

The *Cactus* and
Succulent Journal
of Great Britain

Established 1931

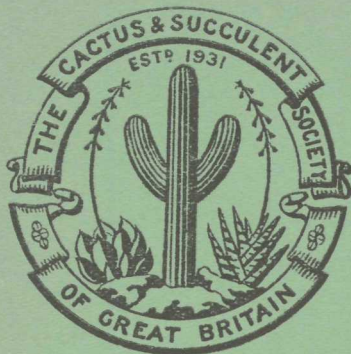
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Editorial

FEBRUARY seems perhaps a little late for new year wishes and yet I feel that for gardeners and cactus growers January is not really the start of a new year. Some people might say it starts in October with the arrival of the seed catalogues but I feel that for the cactus grower at any rate, March is perhaps the real beginning of our year, when we begin to see our plants starting into growth and when most of us get down to repotting and watering in earnest. Therefore I take this opportunity to wish all our readers a happy and successful year with their collections. May their seedlings flourish, their plants bloom freely and all their pests perish!

I have recently been browsing through some of the older journals and in an article by Gordon Rowley on the eighteenth century botanist Richard Bradley and his 'History of Succulents' (1719-1727) I came upon this paragraph which contains a grave warning to careless editors:

'The book as it reached the public was unfortunately marred by errors of plate numbering and binding . . . five of the plates were misnumbered . . . and it is these transpositions which have led to confusion and often peculiar mistakes. For instance, contemporary colourists based their tints on the adjacent text rather than on live plants and thus gave us a white "*Crassula coccinea*" and a "*Crassula tetragona*" with blooms of a "beautiful carmine colour", the plates 41 and 50 being switched in relation to the text. Even Haworth failed to spot this and made a variety "floribus albis" of his *Larochea coccinea* for this botanical chimaera that never existed outside an artist's studio'.

I trust I shall never be the cause of the naming of a non-existent species or variety!

During the same browsing, I came upon the articles written in 1953 and 1954 by the late Howard Gates and it was surely more than a coincidence that when I met Mrs. Shurly at our December meeting, she told me she had been going through our late President's correspondence with Howard Gates and thought that it might be interesting to publish some extracts. She has been kind enough to entrust me with these letters and I hope to publish extracts from time to time. The first appears in this issue.

E.M.D.

Notes and News

Mr. A. J. Edwards

It is with regret that we report the death of Mr. A. J. Edwards who was one of the early members of the Society.

He was elected to the Council in October, 1947, and appointed Chairman in February, 1950, a position which he held until February, 1957.

Mr. L. E. Newton

One or two members have received letters from Mr. Newton, who seems to be settling happily into his new surroundings. He has made several excursions up-country and has come across a number of succulent plants about which we shall no doubt hear more in due course.

Annual Dinner

This function was held on the 26th November at the Shaftesbury Hotel in St. Martin's Lane when we had a very happy reunion with more opportunity for social chat than is possible at the monthly meetings. After the meal, we broke away from cacti entirely and were entertained by Mr. Byford a friend of Mr. Collings, who showed us a very interesting set of slides of Nigeria where he had spent a period as Education Officer.

Stichting I.T.S.S.

The first two years of this non-profit making International Seed Exchange proved highly successful, and this season is expected to be even better. The last list contained nearly 1,150 items, many never before offered. The Foundation has sent over 2,000 portions of seeds to Eastern Europe free of all cost, even postage, because although they are as interested as the rest of us, they just cannot send monies out of their respective countries. Stichting I.T.S.S. also financed a collecting expedition to Curacao this year, and seed from this expedition will be offered in the 1967 catalogue.

Mr. Cyril A. E. Parr, 30 Wray Crescent, London, N.4, England is the sole agent of the Stichting I.T.S.S. for Great Britain and the Commonwealth, and for the United States of America, and collectors in these areas should let him have their names and addresses as soon as possible so that they do not miss the seed list. The patron's fee is 2s. (30 cts.) annually, but as it is costly to send small sums by post, this can be added to their seed order when sending. Correspondence cannot be entered into, and if a receipt is required please enclose stamped, addressed envelope.

Results of Table Shows 1966

1st, Mrs. B. Maddams; 2nd, R. H. I. Read; Equal
3rd, Miss E. M. Drage and Mrs. H. M. Guirl.

Mr. E. W. Young

Would members please note Mr. Young's new address (see inside front cover) where all correspondence for him should be sent. By the way have you paid your sub. yet?

Would subscribers to the journal only, please note

that as from February 1968 the subscription will be 15/- per annum.

Publication Dates

As we are hoping to get the Journal out the first week in the month in future, will contributors please note that the last dates for the receipt of copy will be as follows: February Issue: 15th December. May Issue: 15th March. August Issue: 15th June. November Issue: 15th September.

Cultivation Notes

Cacti—A. Boarder

BY the time this journal reaches you another growing season will be commencing. No doubt many members will have sown some of their cactus seeds already. I always like to get mine in as soon as possible after the turn of the year. I have found that if I can sow in January, perhaps towards the end of the month, I get very good results. I can regulate the temperature better then and the seedlings can be transplanted and grown on to a fair size before the following winter. This has not always been possible if the seed catalogue has not arrived until March. This season I had one seed catalogue before the end of November and so I am hoping that my order will reach me in time to get some seeds in much earlier this year.

You will be noticing that some of the cacti will be showing signs of growth towards the end of the month. These plants can have a little water but just because some are growing it does not signify that all the plants in a collection must be watered. This first watering must be done thoroughly. It is of little use just giving a little drop, as this is not likely to damp all the soil in the pot. Many growers immerse their pots for the first watering and this can be a good way to wet all the compost in a pot. I saw some correspondence from a reader of a gardening magazine recently where it was stated that the only way to water cacti was from below and that they would die if watered from above. I have been watering cacti since 1905 from above and still have at least one plant I started with. My objection to continually watering by immersing is that in time all the soluble nourishment will be washed out of the compost. To allow a pot to soak up some water from below and then when it is lifted up no water runs out, this is not so harmful. However, how could anyone with a thousand plants in pots, as I have, immerse them all for watering during the hot weather?

The same correspondence informed me that on the authority of a successful exhibitor it was necessary to stop any cactus plant from flowering if it was wanted as a specimen for exhibiting. Now this is a new one on me. When I judge a cactus show I examine all cacti which I can expect to flower in this country, to show signs of flowering. I look for buds, flowers, dead ones

and seed pods to signify that such a plant is growing healthily and so flowering. The R.H.S. guide book for judges states under 'Cactus and other Succulents'—'Other points being equal a plant in flower will be preferred to one which is not'.

Taking the advice from this so-called expert, I am wondering how a healthy growing cactus plant is to be prevented from flowering. All cactus flowers with the exception of the pereskias, have no flower stalk or stem. The ovary or seed pod is securely joined directly to the parent plant. It would be quite impossible to remove most cactus buds without causing some damage and probably some bleeding of sap. On many cacti, bad scars would develop if a flower bud was forcibly removed. One can therefore wonder how people get such queer ideas; but when we consider what strange ideas have existed for many years I suppose that this is no more strange than some of the others.

When one talks to other growers of cacti it is surprising how much one can learn. I have found that on many occasions I have met a person who grows and flowers a particular plant better than I may have done. It is quite usual to hear a member say that he or she has flowered and grown a certain plant with no trouble whereas another member states that such a plant has always been a problem one and never flowered for him.

I have now formed quite a different view of these so-called difficult plants. For the past thirty years or so I have specialised in *Mammillarias*. After some years I found that as some of the rarer plants were difficult to keep I had better try to keep two of each species. With this in view I have, over the years, got together a number of duplicates. As is generally known, practically all my plants have been raised from seed by me. In consequence I have tried to keep two plants from each sowing. Now as these plants were grown and kept under the same conditions, it has been an eye-opener to me to note the very marked difference in size and flowering propensities between the two plants.

Some years ago I raised a few seedlings of *Mammillaria canalensis*, I kept two plants for myself and have grown them on to all outward appearances in exactly the same conditions. One plant is now five inches high and as

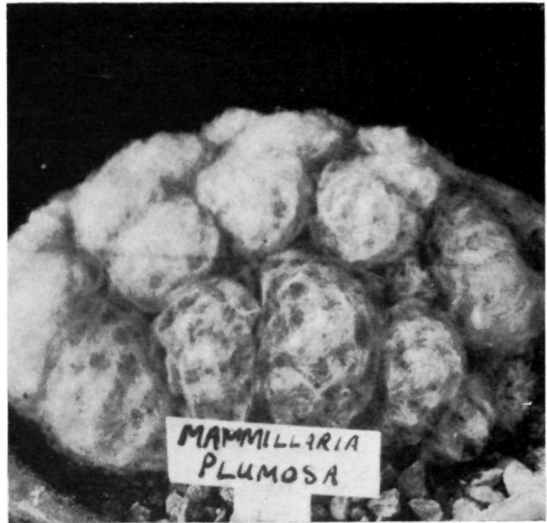
wide whilst the other is only three inches high and wide. The larger plant has flowered and the smaller one has not. Another *Mammillaria* is *M. guirocobensis*, one plant is three and three quarters inches wide and four and a quarter inches high. Another raised from seed at the same time and grown in a similar manner is only two by two and a quarter inches. Again the larger one has flowered whilst the smaller one has not. In each case if I had parted with the plant which grew faster I would have thought that my plant was not doing well and the member who had the other plant and flowered it would have seemed to me to have better growing conditions than I had.

From this I have learnt that all the plants from one sowing are not likely to grow at the same rate and flower at the same time. I find that this trait is more marked in the *Mammillarias* than in many other genera. It is possible to have a row of seedlings pricked out which were all sown and raised under the same conditions and yet there is usually a marked difference in the rate of growth between individual seedlings. I have noticed this repeatedly in many species as well as the two described above. It will now be necessary to ignore comparisons with other growers if their plant grows better than yours as the one plant might be the slower growing one and the rate of growth has nothing to do with the treatment it has had.

My *Mammillaria plumosa* is in flower and this is about the same time of the year when it flowered before. Three flowers on one head opened on 4th December. The plant has over a hundred heads, many rather small. There are several heads as big as the one which is in flower but they show no signs of buds. Why one head alone should flower is rather a mystery. I had thought that the plant would not flower this season as there had not been a lot of sun, but flowers have certainly appeared and so the amount of sun may not be the deciding factor regarding flowers on some cacti.

I have noticed a *Mammillaria zacatecasensis* seedling showing two advanced flower buds and this is from seed sown on 26th February, 1966. The plant is not more than half an inch across and is one of the squat types of *Mammillaria* with short hooked spines. This appears to be rather a freak flowering, but I have noticed very early flowering of other similar types of *Mammillaria*. Others I have flowered at a year old are *M. bullardiana* and *M. monanctristra*. The strange thing about *Mammillarias* is that they should differ so much in the frequency of flowering. With other plants of the vegetable kingdom one finds that all members of a particular genus will flower at about the same time, but with *Mammillarias* this is not so. Many of my *Mammillarias*, although many years old from seed have yet to flower and yet they get the same treatment as others which flower every year without fail.

I mentioned earlier in this article that I had received a seed catalogue from Germany and I am very glad to



say that I have already received all the seeds I ordered. This is the first time in 45 years that I have had my seed from abroad before the end of a year, and it is now the 5th of December as I write. I shall hope to get the seeds sown by about the middle of January. Some of the seeds I sowed this year rather later than usual are still in their seed pans. Others which were sown earlier and pricked out in June are now quite nice plants, showing all their characteristics. I have found over the years that I can do much better with my seedlings when the seeds are sown in January.

I always like to mix my own seed compost but this is done according to the John Innes formula. I know that this is a universal formula but the type one is able to buy does depend a great deal on the type of loam and sand used by the mixer. I sterilise the loam and then make my mix, and find that my results are quite good on the whole. Any seed I sow which I have collected from my own plants usually germinates one hundred per cent, but that which I get from abroad can vary considerably. I had some seed from abroad which was unnamed and just had a number. It has been very remarkable that among seedlings from the same packet have come plants with very varied characteristics, especially in spine counts. Not only that but in a batch of six seedlings are plants with no radials, some with a few and others with many. The number of central spines also varies. From this I conclude that the seeds could have been collected from a plant which was a hybrid and so this would account for the varied forms among the seedlings. Although I have often sown seeds with just a number I do not recommend this method to members. I have done this for very many years and I have yet to find the correct name of any of the many kinds I have raised with a number only. I have even been supplied with numbered seeds and later been told

by the supplier that such a number has never been sent out by that person. However, some of these numbered types have proved to be very rewarding plants and find a permanent home in my collection.

I still find that the difficult Mammillarias I have put into plastic pots have all responded to the treatment, and this is not because they have been repotted into fresh soil as this had been done on several occasions before. Providing care is taken with watering there appears to be little doubt but that most cacti grow better in these pots than in clay ones, as long as one does not over water. If cacti needed watering every day in warm weather in the growing season when in

clay pots, I suggest that the same amount of water would do for three days when plastic pots are used. Of course the whole secret of watering is to water well at the time so that all the compost is thoroughly wetted and then to refrain from watering again until the soil has dried out. Cacti are probably the most difficult plants to water, as ordinary plants with leaves show immediately by drooping leaves when water is needed, and as long as one never waters an ordinary pot plant until the leaves start to droop the plant will be kept in good conditions.

See that plenty of fresh air is available for all plants in frames and greenhouses as without this the plants cannot grow healthily.

Cultivation Notes

Other Succulents—Mrs. M. Stillwell

WRITING these notes on a rather grey December day, I have been wondering how many people really concentrate on plants that will flower during the winter. I always expect a nice splash of colour around Christmas time from my *Cerochlamys pachyphylla* with its large purple flowers. This is a rather large growing stemless mesembryanthemum, with brown-green waxy leaves. It is a native of Cape Province, and quite easily grown; mine is now in a seven inch pot, and flowers regularly every year. I believe there is also a white flowered variety, but I have not yet come across it. Another plant usually in flower at the same time, is *Trichodiadema densum*, with rather more carmine in the colouring. Most of the other *Trichodiadema* flower in the spring with me. They are best if cut back after flowering to allow new growth to shoot up from the base, or they will soon become very untidy. I find the cuttings often take quite a long time to root, and it is often better to grown them from seed. At this date I still have a number of *Lithops*, *Argyrodermas*, and *Conophytums* in flower, but it is not wise to water much at this time, unless a plant looks really in need of it. Many of the *Gibbaeums* are either out, or in bud, and as most of these are in the pinks and purple range they, too, show up well in the winter. I water these if we get a nice sunny morning, when they show signs of shrivelling slightly; otherwise I leave them dry. A particularly nice one which flowers easily is *Gibbaeum pilosulum*. The pale green bodies are covered with fine white hairs. *Antegibbaeum fissoides* is also well budded by Christmas; the flowers take a long time to develop but are worth waiting for in the spring. I like to repot the *Gibbaeums* towards the end of the summer, just at the beginning of their growing season, but they will probably only need it about every third year, if adult plants. Try to keep that nice hard looking natural growth, and do not be tempted to feed them to obtain

larger plants quicker, or they will get far too lush looking and will not flower for you. *Acrodon bellidiflorus* is another low growing caespitose mesembryanthemum that has grown very well this year, and still has a number of its large white flowers, with the pink stripe running down each petal, and giving a very pleasing effect. It should be treated the same as the *Stomatiums*, and can take a fair amount of water. I have also in flower now, a very pretty little hybrid *Crassula*, known as *Crassula corymbulosa* 'royal purple'. It has the same characteristics as the ordinary *corymbulosa* but with a most attractive light purple flower. A large pan of *Crassula lactea* makes a nice pot plant for the house, during the winter with its tall stalks of dainty white flowers. Most of the *Crassula* family are at their best during the autumn and winter, and will need a little water from time to time; also keep a sharp look out for mealy bugs as these seem their favourite plants, and as one should not use Malathion on *Crassulas* it is quite a problem to get rid of them, especially on such plants as *Crassula corallina*, where you have to look really close even to spot them.

Do not be in too much of a hurry to prick out any seedlings that have remained in the seed boxes through the winter. They resent being disturbed too early; unless you are a real expert, it is far safer to wait until the end of March at least, when we should expect more sunshine; then they will get away much quicker. Seedlings always seem to grow much better in the company of others, rather than in individual pots.

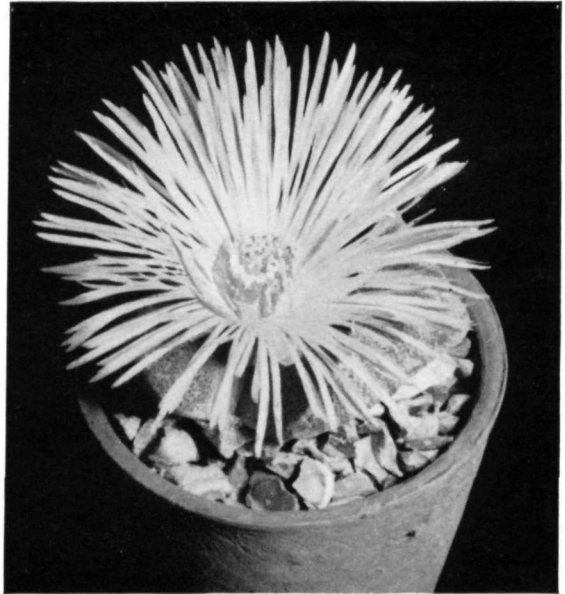
Plants that shed their leaves during the winter, such as *Jatrophas*, *Adeniums*, etc., should on no account be watered until they show some sign of growth from the growing centre. Just watch them carefully until the right time comes round. These are the plants that usually require that extra bit of warmth in the winter, that so many of us find it difficult to maintain; many

such as *Monadeniums*, etc., would probably be in much better shape with a temperature constant at 55° to 60° in the cold periods, and if you have a warm corner that you could shut off and keep especially for those plants that require more tropical conditions, it is something well worth considering for another year, as so many valuable plants get lost during the winter through damp cold conditions. Many of our plants of course would not tolerate these high temperatures, they would grow out of all proportion, and you would of course have to make sure that only the more delicate and difficult plants were placed in this section. By studying their native habitats you would find that the nearer they grow to the equator the more warmth they would require in the winter.

By February *Pleiospilos nelii* should be showing its buds, but keep it dry until the flowers are almost out, or the inner two leaf bodies will swell and crush the flower buds out of existence. The plant should be grown in the sunniest position possible. I have found that it can be very temperamental as regards flowering, and will only flower for me one side of the greenhouse. A year or two ago I shifted all the *Pleiospilos* to the other side including *P. nelii*, and the following season it refused to flower, so I placed it back in its old spot and have had no trouble since. I have another plant of this which I still leave with the other *Pleiospilos*, but although it gets plenty of sun, and just the same treatment, it still refuses to flower. If you have difficulty in getting this plant to flower, try it in a different position each year until you discover the right one, and then let it remain there. The lovely salmon shaded flowers are very attractive and last for several days. The gem of the species is perhaps *Pleiospilos hilmaris*, very small growing, and could almost be mistaken for a *Lithops*. *Pleiospilos* are very easily raised from seed, and will often flower the second year. They need a very coarse sandy compost without leafmould as when grown too lush, they are very prone to rot if over-watered. I prefer not to use plastic pots for these plants which tend to grow far too quickly, and do not keep true to type.

During this last few years I have had an awful lot of cracks appearing in the greenhouse glass, for no apparent reason, but now I am convinced it is caused by these low flying jet planes which are continually in and out of London airport every few minutes, for we seem to be in line with the main runway. The whole place vibrates and shakes every time one goes over, and it can be an expensive business having to keep replacing cracked glass. Bigger and better jets are going to bring more and more hazards to contend with.

One of the first jobs to do at the beginning of spring is to make a thorough individual inspection of all the plants. Pick up each one, remove any dead leaves, bugs, etc., and give the top soil a good stir up, as it usually gets very hard and caked during the winter. It will then be ready for its first real watering of the



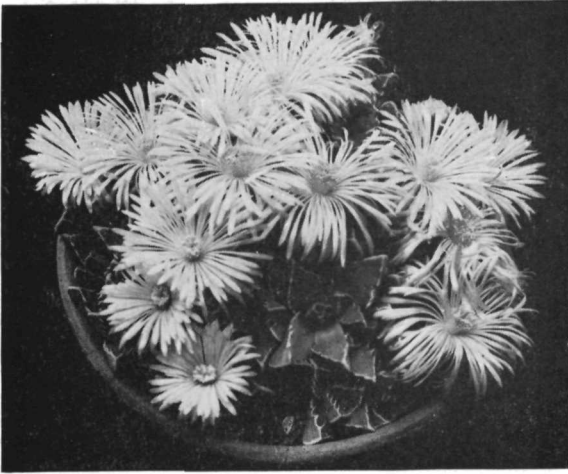
Pleiospilos nelii

season. I always make sure that this first real watering is really thorough, by immersing the whole pot in a bucket of water until the bubbles stop. You can be sure then that the whole root system is really wet, and when one has a lot of plants it is much quicker than standing the pots in water and allowing them to soak up the water at their leisure, although I have no doubt that this is the ideal method where it can be practised. Do a few plants at a time if it is early in the season, as too much dampness in the house at once can lead to trouble. Choose a nice bright morning, when you can open the windows enough to get a good current of air, to ensure the plants will dry out a bit before night fall. I shall continue to give my *Conophytums* one good soaking about the end of March. I was told that they would flower better if kept dry right through until July, so last season I did not give them their usual spring watering, and on the whole I felt that they did not flower so profusely as when they had had it. Small *Conophytums* with only one or two heads, always seem to grow much better if planted together in a seed pan, rather than in separate pots. They do not dry out so quickly. Large clumps can stay in the same pot without disturbance for several years, but once the centres start to dry up and stop flowering, they should be broken up, and the new outer growth grown on. I find an excellent rooting mixture is coarse sand and vermiculite, kept damp and in a shady place under the staging. Do not attempt to break up *Conophytums* until about July.

Let us hope that the New Year will bring good growing weather, and plenty of flowers.

Beginner's Corner

W. I. Acton



Faucari integrum

ASTROPHYTUM MYRIOSTIGMA is a spherical or eventually cylindrical plant which usually has five deep ribs. There are no spines, but the body of the plant is completely dotted with small white scales giving it a pale grey appearance. Large yellow, funnel-shaped flowers are freely produced from near the growing centre. Coming from hilly ground in Mexico, this plant requires a rich but rather more porous soil than is usual, and plenty of water in warm weather is appreciated. If dry it is fairly hardy in winter. There is a

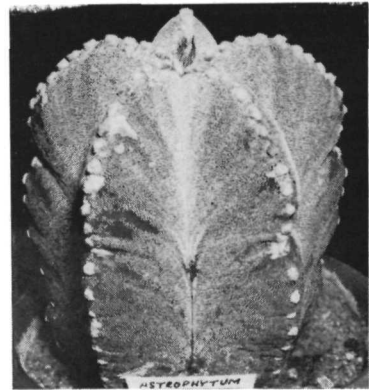


four-sided variety known as the 'Bishop's Cap' cactus, and also varieties with six to eight ribs. Photo : D. Collings

FAUCARIA is a low growing, very succulent plant with four pairs of leaves arranged cross-wise around a short stem which soon branches to form a clump. *TIGRINA*. The leaves are entirely covered with very small white dots giving them a grey green appearance, and the edges have soft teeth which end in hairs facing into the centre of the plant; hence the popular name 'Tiger's Jaw'. *TUBERCULOSA*. The upper surfaces of the leaves are covered with raised white warts, and the edges have soft teeth which end in hairs facing into the centre of the plant.

