoubted nonsense has been written on some aspects of watering. It is certainly not necessary to have the water at the same temperature as the greenhouse and the use of rain water is not obligatory. In fact, tap water is preferable to dirty rain water. Likewise, the cult of 'lifting' the pot to see if it needs water cannot be recommended. Tapping the pot is to be preferred if a method of this sort is wanted but there is really no substitute for visual inspection.

In conclusion Mr. Macdonald dealt with watering in a number of special cases. Newly potted plants should be left dry for several days so that any damage to the roots may be given a chance to mend. Similarly, cuttings should be left long enough for a thin skin to form over the cut surface before they are inserted into slightly moist compost. When establishing imported plants, if there is any doubt as to water requirements, double potting is a safe technique. Seedling cacti and succulents require more water than their adult counterparts; for the first six months it is preferable not to let them dry out completely. The speaker summarised his advice in the comment that watering depends on observation and experience, and one learns by the number of plants that are killed off.

Mr. Middleditch (5 Lyons Avenue, Hetton-le-Hole, Co. Durham) writes to inform us that because of the diversity of his activities and consequent pressure on his time it will not prove practicable to organise the tour to the Riviera at Whitsuntide, 1966, which he had hoped to be able to put before readers.

He hopes that the tour will take place in 1967.

21st April 1965: Mr. F. R. McQuown—*Epiphyllum* Hybrids

The speaker said it was as well to make it clear at the outset that most of the plants referred to as *Epiphyllums* should not be classed as such. They are hybrids between *Epiphyllum* species and other epiphytes, themselves often hybrids. Some of the plants based on crosses involving *Nopalxochia* species contain no *Epiphyllum* strain whatsoever. He concluded his introductory remarks by saying that his talk would deal with the general culture and hybridising of these plants and not with the taxonomic aspects.

The first point which must be fully appreciated is that these plants will not respond to the same treatment as most other cacti, the so-called desert species. In habitat they are terrestrial, growing in the branches of trees, in decayed leaves and similar organic material. Consequently, in cultivation they need a compost which is a good approximation to leafmould. Mr. McQuown recommended a mix consisting of one quarter to one half garden soil, the remainder being leafmould. To this he added a four inch pot full of bone meal for each bushel of the mixture. It is also quite common practice to add manure to *Epiphyllum* composts and the Americans now tend to favour the no-soil composts. Repotting should be done in June and when this is undertaken as much of the soil as possible should be shaken off the roots.

Although these plants resent stagnant moisture they will not stand being dry at the roots. The use of the above compost, coupled with the sort of watering one usually provides for pot plants, will give good growing conditions. Mr. McQuown's experience is that plastic pots give better results than clay pots, due to the conservation of moisture. The older stems of plants harden with age and should be gradually cut away to make room for the new stems appearing from the base. Buds usually come near the middle or the tip of the stems and most abundantly when the stem is one or two years old. The main flowering period is in May and June and many plants will flower again in the autumn.

A minimum winter temperature of 35°F. is required but 40°F is preferable so that the compost may be kept slightly moist to avoid drying off the roots and shrivelling the plants. At the beginning of the growing season, in March, the watering is increased. These plants do better if grown out of doors in the summer in half shade. By mid-September, when they should be put under cover again, the stems will have yellowed but this is a sign that they have ripened satisfactorily.

Propagation by cuttings presents no difficulties. These should be three to six inches in length, to encourage the growth of new shoots from the base. Dipping into powdered basic slag helps to promote root formation but is not mandatory. The cuttings should be inserted to a depth of about one inch in dry compost and no water given for a fortnight.

Perhaps the most fascinating aspect of *Epiphyllum* culture is the creation of new hybrids and, contrary to popular belief, the principles and practice of the technique are not shrouded in mystery. It simply involves transferring pollen from the anthers of one plant to the stigma lobes of another. Whereas in general horticultural practice it is necessary to emasculate the pollen receiving flower before it opens, this is not necessary with *Epiphyllums* because they are usually self-sterile. The fruit should not be picked until it is ripe, as indicated by it turning red and becoming soft; this will occur between six and eighteen months after pollination. The seed should be sown on the surface of the growing medium, in light, and germination will occur after three to five weeks. The young seedlings thrive in a moist warm atmosphere and the speaker recommended sowing the seed in sealed Kilner jars.