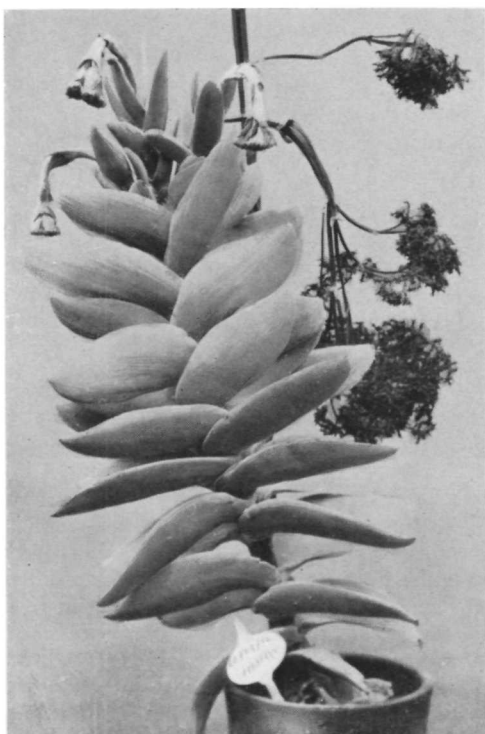
The large yellow flowers are produced freely in the autumn, opening in the afternoon for several days. Cultivation is easy with the growing period autumn to early winter, when a little warmth is required. *Faucarias* grow readily from seed, usually flowering in their second season, but as they hybridise easily propagation from cuttings is recommended. Many hybrids are sold as named species, but these can usually be recognised by a lack of white dots-warts on the leaves and poorly developed teeth.

Photo : W. Beeson

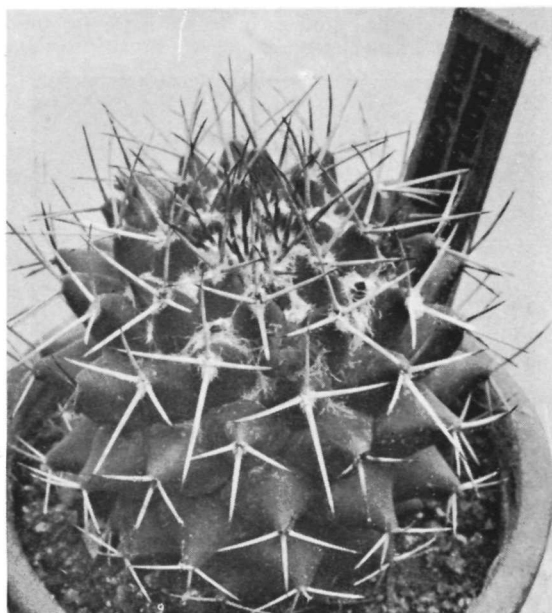


REBUTIA MINUSCULA. This is a plant which should not be omitted from even the smallest collection on account of the striking red flowers which are freely produced around the base of the stem. Individual flowers are about an inch across, opening in the daytime for about a week and are produced in succession during spring and summer. It is a small globular plant with low tubercles arranged into spiral ribs, and freely makes offsets around the base when older. The short bristle-like spines are white. *Rebutias* grow well given a rich open soil with plenty of water in warm weather and cool dry conditions in winter. They are very easily raised from seed and will flower after only two years when the plant may be no larger than the flowers.

COTYLEDON UNDULATA has a thick erect stem which usually remains single. The flat fleshy leaves have a thick white waxy coating and a curious wavy outer edge. Young leaves are carried vertically, but incline towards the horizontal with age. The flowers are reported to be orange and bell shaped. A rich open soil is required with plenty of water in summer and cool drier conditions in winter. Older plants tend to become leggy due to the lower leaves dying but if the plant is beheaded, the top may be treated as a cutting, and further cuttings are usually produced by the stump. *Photo: A. S. Jones*



MAMMILLARIA HIDALGENSIS is one of a small group of Mammillarias of the familiar 'pineapple' appearance but with clear sap. It is a solitary dark green plant, globular when young, but later growing cylindrically. The body is covered with conical tubercles arranged spirally and these are tipped by four spines arranged crosswise. There is abundant white wool in the growing point at first, but the body later becomes bare. Carmine-red flowers are produced in a ring around the top from between the tubercles of young growth. It is an easily grown species given a rich open soil, plenty of water in summer but drier conditions and a little warmth in winter. *Photo: G. A. Burton*



CRASSULA FALCATA (also known as Rochea Falcata). A native of South Africa, this plant has grey-green sickle-shaped leaves about four inches long. They are arranged in opposite pairs cross-wise around a thick vertical stem, which is almost completely hidden. A much branched flower head is produced from the centre of larger plants in summer. Although the individual orange-red flowers are rather small, they are produced in such numbers as to give the plant a strikingly beautiful appearance. After flowering the plant breaks into two or more heads and this tends to spoil its symmetrical appearance, but the new shoots root readily if treated as cuttings. Single leaves will also root and grow well. This species makes a good house plant, but tends to become leggy if not given full sun. *Photo: Dr. E. Elkan*

Stapeliads — Part 4. The Rarer Stapeliads

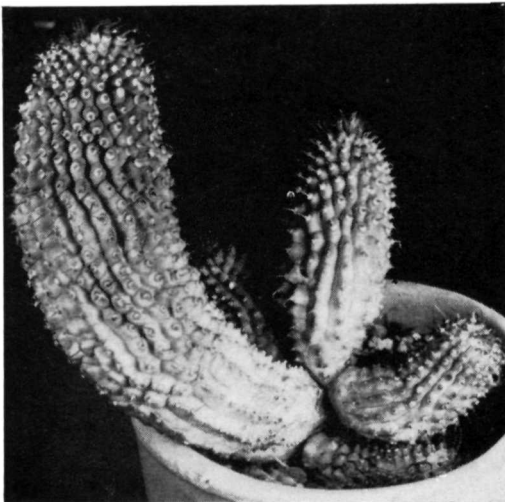
Margaret J. Martin

The last in a series of four articles on the members of the Stapelieae. For the succulent plant lover this is the most important tribe of the Milkweed family.

Stapelianthus madagascariensis was my first encounter with one of the rarer *Stapeliads*, a miserable, brown plant that seemed to be a source of attraction for all the mealy bugs in the greenhouse. Eventually the mealy bugs proved too much for it; I never felt the urge to buy a replacement. *S. madagascariensis* comes from Madagascar and like many plants from this island needs a higher winter temperature than the succulents from South Africa. It also needs very careful watering. The flowers are said to be dark purple and bell-shaped.

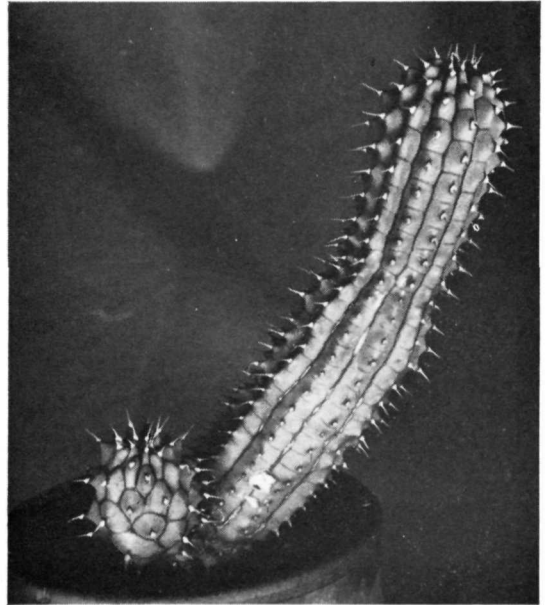
My next experiment with the less common *Stapeliads* was a little surprising. I bought a young seedling of *Hoodia bainii*. This grew with surprising vigour and began to cluster from the base. Then to my amazement the seedling *Hoodia* produced a large bud at soil level. When the bud opened, all was explained. My *Hoodia* was *Tavaresia grandiflora* (now re-classified as *Decabelone*). The bell-shaped flower was pale yellow with brown spots.

Decabelone are found in South West Africa and the Karroo desert. Jacobsen mentions a minimum winter temperature of 70°F. but my own specimen lived for several years in the greenhouse with the cacti before succumbing to one of those mysterious diseases that seem to afflict stapeliads. It died during the summer so its departure was not obviously due to a winter at 40°F. The stems of *Decabelone* are deeply grooved, the angles are 'toothed' and each 'tooth' has three tiny bristles.



Trichocaulon pilifera

Photo : Miss M. Martin

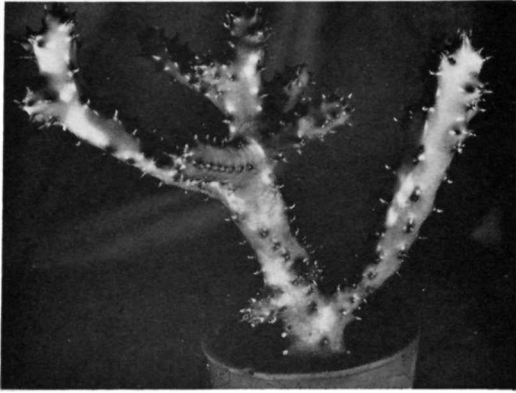


Hoodia Bainii

Photo : Miss M. Martin

Eventually, I obtained a seedling *Hoodia bainii* and the habit of this plant even as a seedling was quite different from that of the *Decabelone*. The main stem rapidly elongated and the side-shoots were formed along the stem and not from ground level. *Hoodia* have to become quite large before flowering and my plant has obviously a long way to go. *Hoodia* are natives of South and South West Africa. The stems may reach a length of three feet and the flowers are carried on the ends of the stems. These are either bell-shaped or flat. *Hoodia* require a higher winter temperature than many of the stapeliads.

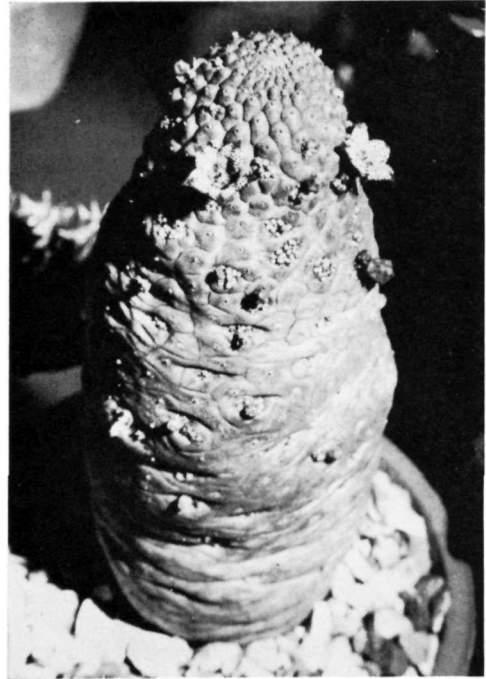
Edithcolea grandis was given to me as a seedling a couple of years ago. This has grown rapidly and is now a much branched plant about nine inches high. This *Stapeliad* spends its winter in the propagator. Although some writers suggest a dry winters rest for this plant. I find that my own specimen grows vigorously during the winter. I water *E. grandis* all the year round. The rather pale winter's growth soon colours up when the plant is moved into the greenhouse during the summer. The stems become a glossy green with bronze markings. *E. grandis* is found in East Africa. My own specimen has not yet flowered but according to Lamb the flowers are over five inches across.



Edithcolea grandis

Photo: Miss M. Martin

To conclude, the genus *Trichocaulon* is probably the only remaining one of the rare *Stapeliads* that the average collector can hope to obtain. I have had a couple of imported plants but after a year or two they have shrivelled and died. *Trichocaulon* are found in South and South West Africa. They have thick, fleshy stems and are much slower growing than the other stapeliads. The tiny flowers are formed in clusters towards the ends of the stems. *T. grande* and *T. officinale* appear to be the tallest growing species. The former reaching a height of two feet. Most other *Trichocaulon* appear to be around six inches high.



Trichocaulon similie

Photo: Miss M. Martin

What Shall Be Done Now ?

by Prof. Dr. Franz Buxbaum, Judenburg, Austria

IN their article on the reunion of *Neoporteria*, Donald and Rowley have discussed the question, what now, in the 'post Backebergian' era will happen in cactology. These authors are of the opinion that now the pendulum will turn to the other side and a reunion of the superfluous genera will take place.

This is true, indeed, but the reunion is not the essential point. Therefore these authors overlooked the fact that they, themselves, continue the Backebergian era—with reverse signature. Actually we can observe this fact by their table of characteristics of the genera which they unite to *Neoporteria*. All these characteristics are suitable neither to separate nor to unite genera! For all these 'characteristics' contain only the insufficient details of the equally insufficient 'diagnoses' and the table does not contain any of the really essential and necessary characteristics, either of the inner morphology of the flower, or of the seed.

As long as insufficient 'descriptions', i.e. words only, are used for taxonomic conclusions instead of exact examinations, the 'Backebergian era' will not be finished!

As an example of union, Donald and Rowley have cited the revision of the genus *Ariocarpus* by Anderson. This is an excellent example, indeed! For the reunion of *Ariocarpus*, *Roseocactus* and *Neogemesia* was the result of classically exact examinations of all parts of the plants including all details of anatomy, too. Therefore there cannot be any doubt about the correctness of this reunion. This, indeed, is an example, how the 'post Backebergian era' must continue.

If Rowley had remembered my lecture on the evolution of the Tribe *Notocactae* at the I.O.S. Congress at Vienna, he would necessarily have known that *Pyrrhocactus* in the correct sense of A. Berger, i.e. with *Pyrrhocactus straussianus* as the type-species, is the 'genus primitivum' of the whole tribe (over *Corryocactus*, which is the 'genus promordioides') and thus this genus (correctly its 'morphological typus') represents the origin of all further lines of evolution of the tribe. Therefore, *Pyrrhocactus*—in the correct sense of A. Berger and not in F. Ritter's sense—MUST remain a separate genus.

On the other hand Rowley would know that I had

shown in my lecture that, originating from *Pyrrhocactus sensu stricto*, a separate Line *Islaya*—*Pilocopiapoa*—*Copiapoa* has developed without connection with the *Neopterteria* line. This '*Islaya* branch' has nothing to do with the Chilean '*Neopterteria*-Branch' and therefore *Islaya* cannot become united with *Neopterteria*.

The genus *Neopterteria* itself shows the origin of most mistakes in the cactus-taxonomy. These mistakes have been made because newly discovered species have been put into a genus without exact comparison with the essential characteristics of the type-species of the genus. Thus species have been put into a genus which do not correspond with the essential characteristics but, perhaps, may be somewhat similar in the outer shape. This method was typical for F. Ritter's 'emendation' of *Pyrrhocactus*. In this way later 'new species' have not been compared with the true type species, but with any of these incorrect '*Pyrrhocacti*' and the 'genus' *Pyrrhocactus* became more and more a 'hodge-podge' of species. Donald and Rowley's reunion of *Neopterteria*, too, is such a hodge-podge.

My examination of the tribe *Notocacteae* which I had discussed at the I.O.S. Congress at Vienna is now so far

completed that the genera *Notocactus* and *Parodia* separately are in print in 'Krainz, Die Kakteen' and the manuscript of the general revision of the tribe is in preparation. If Donald and Rowley had asked my opinion, I would have given to them every information on this matter. For we are members of the I.O.S., and it is my opinion that the I.O.S. members should help each other as well as possible.

Therefore, once more: What should be done now? Every taxonomic work on cacti essentially must unconditionally be based on the most exact examinations and on a profound knowledge of the morphology of cacti. It is, and always will be, essential to use the 'dynamic method' to distinguish convergences and true relationships. Also, only this method can and will show that the evolution of the cactus family is not a 'net-work' of lines but, on the contrary, consists of rather clear lines of evolution. Only in this way will it become possible to get clearly defined genera, as *Ariocarpus* now is.

And finally there must be a better co-operation between the members of I.O.S. Otherwise, this hopefully founded organisation will become useless!

We Agree To Disagree

How to turn a Hodge-Podge into a Hotch Potch—by J. D. Donald and G. D. Rowley

PROFESSOR Buxbaum will by now have seen Part II of our paper on *Neopterteria* which pays due credit to his very excellent work on this genus and answers most of the points he raises. Our main difference seems to lie in the weighting of characters and in particular on how far a 'dynamic system' based on 'primitive' and 'advanced' characters is possible in Cactaceae. In this family in particular, some features may remain quite stable (as perianth form) while others independently evolve up or down (ovary immersion and armature) so that, in absence of fossil remains, it seems hazardous to name any living genus as primitive or advanced. Buxbaum attaches high importance to the characters of the seed—a valuable addition to knowledge, but surely just as prone to convergence or parallel evolution as any other character. By all means let us have phylogenetic systems—and Buxbaum's is probably better than any other—but let us accept them as individual interpretations, of which there could be as many different as there are different botanists! Until Professor Buxbaum agrees that there could be other interpretations of cactus phylogeny than his own, the plea for closer co-operation loses validity. The most we claim to produce is a phenetic system: a very different proposition, in which all the data are sifted mechanically to show maximum numerical correlations, and subsequent speculations on the possible course of evolution are incidental only. Here all characters are treated as far as

possible as equal without any quasi-philosophical theories on which are 'essential' or not.

Incidentally, we cannot accept either the view that if *Pyrrhocactus* s. str. is ancestral to the group it must be retained as a separate genus. We define genera on character aggregates, not on evolutionary concepts.

We cannot allow Professor Buxbaum's categorical denial of the very close relationship between *Islaya* and *Neopterteria* (sensu Don. and Rowl.) to go unchallenged. We remember with pleasure the fascinating, even if controversial, lecture on the evolution of the tribe *Notocacteae*, but recall remarking at the time that we would have been happier, if the evolutionary lines as proposed could have been supported by the detailed study of other characters than the seed and by a more convincing study of a larger number of species, particularly of the newer discoveries, within each genus. If the Professor has now done this in his draft manuscript, which we look forward to seeing in print, we would be only too ready to acknowledge our errors if proved wrong. Our studies on a large number of species of *Islaya*, *Nichelia*, *Neopterteria*, *Pyrrhocactus* and *Copiapoa* gave a much larger selection of characteristics to use over the above those shown in Table 1. Preliminary checks with this large sample showed that *Copiapoa* did not appear to be closely related to any of the other genera studied including *Islaya*. The check showed also that the larger sample did not grossly affect the outcome

of the relationships, and so to ease the arithmetical processing, fewer characters were used. A strong relationship was found between *Islaya* and *Nichelia*, *Islaya* and *Thelecephala* and *Islaya* and *Pyrrhocactus*, particularly with the two former pairs in the floral and fruit structures and in the manner of fruit development and seed retention. It is also pertinent to realise that *Islaya* can form fertile hybrids with *Nichelia* but not as far as we know with *Copiapoa*.

Any composite genus must seem to be a 'Hodge-Podge' or 'Hotch-Potch' whether compiled by Donald

and Rowley or Ritter or anyone else for that matter. This is nature's way of refusing to co-operate with man's attempts to create order out of chaos. 'All natural processes lead to an increase in random distributions. Is it so unrealistic to accept the implications of the law' of thermodynamics in dynamic botany?

CORRIGENDUM to Part II—

On p. 75 'Fig. 2' should read 'Fig. 1'
and 'Fig. 3' should read 'Fig. 2'

Winter Flowering Succulents

by Mrs. T. Watt

(Based on a talk given to the Society on 6th December 1966)

WHEN I was told that I had to give a talk on winter flowering succulents in October 1966 I thought that the best time to prepare for this was in 1965. When, I asked myself, does winter start? If you think back to 1965, you will remember we had a very fine October, with a lot of sunshine, and after a windy start November continued the good work. So to start with I had a look round my greenhouse at the end of October and beginning of November and found a good deal of colour still there. Cacti are succulents are they not, so I will just mention that there were masses of *Mammillarias* still in bloom, many for the second time, and even a *Gymnocalycium* and a yellow *Parodia* still in flower. But to come to the plants we generally think of as succulents there were a number of white flowered



Psamphophora sp.

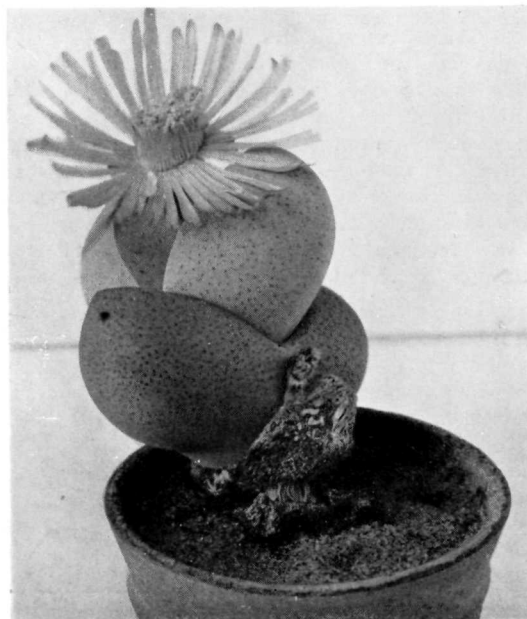


Lapidaria margaretae

Photo: Dr. Luckhoff

Lithops and of course *Conophytums*, shining yellow and shades of mauve, *Argyroderma formosum* which is wrongly named as it has very attractive yellow flowers; according to Jacobsen, these should be mauve and *Argyroderma roseum*, my delight, with rosy mauve flowers. The *Titanopsis* and *Nananthus* bloomed in early summer and again in November for me in 1965 and I have had *Dinteranthus microspermus* in bloom in October and also in late spring as shown in the slide. Another charming and unusual favourite is *Cheirodopsis peculiaris* which has the added beauty of developing a lovely grape like colour and bloom on the fleshy leaves, followed by the shining yellow flowers which open every mid-day for weeks in late February. My plants were raised from seed about eight years ago and first bloomed at around four years old. Another great favourite of mine is the delicate and charming little *Crassula nemorosa* with its green fairy like flowers, even lovelier seen under the magnifying glass, which applies to most of the *Crassula*

family, the lovely pale yellow cornuta, the little mop heads of *C. tecta* and tiny but beautiful *C. corallina*. Mine was given to me by Mr. Schupbach of Zurich and is a delightful little plant with clusters of greyish roughened leaves. I am very fond of the *Crassulas*, they are a most varied and interesting genus, covering as they do a wide range of plant types and flowers. One more that I admire very much although I lost my first plant after the bad winter of 1962-3, when I had photographed it on Boxing Day in full bloom, is *C. mesembrianthemopsis*. Then of course, we must not forget the *Sedums*, *bella* and *hintonii*, *Echeveria carnico*lour, and *E. affinis*, which was in bloom with me in November. Through January *C. monticola* was full of buds and finally opened with its charming heads of pink flowers, but as the weather was cold and dull, I did not manage to get a picture of it. I noticed that the plant itself suffers a good deal when flowering and drops its leaves, growing leggy and woody, but I took cuttings of this as soon as the growing season started as many of these shrubby *Crassulas* need this treatment to keep the species going and the little *Kalanchoe pumila* with its silver leaves and delicate pink flowers coming into bloom at winter's end is always much improved by being started off afresh. I waited awhile for the two tremendously tall spikes of *C. barbata* to come into flower just before the first day of spring, deliciously scented pink tipped flowers that last for weeks, and last, but I think one of the best and prettiest, is *C. comptonii*, one of the true dwarfs with the most delightful bright yellow flower heads and the most heavenly scent, again lasting for weeks. I had intended to photograph this plant on the last day of winter, but alas I was laid up with influenza and a touch of pneumonia and it wasn't until the first Friday in April that I finally got the picture I show you now. Of course, the *Zygocactus* flower gaily through



Dinteranthus microspermus

this period, too, and mine was a picture with its fuchsia-like blooms. In one of the slides you will see the lovely white flowered wintermaerchen which I brought back from Switzerland last October. This brings us up to date and you will realise that as my talk had to be postponed to November, the wheel has turned full circle. I cannot finish without mentioning the *Faucarias* which are brightening the greenhouse, at the moment together with *Pleiospilos optatus*, *Lapidaria margaretae* and many of the *Lithops* and *Psammodaphne herrei*, all of which are delightful and interesting winter flowering succulents.

Book Review

Rauh, Werner. Die Grossartige Welt Der Sukkulanten. Paul Parey, Hamburg. DM.98.

IN HIS Foreword, Herr Rauh says he feels that, while there are many books dealing specifically with cacti, apart from the standard works of Jacobsen and Krainz, there are few books, at any rate in German, dealing with the 'Other Succulents'. He therefore sets out to remedy this lack. He does not, however, claim to have produced an exhaustive handbook, but rather to have described a number of what he considers to be the more attractive and comparatively easily obtained and easily grown varieties, with a view to spreading the popularity of these plants.

After a short section on 'What are succulent plants?', he continues with notes on habitat and cultivation and explains his method of classification. This is perhaps a rather unusual method as he starts by dividing them into 'Stem-Succulents' and 'Leaf-Succulents' and then

lists them under the usual families and genera. This is a little confusing as it results in some species being split where, as in the case, for example, of *Cotyledons*, some are listed under 'Stem-Succulents' and some under 'Leaf-Succulents'.

The main part of the book consists of descriptions of some 2,000 plants which together with the excellent illustrations show the immense variety which can be found among the succulent plants. The plates contain about six or eight smallish photographs of individual plants which enables some 700 plants to be illustrated and these photographs are some of the best I have seen. They include eight plates in full colour in which the colours are both attractive and accurate.

The language is simple and straightforward and even anyone whose German, like mine, is somewhat sketchy should have no great difficulty in understanding it and the illustrations certainly make it an attractive addition to a collection of books on succulent plants.

E.M.D.

The Genus *Gymnocalycium*

by E. W. Putnam

HISTORICALLY *Gymnocalycium* is one of the older cactus generic names, dating back to the beginning of the process of sub-dividing the former collective genus *Echinocactus*. The sub-dividing of *Echinocactus* began with the separation of *Astrophytum* by Lemaire in 1839 and was followed by the creation of the genus *Gymnocalycium* by Pfeiffer in 1845. Thus *Gymnocalycium* is associated with the beginning of a process which has continued up to the present day: the progressive splitting of the *Echinocactus*-like cacti into more and more genera.

Botanically *Gymnocalyciums* are distinguished from the other globose *Echinocactanae* principally by the possession of smooth, naked flower-buds and flower-tubes. The scaly buds, entirely free from bristles or hair, are readily recognised and amateurs do not need to be botanists in order to identify this genus. Other characteristics are not so reliable. In general *Gymnocalyciums* have relatively few ribs and these are divided into blunt tubercles carrying areoles. The tubercles are usually rather protuberant below the areole and surmount a transverse cleft, giving a chin-like appearance. However, the possession of 'chins' is not a reliable diagnostic character since similar structures can be seen in other genera of *Echinocactanae*. Moreover the recent expedition to South America organised by Herr Uebelmann has returned with a number of new species of *Notocactus* which, when not in flower, show very close resemblance to *Gymnocalyciums*. Even the most experienced growers could be forgiven for mistaking these 'gymnocalycioid' *Notocacti* for *Gymnocalyciums* from their general appearance.

Until quite recently *Gymnocalyciums* have not enjoyed any widespread popularity with British collectors. It is difficult to understand why this should be, as their merits as attractive, floriferous and easily cultivated cacti are considerable. The genus enjoys well-deserved popularity in Austria, Germany and Czechoslovakia and in these countries the growing of *Gymnocalyciums* for sheer enjoyment is accompanied by much serious study of the genus by botanists.

Because most up-to-date literature on cacti is in foreign languages, the British collector is often in the dark when confronted with lists of species offered in seed and plant catalogues. This is especially true for *Gymnocalyciums*. Borg's 'Cacti', which is still the only comprehensive monograph on cacti available to most British collectors, lists a bare three dozen species and contains several errors of nomenclature. In contrast, Curt Backeberg's last work, 'Das Kakteenlexikon' lists over eighty species of *Gymnocalycium* and in the very short time since that was completed at least six more species have been described.

It is little use to recommend a genus of cacti to collectors without providing some practical information on cultivation and choice of plants. *Gymnocalyciums* are well worth growing whether one's interest is limited to the cultivating of handsome and free-flowering cacti or whether it extends to the thorny problems of classification and nomenclature. It is hoped that the following notes may be of interest to those who have yet to discover what a fine genus of cacti this is as well as to those who share the enthusiasm of the author for *Gymnocalyciums*.

Cultivation

The plants are not fussy or demanding. Good drainage is essential—a gritty but fairly rich soil is suitable. The John Innes No. 2 potting compost with coarse grit added is excellent. Some growers prefer to keep *Gymnocalyciums* in half-shade, but I have never found this necessary. Watering should be frequent and generous throughout the growing season—this coupled with well-drained compost will give strong and healthy growth. In late autumn watering is reduced drastically but small plants should be watched throughout the winter and not allowed to become so dry that they shrivel. High temperatures are not needed. Frost-protection is sufficient as long as the plants are cultivated correctly. The re-commencement of watering in the spring should depend on the weather rather than the calendar. Early spring sunshine and rising temperatures will start the plants growing and watering should be begun at weekly intervals. *Gymnocalyciums* are not difficult to raise from seed as long as sound seed is available. I find that they rarely germinate in under twenty-one days and that best results come from sowings made from May onwards.

Flowering

Flowering begins in April to May and can continue until late autumn. Most flowers are produced in June and July. Most species have large, showy flowers which are long-lived. A single bloom can last for a week or more before withering. Flower colours include red (*G. baldianum*), yellow (*G. andreae* and *G. hyptiacanthum*), white with red throat (*G. quehlianum* and many others), pink (*G. mihanovichii* v. *friedrichii*) and white (*G. leptanthum* and many others). Professor Cardenas has recently described some new species from Bolivia (*G. chuquisacanum*, *G. izozogsii* and *G. millaresii*) with very beautiful and unusual flowers with salmon-pink petals. It is to be hoped that seed of these may become available over here in the near future.

Grafting

Gymnocalyciums grow to maturity so rapidly, in the vast majority of cases, that in my view grafting is quite unnecessary for this genus. However, growers who

order plants from European firms will usually find that they receive grafted specimens. These can be used for propagation by the well-known method of cutting off the scion from the stock, leaving part of the scion still attached to the stock. The cutting can be calloused and rooted and the piece remaining on the stock will offset, providing a supply of further plants for re-rooting.

Species

There is a wide range of spination and flower colour in this genus. A complete collection would contain many very similar plants but the following species are examples of the main types and are among the best in the genus:

G. bruchii (syn. *G. lafaldense*). A very small, caespitose species forming clumps of heads and flowering very freely. Flower white tinged with pink or violet.

G. andreae. An excellent species with large and brilliant yellow flowers. Strongly recommended to all cactus-lovers; it flowers freely as a young plant and is quite happy in a three and a half inch pot.

G. asterium (syn. *G. stellatum*). A popular white-flowered species. Very easily raised from seed. Similar to *G. bodenbenderianum*, which is an extremely easy plant to flower at seedling size.

G. cardenasianum. A recently discovered Bolivian species now becoming available to collectors. Strongly spined, it is a handsome plant with rose-pink flowers according to Backeberg. I have a young plant which has not flowered yet.

G. denudatum. The type-species of the genus, originally known as *Echinocactus denudatus*. The flower is large and white.

G. gibbosum. A remarkably large number of varieties of this species have been named by various authorities. Backeberg pruned these down to three: the varieties *leucodictyon*, *nigrum* and *nobile*. The first is unknown to me but is described by Backeberg as smaller than the others and more caespitose. The varieties *nigrum* and *nobile* are well worth growing.

G. hyptiacanthum. One of the few yellow-flowered *Gymnocalycium*s. The flowers are not so large or brilliant as those of *G. andreae*.

G. lecanum. A dwarf, caespitose species with yellow flowers. The plant often listed as *G. netrelianum* is classed as *G. lecanum* v. *netrelianum* by Backeberg. Easily raised from seed.

G. leptanthum. A well-known species with white flowers. The flower tube is unusually long and is the feature which distinguishes this species from the closely related *G. platense*.

G. marsoneri. A desirable species related to *G. mihanovichii*. Free flowering as a young plant with large delicately coloured flowers. A plant offered by nurserymen under the name *G. knebelii* is in fact this species. The name *G. knebelii*, which was never validated, was given by Fric. Dr. Valnicek considers that Fric's plant

was either identical with *G. marsoneri* or at the most no more than a local variant of it.

G. michoga. Another plant which has been widely distributed in recent years. It is quite similar to *G. marsoneri*, having rather fewer ribs, and might well be regarded as no more than a variety of that species.

G. mihanovichii. A very popular and variable species, scarcely needing description. A number of new varieties, so far only known under collectors' numbers, have been introduced recently. Two remarkable cultivars have been produced from this species by the Japanese. These are named 'Hibotan' and 'Hibotan Nishiki'. The first has become quite well known in Britain and Europe as the 'Red Gymnocalycium' and is available from dealers under a number of names of doubtful validity ('Ruby Ball', 'forma rubra', 'optima rubra'). The second cultivar is hardly known here yet. It would seem to be even more remarkable than 'Hibotan' in its appearance as it is striated with green and scarlet or tomato-red. Both cultivars are sold as grafts and cannot be grown on their own roots since they cannot produce any.

G. multiflorum. This species, in spite of its name, seems to flower rather less freely in our collections than most *Gymnocalycium*s. It is a strong-growing plant with sturdy spines. Flowers are usually white with a faint pinkish tinge.

G. oenanthemum. My first acquaintance with this very beautiful species was in raising a number from seed last year (1966), so I have no personal experience of the mature plant or flower. I would, however, refer the reader to the excellent colour photograph in Mr. E. Lamb's 'Illustrated Reference on Cacti and Other Succulents' (Vol. II, p. 389). A plant producing such delightfully tinted pink and white flowers of such size needs no further recommendation.

G. pungens. I include this species, named as recently as 1962, since seed of it is available from dealers and no doubt many collectors have raised young plants. My own crop was unfortunately very small, totalling two seedlings, one of which I have given to a friend. The seedlings are most attractive and distinctive, with dark transverse markings on the deep green bodies. Backeberg states that the flower is white but is in doubt as to the natural habitat. The species was named by Fleischer in the Czech journal 'Friciana Rada' (1:74:1962). *G. saglione*. This *Gymnocalycium* is one of the very few species that does not flower readily as a small plant. Nevertheless, it is a good plant to add to the collection. Plants I have seen in collections show a certain amount of variation in spination. All or some of the spines are curved and strong. Generally they are dark-coloured, often almost black. As with most cacti, the dimensions and colour of the spines can be influenced by cultivation conditions.

G. vatteri. My final choice is another recently named species (Buining, 1950). Once again I do not have any great personal knowledge of this plant. I have a single

grafted specimen, recently obtained from Holland, which has yet to flower. But it is a species which I had sought eagerly after first seeing the full-page colour photograph in Backeberg's 'Die Cactaceae' (Vol. III, p. 1726). The plant shown has a large white flower. The body of the plant is olive-green and shows well-defined 'chins'. The outstanding feature is that each white, woolly areole is armed with from one to three short, stout spines. Three areoles are visible which carry one downward-pointing spine each. Two or three areoles can be seen with pairs of spines of which one points up and the other down. The other areoles, of which about fifteen can be seen in the photograph, display three spines each.

As mentioned earlier, the genus *Gymnocalycium* is being actively studied in several European countries. A growth of serious interest among succulent plant collectors in this country during the last few years has led to the birth of a number of postal study-groups sponsored by various organisations. The earliest of these was the *Gymnocalycium* study-group launched by the Succulent Plant Institute in 1964. This group has grown to the point where it has had to be split into two sections, both of which are forging ahead with studies of cultivation and classification. The letters exchanged by the members of the original group during 1964 and 1965 have now been edited by Mr. R. Ginns and published by the Succulent Plant Institute as an illustrated booklet.

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Correspondence

To the Editor:

As one who is mildly interested in the taxonomy of *Neoporteria* and allied genera, I welcome the two articles by J. D. Donald and G. D. Rowley, although this should not be taken to indicate unqualified support for their views. What is important is that new ideas have been put forward for classifying this difficult group of plants and the discussion that will arise from these is bound to lead to progress. Messrs. Donald and Rowley will no doubt be branded as 'lumpers' by some critics but, without going into details of the plants under consideration, it is surely incontestable that the degree of subdivision that has been going on here is far greater than with many other plant families. Surely there is everything to be said for uniformity in this matter and it is here that the botanist sees things in perspective whereas the rest of us are inclined not to distinguish the wood from the trees. It would be valuable for many

of us without botanical training to display the same interest in naming some of the plants we grow in our gardens as we do in the contents of our greenhouses; this would quickly lead to a better appreciation of the variability factor in taxonomy.

Although I welcome the work of Donald and Rowley I doubt if the time is yet ripe for a re-classification of the *Neoporteria* species. Having grown a number of these plants and examined many others in various collections, I am convinced that we have yet to assess effectively their variability. With the formation of The Chileans, a group of enthusiasts specialising in the *Echinocactanae* from Chile, there is hope that these variability data will become available in the not too distant future. In one respect the situation is easier than for those doing similar studies on other genera. *Mammillaria* for example. This is because most of the seed of *Neoporteria* species and allied genera now available is certainly field collected whereas this is far from being the case with those groups of plants which have been longer in cultivation. Hence, we are only measuring the variations which nature has imposed upon us and not the misguided efforts of man.

Another welcome feature of the work of Donald and Rowley is the use of numerical taxonomy. They have given a very fair account of its scope and limitations and I concur with their hope that others will be stimulated to explore more deeply. Clearly, this technique, which is in its early stages of development, can never be so impersonal as, for example, the computer reduction of the results from an experiment in Chemistry or Physics; nevertheless, it does represent a step forward. I hope that it will be recognised as such and not made the subject of controversy between taxonomists and pseudo-botanists.

W. F. Maddams,
Banstead, Surrey.

To the Editor:

As another recipient of the cactus-seed chain-letter (I, in fact, received it five times from different sources) may I say that I agree completely with Mr. Brewerton's comments.

Perhaps it should be said though that some well-meaning folk have passed on these chain-letters with the best intentions: one of the batch that I received was sent on by a well-respected friend of mine.

May I suggest to those interested in this idea that a far more constructive scheme, without the unfortunate connotations attached to chain-letters, would be the passing round of names and addresses of persons who would like to correspond with fellow-enthusiasts. A note of particular interests could be put by each name. Such a scheme would be of great value to members living in areas remote from cactus organisations and also could help to forge worthwhile links with enthusiasts abroad.

E. W. Putnam,
Hooley, Coulsdon, Surrey.

Notes on the 1967 Seed List

These notes have been prepared to assist less-experienced members in making a choice of seed from the list enclosed with this Journal. Having of necessity been prepared some weeks in advance of the publication date, they are based on the seed which has been ordered but not received at the time of writing; it is hoped that all the species mentioned will be available.

Acanthocalycium violaceum is the best known species of the small genus separated from *Echinopsis* because of the bristly calyx. It is of slower growth than most *Echinopsis* but is easily raised from seed. The flowers, freely produced on older plants, are an attractive pinkish-violet shade. *Aylostera kupperiana*, or *Rebutia kupperiana* for preference perhaps, can be thoroughly recommended. It is very easily raised from seed and is therefore an ideal choice for those with little experience. There should be no difficulty in obtaining the lovely dark, orange-red flowers two years after sowing the seed.

The list contains five species of *Coryphantha*, although one of them, *C. arizonica*, is usually accepted as a variety of *C. vivipara*. Unlike some of the *Coryphantha* species, these two flower at a reasonably early age and soon form attractive clumps of heads. *C. gladiospina* is a solitary globular plant, rather slow growing and unlikely to exceed about five inches in height and three inches in diameter. With its rather large tubercles and showy yellow flowers it is a typical globular *Coryphantha*. The two remaining species, *C. bergeriana* and *C. schwarziiana* belong to the group of plants which have a gland at the base of the groove on the upper surface of each tubercle. These glands exude a sugary fluid on which a black mould is prone to form, but this should not deter members from growing the plants. It is surprising that the genus *Coryphantha* is so poorly represented in collections because its species present no difficulty of cultivation, even if they do grow less rapidly from seed than *Mammillarias*.

The three species of *Echinofossulocactus*, or *Stenocactus*, the more familiar but unacceptable name, provide an interesting contrast. *E. multicosatus* has as many as one hundred closely-set undulating ribs when mature and is a fascinating species. On the other hand, *E. coptonogonus* is the only member of the genus with broad ribs. These usually number ten to fourteen and bear longish curved spines. *E. zacatecasensis* is rather intermediate in character, with some fifty very thin wavy ribs. One of the spines on each areole is long and flat, a feature found with an appreciable number of the species. These plants are easily raised from seed, making steady if not spectacular progress. The first year or two the seedlings are quite unlike the adult plants in spination, having long, thin spines which tend to curl over the top of the body. Although not reaching flowering size so early as

most *Mammillarias*, *Lobivias* and *Rebutias*, they are still worth raising from seed.

Of the *Ferocactus* species, *F. stainesii* v. *pringlei* is one of the most rewarding with its strong, thick, blood-red spines. This is one of the largest growing of the *Ferocacti*, but it will not become an embarrassment in cultivation and although flowers should not be expected, its colourful spines make it attractive. The three *Gymnocalyciums* listed all belong to the group of larger species, ones which eventually make impressive plants but do not occupy an excessively large amount of space on the staging. The best known is *G. monvillei* with its yellow-green body and pale yellow awl-shaped spines. *G. nigriareolatum* has rather strong spines set on darkish areoles and white flowers. *G. zegarae* is related to *G. saglionis*, magnificent specimens of which are seen in shows from time to time. *G. nigriareolatum* is rather smaller growing than this latter and the 'chins', so characteristic of *Gymnocalycium* species are more angular.

Lobivia famatimensis is a well-known variable species. A number of varieties have been erected by different writers and those interested in a more detailed account would do well to consult Volume three of Backeberg's 'Die Cactaceae'. All are very easy to raise from seed, and the typical form has yellow flowers. *L. muhriae* is a new species, described by Backeberg in 1963. It comes from Northern Argentina and has reddish-yellow flowers. *Mediolobivia pectinata* v. *orurensis*, one of several varieties of *M. pectinata*, is also frequently encountered bearing the names *Lobivia orurensis* and *Digitorebutia orurensis*. The last is quite apt in that it correctly conveys the impression of a clustering group of short-cylindrical stems; these bear attractive red flowers.

The *Mammillaria* enthusiast has the choice of some interesting material and in this grouping must be placed *Dolichothele aylostera*, a widely used synonym for *M. beneckeii*, an uncommon and rather difficult species with a lovely large, orange-yellow flower. The seeds are unusually big for a *Mammillaria* and the seedlings grow rapidly but they, and older plants, must have more than average warmth during the resting period; a minimum of 45°F. is recommended. *M. brandegeei* is a straight-spined species from Baja California, with red-brown spines, yellowish flowers and attractive red fruits. *M. bravoae*, a relative of *M. hahniana*, will always attract attention because of its appearance, and the deep pink flowers, appearing in April and May, contrast well with the white wool and spines. It is a species for those not skilled in the art of raising from seed. Whether or no *M. carnea* v. *cirrosa* differs appreciably from *M. carnea* is debatable but, for those interested in *Mammillarias*, it is worth a place in the collection.

As its name implies, *M. densispina* is a closely spined species, attractive not so much on this account as the pleasing spine coloration, usually yellow with reddish brown tips, although paler forms are known. It bears buttercup yellow flowers in late March and April and is rather slow growing. *M. gummifera* belongs to the group of species, including *MM. applanata*, *heyderi* and *hemisphaerica*, which have flattened hemispherical bodies; the whitish radial spines number ten to twenty and there are one or two darker central spines. This group have particularly attractive red fruits. *M. marksiana* is one of the most distinctive species described during recent years. The body is a lighter and more yellow green than that of most *Mammillarias* and it has both yellow spines and flowers. It is definitely a plant for every collection. It is as well to point out that the plants from seed now in circulation as *M. meissneri* are, in fact, usually called *M. elegans* v. *schmollii* in this country and the U.S.A. Backeberg suggested that the plant described by Ehrenberg in 1844 tallies with Craig's description of *M. elegans* v. *schmollii*, and therefore *M. meissneri*, as the older name, takes priority. However, it is not in general usage as yet. Setting aside this taxonomic point, the plant has much to recommend it. It grows more cylindrical than *M. elegans* and offsets freely after a few years. Like *M. elegans*, it bears carmine flowers in April or May.

M. michoacensis will be an unfamiliar name to many and, as yet, it is undescribed. It has affinities both with *M. bella* and the whitish-spined form of *M. spinosissima* and, in view of the great variability of the latter, it may well not achieve species status. Propagation from seed presents no difficulties and it can be tried with confidence by those with limited experience. It would be possible to write at some length about the confusion that has arisen over the names *M. neocoronaria* and *M. coronaria* but it will suffice to say that the plants in circulation nowadays are not the *M. coronaria* described by Schumann in 1898 and subsequently renamed *M. neocoronaria* by Knuth in 1935. This species has hooked central spines whereas the plants now available bear considerable affinities to *M. rhodantha*. They have attractively coloured spines and grow well from seed. *M. orcuttii* has a dark green body and rather stout, blackish spines. Abundant white wool develops in the flower-bearing axils and shows up the carmine flowers to perfection. A considerable variation is found among plants of *M. parkinsonii* and the variety *brevispina* has, at best, central spines as short as three millimetres. In practice, the seed is sure to give plants with a variety of spine lengths, from which the true *M. parkinsonii* v. *brevispina* may be selected.

Although plants bearing the name *M. sanluisensis* have been freely available for some years now, these are totally different from the species described by Mr. Shurly in this Journal in 1949. The true *M. sanluisensis* has straight central spines whereas the plants now in

circulation have hooked centrals, sometimes dark brown and sometimes yellow; they probably represent a new species. Whatever their identity, they can be recommended because they are very floriferous and are easily raised from seed. It is pleasing that seed of *M. sonorensis* is available because this species is seen too infrequently. Rather variable in its spination, its attraction lies in the handsome, pink flowers. Last among the *Mammillarias*, *M. trichacantha* is another species for the novice at seed raising who should be able to flower it two years after sowing. Its chocolate brown hooked spines make a refreshing change from plants such as *MM. bocasana*, *erythrosperma*, *schelhasei* and *wildii*.

The genus *Neowerdermannia* was placed near to *Coryphantha* by Borg and although we now know that it is closely related to *Gymnocalycium*, Borg's error is partially understandable. Unlike *Gymnocalycium* which has the areole on the centre of the 'chin', and *Weingartia* where it occurs at the top, the areole is found at the base with *Neowerdermannia*. Consequently, it does rather resemble a member of the *Coryphanthanae* if one imagines the areoles having been moved to the axils. One of the spines of *N. vorwerkii* is strong and hooked and the flowers, appearing in May or June, are whitish. *Pseudobolivia kermesina* has many characteristics of the *Echinopsis* species; for example, its body form and the flowers with the typical long tubes. Only the vivid reddish-magenta flower colour points to affinities with the genus *Lobivia*. It is easily raised from seed and will reach flowering size in four years.

The number of *Parodia* species has risen rapidly of recent years, the result of much collecting activity in Bolivia and adjacent territories. Of the four species listed, three have been known for some time whereas the fourth, *P. cardenasii*, is quite new. This latter is small growing with slender white spines and, not surprisingly, is uncommon in cultivation as yet. *P. sanguiniflora*, with its blood-red flowers, has long been a favourite and *P. tilcarensis*, with orange-red flowers, is also quite well-known. *P. sanagasta*, although described as long ago as 1936, is encountered less frequently; it is an attractively spined species with bright yellow flowers. The seed of most *Parodia* species, with the exception of some of the recently discovered ones, is almost dust-like and the seedlings are very slow-growing for the first year or more. Consequently, some experience in raising from seed is advisable before these are tackled. *Rebutia xanthocarpa* v. *dasyphrissa* has pinkish-purple flowers and is as rewarding as most *Rebutia* species.