Mr. McQuown concluded his talk by showing a series of colour transparencies of some of the more striking hybrids. Argus and Karl von Nicolai both have attractive pink flowers and those of June Bride are creamy yellow. Among those with flowers of deeper shades mention should be made of Mignonette, which is orange, Padre, free flowering with pinkish-purple blooms and Deutsche Kaiserin, rather similar to *Nopalxochia phyllanthoides*. Hybrids with two-tone flowers include Scherezade, salmon and pale pink, Transvaal and Sherman H. Beahm. Mr. McQuown also showed transparencies of his own 'London' series of hybrids. These included London Superb, a good plant for producing a second crop of flowers in the autumn, the crimson London Girl, London Lady with shrimp pink flowers, London Delight, a two-tone in rose-pink and salmon-pink and London Glory, deep red with a magenta centre. The recently bred London Sunshine, one of the very few true yellows, with mimosa yellow flowers, provided a fitting finale and a practical testimony to the success of the speaker in breeding exciting new *Epiphyllum* hybrids.

15th June 1965: Mr. L. F. Tookey—Less Common Cacti

The speaker began by saying that he preferred to title his talk 'Less Common Cacti' rather than 'Rare Cacti'. A number of people had tried to practice one-upmanship by claiming that a plant in their possession was the only one in cultivation but it usually turned out that, although these plants were seldom found in collections, they were by no means unique. A species difficult to obtain at a given time had a habit of becoming relatively plentiful a few years later. Mr. Tookey made it clear that his interest was in collecting and growing the less common cacti and his colour slides and informed commentary demonstrated how successful he has been in both respects.

Ariocarpus was the first genus covered. Its species present no cultural difficulties if it is remembered that they are not fossils or herbarium specimens. In the past it has been common practice to under water them and this leads to their existing rather than growing. The speaker mentioned that he had used a variety of no-soil composts for these plants and various others he would be discussing. In addition to the commercial no-soil composts of the peat-sand type he had used sand, granite chips, crushed bricks and various other media. Nutriment was provided in the form of the high potash type of 'Solufeed' applied quite liberally during the growing season. *Ariocarpus* species, in common with many other imported plants, may be rooted by placing the plant on top of an empty pot and letting the roots form in air and darkness. Among the plants shown was a nine inch specimen of *A. trigonus*, a second plant of this species with abnormally long tubercles and purple fruit, and the related *Neogomesia agavoides*. This, included in the genus *Ariocarpus* by some taxonomists, was formerly rare in cultivation but is now encountered frequently.

Further slides covered other less common species from Mexico, including a large Plant of *Leuchtenbergia principis*. This is easy to root and grow but its wonderfully scented flowers appear only sparsely. Mr. Tookey dealt in some detail with the choice miniature species of the genus *Turbincarpus*, well illustrated by a mature plant of *T. klinkerianus* only threequarters of an inch in diameter. Of this group of plants *T. lophophorioides* is the only one presenting any cultural difficulties. Other slides portrayed the free flowering *Encephalocarpus strobiliformis*, a many headed specimen of *Pelecypora asselliformis* and *Strombocactus disciformis*, which is often difficult to establish because of damage to the tap root when it is collected.

Mr. Tookey then turned to a group of plants which he said presented cultural difficulties only because they were usually treated wrongly. All the *Sclerocactus* species, *Pediocactus simpsonii*, *Utahia sileri* and *Neobessaya missouriensis* come from areas of the U.S.A. where winter temperatures down to -40°F . are experienced. Unless this group of plants is kept cold during the resting season they will not go really dormant and, therefore, will not grow and flower satisfactorily. Because of the high humidity of the English winter leaving these plants in an unheated greenhouse was not to be recommended. He had found a shed with brick walls and a half glass roof to be ideal. In addition to these species, it was his experience that *Mamillopsis senilis* flowered more freely if kept reasonably cold during the winter.

There followed a group of slides of *Copiapoa* species, *C. cinerea*, nine inches in diameter, *C. lembkei*, *C. coquimbana* and *C. grandiflora* were all impressive and it is easy to understand why the genus is rapidly gaining in popularity. The speaker remarked that the flowers of these plants appear quite suddenly, are rather similar for the various species and are not particularly impressive. Whereas many of the *Copiapoas* only produce flowers in age a few species do so when small and, among these, *C. pepiniana* is recommended.