Turning to the other succulents, although *Aloe striata* is a rather large growing species, its size can be controlled by the frequency of repotting. Its leaves have distinct white margins and are faintly spotted. *Aloe* seeds are quite large and need to be covered to their own depth to ensure good germination. *Astroloba foliolosa* rather resembles *Haworthia viscosa* in that the leaves are set spirally around the stem but they are

brighter green in colour. *Astroloba pentagona* also has this spiral arrangement and, as the name suggests, the leaves are arranged in five straight or slightly twisted vertical rows. They are longer and sharper than those of *A. foliolosa*.

Cotyledons are reasonably easy to raise from seed although it is important to use a well-drained compost. *C. coruscans* is a short-stemmed erect species whose leaves are very pruinose when young. *C. teretifolia*, with its rather blunt leaves covered with white hairs, is very attractive. The flowers, produced in umbels, are yellow. *Crassula rubicunda*, with ciliate leaves and red flowers, is one of the more shrubby of the *Crassulas*; its stems are up to three feet tall. *Crassula perfoliata* is

another tall growing species; it is similar to *C. falcata* but the leaves are narrow and tapering and the flowers are scarlet. *Kalanchoe lateritia* is a synonym of *K. velutina*, an apt name on account of its attractive velvet leaves. It is shrubby in habit and bears yellow flowers. *K. pumila* is a gem that should be in all collections; its grey-green pruinose leaves are always attractive and the purplish pink flowers, appearing in February and March, provide winter colour for the collection. The seed of both *Crassula* and *Kalanchoe* species is dust-like and best results are obtained by mixing it with a little fine sand and spreading the mixture over the surface of the compost.

W.F.M.

Howard Gates

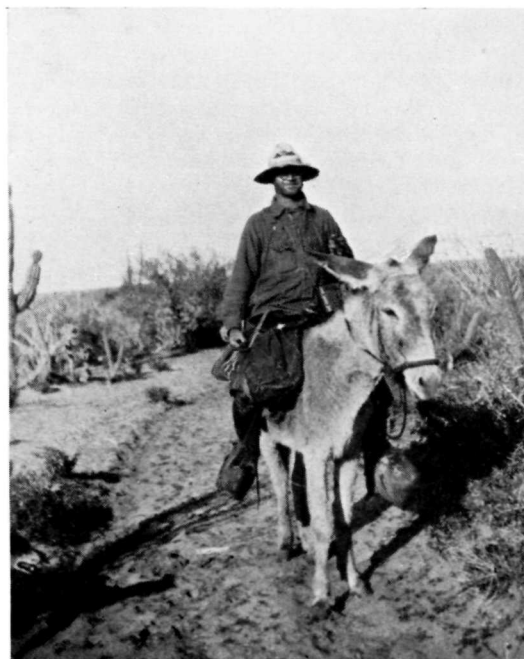
(Extracts from his letters to the late Mr. Shurly)

Howard Gates who died in 1957 was a past president of the Cactus and Succulent Society of America and was well-known to older members of our own Society as a great collector, particularly in Baja California. He was a good friend to this Society and our late President, Mr. Shurly, was in regular correspondence with him. Mrs. Shurly has now allowed me to publish extracts from Mr. Gates' letters and the following notes on seed-raising seemed of topical interest at this season, even though he is writing of large scale nursery cultivation in California where he ran a large wholesale business.

Letter dated 2.2.1951
Sub-watering of Seeds

Since my last writing we have prepared a vat to hold twenty-four flats for sub-watering. Our system is to partly fill the vat and then when capillary attraction has brought the moisture to the surface, drain the vat and let the flats set for about a week until the surface begins to dry. All we can report so far is that germination in these sub-watered flats is a little slower than the check flats we have planted in the regular manner. The little plants that germinated in the flower pots set in the flats early in November are still alive but now not as large as the ones in the soil above.

Our plantings of seed this winter have been in flats of steam sterilised soil. The seeds are sown on the surface of the soil mixture, then hidden with charcoal to prevent the growth of algae. Then the charcoal is in turn hidden with screened sand. In all the flats of cactus seed we have planted since the middle of October, there has not been a case of damping off. . . . However, with *Aloe variegata* of which we planted nearly two hundred flats, there was considerable damping off. . . . All of our seed flats were grown comparatively wet. Our university authorities say that they find that if the growing medium is sterilised and then kept from becoming re-infested that cactus will stand watering.



Howard Gates in Baja California

Our biggest trouble this year has been in the cotyledon stage with the small seeded types that make a very small cotyledon and stay that way for a long time, such as *M. bocasana*, *Trichocereus spachianus*, *pachanoi*, *Cleistocactus straussii* and *Gymnocalycium saglione*. Many germinate, grow for a while and then disappear without ever getting out of the cotyledon stage. This does not appear to be due to any form of rot as the survivors do not show any signs of injury. Examination under a low power glass indicates that one of the following may be the cause; actually no bud between the cotyledons, a

very weak bud or some injury to the bud. I hope eventually we may solve these problems.

Letter dated 29.4.1951

Growing of seedling cactus varies a great deal from place to place and with different growers. We use what might be called a modified John Innes compost. It is composed of coarse sharp sand and partially decomposed leaves that we call leaf mold. We do not use peat as we have found it does not give as good results as the leaf mold. It is steam sterilised as this cuts down disease, weeds and makes the fertility of the mixture more readily available. The seed is planted on top of this mixture then lightly covered with ground charcoal to keep down algae and then topped with concrete sand with the fine particles screened out. We water from overhead with a nozzle that gives a very fine spray. Since the seeds and the roots of newly sprouted plants are in the top quarter inch, we feel this must be constantly moist through frequent waterings, light of course. A couple of hours drying out on warm days will kill many of them. We have never found ordinary soil satisfactory in the mixture, though we have not tried it since we have been sterilising the soil. One factor that is very important is not to get too heavy a covering of

top material I have seen spots in a flat where a little too much cover was dropped and nothing grew. On the other hand, spilled seed has germinated on top of the ground and done well. While my heater is not powerful enough to maintain the temperature on our coldest winter nights, it is set to cut off at seventy degrees. One handicap we have is that we start to sow seed in October. Results are much better if sowed in February, March and April with most kinds. However, by sowing in the fall and winter, the seedlings are ready to transplant in the early spring and can be grown to saleable size for the next winter. This cannot be done with the spring sown seed except for some quick growers like *Piptanthocereus*, *Lemaireocereus pruinosus*, *Harrisias*, etc.

We have taken the first batch out of the sub-irrigated vat. We did not consider the results very good as the salts in the soil came to the top and crusted. We have another lot in now. With this lot we leached the soil before sowing to reduce the saline contents. The seeds have germinated nicely but it is too soon to judge results otherwise. By check flats we mean flats that are grown in the regular manner to determine whether the results are better or poorer with the experiment that is under way.

Bulletin of the African Succulent Plant Society

The more unusual African succulents, becoming increasingly available to connoisseurs and collectors through the expeditions of Bally, Mason, Rauh, and others, are currently enjoying a welcome wave of popularity along with some of the temperate South American cacti, obtained in quantity by Ritter. Riding the crest of the African wave in no uncertain fashion is Mr. Cyril Parr, a former secretary of the Mammillaria Society, now devoting his industry and energy to another interest and to his brain-child, the African Succulent Plant Society. Mr. Parr and his Committee have made their market international, like that of the Mammillaria Society, but are concerned with a much wider range of plants, including most of the succulent *Aizoaceae*, *Asclepiadaceae*, *Euphorbiaceae*, and *Liliaceae*, among others. The main annual publication of the Society is the projected year-book. Meanwhile an extensive mimeographed bulletin is also being produced, of which no. 5 is under review. It contains mainly descriptive articles to interest growers and collectors of a wide variety of groups, combining the writers' personal experience of particular plants with reference to published accounts. There is also a discussion of pots and other plant containers. One wonders whether Mrs. Shield's quotation from the 'Flora of Tropical Africa' about the flowers of *Euphorbias* was really intended to enlighten the amateur or written tongue-in-cheek. Similarly, Mr. Parr's descriptions of *Jatrophas* make no attempt to dilute botanical terminol-

ogy for lay readers. Incidentally, the description of *Jatropha gossypifolia* quoted (without acknowledgement) from the 'Flora of Tropical Africa' contains an error introduced in converting dimensions to the metric system; The capsule is 1.25 cm. long, not 1 mm.

D. R. Hunt

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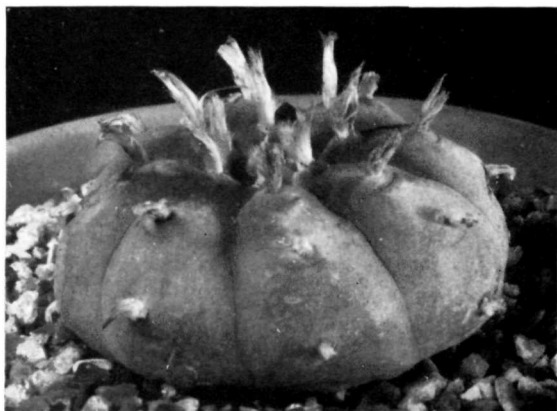
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The Gourd Of The God Of Fire

by Keith G. Morris



Lophophora Williamsii

Photo: Miss M. Martin

MANY cactophiles are aware that the cactus *Lophophora williamsii* of Central Texas and North Mexico contains a small amount (6%) of a drug called Mescaline. Some will doubtless know that its chemical composition is similar to neo-adrenalin. Another well-known fact is that it was used by North American Indians in their religious festivals. But the actual ceremonies of the collection of the plant are not so well known.

This article is on the anthropological aspects of *L. williamsii* and the other members of the genus.

The Huichal Indians of Mexico treated this plant as a demi-god believing that the fetching of the sacred plant resulted in the benefits of good crops and rain. The plant grew a considerable distance from the home of the Indians, a journey of forty-three days being necessary to fetch it. The wives of the men who went to fetch the plant did their best to contribute to their husband's successes by observing certain taboos, which to some extent copied the restrictions imposed on their husbands. Until the festival of the cactus neither party washed except on certain occasions and then only with water from the cactus country. They also fasted much, ate no salt, and were bound to strict continence. Anyone breaking this taboo was punished with illness, and also jeopardized the result which the community was striving for.

KEITH MORRIS must surely be one of our youngest contributors if not the youngest. He is 16 years old, still at school where he is studying hard in the hope of becoming a bio-chemist. His collection at present is small, being housed on sundry window-ledges, but obviously his interest in his plants goes deeper than just growing them and no doubt he will later graduate to a greenhouse for them.

Health, luck and life could be gained by gathering the cactus, the gourd of the god of fire. But because the pure fire cannot benefit the impure, the Indians not only had to remain chaste but had to make a confession of their past love lives. Thus, four days after the men had started out the women would gather and confess to Grandfather Fire the names of the men with whom they had made love from childhood to the time of the festival. They dared not omit a single one because if they did so the men would not find a single cactus. To prompt her memory, each woman would prepare a string with as many knots as she had had lovers. She would bring this to the temple of the god, and by use of the knots recite her boyfriends' names in front of the sacred fire. Having ended her confession, she would throw the string into the fire, and when the god had consumed it in his pure flame, her sins would be forgiven her and she would depart in peace. Thereafter the women would be averse even to letting men pass near them. The cactus seekers themselves would make a clean breast of their past affairs and would give their leader a string of knots to be burned, after they had 'talked to the fire minds'.

I very much doubt if modern plant collectors would go to these lengths to ensure the success of their trips.

References:

'Mescaline' The Cactus and Succulent Society of G.B. Journal, Vol. 18 p. 21. 1956.

'The Golden Bough' by Sir James Frazer.

News From Branches

Northern Counties Branch

The First Northern Show: The Northern Counties Branch will hold the first Northern Show of this Society in the Main Hall of the Social Service Centre, Whitley Bay on Saturday, 10th June 1967.

Forty-six (46) classes are scheduled under the following Sections: Open 20, Advanced Members 12; Less experienced members 12; Novices (non-members) 2.

Exhibits may be staged after 7 p.m. on Friday, 9th June or prior to judging on Saturday 10th. Schedules are available on request from the Secretary of the Northern Counties Branch (See inside front cover).

It is hoped that our members will support the show in the role of exhibitors. The Social Service Centre is close to the sea front and town centre and a visit to the show can be combined with a pleasant day at the seaside.

West Kent Branch

Our October meeting was the first at our new venue. The Old Council Hall, Beckenham, and the reconstitution of the Branch resulted in a record attendance of twenty-six members. A pleasant innovation was the serving of tea and refreshments during an interval at the

Meeting, which, that evening, was devoted to the sale and exchange of members' surplus plants.

For our November meeting, the speaker was Mr. Maddams who, in company with his wife, gave us a very interesting talk and showed some colourful slides of interesting plants in his own collection.

Essex Branch

We have received from this Branch a copy of their quarterly review, which is quite an ambitious effort for a Branch and is now starting on its fourth year. It has a printed cover on art paper, bearing a photograph of a plant on which a note is included in the text. The inside is duplicated and gives news of Branch activities, reports of meetings, show successes, etc., as well as cultural hints and notes on branch personalities. We note that this issue lists a goodly number of successes at the Westminster Show. Could it be that the review helps to encourage keenness on the part of members?

The Branch Secretary also asks us to mention that meetings are now being held at a new rendezvous, i.e. Cranbrook Park Methodist Church Hall, The Drive, Ilford, Essex.

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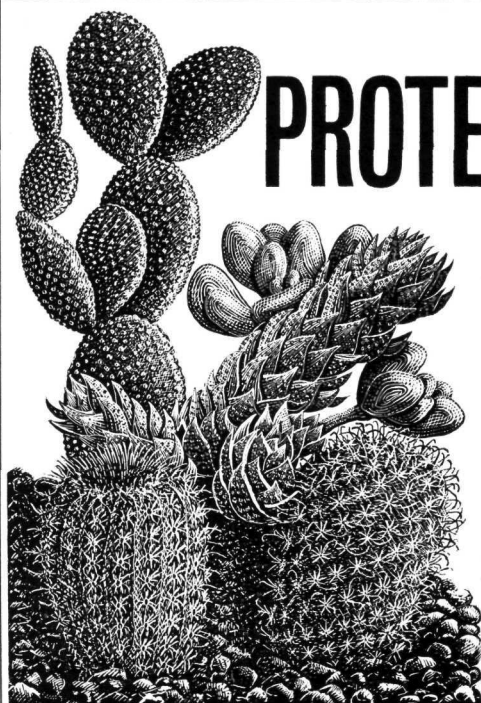
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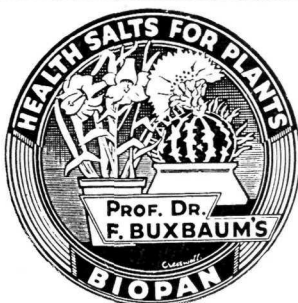
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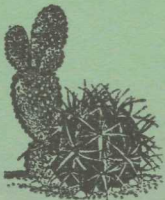
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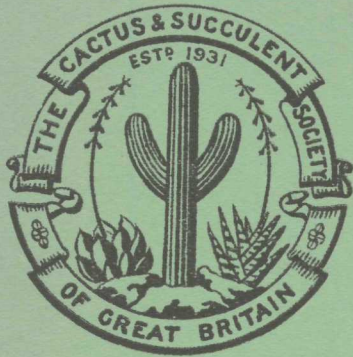
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MAY, 1967

No. 2



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THE CACTUS AND SUCCULENT JOURNAL OF GREAT BRITAIN

Vol. 29

May 1967

No. 2

Editorial

WITH THIS, the third issue of the Journal under my Editorship, I am beginning to find my feet and to experience the interest and enjoyment of the job. There are, however, certain difficulties, one of which is the supply of photographs. Readers will have noticed that present policy, started by my predecessor, is to use only illustrations linking up with the articles. It is, therefore, necessary for us to have a good supply of photographs in reserve. While I already have a number, particularly of Cacti, I am definitely short of Other Succulents. It seems that most of our members are very keen to photograph their Stapeliads and their *Euphorbia Obesa* but the more common succulents, in particular those suited to the Beginners' Corner seem to evoke less interest. If any members have suitable photographs, I should be very glad to have them, preferably glossy prints not less than 5 in. by 4 in., or if they have finished with the negatives of suitable subjects, I can get the prints made. Possibly readers could let me have a list of what they can offer me to avoid my being sent a number of the same species.

Only a short note from me this time. I must get on with my reporting !!

E.M.D.

Notes and News

An Aversion to Alcohol

An intriguing study of the germination of seeds of *Opuntia echinos v. gigantea* has been reported recently by I. L. Wiggins and D. W. Focht, in the American *Cactus Journal*. These workers measured the proportion of germination of seeds subjected to a variety of treatments. When soaked in tap water 65 per cent of them germinated and the figure dropped to 35 per cent when they were left in concentrated sulphuric acid for half an hour. However, immersion in alcohol for three days gave only 5 per cent germination!

Gardeners' Sunday

We have just received the 1967 issue of *Gardens to Visit* listing the gardens open to the public in aid of the Gardeners' Royal Benevolent Society and the Royal Gardeners' Orphan Fund. A visit to one or more of these gardens may well provide an object for a weekend outing. Copies of the booklet (price 1s.) can be obtained from bookstalls or direct from Gardeners' Sunday, White Witches, Claygate Road, Dorking, Surrey (price 1s. 4d. inc. postage).

Cultivation Notes

Cacti—A. Boarder

AT this time of the year many cacti can be repotted as most of them will be making good growth. It is far better to repot when new roots are being made although if it is not possible to do so during the spring and summer it can certainly be carried out at any time of the year. If repotting has to be done in the winter it is essential to make sure that no more disturbance of the root system is done than is absolutely necessary. It is of course certain that if this task is done when the plants are making rapid growth fresh fibrous roots will soon be formed and the plants will grow on well with no check.

The old query as to how often to repot will always crop up and it will be found that there is no hard and fast rule for the frequency. Some plants, especially young ones, can grow at a much faster rate than older established ones. A sure sign that a plant needs repotting is when it reaches the side of the pot. It is then

almost impossible to tell when the plant requires watering as the soil is hidden. Another sign is when roots appear through the drainage hole or on top of the potting soil. If it can be managed it is better to repot at least once every two years. Many cacti which are of the rather fast growing types should be repotted every year. If plants are left in the same compost and pot for over two years it is almost certain that the soil has become so impacted that no air can enter and it will be far more difficult to water such a plant. Many of the fine roots will have died and so the plant cannot be expected to grow well under such conditions.

For the grower with a few plants it will be better to purchase the potting soil. Several firms specialise in a cactus compost but if this is not obtainable locally it is usually possible to buy the John Innes potting composts. For most cacti I suggest that if J.I. potting compost No. 2 is bought it is fairly easy to make this suitable for cacti

by adding a sixth part of coarse, sharp sand to make the mixture more porous. It is quite a good idea to incorporate in this extra sand some broken brick or granulated charcoal. In fact anything which is likely to keep the soil open and to enable surplus moisture to escape.

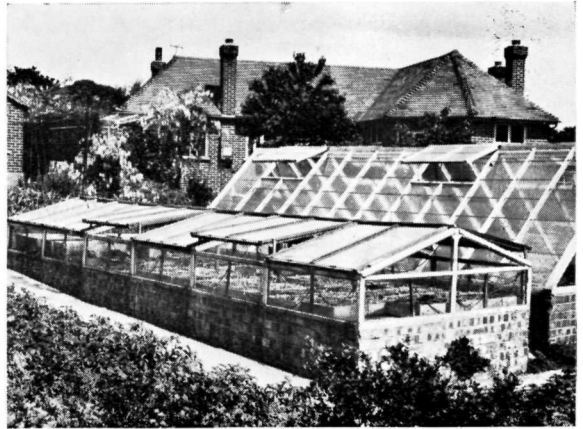
It will be noticed that I have said the compost No. 2, and it may be thought that this is rather rich in fertilisers. However, this is slightly weakened in proportions with the addition of the extra roughage. In any case I do not think that this will have much effect on the cacti and the amount of watering done subsequently will regulate the available fertilisers to the plant. Only in a soluble form is it possible for any plant to take in the necessary nourishment. Therefore if there happens to be rather more fertiliser to the bulk than seems necessary, the plant cannot make these available for consumption unless sufficient watering is done.

I have noticed in some books on cacti that different composts are recommended for each genus of cacti. I consider that this is quite unnecessary as I have grown plants from practically every known genus over the past sixty-two years and have found that they grow well and flower as well as can be expected in this rather sunless country. Just fancy having to make up a fresh compost for each plant of a different genus, one would have to have dozens of types. I use one mixture for all my plants which also include a good collection of Lithops.

I will readily admit that such plants as epiphyllums will benefit from a richer compost, but I have had no difficulty whatever in flowering such plants when potted in exactly the same mixture as all my other cacti. Naturally when a plant is repotted it is necessary to remove all the old soil. Unless this is done one could dispense with repotting altogether, for it must be obvious to everyone that soil which has been subjected to constant watering and exposure to the sun for two years or more, can have little nourishment left in it.

The size of the pot into which the plant will be placed depends a great deal on its type. For all the globular types of cacti the pot should be large enough to leave at least half an inch from the plant to the edge of the pot where pots up to three inches of diameter are used. Where larger pots are required then an inch is essential. This will allow for fresh growth and enable the soil to be inspected when watering is carried out.

When tall cacti are being repotted it will be necessary to use a pot which allows for more than an inch of space to the edge of the pot as otherwise the plant could become top-heavy. Large pots should not be used if a smaller one is sufficient, as they would only waste potting compost and encourage the retention of too much surplus moisture. I have found that the plastic half-pots are ideal for many cacti. This is especially the case when repotting the caespitose (grouping) cacti. I repotted many of my caespitose mammillarias into 4, 4½ and 5 in. half-pots and they have made such good



Mr. Boarder's Greenhouse and Seedling Frame

growth that they are already touching the sides of the pots. Most of such plants have only shallow roots and so it is quite unnecessary to use deep pots. Not only have these mammillarias made such good growth since early summer but they are budding for flower much better than they have done before.

With some of the grouping types of mammillarias it is a good policy to mound pot. This is done by ensuring that the soil near the edge of the pot is lower than that under the plant base. By this means it is possible to assist the surplus moisture to drain away from the base of the plant which is usually where rotting can occur. Another point to watch is that enough space is left at the top of the pot for watering. Unless this is done it will be quite impossible to water a plant adequately as it needs little imagination to assess the amount of water which can be poured into a space about a quarter of an inch in depth.

Providing the potting compost is of the right dampness, the plants should not require watering for a few days. This will depend on the weather and the warmth of the position where the cacti are grown. Potting compost should be just crumbly moist, not wet enough to soil the hands but yet not too dry to prevent one from firming the soil. This firming should not be over done as it would be possible to so ram it down that no air could enter and watering would be made difficult. Just firm sufficiently to keep the plant steady. The amount of crocks to be put in a pot has been discussed for many years but I think that if too many crocks are used they take up valuable space. Providing the soil is porous enough then all that is required at the base is a crock large enough to prevent the soil from falling out. I like to use a large piece of a clay flower pot and trim it so that it just fits the base. This trimming can be done quite easily by nipping at the edges with a pair of pincers. Some growers are using some of the coarse

vermiculite above the crock for drainage. This is the type sold for surrounding water tanks to prevent freezing.

The idea of using one large crock is so that it is very easy to remove the plant another time. All one has to do is to push a rounded stick up the drainage hole and the whole plant and soil can be moved without disturbance. If a number of small crocks are used it will be found that it is very difficult to remove a plant if the soil has become impacted and the base of the plant could be damaged before the plant is moved. When a large crock is in position one can place some larger pieces of potting compost first. This is readily obtained by shaking some of the compost in a bowl when the large pieces will come to the top.

One still hears of some strange stories about cacti which flower, and some of the so-called mysteries of cacti growing are encouraged by the popular press. When I opened my daily paper a short time ago I was confronted with the startling news of a cactus at Kew which was growing about three inches in height every day and that it was thought that it might be necessary to remove a pane of glass in the roof to let it through. On reading on I found that the 'cactus' was an Agave, not a cactus at all, and that all that was growing at such a rate was the flower spike. Now I feel sure that the reporter was told that this was not a cactus—but of course this would not be news, for how many people would know what this meant? Many readers would have thought that a succulent was something to eat.

Another thing which never fails to amuse me is that many growers of cacti who have taken up the hobby since the last war are of the opinion that anyone who grew them before this could not be expected to have known anything about growing cacti or that there were any good collections in the country. How wrong such people are; many fine collections of cacti were owned over a hundred years ago in this country and I used to visit a grand private collection forty-five years ago. This collection would compare most favourably with any private collection today. The owner also used to show me the journals which were issued by the cactus society which was in existence about the turn of the century. Many of the newer growers have obtained their knowledge from books, and although this is all right in theory there is nothing like practical experience at growing these plants. I would much prefer to be able to grow and flower a plant well than to study its history or try to split up all the species into separate genera. As I have said before such growers may as well keep a collection of labels and argue about these.

To emphasise my point about growers of cacti years ago, it may be helpful if I compare the cactus shows

which are held today with those before the last war. For the last Society show in September, 1966, there were 21 classes, only three of which were for cacti. One class called for six cacti, two for six other succulents, and then three or four each for the other classes. Now let us compare this with the schedule for July 2nd, and 3rd of July, 1935. This had 28 classes as follows: Class 1, twelve echinocacti; Cl. 2, twelve mammillarias; Cl. 3, twelve cerei; Cl. 4, six echinocacti; Cl. 5, six mammillarias; Cl. 6, six cerei; Cl. 7, twelve cacti, any genera; Cl. 8, six cacti, 4 in. pots max.; Cl. 9, three cacti ditto; Cl. 10, one specimen cactus; Cl. 11, one cactus ten years in possession; Cl. 12, seedlings raised from my distribution; Cl. 13, cacti from seed; Cl. 14, miniature garden; Cl. 15, twelve other succulents; Cl. 16, six other succulents, 4 in. pot max.; Cl. 17, twelve euphorbias; Cl. 18, six euphorbias, 4 in. pot max.; Cl. 19, twelve mesembryanthemums; Cl. 20, six mesems.; Cl. 21, twelve aloes, agaves and/or gas-terias; Cl. 22, six haworthias; Cl. 23, twelve sedums, sempervivums, cotyledons and/or other crassulaceae; Cl. 24, ditto, 4 in. pot max.; Cl. 25, twelve stapelias and allied genera; Cl. 26, six other succulents raised from seed; Cl. 27, twelve cacti, open to non-members; Cl. 28, twelve other succulents ditto.

This exhibition was housed in the Old Hall, Vincent Square, and no other plants were on show. The late Mr. Neale exhibited a fine collection of cacti which included specimens of all the genera introduced by Britton and Rose.

From this schedule it can be seen that the shows of today held at the R.H.S. hall compare sadly with the ones before the last war. It can also be realised how I feel when some of the younger growers today treat me as if I could not have known a cactus from a cabbage sixty years or more ago. I am all for encouraging further study of the evolution of cacti but I feel that it is far more important to be able to grow and flower these plants well. For the past forty odd years there have been arguments about the correct naming of cacti but I do not see where anyone can have any more satisfaction in growing their plants now that there are supposed to be between a hundred and two hundred different genera. When there were only twenty-one under the Schumann nomenclature we obtained just as much pleasure from growing and flowering our plants as we do now. My own opinion is that there will still be arguments as to correct naming going on for many years, but I for one will lose no sleep over it.

Grow your plants well by giving air on all suitable occasions, water well when necessary and then wait for the soil to almost dry out before watering again, repot when necessary and before the soil is full of root-bug and you will get plenty of pleasure from your hobby.

Cultivation Notes

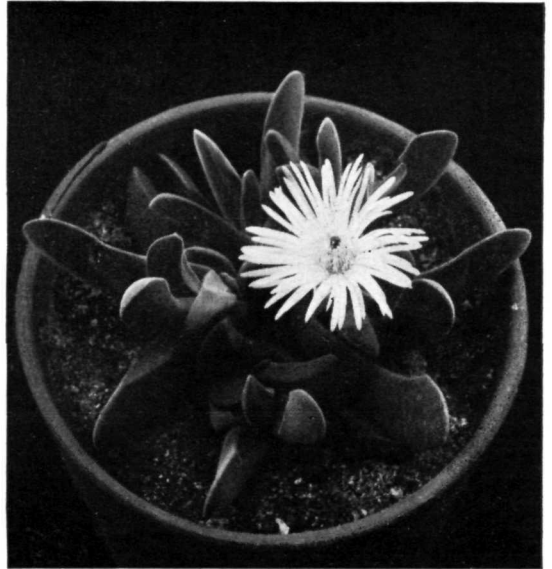
Other Succulents—Mrs. M. Stillwell

WITH the coming of Spring, one always get filled with enthusiasm once more, and all the hard work in the greenhouse becomes more of a pleasure than a task. The first job is to give all the plants a good clean up, for I always find that during the winter they often get very dusty and dull looking. Either a good spray, or my other method of completely immersing each plant in a bucket of water soon freshens them up and gives the pores a chance to breathe again.

I dipped all the *Gibbaeums* the second week in March, and within a few days it was amazing how many buds appeared. I am fairly lucky in getting these plants to bloom, and I am quite sure it is all a matter of knowing just when to water them. They receive a little all through the winter, just enough to keep them growing slowly, and as the buds appear I increase the amount. If they get too dry when in bud, I find instead of opening the buds will often dry up, or cease to grow. *Antegibbaeum fissoides* had nine large magenta flowers out in February, and was a lovely splash of colour. Others in bud are *G. album*, *G. velutinum*, *G. petrense*, *G. angulipes*, *G. haagei*, and several varieties of *G. heathii*. Others such as *G. pilosulum*, *G. luteoviride*, etc. bloomed earlier. The best time to repot, if you must, is early autumn, but I prefer to leave them undisturbed for several years.

There are a number of new potting mediums appearing on the market, and no doubt some of the plants grow very well in them, but it is never wise to transplant a perfectly healthy adult plant into some new medium—it will either give it a check, or possibly cause it to grow at a faster rate, and so lose some of its characteristics. If a plant has been grown in one of the new composts right from seed, or from a small cutting I have no doubt that the results would probably be good; but old plants, like us, often resent drastic changes.

I always feel March is the ideal time to sow seed. I do not grow many, but hope to try a few again this year in the plastic bags. I would never try any other method, for I am convinced it is the most successful one I have ever come across. It completely does away with all watering problems, and keeps out the sciarid fly and other pests. It is possible to go away for a holiday without any fears that the seedlings will dry out. Some of mine that were sown late remained in the plastic bags unopened since sowing all through the winter. They remained small of course, but in the spring the bag was opened, and they were given a good watering and were soon plumped up and ready to prick out, without any winter casualties. From the small pots they are pricked out into small plastic trays, and



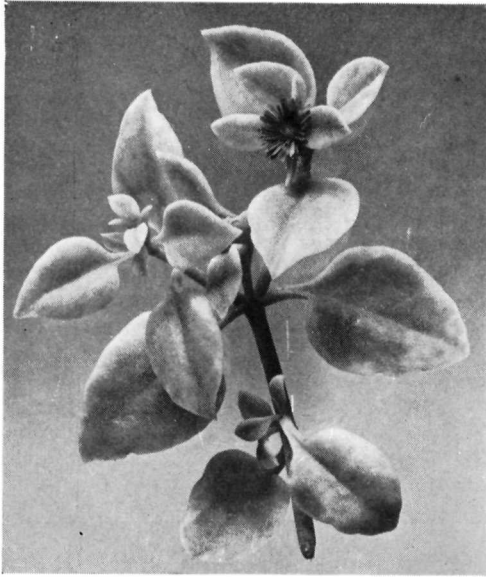
Gibbaeum velutinum

Photo: W. Beeson

placed into larger plastic bags with the end left open, and a small stick pushed into the centre of the pan, so that the bag forms a tent. This I think is the best method of gradually hardening them off. I find this is an ideal way of growing lithops, and have had no trouble with damping off. Leafy succulents will of course have to be removed from the bags much sooner.

Echeverias will probably need a clean up in the Spring, and the old dead leaves should be removed around the base of the plant, as this is where the mealybugs hide out. Behead any *Echeverias* or *Pachyphytums* that have gone up on a long stem, they quickly root up and make a much neater plant.

Many people tend to despise the *Agaves*, as many of them grow to very large specimens, but there are also some charming small varieties, well worth looking out for, which always remain compact and seldom make offsets. *A. parviflora* is a striking species with dark green leaves and white lines on the upper surface, and short white threads that stand out from the leaves. It is a native of Mexico and Arizona, and can only be propagated from seed. It likes a good sunny position and a fair amount of water. A true specimen of *Agave victoriae-reginae* can be very handsome, and while it is not a dwarf, it will be many years before it reaches maturity. The size can be restricted by not repotting too often. These plants will often do quite well on the window sill as they are very accommodating.



Aptonia cordifolia. From Prof Schwantes' "The Cultivation of the Mesembryanthemaceae"

Some of the *Kalanchoes* may have suffered during the winter by loss of their bottom leaves. They can be beheaded during the early summer and rerooted, while the old stump will usually throw a number of offsets which you can again treat as cuttings. The dainty little *Kalanchoe pumila* comes into bud very early in the Spring. This benefits from being broken up from time to time. It looks at its best when stood up on a shelf and allowed to overhang the pot. All *Kalanchoes* like full sun, and to be grown on the hard side to develop their true colouring, nothing looks worse than a lush *Kalanchoe*.

It will soon be time to think about the summer show; make an effort to enter this year. Think of the pleasure it gives the general public just to see our plants—they

are so different from the ordinary common or garden, and your plants might make all the difference to the show. I remember how proud I was at my first show, when I won two firsts, one second, and one third; you really begin to have faith in your plants, and to feel that you really belong to the Cactus Society, because you have helped in your small way to make a better show. If you are a beginner study the schedule carefully, and do not be afraid to consult any of the older members if you are not quite sure which class your plant comes under, for we are all only too happy to give any help we can. I used to devote all the weekend before the show to preparation. Each plant was given a new label, carefully watered, and the pot cleaned, and the soil top-dressed either with fresh soil or grit, and finally each pot was wrapped round in folded newspaper and packed in its box so that it was quite free of its neighbour and had no fear of moving about on the journey. I always made a plan of the boxes so that each plant was returned to the same place after the show. The packing and safe transport of your plants is of the greatest importance.

If you have any small succulents that are not looking too happy after their winter ordeal, try turning them out of the pots and examine the roots and instead of returning them to a small pot plant them altogether in a large seed pan. This often gives them a new lease of life owing to less root restriction, and also they often like the company of others. When the plant has regained its former beauty it can be returned to a separate pot again. If this treatment fails, stand any sickly plants out in the garden for the summer, or even plant them in the ground; it is often surprising what the natural elements will do for a plant you have been on the point of discarding. Old stone sinks or troughs make a nice outdoor summer garden for succulents, and the shrubby mesems in particular flourish and bloom very well outdoors. *Aptonia cordifolia* will grow into a really large clump if planted out and will also flower very freely. Let us hope for a really fine summer with plenty of flowers, and good healthy growth on our plants.

News From Branches

Hertfordshire Branch

Miss A. Dixon, who has been Secretary of the Branch since its formation in 1957, has retired from the position though she will continue to assist her successor. In appreciation of the hard work she has carried out over the past 10 years, the Branch members made her a small presentation on her retirement. The new Secretary is Mrs. B. Massey, of 86 Auckland Road, Potters Bar, Herts.

Northern Counties Branch

Just a reminder of the First Northern Show of the Society to be held in the Main Hall of the Social Service Centre, Whitley Bay on Saturday 10th June 1967. Schedules available from the Secretary of the Northern Counties Branch (see inside front cover). Any members are invited to show, and those unable to do so but visiting the area at that time can be sure of a pleasant outing by combining a visit to the seaside with a visit to the show.

Haworthia Maughanii v. Poelln *

by C. L. Scott

AFTER many years of studying Haworthias both in the field and from cultivated plants, I find I cannot agree with Fearn's views on the 'Windowed Haworthias', expressed in the *Cactus & Succulent Journal*, Vol. 21, Part 1, Page 28 (1966). Here he reduces *H. maughanii* to a variety of *H. truncata* stating:

'This variety is very close to var. *truncata* f. *crassa* in that the leaf shape is similar, often with small radially arranged white lines, and it has the same wild locality—i.e. Calitsdorp in the little Karroo. The chief difference is the rotation of the leaves from a fan shape to that of a rosette. *Haworthia maughanii* v. Poelln. is thus reduced to a variety of *H. truncata* Schoenl[†].

In separating the forms, Fearn uses the number of leaves viz; 'Leaves never exceed 7 = *truncata* var. *truncata* f. *crassa* v. Poelln. Number of leaves up to 13 = *truncata* var. *truncata* f. *tenuis* v. Poelln. As von Poellnitz did not indicate the number of leaves in his descriptions, the number of leaves must be derived from Fearn's interpretation. As there is such variation in the number of leaves on plants found in their natural habitat, an average number can be given only after colonies of plants have been examined. Fearn's determination of the different forms referred to by him is best judged when compared with the original description of von Poellnitz in Fedde, Rep. 1938, and Jacobsen, Handbook of Succulent Plants Vol. II, 1960, which Fearn quotes as a reference.

Von Poellnitz

f. *normalis* v. Poelln:
Truncate apex of leaves 6-8mm. thick; near Oudtshoorn and Ladismith.

forma *crassa* v. Poelln:
Truncate apex of leaves 9-11mm. thick; near Calitsdorp. The length and breadth of the leaves cannot be employed for the purpose of distinctions; they vary greatly with all forms.

forma *tenuis* v. Poelln:
(Truncate) apex of leaves only 3-4mm. thick; this especially striking form grows near Oudtshoorn.

Jacobsen

Haworthia truncata forma *truncata* v. Poelln: Truncate leaf tips 6-8mm. thick; near Oudtshoorn and Ladismith.

Haworthia truncata forma *crassa* v. Poelln: Truncate leaf tips 9-11mm. thick; near Calitsdorp.

Haworthia truncata forma *tenuis* v. Poelln: Truncate leaf tips only 3-4mm. thick; near Oudtshoorn.

Fearn

Haworthia truncata var. *truncata*: Number of leaves up to 13 which are 25mm. broad and 5-8mm. thick. Often the truncate leaf tip is shining and transparent. This form appears to be intermediate between f. *tenuis* and f. *crassa*.

Haworthia truncata var. *truncata* f. *crassa* v. Poelln. Number of leaves never exceeds 7, leaf tips 15-20mm. broad and 9-12mm. thick. Short white radiating lines present on the truncate surface. These were present in all specimens of f. *crassa* that the author has examined but not always present in f. *normalis* and f. *tenuis*. Collected near Calitsdorp in the little Karroo.

Haworthia truncata var. *truncata* f. *tenuis* v. Poelln: This is a smaller form and may have up to 13 leaves which are 20mm. broad and 3-5mm. thick. Collected near Oudtshoorn.

Fearn does not seem satisfied that *H. truncata* Schonl[†] was discovered at the type locality indicated by Miss Britten; he states:

'An interesting point is to consider the plant originally described by Schoenland. This corresponds to forma *crassa* of von Poellnitz, but forma *crassa* does not occur near Oudtshoorn, where Schoenland's plant was supposed to be collected, but at Calitsdorp in the little Karroo'.

These two towns are 34 miles apart, and both situated in the little Karroo.

In support of my views, I collected specimens from

the type localities of *H. truncata* f. *truncata*, f. *tenuis* and *H. maughanii*, which are reproduced in the accompanying photographs.

In Fig. 1 there are three distinct forms of f. *crassa* collected at Calitsdorp, together with two specimens of *H. maughanii*. That forms of *H. truncata* vary greatly in leaf thickness in their natural habitat is a fact, but not to such a degree as to resemble *H. maughanii* as Fearn would have us believe.

In Fig. 2 the two specimens of *H. truncata* Schonl. are from the original site, where in 1909 it was first collected by Miss Britten. Here in its type locality *H. truncata*

*The species name has been corrected to 'maughanii' in accordance with Art. 73 (1961 edition) of the International Rules of Botanical Nomenclature.

†In later years Schoenland dropped the 'umlaut' from his name and hence it is preferred to follow his wishes and abbreviate his name to Schonl. rather than Schoenl.



Fig 1

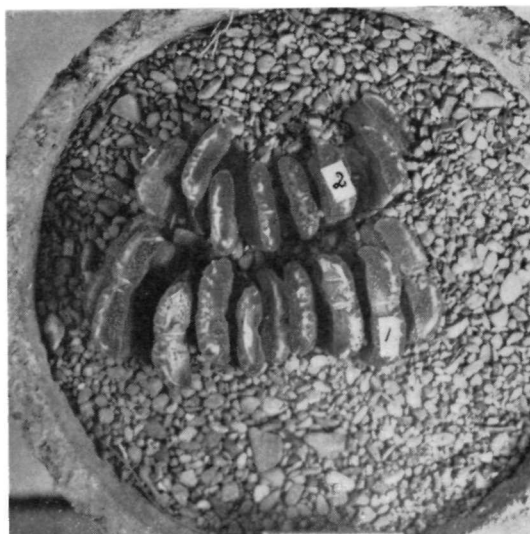


Fig 2

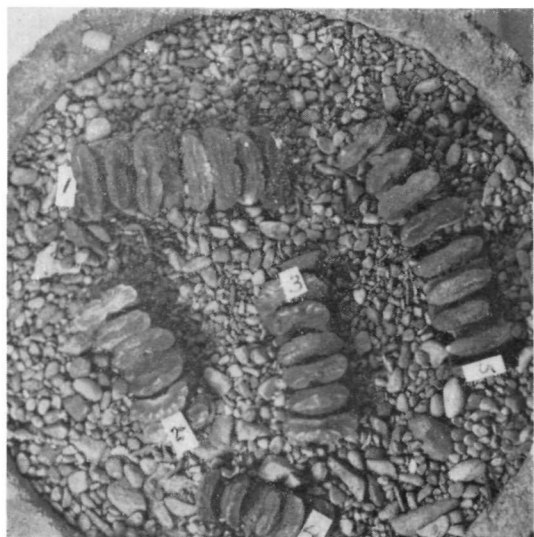


Fig 3

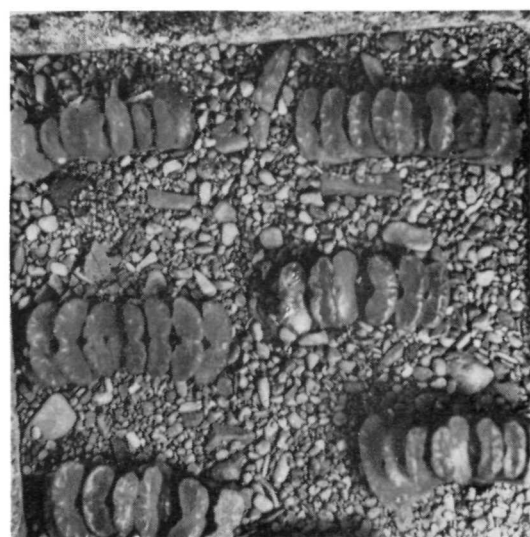


Fig 4

Schonl. grows massed together under bushes, and in places the plants cover an area of nearly 3 feet square. Great variation in the number of leaves is to be found, and of the dozens of specimens checked, the average number of leaves was found to be 10. *H. truncata* f. *tenuis* also occurs here and, whereas *H. truncata* is always found growing under a bush, f. *tenuis* grows in the open and amongst stones, and the plants do not grow in clusters, being restricted to single individuals. Counts made on numerous plants revealed that the number of leaves = 9. Fig. 3 shows two specimens of f. *tenuis*, 1 and 5, collected at the site locality of *H. truncata*

Schonl. It will be noticed that both plants have 9 leaves, but that the overall length of the plants and leaf widths vary considerably. Specimens 2, 3 and 4 of f. *tenuis* were collected at the site locality at Oudtshoorn, specimen 2 has 7 leaves, specimen 3, 6 leaves, and specimen 4, 5 leaves. Six specimens of f. *truncata* v. Poelln. are shown in Fig. 4, collected at the site locality at Oudtshoorn.

H. truncata f. *truncata* and f. *tenuis* grow amongst stones and in full sun. As in other forms, the number of leaves and sizes vary greatly, and here too the average number of leaves of numerous plants has to be checked

before the number of leaves in these forms are quoted. *f. truncata* and *f. tenuis* do not cluster but occasionally 2 to 3 plants are found growing side by side.

In their respective site localities *H. maughanii* and *H. truncata* *f. crassa* grow in exposed positions amongst stones. *f. crassa* is widespread, and grows on flat and hilly areas, whereas *H. maughanii* occurs only on the side of one particular hill which faces east. The type locality of *H. maughanii* is limited to $\pm \frac{1}{2}$ square mile. According to Fearn, both *H. maughanii* and *f. crassa* occur in the same wild locality at Calitsdorp and, mainly on the basis that these two forms occur in close proximity to each other, he has decided to reduce *H. maughanii* to a variety of *H. truncata*. The nearest point that these two forms occur from each other is ± 3 miles. It is not uncommon for several species of *Haworthias* to be found growing side by side, and in no way resemble or merge into one another.

The following amplified descriptions, based on field observations, will help to separate the two species:

H. maughanii v. Poelln:

Leaves multifarious, spirally arranged, semicylindrical in shape, more or less erect, ovate-triangular or ovate-elongated, truncate, and rounded near the apex of the leaf. Truncate surface minutely tuberculed, broader from the upper third towards the base. Back and sides minutely tuberculed in the upper third, remainder smooth, margins smooth, face concave towards the middle, and flat at the base.

Peduncle 10cm. tall including the raceme, $1\frac{1}{2}$ mm. in dia. 6-7 flowers. Fertile bracts 12, 4mm. long deltoid, white with a fine indistinct brownish nerve; pedicels 1mm. in dia., 1mm. long; perianth 7mm. long, white, reddish brown lined; fertile bracts 5mm. long, deltoid, white, with a reddish brown nerve.

H. truncata Schonl:

Leaves bifarious, in 2 exactly opposite rows and abruptly truncate at the tips; 2-3cm. long, ± 17 mm. wide, flattened, ovate-deltoid, nearly erect, slightly incurved, faces of the tips somewhat oblong, constricted in the centre, wrinkled, with minute tubercules; face convex towards the tip, channelled lengthwise and roughened with minute tubercules, lower sheathing part concave, smooth, margins fimbriately toothed; back smooth, convex, lightly channelled lengthwise in the middle, and roughened in the upper third with minute tubercules. The length of the peduncle including the raceme varies with different forms, from 15-30cm. tall and $1\frac{1}{2}$ - $2\frac{1}{2}$ mm. in dia.

Perianths in various lengths 8mm. to 10mm. number of flowers varying from 10-18. A variation is also observed in the number of sterile bracts and nerve colours; pedicels vary from 1mm. to 5mm., nerve colours on upper and lower segments vary with forms.

Length and breadth of leaves, peduncle and nerve colours are more or less consistent in the different forms

of *H. truncata*, irrespective of their habitats, which cover an area of roughly 100 miles in the little Karroo basin—i.e. from Ladismith to De Rust.

The forms of *H. truncata*, as separated by von Poellnitz, may be observed in nature, each form having its own distinctive characters, but the differences are not sufficiently stable to justify giving them varietal rank.

H. maughanii and all the forms of *H. truncata* are not found growing together, and forms which do grow side by side to each other do not grade into one another, nor does *H. truncata* grade into *H. maughanii*.

I believe that I have advanced sufficient evidence, based on a study of the plants and their variation in their natural habitats, to oppose Fearn's observations and conclusions and to restore *H. maughanii* von Poelln. to its original rank as a species.