Mr. Tookey's next topic was the genus *Blosfeldia*, whose species are the smallest of the *Cactaceae*. These plants have become more readily available of late but are seldom grown with success due to lack of understanding of their requirements. In habitat they grow in the shade in warm, dry localities and are very sparsely rooted. In cultivation they respond to grafting on *Harrisia* species and also do well, on their own roots, growing under *Zygocactus truncatus* where they get shade and are not overwatered. Various other South American plants were then featured, covering a variety of genera, most of them in flower. They included *Sulcorebutia kruegeri*, *Horridocactus aurispinus*, *H. horridus*, *Seticereus aurivillus*, *Neoporteria reichii* and *Rebutia kranziana cristata*.

To conclude his talk Mr. Tookey returned to species from Mexico and the southern U.S.A. and dealt with some of the *Coryphanthanae* and *Echinocerei*. A series of slides showed *M. wrightii* and the related *M. wilcoxii* and *M. viridiflora*, *M. macdougalii*, *M. fasciculata*, *M. aurisaeta*, *M. fusconamata* and an eight inch diameter plant tentatively identified as *M. monocentra*. The *Echinocereus* slides covered plants seldom seen in cultivation: *E. mantimus*, *E. scopulorum*, *E. monocentra*, which flowers from the base of the plant, and *E. perbellus*, with double flowers.

REPORT OF SHOW (continued from page 69).

P. V. Collings Cup for Euphorbias—S. W. Young

Mrs. Luty Wells Cup for Three Cacti—J. W. Pilbeam

Mrs. Pryke Howard Cup for Six South African Succulents—Mrs. T. Watt

Challenge Shield for Juniors under 18 years—G. A. Page

W. Denton Memorial Medal for Six Stemless Mesembryanthemums—K. H. Walden

Banksian Medal Presented by Royal Horticultural Society—Mrs. J. A. Wells

Amateur Gardening Silver Bronze Medal—S. W. Young (for Group)

Amateur Gardening Award of Merit—Mrs. T. Watt (for Specimen Succulent)

Amateur Gardening Diploma—J. E. Taylor (for Nine Cacti)

Amateur Gardening Diploma—K. H. Walden (for Six Lithops)



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SOCIETY NEWS

<i>1965</i>	<i>Subject</i>	<i>Lecturer</i>	<i>Table Show</i>
Dec. 7	Member's slides	By invitation	—
<i>1966</i>			
Jan. 18	Seed raising	Panel and Discussion	—
Feb. 22	ANNUAL GENERAL MEETING	6.30 p.m. for 7 p.m.	—
Mar. 22	Habitats of Succulents	A. W. Squire	Seeds sown 1965

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RIPPLES

At the foot of page 60 of our last issue there appeared a reference to natives eating shredded *Trichocaulon* to clear their throats of phlegm. Dr. Geyer was prompted to write:—

'*Trichocaulon piliferum* occurs in the Little Karoo, but is fairly scarce, partly due to the fact that the coloured farm labourers are fond of it. They assure me that, if one is away in the veld with no chance of being home for lunch, nothing stills one's hunger so completely as a piece of peeled 'ghaap' (i.e. *Trichocaulon*).

Years ago I called on a clergyman in this area, a great pipe smoker, and expressed my surprise at seeing a *T. piliferum* stem lying on a plate on his desk. In reply he cut off a slice, and said, 'Put this in your mouth, then light your pipe.' I did, and then I could understand; the tobacco smoke had a really delightful, sweet taste, difficult to describe.

Let me hasten to add that I do *not* cut up my few *T. piliferum* plants in order to get more pleasure out of my pipe!

Dr. Geyer has frequently supplied us with information (as well as seeds) in the past but this is quite a new angle on the economic uses of succulent plants.

We are always pleased to hear from you Dr. Geyer.

A.W.H.

This issue brings to a close Volume 27 of this Journal and the time will soon be near for a renewal of subscriptions. The Honorary Treasurer will be pleased to receive renewals at any time. Additional members will be welcome and every addition to our numbers will make it easier for us to carry out our plans for giving our Journal even greater appeal.

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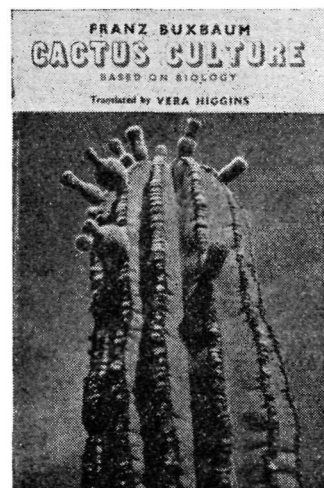


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