G. G. Smith in 'The Journal of South African Botany' April 1948 p. 61 wrote:

'Long and wide experience as a taxonomist has convinced me that in the genus *Haworthia* at best, opinions on systematics are likely to be of diminishing value unless based partly on or correlated with ecological aspect. My observations show that the work at long range of overseas taxonomists is hardly likely to afford any important aid in the solution of the many perplexing problems presented by this genus. When their descriptions are based on unnatural looking plants and are accompanied by illustrations of poor quality, such work may indeed have to be ignored altogether'.

MAJOR C. L. SCOTT is a Major in the South African Police stationed at East London and in charge of an area where *Haworthias* abound, which gives him a golden opportunity to study the plants in their native habitat. He has been interested in succulents for some 26 years and recently has concentrated entirely on *Haworthias*. He has described several new species and is at present writing a monograph on the genus *Haworthia*. In his own collection he has just over 3,000 forms of *Haworthias* in individual pots! In his spare time he is Chairman of the Border Succulent and Cactus Section of East London!

Lists Received

K. Uhlig, Stuttgart.

Ernest Hepworth, Telscombe Cliffs. Printed List of Lithops and Other Succulents with Leaflet on Cultivation. Also Mr. Hepworth has invented a game called 'Cactus Loopaball'—an 'Indoor Game of Skill', but no details are given. He hopes to get it marketed in this country. Any Games Manufacturers among our readers?

Rambling Recollections

by Dr. A. L. Geyer

WE were hunting in South Africa when, after some days, our host suggested that we should move to another area, there to collect succulents. We were sarcastic; anyone wasting his time on succulents must be slightly dotty!

Four years later I accompanied that same host, then living in Cape Town, on a succulent collecting expedition to that very area. I had been bitten by the bug!

Thirty-five years later, in keen anticipation, I still begin to dream about my next expedition months ahead, meanwhile praying for rain. *Lithops*, on which we concentrated more and more, have the sensible habit of remaining fast asleep, under a safe blanket of sand, until the rains come. Then, almost literally, they are out in a flash. In 1964, on the last expedition which my wife and I could undertake together, we arrived at the habitat of *L. erniana* 14 days after two of our friends had been there. They had not been able to find a single plant, but four days after their departure, rain fell, and on that same site we saw any number of plants, plump and, in many cases, with the buds already showing.

The enthusiasm, then, is as great as ever and yet

there is a difference, quite apart from the fact that only my coloured chauffeur now accompanies me. To the beginner every plant is new, every find a source of great excitement. With the years, that changes. I still intensely enjoy the hunt. *Lithops* very seldom occur in numbers. Moreover, because of the heat in summer, collecting is a pleasure only in winter when, unless the rains had fallen very late, the plants are already entering their dormant period, many of them already covered by sand. It is quite usual to search for a long time and to find only a few. The search, therefore, remains fascinating, but the great thrills are rare. One is now always on the lookout for something new, and with one's interest confined to *Lithops* and the *Stapelieae*, something new does not crop up every day.

My wife and I could count ourselves fortunate. We were able to find four new species or varieties of *Lithops*, besides a few other things (but never a new *Stapeliad*). It was really largely a matter of luck. Once we had stopped for tea where one did not in the least expect to find *Lithops*. It was hot and I was thirsty, but while my wife was pouring the tea I suddenly saw



Dinteranthus vanzylii

Photo: Miss M. J. Martin



Lithops erniana

Photo: W. Beeson

a plant right at my feet, beside the road. It proved to be a new variety, to be called *L. salicola* var. *reticulata*. The tea was forgotten. On another occasion we were on our way home, with no thought of doing any more collecting. We had travelled for hours when, some miles south of the Orange River, I suddenly applied the brakes, remarking to my wife, 'This is becoming monotonous. Let us go and see whether there is anything over there'. A hundred yards away there was an insignificant patch of white quartz pebbles—and there we found what became known as *L. elisae*.

However, it wasn't all pure luck. A farmer offered to show us where *Lithops* grew on top of a hill on his farm (it turned out to be *L. triebneri*). Off we went along a faint footpath across the boulder-strewn veld, the farmer leading, with my wife behind him. With an exclamation she suddenly went down on one knee. Beside the footpath she had spotted a partly hidden specimen of the species that was to be named after her, *L. amae*. The farmer had not been aware that there were *Lithops* at the foot of that hill nor that he had two species on his farm.

It is just as well that almost all *Lithops* species are to be found only in the very arid, semi-desert or real desert areas. (*L. lesliei* is the remarkable exception, being found in areas with an annual rainfall of up to 25 inches, a xerophyte indeed!) These areas are far, by British standards immensely far, from the large popula-

tion centres, so that in the main only the serious collector goes to the trouble and the expense of visiting them. It has the further great advantage that there one can really escape from 'the madding crowd'. Farms in the North-Western Cape Province are, admittedly in only a few cases, up to 200,000 acres in extent, and in the adjoining Southern part of South West Africa up to 80,000 acres, while a farm of a mere 15,000 acres is considered to be quite small. As can be expected, the villages are far apart. From the Orange River to Windhoek, a distance of 500 miles, the main road passes through only four. From Pofadder, again, the centre of a district rich in succulents, among them the rare *Dinteranthus vanzylii*, execrable roads radiate to four other villages, the nearest 90 miles, the farthest 140 miles away.

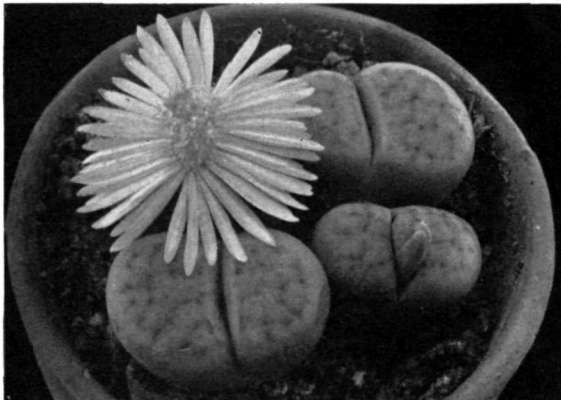
In areas so thinly populated good roads are not to be expected, and in our wanderings we naturally often made for the less accessible parts where the roads were mostly mere tracks across the stony veld. Once we were following the worst road, bar one, in all our experience. The speedometer needle remained close to zero, so that eventually my wife laughingly suggested that she should walk in order to look for plants, while I drove. And all that day we found nothing worthwhile!

The worst road of all, however, was the one on the way to the locality of *L. geyeri*. First one had to travel

for 150 miles from Springbok, the last 50 miles a mere track, to the foot of what is appropriately called Hell's Kloof. A very steep and indescribably bad track leads to the summit, and with a farmer in a sturdy truck to lead the way, we literally bounced up that mountain in our Volkswagen Kombi, my wife clinging for dear life to anything she could hold on to. On top there were further miles of winding track, which came to an end near the foot of the Katberge. The final stage, on foot, was a steep climb to the summit of the 2,000 ft. high mountain, the only locality where *L. geyeri* has yet been found. This sort of thing is, of course, not exactly good for one's vehicle! One has the odd satisfaction of feeling that the very last Lithops to be exterminated by man (and many are already on the danger list) will be my species.

We would not have taken the risk of going there alone along a track used by practically no-one but that particular farmer, and that perhaps once in two months. On several occasions, however, we did follow roads which were not only bad, but on which we seldom met another car. My attitude was that, with a dependable vehicle in perfect condition, and with careful driving, a breakdown was not very likely, and that if we did get stuck, we had water and provisions to last us, at a pinch, for at least a week. Within that time, someone was sure to pass our way, if only a shepherd looking for stray sheep. My wife bravely, even if somewhat nervously, accepted this philosophy. It may have been foolhardy, but it worked! In all our wanderings we were never once stranded in the wilds.

In fairness, I must add that not all the roads were very bad, and today even the minor roads in South West Africa have been improved beyond all recognition.



Lithops triebneri

Photo: W. Beeson

I was exceptionally fortunate in that my wife fully shared my interest in succulents and my love of the lonely, arid veld. It meant that, especially after our only child had gone to university, to both of us the

ideal way to spend a winter vacation was to go succulent hunting. At first we used a big car, with the rear seat removed and the camping equipment etc. piled inside. We slept under the stars. Later we acquired a Volkswagen Kombi, which we had plainly but comfortably furnished. We always had an itinerary, but this was really no more than an indication of what area we expected to cover, and when we expected to be home again. One day we would travel more than 200 miles, the next day scarcely half as much. It all depended on how interesting the veld happened to be. On one occasion we came to a plain with a large number of low koppies covered with white quartz pebbles, all of which we decided to investigate. That evening we could see our previous camping site only 38 miles away.

The chances are that in such a case one would find the same species and nothing else on all the koppies, but one can never be sure. After all, we have found *L. olivacea* and *L. fulleri* growing cheek by jowl, with *D. vanzylii* only a few miles away. The only safe course is to have a good look at all the likely looking spots—but then, what are these spots? To give one example, on one and the same farm we found *L. kunjasensis* growing, not only amongst white quartz pebbles on the slopes of a small koppie, but also in the fissures of red granite rocks, on level ground covered by a mixture of limestone and quartz pebbles, and on a mountain among ironstone boulders. White quartz pebbles, however, always draw the collector. So many *Lithops* have a partiality for soil thickly covered with these small pebbles, probably because, by reflecting the heat of the sun these help to keep the soil cool, and also because the tiny seedlings find shelter and protection among them.

I have stressed that our favourite hunting grounds were very thinly populated. Often for a whole day we would meet not a soul; one had the feeling of having the world to oneself. With an ideal companion, wonderful weather, the thrill of suddenly coming upon an interesting plant, perfect evenings beside the camp fire, the air crisp, the sky bright with the stars of the Southern Hemisphere, the stillness of the evening perhaps broken only by the far-off cry of a jackal calling to its mate, that indeed was bliss.

Dr. A. L. Geyer was High Commissioner in London for the Union of South Africa during the early 1950's, when he was personally known to some of our members and accepted an Honorary Vice-Presidency of the Society. In March 1951 members had the pleasure of hearing Dr. Geyer talk on his experiences when hunting lithops in South and South-West Africa. He specialised then in *Lithops* and *Stapelia*s with *Lithops* as "his very special love" and much of his spare time has been spent collecting these plants, one of which he mentions, *L. Geyeri*, having been named after him.

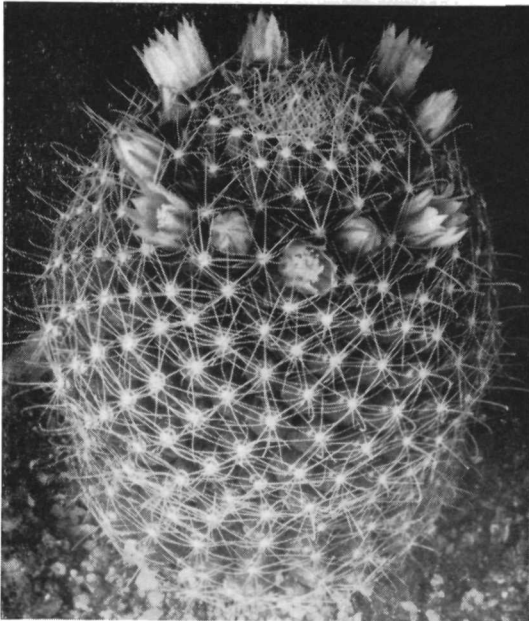
Beginner's Corner

W. I. Acton



Lobivia hertrichiana Photo: Miss M. J. Martin

NOTOCACTUS LENINGHAUSII is a very decorative plant with long yellow hair-like spines and whitish wool in the growing centre. Young plants are spherical, but they soon become tall and cylindrical with a flat top which slants to face the sun. Unlike most other Notocacti, which flower when quite small, *Notocactus Leninghausii* has to be quite large before it produces its beautiful yellow flowers. Large plants also produce offsets around the base. This plant is rather susceptible to damp in the winter and, again unlike other plants of the same genus, requires a little warmth.



Mammillaria wildii Photo: Miss M. J. Martin

LOBIVIA HERTRICHIANA is a small glossy green globular plant from Peru. The ribs are rounded and the spines curved backwards giving it a rather neat appearance. Offsets are freely produced but this does not affect its flowering ability, and if they are left attractive clumps soon form. The large bright scarlet flowers open in the daytime and are freely produced by quite small plants. This species grows and flowers well given a rich open soil, plenty of sun and water in summer, and if dry in winter cool conditions will be tolerated.



Notocactus Leninghausii Photo: K. H. Halstead

MAMMILLARIA WILDII is covered with yellow spines which come from the tips of small tubercles. The central spines are stronger and hooked. The cream flowers are produced in a ring around the top by even quite small plants, and the ease of flowering is a feature shared with other hook spined, soft bodied *Mammillarias*. Older plants form clusters and may produce hundreds of flowers in a year. The offsets may be removed, but this leaves a permanent scar, and single tubercles will grow although this method of propagation is slow. Flowering sized plants can however be grown from seed in two years. Cultivation is simple with a rich porous soil, plenty of water in summer and a little warmth in winter.

Stapelia Barklyi

by Harry Hall

(First published in "The Cactulent," January, 1960).

ONE of the real joys of plant hunting is, in my view, the discovery of something not seen for so long that it is virtually regarded as extinct. Quite a number of plants have never been seen again in the wild state since the time of their first bow to the world of science. For instance, some half-dozen Stapeliads collected by Francis Masson at the Cape, 1772-96, have never been re-collected since his day and these are popularly known as 'Masson's lost plants'. Masson's book, *Stapeliae Novae*, by the way, is so rare and so much sought after that copies change hands for about £100. It is even more exciting when a re-discovery is more or less by chance, as in the example to be described.

As readers must be aware, the vast majority of Stapeliads are native to South Africa. *S. variegata* was the first species to be taken to Europe, by the Dutch missionary Justus Heurnius in 1639. It is still the commonest species in cultivation and it still grows wild in the suburbs of Cape Town. Lots of other collectors followed but for the sake of brevity I will refer only to Sir Henry Barkly who was Governor at the Cape from 1870 to 1877. He was an enthusiast who collected and cultivated Stapeliads in the grounds of Government House and he had a number of friends who helped him in his searches. Barkly sent many specimens to Kew where, in 1890, N. E. Brown published an account of them. The species that Brown named after Sir Henry is the subject of this note. N. E. Brown, by the way, is remembered by all students of taxonomic botany, and the letters 'N.E.Br.' are appended to legions of plant names in many genera. However, to confine ourselves to Stapeliads, by reading through the pages of White and Sloane's 'Stapeliae' it is possible to gain a slight impression of the work he accomplished with this group of plants. 'The total work done by Dr. Brown on behalf of the Stapeliads cannot be estimated' was the authors' compliment to this great botanical authority. During my spell at Kew, 1930-33, I saw him frequently. He joined the staff at Kew in 1873, retired in 1914, and continued his researches in the Kew herbarium until his death in 1934. *S. barklyi* was christened by N. E. Brown but there are no records that it remained long in cultivation nor that it had ever been collected again. Undoubtedly it had been sought for by more recent collectors such as N. S. Pillans who did tremendous work in finding both old species and new ones in the early years of the present century. Barkly's plant was collected near O'Okiep, a small copper mining village near Springbok in Namaqualand. My own modest researches revealed that there was no record of any dried material in any South

African herbarium. A rare species indeed. Whenever I found myself in the vicinity of O'Okiep I have looked out for Barkly's *Stapelia*, all to no avail.

In November 1957 on one of my periodic jaunts in Little Namaqualand with my friend Bernard Carp, winding our way over the sandy tracks from the almost rainless West coast inland to the Khamiesberg, to civilisation and home, we found ourselves in an unusually large concentration of *Stapelias*. Two well-known Namaqualand species grew here and there almost underneath every shrub. These were *S. pulvinata* Mass. and *S. namaquensis* N.E.Br. The former was in flower and the latter always recognisable by its fat mottled joint stems very like a gigantic version of *S. variegata*. Because we were about 70 miles southwest of O'Okiep I'm afraid no thoughts of *S. barklyi* were in my mind and we were soon busy snipping bits from various plants because there is usually some colour variation amongst *Stapelia* flowers. When the specimens came into flower a couple of months later, some were so obviously neither *S. pulvinata* nor *S. namaquensis* that I got them investigated and to my great joy our botanist, Miss Barker, declared them to be the long lost *S. barklyi*. Thus, by sheer chance, this very rare species turned up again after more than half a century. White and Sloan do not tell us the size of the plant, but since most of the specimens we saw of the two previously referred to were at least 2 ft. dia. I shall assume that *S. barklyi* also gets to this size. Its stems are four-angled, about 4 in. in height, purplish green where exposed and covered with small purplish flecks. The flowers are 5 in. dia., purple brown with very narrow transverse yellow lines on the basal half of the lobes, dark purple brown near the tips. The fleshy annulus and the lobes are covered with soft purple hairs. I now know that should I ever find myself in that same area in Namaqualand I shall be able to recognise the genuine plant even though the severe and frequent droughts dull the stems of *S. namaquensis* for it surely must have been one of these specimens that supplied us with *S. barklyi* all unwittingly, because it was amongst them that we first saw the flowers of the newcomer, in cultivation here. I would stress here that when no flowers are present it is quite impossible to identify a great many *Stapelias*. *S. barklyi* seems to be quite a vigorous grower and flowers well.

This story has an amusing sequel. To make quite sure of a good photographic record I enlisted the aid of a professional photographer, a specialist in child portraiture! To him, a *Stapelia* flower was so queer that he must have told my version of its origin to his

friend one day in the local. His friend happened to be the editor of a Cape Town paper and quite naturally he scented a story. In brief, then, in a misguided moment, I agreed to supply him with a few details. To my embarrassment, but to his joy, we were both inundated with letters and 'phone calls from readers all with more or less the same story that they had had this lost plant in their gardens all the time, that it grew in waste ground near their property, that they remembered seeing it as children here, there, and everywhere.

Others kindly sent specimens, all of which proved to be either *S. variegata* or *S. hirsuta* (an equally common and widespread species). None of them had read the description carefully but their error was quite understandable. There are hundreds of *Stapelias*. To me it was quite a headache for a few weeks, but to the said editor it was all that he could wish for since it proved how many folks read his paper! Gradually the batches of letters forwarded to me from his office with the covering note "More of your *Stapelia* fan mail" ceased.

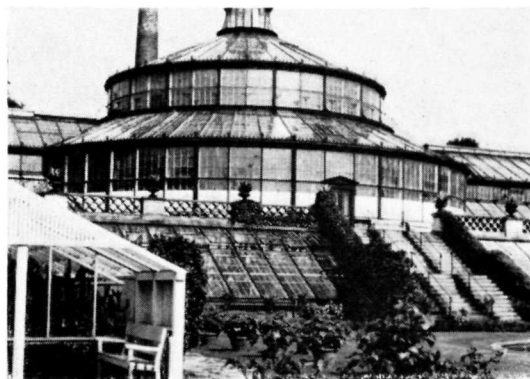
Succulents In The Botanic Gardens, Copenhagen

by B. and W. F. Maddams

MUCH has been written about a few of the prominent cactus collections of Europe and many are the slides that are shown of succulent plants in the Jardin Exotique and Pinya de Rosa. In this connection, it is often tacitly assumed that it is only in the South of Europe that there are worthwhile succulent collections to be visited. Although this may be true in the case of plants growing out of doors, we discovered in the late summer of 1965 just how fine a collection may be found under glass in a seemingly unlikely spot far removed from the Mediterranean. When we knew that we would be visiting Copenhagen, the capital city of Denmark, we had little expectation of encountering many succulent plants, but there was certainly a surprise awaiting us at the Botanic Gardens.

Our first visit to the Gardens was by way of a reconnaissance, fitted in during a spare hour. One end of the site is dominated by a tall palm-house, around which are grouped other glass-houses and, as we approached these, we caught our first glimpses of cacti. One of the structures, somewhat removed from the others, had a glass arbour and seats at one end with a colourful group of succulents immediately behind the glass. Although this house was not open to the public it was possible to sit and enjoy the plants and to appreciate their finer points. The first plant to attract our attention was a fine specimen of *Kalanchoe beharensis*, some two feet tall, the whole length of the stem being clad with the large tan to rust coloured velvety leaves. The fine condition of this plant was typical of the whole group. Needless to say, the sight of this colourful specimen filled us with the urge to acquire one, an ambition that has recently been satisfied. Among the other plants in this house was a *Cereus* species, little more than two feet in height but well in bud, and a good selection of *Euphorbias*.

We also discovered during this hurried first visit that a lean-to greenhouse immediately below the palm-house was the home of a substantial collection of cacti



and other succulents, as will be evident when we mention that it is about eighty feet in length. This house was locked, but we interpreted the notice on the door to indicate that it was open to the public on Saturday afternoons. We therefore returned at the appropriate time, which happened to be our last full day in Copenhagen only to find that our skill as linguists was wanting, and that the collection was on view on Sunday afternoons. However, the sight of the fine array of plants filled us with determination and we therefore entered the adjacent palm-house and approached a gardener. Although his understanding of the English language was rudimentary, a state of affairs which is unusual in Copenhagen, we managed to convey the information that we wished to see the cacti and were not in a position to come back the following afternoon. He passed us over to one of the botanical staff who was busy showing round a group of students. However, the sight of our Society Membership convinced him of our *bona fides* and he politely suggested a visit to the fern-house until such time as he had finished with his party in the cactus-house.

In that we pride ourselves on being gardeners in general and not succulent plant specialists, and having

caught sight of some fine *Strelitzia* plants, we acquiesced readily, little knowing what pleasure was in store for us. The fern-house also contained many hanging baskets holding unusually fine specimens of the various epiphytic cacti. We made copious notes for future reference and can only mention some of the more impressive plants in this article. Among the *Rhipsalis* species, *R. monacantha* was well covered with pink berries, *R. mesembryanthemopsis* caught the eye on account of its dainty stems and others were gay with flowers and fruit. We were also gratified to see so many *Lepismium* species; of these *L. paradoxum*, with its reddish berries, was outstanding. There is no doubt that conditions in the fern house were ideal for these epiphytic cacti, if not for photography, and we were sorry there was no-one on hand from whom to ascertain such facts as the minimum winter temperature in this house.

A few minutes later we were ushered into the cactus house and left to our own devices. We are still undecided as to whether it was the honest look on our faces or the sight of our Society Membership cards that led to this considerable privilege. Needless to say, more note-taking ensued and with a better light than in the fern house, photography was possible. The plants in this eighty-foot lean-to structure are segregated into three sections. In each the larger plants are bedded out at the rear, butting on to the side of the Palm-house, and staging on which the smaller plants are sited, runs the length of the structure on the opposite side. Among the potted specimens in the first section, mention must be made of a fine plant of *Astrophytum ornatum* v. *potosina* x *ornatum*, one foot in height and remarkably clean, and several *Malacocarpus* (*Wigginsia*), of good size, in flower. Among the *Gymnocalycium* we saw *G. mazanense*, some seven inches in diameter and *G. hybopleurum* in a six-inch pot and about eight inches tall. Naturally, the *Mammillaria* species held our interest for some time but, alas, this was where we found one of the few mistakes in labelling, a plant of *M. bombycina* bearing the name *Mamillopsis senilis*! However, a plant of *M. geminispina* bearing many fruits, and one of *M. chionocephala* some seven or eight inches tall atoned for this.

Other good sized *Mammillarias* are bedded out, including a columnar specimen of *M. hahniana*, about nine inches tall but, in this group, it was the *Cerei*, *Opuntia* and *Euphorbia* species which really attracted our attention. For example, a ten-foot specimen of *C. jamaracaru*, bearing many buds, made us wish that we could return in a week or two to see the flowers. We also regretted that there was no-one around to ask what would happen when this plant grew a few more inches and met the roof! *Euphorbia grandidens* was really tree-like and *E. tuberculata* was flowering profusely as were several *Opuntias*, notably *O. robusta* which was also full of fruit. The various genera from the western side of South America were also in evidence.

A six-foot specimen of *Oreocereus celsianus* made us envious and there were several beautifully clean plants of *Espositoa sericata* up to three feet in height. Many of these plants had dates marked on the labels which we took to be the year of acquisition; some of them went back to the early years of the century.

Dragging ourselves away with reluctance from this fine array of specimen plants, we passed into the second section of the greenhouse, which contains a wide range of the 'Other Succulents'. Here we particularly noted *Kalanchoe rhombopilosa*, one of the smaller growing of the genus with pale variegated leaves, and *Aloe bakeri*, a dwarf species with yellow-marked leaves and yellowish flowers. The stemless mesembryanthemaceae are well represented; we saw several multi-headed plants of *Conophytum* species including *C. giftbergense*, an unusual spotted one. We were also impressed by a fine plant of *Cheiridopsis candidissima*.

The third section of the house contains many larger succulents. Here we saw *Agave paranana* with a four-foot flower spike and *Yucca aloifolia* in bloom. An unusually large plant of *Glottiphyllum taurinum* was conspicuous because of the dazzling yellow flower it bore and we could hardly fail to notice a two-foot specimen of *Cotyledon paniculata*. An Aloe-like plant, called *Fourcroya stratiodes* was something we had not previously encountered. This section also included more hanging baskets of epiphytic cacti.

We have only been able to give you a glimpse into this fine collection and have certainly omitted many plants worthy of mention. We can say without hesitation that if our readers are in the Copenhagen area, on holiday or business, they should make every effort to fit in a visit to the Botanic Gardens.

When is a Dicotyledon not a Dicotyledon?

by G. G. Leighton-Boyce

THERE are plenty of references* to how prominent the pair of leaves is on a seedling *Opuntia* or *Grusonia* before the characteristic stem develops, and these genera, with *Pereskia* and *Maihuenia*, are among the most convenient to illustrate that cacti are dicotyledonous plants, that is, having two seedling-leaves. Very little, however, seems to have been published on the extent of divergence from the two leaf norm. Indeed this is such a fundamental characteristic that I suspect it is sometimes assumed to be invariable.

I have been raising this year a few of the smaller pad type *Opuntia* species from seed, and it may be worth noting that of *O. rastrera* I have three out of thirteen seedlings with three leaves. The same phenomenon has occurred with *O. zebrina* but less frequently. These are not

* e.g. Borg, *Cactic*, 2nd edn. 1951. p. 43
Marsden, *Grow Cacti*, 1955. p. 82.

very closely related species, and, as the former is Mexican and the latter from Florida, there does not appear to be much geographical significance in the deviation. It is associated in *O. zebrina* once in my experience with twin characteristic stems from the same seedling stem, as is met with in *Mammillaria* species. Several species grown at the same time under the same conditions do not show the deviation, e.g. *O. procumbens* nought out of eight, *O. microdasys* v. *pallida* nought out of thirteen.

A possible explanation may be inferred from what has happened to two *O. tapona* seedlings out of thirteen: they have only two cotyledons but each has one which has forked towards the end into two lance-shaped tips. The three seedling leaf forms in other species may well be caused by this forking happening to one of the leaves immediately it begins to grow. The absence of a four-leafed example (did anyone mention clover?) may be due merely to the small numbers of seedlings to which this observation is limited.

I would add that all the seeds came from Germany, and all before sowing were frozen, sanded and then (as is commonly done with lupin seeds) nicked and soaked.

I have not noted the deviation in the only batch of *Grusonia* seed I have grown. It would be interesting to know to what extent it has been observed in numerically larger batches of seedlings.

Oddities

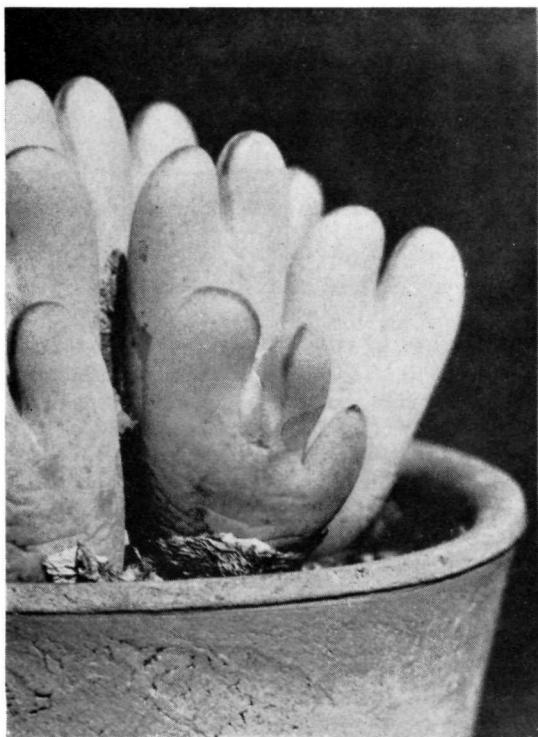
Strange goings-on in the greenhouse

The aim of this series is to report unusual growth forms observed in members' collections. Members are invited to send contributions to the series, preferably including a photograph or line drawing. If any morphologists among our readers can provide an explanation of these phenomena, the Editor will be pleased to hear from them.

No. 5 *Malformed leaves* by L. E. Newton

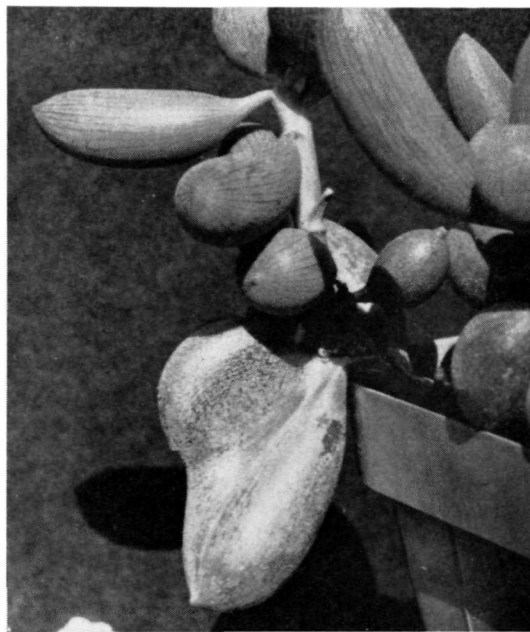
The mechanism by which the genetic structure of a plant (or animal) actually directs growth and development is one of the central focal points of current biological research. Allowing for the variation resulting from changes in water supply and other factors, and discounting plants such as *Mitrophyllum* species with more than one form of leaf, an adult plant will usually produce leaves of the same shape—or almost always. Occasionally something goes wrong, and two such cases are illustrated here.

Senecio ovoideus produced one peculiar leaf in 1965. The rest of the plant is quite normal. *Conophytum bilobum* emerged with a spur on one leaf in 1966. In this case, of course, the deformity will not be permanent. Malformation of leaves is often caused by parasites of various kinds, but there is no evidence that any parasite was responsible for either of these cases.



Conophytum bilobum

Photo: L. Newton



Senecio ovoideus

Photo: L. Newton

Senecio Haworthii in Bloom

by Gordon Rowley

THE flowering of this, most handsome of all succulent groundsels, is sufficiently unusual to merit putting on record. Haworth described it first as *Cacalia tomentosa* in 1803 and 9 years later transferred it to *Kleinia* as *K. tomentosa* Haw.—the valid name under that genus. His plant came from a grower in Surrey who had had it since 1795, the year given for its introduction to Europe. The exact habitat remained unknown until recent years when Harry Hall found it wild near Laingsburg, and other forms of it have also been collected by

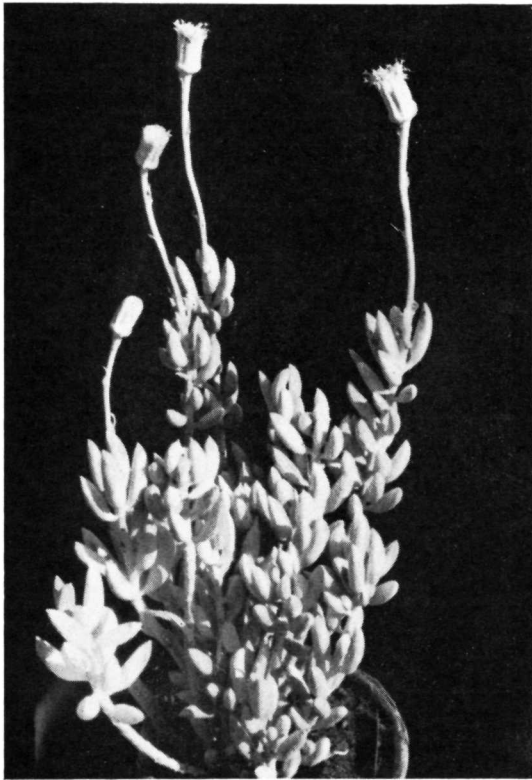


Photo: G. D. Rowley

Herre—some very fine. Until then all the plants in cultivation were probably descendants of Haworth's original clone.

Haworth waited in vain for flowers, as did Harvey, Lemaire and many others to come after him. In 1873, flowers were reported on plants at La Mortola, and from material sent to London an excellent plate and description were made for the Botanical Magazine. But as late as 1949 Mrs. Higgins wrote: 'There appears to be no record of the plant having flowered in this country'.

As will be seen from the photographs, the flower heads are borne singly on extensions of the main axis 8-10 cm. long. Individual florets are a rich clear yellow and all are discoid, without rays. The involucre of 8 to 9 bracts and rachis are covered in the same white felt that envelops the whole plant. No seed was set.

Senecio haworthii Sch. Bip. is often regarded as a 'difficult' plant in cultivation, but I have never found it so. The only justification for this opinion might be the absence of flowers and the tendency for lower leaves to wither and fall in winter—a quite natural occurrence in the wild, no doubt. Beheading the plants when they get leggy and re-rooting the tips is the answer.

Just what prompted one of my plants to burst into bloom in a small, grimy London glasshouse in the wet autumn of 1966 I shall never know. It would be ungrateful to say that the flowers added nothing to the beauty of the plant, but I would be interested to know if anyone else flowered this capricious species, and whether or not we shall have to wait another 171 years before it happens again!

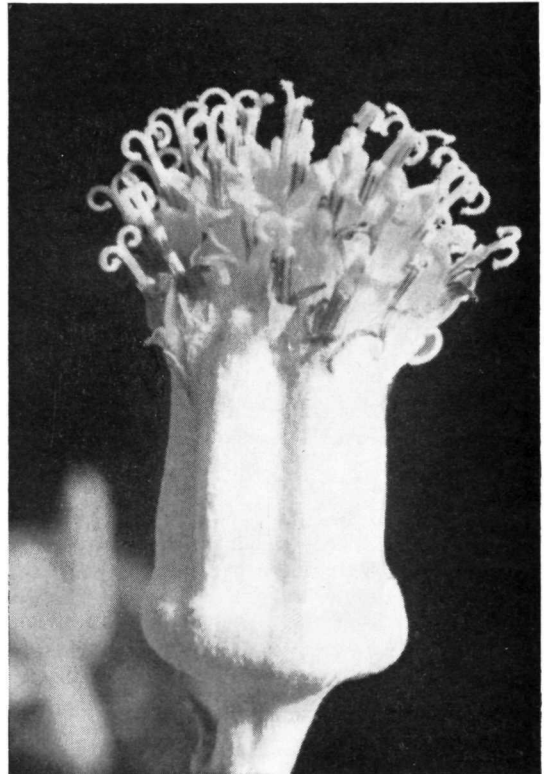


Photo: G. D. Rowley

Book Reviews

Reynolds, G. W. *The Aloes of Tropical Africa and Madagascar*, xxii, 537 pp., 106 colour plates, 557 text figs. 1966. £5.2.6.

WHEN Dr. Reynolds' first book 'The Aloes of South Africa' was published in 1950, it was immediately hailed as one of the finest monographs ever produced for a group of succulent plants. This achievement has been well matched by the same author with the publication of the companion volume covering the rest of the genus.

The first main section of the book deals with the species of Tropical Africa, Arabia and Socotra. The other main section covers the Madagascan species, and brings up to date the author's previous monograph of this group (1958). For each species there is a full description, and data such as synonymy, distribution and variation. The text is accompanied by numerous fine photographs, mostly showing habitat views and flower form. Identification keys are included, though the author states that because of the variation exhibited by Aloes, identification is difficult and it is impossible to devise an infallible key. The habitat photographs, especially those in colour, are mostly of such superb quality that it may appear churlish to question their value in attempting to identify a potted plant in a British greenhouse.

The extensive travels of Dr. Reynolds in search of Aloes, taking him to most parts of the vast Continent of Africa, have been well publicised. One reason for his undertaking this enormous amount of field work was his desire to visit the type localities of as many species as possible. By starting with plants from the type localities, and armed with the expert knowledge of variation in the wild acquired during years of field study, Dr. Reynolds was in a better position to assess speciation in the genus. However, many problems still remain, and a small third section of the book gives some account of imperfectly known and doubtful species. At the time of writing the Preface, the author stated that a total of 324 species of *Aloe* were known, though other collected plants are awaiting description.

In spite of its possibly formidable description as a botanical monograph of a high technical standard, the veriest novice will find this book a joy to handle and a pleasure to read. The occasional notes on native uses are of interest. We read, for instance, that the leaves of *A. megalacantha* are used for making a permanent black dye. We learn too, that in Western Angola the flowers of *A. baumii* are used to make cakes. Likewise, the frequent references to the adventures of collectors, including the author, make fascinating reading. On reaching the type locality of *A. veseyi* it was found that the largest number of plants grow on a perpendicular rock face about half a mile broad and 400-500 feet deep, and cannot be reached without block and tackle.

One collector secured some of this material by using a rope with a slip knot.

In recent years, many of the dwarf species of *Aloe* have become more readily available and have proved to be attractive and free-flowering. Their growing popularity will undoubtedly be enhanced by the appearance of this magnificent book. It is beautifully produced and offers excellent value for money. Indeed, judging from the fact that the 1950 volume is already out of print and much in demand, one may confidently predict that this book will be a sound financial as well as an intellectual and pleasurable investment. L.N.

'**Gymnocalycium**—Some observations on the Genus by a Study Group of the Institute' edited by R. Ginns for the Succulent Plant Institute, 48 pp., illustrated cover and 12 figs. Available at 5s. from Mr. R. Ginns, 112 Rothwell Road, Desborough, Northants, or Mr. S. L. Cooke, 63 The Drive, Morden, Surrey.

This booklet represents something of a landmark in the organised study of succulent plants in Great Britain. It is a selection of the comments made by a group of members of the Succulent Plant Institute who are particularly interested in the study of the genus *Gymnocalycium* and, in that the Institute also has members working on other genera, it presumably represents the type of information which will be forthcoming from time to time. This seems to be an eminently sensible way of making known the results of such studies in the absence of a regular publication such as those put out by The Mammillaria Society and the African Succulent Plant Society. It also provides the opportunity for a refreshing degree of informality, and congratulations go to Mr. Ginns for preserving the authenticity and frankness of some of the comments which have the ring of the spoken rather than the written word in some instances.

The topics covered comprise cultivation, raising from seed, flowering records, self-sterility in the genus, taxonomy and comments on some forty species. It is stated clearly at the outset that it is hoped to produce a supplement to this first effort and that many of the species mentioned require far more study; however, its contents will satisfy many except that they may not find the details of a particular plant of interest to them. It is pleasing to find twelve good black and white photographs in a booklet so modestly priced. In view of the remarkable growth of specialist Cactus societies of recent years it will be interesting to see what the demand for this booklet proves to be. It should certainly be read by all who profess a real interest in a particular genus because it will show them very clearly how they must set about solving the problems which they will encounter. W.F.M.

Correspondence

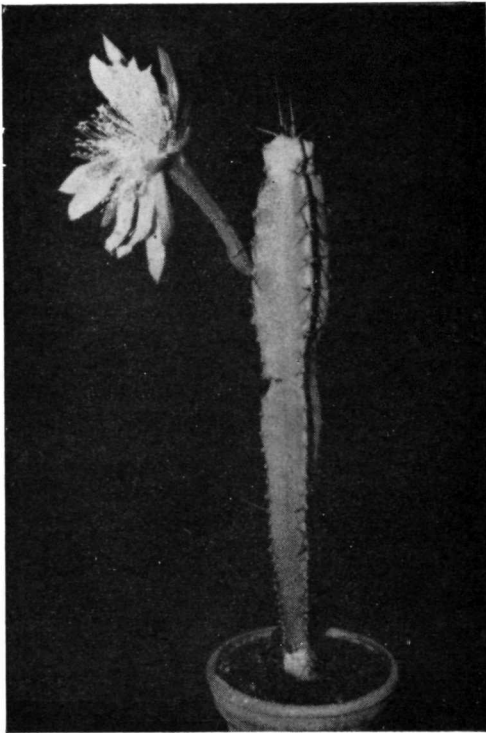
To the Editor:

Readers may be interested to hear of the flowering of *Cereus Jamaracaru* at the age of only seven years from seed.

On Friday, 19th August, out of nowhere, appeared one bud which grew about $1\frac{1}{2}$ inches in its first day. It continued to grow at an even more startling rate so measures were taken to ensure that this was recorded. The plant was removed from my collection to Mr. Read's to be photographed. After thirteen days of suspense it began to open, the first signs being around 7 p.m., and by midnight it was almost fully open.

The size of the bud just before opening was $7\frac{3}{4}$ inches long and when fully open the diameter was almost the same. A really splendid show, I think, for a plant grown from seed in 1959 and only 1 foot 6 inches tall.

G. A. Page,
Epsom, Surrey.



Cereus jamaracaru

Photo: E. M. Drage

To the Editor:

It is always refreshing to find someone interested in the non-botanical aspects of cacti, so I read with pleasure Mr. Keith Morris' article in the February issue on 'the anthropological aspects of *Lophophora Williamsii*'. However, I feel that it has two serious defects which combine to create a false impression of these aspects.

(1) Most of it is based on Frazer's 'The Golden

Bough', completed in 1890. Frazer, as Ruth Benedict pointed out in 'Patterns of Culture', ignores aspects of cultural integration in his effort to present a uniform view of mankind. He had no *direct* knowledge based on field research for most of his assertions. Worst, the impressive parade of customs and rituals ripped from their cultural context to fill the pages of 'The Golden Bough' is used to show the 'Inferior' nature of non-European cultures by presenting a false view of magic and its functions (as a pseudo-science, in fact). 'Fancy Indians being silly enough to imagine that going to fetch a cactus would bring good crops and rain'!—this is Frazer's attitude; we, of course he implies, have learned the uselessness of such superstitious follies. Fortunately, in the words of a leading contemporary anthropologist, 'modern anthropology has grown away from Frazer—or rather it has outgrown him' (M. Fortes, 'Oedipus and Job in West African Religion')—just as it, along with the rest of us, has outgrown the positivism which framed his thought. But a Cactus and Succulent Journal is no place to embark on a detailed criticism of Frazer; indeed, a demonstration of his inadequacy would be entirely superfluous were it not for the fact that the public has adopted 'The Golden Bough' as its Anthropological Bible. Nowadays, as Collingwood remarked, 'Anthropologists know too much about magical practices to believe that they can be explained on positivistic principles as symptoms of disorder in the machine of inductive thinking'. It is unfortunate that Mr. Morris' article is permeated by this error.

(2) Because he confines himself to Frazer, Mr. Morris writes in the past tense. But *Lophophora Williamsii* is still extensively used by Indians in Oklahoma, Arizona, Wisconsin, Utah, Colorado and Nevada: although in different ways from its original, pagan use.

Today, anthropologists tend to see magic and religion in folk cultures in terms of their social function. Thus the cult built up around the eating of *Lophophora Williamsii*, embodied in the Native American Church and other organisations, is a cohesive force, and a way of preserving native American Indian culture from being overwhelmed by the white man.

Quite apart from this, there has been considerable interest in the hallucinatory experiences caused by eating *Lophophora Williamsii* shown by men such as Aldous Huxley. It was a meal such as this which put Dr. Timothy Leary on the road to founding his LSD cult, which is growing rapidly among certain sectors of the American population, and shows signs of catching on over here. The dangers involved in this cult (LSD is 400 times more powerful than mescaline) are considerable; *Lophophora Williamsii* may well have a lot to answer for.

The literature on the whole subject is staggering. Donald Collier's bibliography of it totalled more than 400 published books, articles and papers; that was in 1937! The standard work is 'The Peyote Cult' by

W. La Barre (Yale University Publications in Anthropology, XIX, 1938). The physiological effects of mescaline are discussed in 'Mysticism, Sacred and Profane' (Oxford, 1957, pp.1-29, 208-226) by R. C. Zaehner. There is a brief summary of present-day Peyotism, with a good bibliography, in 'The Religions of the Oppressed' (Mentor Paperbacks, 1965, pp. 63-100) by V. Lanternari; V. Petruccio, 'The Diabolic Root: a Study of Peyotism, the New Indian Religion, among the Delawares' (Philadelphia 1934); J. S. Slotkin, 'The Peyote Religion: a Study in Indian-White Relations' (Glencoe, 1956) and O. C. Stewart, 'Washo-Northern Paiute Peyotism: a Study in Acculturation' (University of California Publications in American Archaeology and Ethnology, XL, 3, 1944) are also useful.

R. J. Evans,
Jesus College, Oxford.

To the Editor :

On opening my copy of the February 1967 Journal and finding the enclosed seed list I could not help wondering, once again, what proportion of the considerable amount of seed distributed by the Society eventually ends up as mature plants. I judge that the figure must be small, both from discussions with many members and from the deplorable number of entries in the classes for seedlings of cacti and of other succulents at the Society Shows.

This situation rather depresses me because I know from experience the considerable satisfaction to be gained from raising one's own plants and, above all, seeing them flower for the first time. Quite apart from this it is the economical way to enlarge a collection, to avoid paying some of the ridiculous prices which are now being asked for plants. For example, I have just seen an advertisement by a well-known specialist nursery in which a six-inch plant of *Echinocactus grusonii* is priced at £3, and a four-inch plant of *Mammillaria spinosissima* at 25s. Plants of these sizes can be obtained in eight to ten years from seed; if most of us are really honest with ourselves we shall have to admit that this is not an unduly long time, particularly if the decision to raise from seed is made early in one's collecting career.

Why then is such difficulty apparently experienced by the majority of members who attempt to raise from seed? I feel that they despair too easily. The first point to realise is that young seedlings require rather more attention than older plants and the vital point is to keep a reasonable balance between the three factors influencing growth, namely warmth, moisture and light. Insufficient moisture and unscreened sunlight are probably the causes of most failures. It is not my intention to write an account of seed raising; Mr. Boarder deals admirably with this matter from time

to time. I simply wish to encourage those who have previously been unsuccessful and advise them to try again, because one definitely gains by experience providing that lessons are learned as they occur.

W. F. Maddams,
Banstead, Surrey.

To the Editor :

As an overseas member I am in complete accord with the letter by E. W. Putnam in the February issue of the Journal. The American Society has a series of 'Round Robins' for its outlying members. These create an opportunity for contact between members with similar interests.

I would like very much to promote the idea of Mr. Putnam by presenting the following two personal interests—growing succulents under fluorescent lights and window sill growing of cacti. I would enjoy very much corresponding with any other members of the society on either of the above, or any other topic concerning the collection of succulent plants.

Harry G. McCrone,
94, Gay Street, Westwood,
Mass. 02090, U.S.A.

Secretary's Notes

Our New Vice-Presidents. At the Annual General Meeting of the Society, held on Tuesday 21st February, three of our most loyal and long-serving members were raised to the rank of Vice-Presidents. They are Mrs. M. Stillwell, Mr. A. W. Heathcote and Mr. E. W. Young.

Mrs. Stillwell has been the Hon. Secretary of the very successful Berks and Bucks Branch since it was formed in 1949. She has been contributing the article 'Cultivation of Succulents' in this Journal since July of 1953, when she took over the series on the death of Mr. William Denton in April of that year. In 1956 Mrs. Stillwell was elected to serve on the Council, and in recent years has been the Judge for the 'other succulent' classes at our Shows.

Mr. Heathcote probably had more to do with the formation of the Essex Branch than any other member; he became the first Hon. Secretary of that Branch, and put it firmly on the road to success. In the same year, 1953, he was elected member of the Council. By 1957 he had become Chairman and held that office until last year. On the death of Mr. E. Shurly, towards the end of 1963, he took on the mantle of Editor of the Journal and maintained its high standard until relieved of the post by Mr. L. E. Newton in January of 1966.

Mr. Young has been our Hon. Treasurer since 1952, which represents fifteen years of 'hard labour' in any language! He performed this duty with enthusiasm, accuracy, and with his well-known good humour throughout. He was a founder-member of the Essex Branch, along with Mr. Heathcote, and served as Branch Chairman until the end of 1964, when he began making plans to retire to his present home in Sussex. Mr. Young gave the Society notice at the A.G.M. that he wishes this to be his last year as Treasurer. We will be hard put to it to find a better.

Gift of Books. Several books were donated to the Society recently by Mr. A. G. S. Gould of Dorset. Mr. Gould was once helped, in an unspecified manner, by our late Hon. Secretary, Mr. K. H. Walden, and felt he was returning a favour with his gift. Most important among these books are the three volumes of 'Stapeliae' by White and Sloane. The thanks of the Council are extended to Mr. Gould, and the books are now in the care of our Librarian.

The London Cactus Club. Through the good offices of Mr. V. Farrow, past President of the late lamented London Cactus Club, a total of seven Cups and Trophies have been passed on to this Society. It is expected that several of these Trophies will be distributed to Branches who hold their own Competitive Shows.

New Honorary Member. It is unusual for a Society to have the offer of the services of a non-member, but this happened when Mr. E. R. Brewerton of Ilford voluntarily took on the task of distributing the Journal. At the A.G.M. Mr. Brewerton was elected Honorary Member of the Society in recognition of his generous offer and his future services. All queries concerning Journal distribution should now be addressed to Mr. E. R. Brewerton, 18 Sackville Gardens, Cranbrook, Ilford, Essex. Our thanks to Mr. and Mrs. A. Krogulski who have devoted many hours over the past three years to this onerous task, but through pressure of business can no longer continue with the distribution.

Success in Rhodesia. Society member, Mrs. Monica Hicks, reports that in January of this year she won First Prize for a display of Cacti and Succulents at the Salisbury and District Garden Club Summer Flower Show. There were seven entries in the class. Mrs. Hicks displayed her plants on a four tier, 3 ft. by 2 ft. wrought-iron stand. Congratulations, Mrs. Hicks!

The Journal and Associate Members. In accordance with an instruction from the Council, Journals are no longer being sent to Associate Members of the Society. The practice of sending Journals to these members seems to have developed some time ago, but has never been an entitlement. The subscription of 12s. 6d. paid by Associates does not cover the cost of printing and postage. It cannot be expected that full members should subsidise Associates. The Council regrets any inconvenience that this implementation of the Rules may have caused.

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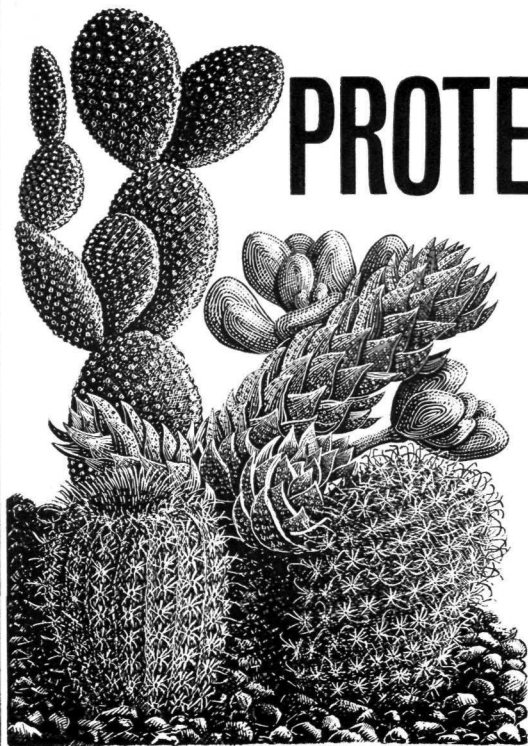
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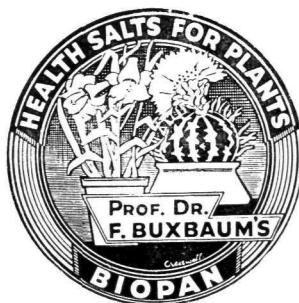
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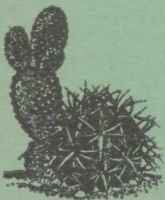
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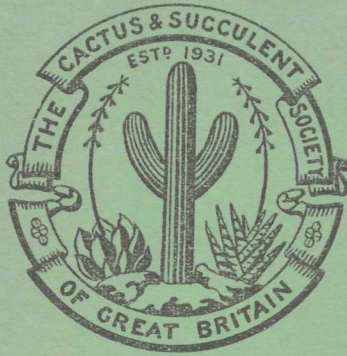
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Obituary

GILBERT WESTACOTT REYNOLDS

Gilbert Westacott Reynolds, internationally known as the author of "Reynolds' Aloes", passed away at his home at Mbabane, Swaziland on 7th April, 1967 at the age of 73.

It will be with a sense of irreparable loss that all lovers and connoisseurs of succulent plants, be they professional taxonomists or amateur horticulturists, will have learnt of the passing of this most distinguished amateur of Aloes.

Born in Australia towards the end of the last century Gilbert Westacott Reynolds came to South Africa with his parents, at the early age of seven. Qualifying as an optician he practised professionally almost throughout the Transvaal, basing his headquarters in Johannesburg.

It was during this period, now more than 35 years ago, that his interest in Aloes was first aroused; an all consuming interest which was to endure for the rest of his life and to take him into some of the most inaccessible and unknown parts of Africa in search of his beloved Aloes.

Very soon contributions began to appear in *The Journal of South African Botany*; from then on the genus *Aloe* and everything appertaining to it became his absorbing passion. The year 1950 saw the publication of his first exhaustive and masterly monograph "The Aloes of South Africa", a work for which he was honoured, in 1952, with an Honorary D.Sc. by the University of Cape Town.

The quality and completeness of the research embodied in this work is evidenced by the almost negligible nomenclatural changes and additions which have become necessary in the 17 years since its publication. This despite the tremendous upsurge of interest in Aloes it created and the size of the territory covered: a truly amazing achievement.

Dr. Reynolds now turned his attention to

tropical Africa, in his own words "the urge to investigate and monograph the Aloes of all Africa, and Madagascar, began to assert itself—soon irresistibly".

Numerous and extensive journeys followed; Aloes at their type localities were tracked down and their distribution and variability studied, all with unmatched vigour and dedication. Undaunted by the vast distances and difficulties encountered, nay, perhaps inspired by the challenge they presented, he set to work to unravel the intricate problems involved. In 1958 "Les Aloes de Madagascar" appeared and was to form the basis of the Malagasy section of his final work. The year 1960 saw him working in the herbarium at Kew and in 1966 came his second masterpiece "The Aloes of Tropical Africa and Madagascar".

Only a few months before his death he was awarded the Harry Bolus Medal in recognition of his distinguished services to botany, but it may well be that his work will be appreciated in the future more even than it is today; the solution of some of the problems may well have become impossible a few years hence and we are fortunate indeed to have the benefit of his vast field knowledge so ably and meticulously preserved. It is also to Gilbert Reynolds with his unbounded enthusiasm, probably more than to any other, that the world owes the Aloe as a cultivated ornamental plant.

It was, to him, a source of great satisfaction to see his second volume published; that he was given the time to complete it despite his rapidly failing health was due in no small measure to his valiant determination to "see it through".

To his widow, Kathleen and to his daughters we extend our sincere sympathy.

L.C.L.

Editorial

I WRITE this after the better part of two days spent at the London Summer Show. I am happy to say that this was undoubtedly the best show we have had for a number of years both as regards the number of entries and also, I think, in the quality of the plants shown. There were a number of new exhibitors some of whom had some fine plants in beautiful condition, and I was also glad to see a number of new entrants in the Junior Classes. It is good to see these young members keen enough to enter, as, after all (forgive the platitude!) the Juniors of today are the Experts of tomorrow. You will find the results of the show on page 61.

It was also interesting to note a number of overseas visitors who were very interested in the exhibits. I was chatting to a couple from Jamaica who were surprised and interested to see that we collect plants which they find growing wild in their own island.

It had never occurred to them to make a collection, but I have the feeling that, on their return to Jamaica this seed may germinate. And who knows? Perhaps we may strike a new area for membership of the Society.

I would like to call the attention of readers in particular to the note on page 58 regarding the possible formation of "Round Robins" and I look forward to receiving news of members prepared to take part in this venture. Please do not think you have to be an expert to take part. Even those (like myself) with a small collection of the more common plants can help by observing these carefully and making notes of their observations—flowering dates—spine colouring—any variations, etc.

By the way, what has happened to our SMALL ADS. Surely some of you have some wants or some surplus!!!

E.M.D.

Cultivation Notes

Cacti—A. Boarder

FROM reports I have received there seems to have been rather poor germination of seed sown this year. In my own case although I have used the same methods which have been most successful in previous years the results so far have been disappointing. Many kinds have not come up at all and as these were sown in the same containers as others which have germinated fairly well it does appear that the seed was not as good. It may be that the summer last year was not hot enough to ripen the seeds. The seeds which I had from the Society were among the worst to germinate but I think that this may be partly due to the fact that in most cases there were only four or five seeds to a packet. My normal number of seeds in packets I purchase from abroad would be 10-20, and so it is not easy to draw firm conclusions.

Not that all my own seeds came up well, as I sowed over a hundred seeds of *Mammillaria longiflora*, and although conditions seemed to be as good as usual, I have had only one seed germinate. These seeds are rather large for mammillarias and to experiment I washed one portion in warm water to remove any pectin which might have covered them. Of these not one has so far come up. Most of the seed from other plants in my collection have germinated better but I still think that they have not done as well as in other years.

The flowers on my mammillarias have been particularly splendid this year. Up to the 25th May, I have listed 170 different species which have flowered. This does not include several of the more common ones, as I have had eleven different varieties of *M. elongata*

flower besides three varieties of *M. gracilis* and three of *M. multiceps*. Several mammillarias which had not flowered for me before have done so this year and some of the caespitose ones with several heads have had over a hundred flowers.

The genus *Mammillaria* seems to me to be by far the most popular genus of cacti grown in this country. This may also be the case abroad as the *Mammillaria* Society has many members in several parts of the world. I also find that many of my visitors are very interested in the genus. One of the most popular points about them is that a large collection can be housed in a comparatively small space. I know that some can grow rather tall, as I have some *M. rhodanthas*, which I raised from seed, over a foot high. Some of the caespitose ones are also spreading out and housed in nine-inch containers, and ready for a move. However there are many species which remain fairly small for many years and as they flower so well year after year they are always an attraction. Added to the colour of the many flowers is the fact that the resultant seed pods are very colourful and there is never a week in the whole year when some have not red seed pods.

The colour of the spines of many of them makes a very colourful sight at all times and a good collection can be attractive all through the year. Admittedly several other genera have larger flowers but once their flowers are over many are so very much alike that they cease to be attractive. Another grand feature is that several are sweetly perfumed. This is so very strong with some species that part of the greenhouse can smell very sweetly. This fine perfume is usually

found in the white or white-cream flowers. *M. viereckii* is one of the very best with a scent like the flowers of the Lime tree. *M. camptotricha* is another which has a similar scent, as are also *M. picta*, *M. pilispina*, *M. decipiens*, and *M. albescens*. Two of the yellow flowered ones, *M. baumii* and *M. surculosa* have a very strong lemon scent.

The colours of the flowers of mammillarias range from pure white, to cream, then into pale pinks and deepening to carmine and red. Some have a greenish tinge and *M. zahniiana* has large pale yellow flowers almost as big as those of the *Dolichotheles*. *M. sonorensis* has deep carmine flowers and *M. bella* fine dark, almost beetroot-red ones.

To flower mammillarias at their best it is necessary to grow them well. As I have stated before a mammillaria will not flower again at the same axil or below where it has already flowered on the main stem. It is quite easy to see when a mammillaria is in flower whether it grew well the previous year. If the only flowers are at or very near the growing point it is a sure sign that the plant made little if any growth the previous season. On the other hand if a plant shows several rings of flowers and the lowest one well down the plant, it is certain that the plant grew exceptionally well the year before.

It has been said very often, and I may have said so myself, that cacti will not flower unless they get a good winter's rest. I decided to try out this theory and have now proved that, in the case of *Mammillarias* at least, this is not so. I had a number of seedling *Mammillarias* which were too large to go back in the box when it was replanted. I put these into pots and watered them all through the winter. This did not mean that they were continually soaked but were watered as they dried out. These plants not only grew well but have flowered much better than many of the *Mammillarias* which were kept fairly dry. I have often suspected that this recommended winter's rest was unnecessary as I have repeatedly had *Mammillarias* flower the year after the seed had been sown and when they had had no long winter's rest.

I realise that last winter was a comparatively mild one or perhaps I would not have been able to water as much as I did. I do not think that any of my adult *Mammillarias* went more than a month without some water right through the winter and I have never had more flowers. Now I am not advising any one to water right through the winter as so much depends, not only on the weather, but the temperature which one is able to maintain in the greenhouse. I found that my 'Monster' blue flame heater kept a steady night temperature of not much below 50°F. I stopped using the lamp on the first day of spring and relied on the four eighty-foot electric heating cables. Since I stopped using the lamp the temperature in the house has been lower during the rest of March, all April and most of

May, than it was all the winter. We had warmer nights in January and February than we had in April and early May.

Several of my *Echinocereus* have flowered well this year and *E. salm-dyckiana* is a particularly fine one with trumpet-shaped flowers of a rich terra-cotta colour. The shape of the flowers is similar to that of *E. scheerii*, but this one is a beautiful pink, and I also have one with a red flower. Some of this genus flower when the plants are quite small and only two or three years old from seed. Such species as *E. oklahomensis*, *E. perbellus*, *E. websterii* and similar types can flower when no larger than one's finger.

Some of the hybrids between *Lobivias* and *Chamaecereus silvestrii* are very free flowering, and most of them have larger flowers than the latter plant with varied colours. The *Lobivias* have mostly fine flowers but they do not last very long; on a hot day they may only last the day. *L. aurea* has very large yellow flowers and usually they are produced prolifically.

Having had to postpone adding to this article for a time owing to a holiday break and pressure of other work, I am now continuing it in the middle of June. Many more *Mammillarias* have flowered since May, and one or two more new ones have done so, including *M. lenta*, *M. spaelata* and *M. michoacanensis*. Although so many of my *Mammillarias* have flowered this year there are still some which have never flowered and a few must be about twenty years old from seed. I have a group of *M. cirrhifera* with sixteen fairly large heads and a *M. phymatothele* with eight large heads. These have never flowered, nor has a large group of *M. geminispina*.

When judging at the Hillingdon show recently I saw a *M. rhodantha* which was about eighteen inches tall and about four inches across. I had never seen one of this species as tall whilst remaining single. However, there are now signs of a few small off-sets forming. Another plant at the show which interested me was a large *Echinopsis eyriesii*. I recognised this plant as one I had seen last year at the same show with about fourteen flowers fully open at the same time and just right for the show day. Although this plant had no flowers out there were plenty of prominent buds. The remarkable point about some of these was that at least three were at ground level. I have never seen any echinopsis buds so low down before. One usually expects to see them at or about the upper third of the plant and occasionally a few lower down, but at ground level, surely this is fantastic.

Still, strange things can happen in the cactus house. Some time ago I had a photographer from a gardening magazine to take shots of taking cuttings. I do not do this as a rule but having a *Epiphyllum* with several shoots I took some off as an illustration. I afterwards stuck them roughly into some sandy compost in a concrete pan. This year I noticed that some of them

were budded for flower. One looked very strange with the flower buds pointing downwards. On examination I found that I had pushed this cutting in upside down. The growing tip had rooted well and two flowers were forming. This illustrates how easy it is to take cuttings from this type of cactus.

I have found that even very small cactus seedlings can go for long periods without water and yet come to no harm. Whilst away on holiday my seedlings were left dry for most of the time and they do not appear to have suffered in any way. These seedlings had lost their cotyledons and were about large enough for pricking out. It would not do to subject such seedlings to drought conditions when they were germinating or just after. In such a case it is probable that they would not survive. I have also found that quite small seedlings can go through the winter in an almost dry state and come to no harm.

It has been surprising to note that many *Mammillaria zeilmanniana* seedlings have flowered at a year old. Some of them were not a half-inch across. I bought some seed which were presumed to be the white flowered variety, but when they flowered it was with the usual magenta colour. It may be that only

a few of the *M. zeilmanniana v. alba*, have a white flower or it may be that my seed was wrongly named. This is a chance that one must take when ordering seeds from abroad, or even in this country. Over many years of seed growing I have had several disappointments, some never come up, whilst others are not what they are purported to be. Still it all adds to the interest of seed raising as one is never sure what will come up. I still have two fine plants of *Mammillopsis senilis* which came up from supposedly *Lithops* seeds.

You may find that many *Mammillarias* commence to grow again after a rest during the hottest part of the year. In their native habitats they would normally only grow in the rainy season and not at all when it is scorchingly hot. These seedling *Mammillarias* which survive are probably those which receive some shade from strong sunshine given by coarse grasses or shrubs.

Watch for the effects of an attack by red spider. These pests are so small that their presence is usually unnoticed until the skin of the plant is covered with a brownish rusty colour. Water or spray with Pesticide as a cure. A damaged plant will grow fresh parts once the pests have been killed.

Cultivation Notes

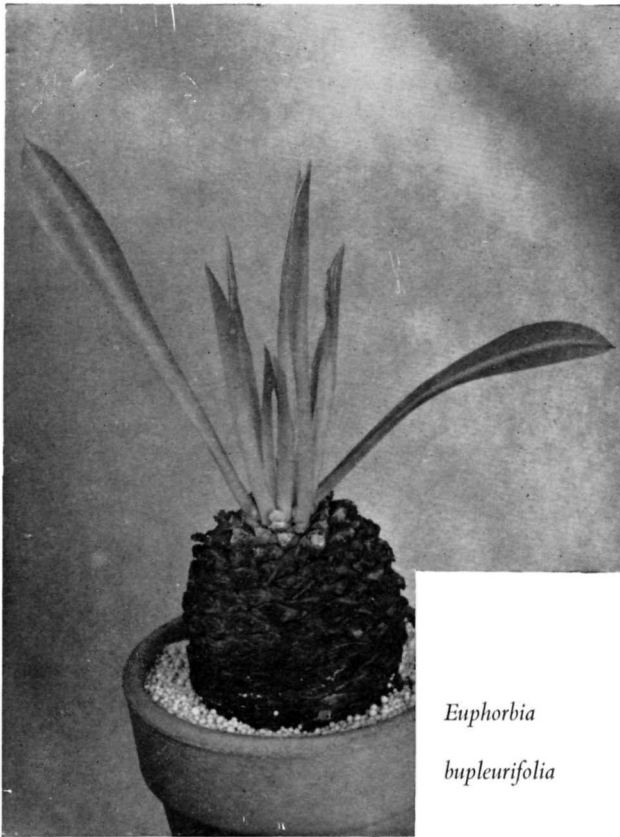
Other Succulents—Mrs. M. Stillwell

HAVING just judged at the summer show at the R.H.S. Hall, one is struck by the high standard and quality of the plants these days. It is hoped that all the rare succulents now becoming available to the public, are falling into the hands of experienced growers and will not be lost after a few months. There were some attractive *Gerardanthus* which come from the very dry regions in S. Kenya Colony, and therefore resent too much dampness except at the height of their growing season when they are in full leaf. A good proportion of the caudex should remain above the ground, and about two inches of very coarse sand or aquarium gravel should be placed on top of the pot to ensure good drainage. There were also some nice specimens of *Pachypodium brevicaule* another rare succulent with a low caudex and sessile leaves. They will need a little more warmth in the winter, when they should be resting. Several members showed some very fine *Euphorbias*. A very large *E. bupleurifolia* was a joy to see, with leaves much longer and wider than one usually sees. This plant does better in semi-shade, and should be rested when the leaves start to die off.

During the summer months when most things are growing vigorously I like to break up some of the older clumps of succulents, which have grown rather past their prime, and become rather dull looking. When

one has a lot of plants and space is very short, there does not seem much point in keeping large ancient plants when one can start afresh with a nice young cutting, and also it gives a much nicer look to the collection. *Echeverias* and *Kalanchoes* particularly, that have lost their bottom leaves and have the appearance of a rosette on a stick, should always be beheaded and rerooted. Every three or four years, I always break up my *Faucarias* and *Stomatiums*. Remove all the heads, and cut away all the old dead leaves and the woody stems, and just keep the young new green heads, which are usually those growing round the edge of the pot. Place them all close together in a pan under the staging in a mixture of peat, sand and coarse vermiculite, and keep it fairly damp, when they will very quickly root and can then be put back in their original pots, and in their normal soil mixture. If you have an *Anacampseros papyracea* that is not looking as white as you would like it to, harden your heart, and cut off all the old dirty branches, and you will be surprised how, within a very short time, it will send out plenty of new growth from the base, and your plant will look beautifully white again.

While the trend for plastic pots does encourage our plants to put on some very fine growth, there are always some people that get a little too carried away and get



*Euphorbia
bupleurifolia*

their plants too lush. There were a few of these at the show, which in my opinion rob a plant of its true colouring and give it that uninteresting all-over green appearance, and of course causing the outer body of the plant to become very soft, and more prone to disease, particularly during the winter. It is usually the shade loving plants such as *Aloes*, *Haworthias*, etc. that are the worst offenders. If you use liquid fertilizers together with plastic pots, this is when you have to be very careful not to overdo things, unless the plants are in a greenhouse that gets the maximum of sunshine, and the plants dry out quickly. Personally I am not in favour of too much feeding of young seedlings, I prefer to let them take their time, and become nice and firm and compact. It makes me wonder, when I see these massive seedlings at the shows how long they can stand the pace, and in fact how many years they will live, growing at such a fast rate. If you buy seedlings from someone who, you know, grows in no-soil compost and waters with a liquid feed, it is as well to continue growing them in the same way, for a short period at least, until you can gradually introduce them to your own particular

method of growing, as they will often resent the sudden change. This year's seed sown at the end of March is still in the unopened plastic bags, after three months, but now out of the propagator and standing on the top of it under an over hanging shelf where they are in semi shade. This is a foolproof method for beginners as there is very little danger of damping off, and of course no watering difficulties. When the seed is first sown by this method and put in the propagator, it is not advisable to stand the pans directly on to the hot-plate, as this may cause the bags to dry out too quickly, but to place them on a shelf mid-way up.

I have just erected a new shelf for my *Lithops* running the full length of the greenhouse, on the south side, where they will get plenty of sun, near the glass, to bring out the beauty of the colourings. The pots are stood in trays of coarse sand, this prevents the water running through to the plants below. Providing there is plenty of ventilation in the house, it is quite safe to grow *Lithops* near the glass without fear of scorching. I find that *Conophytums* scorch far more easily and I keep these farther away from the glass.

Most succulents like to be repotted just at the commencement of their growing season, which with many is about September. The stemless *mesembryantheums* can be watched for signs of new growth, in fact beginners might like to make a chart for future reference, giving the times of the year most suitable for repotting when necessary. I do not think it is a good thing to disturb a plant during the depth of winter, unless it is absolutely necessary.

If you have any unhealthy looking plants in the greenhouse put them out in the gardens until the beginning of October and just forget them. It often works wonders, especially if you bed the pots directly into the ground where they will keep cool and moist, but make sure to distribute plenty of slug bait among them particularly if we get a rainy spell. Plant out also, all unwanted cuttings etc., and the ones that develop into nice plants can always be potted up and given to deserving charities at Christmas time for their bazaars, it will also get rid of some of the excess of clay pots that one accumulates when changing over to plastic.

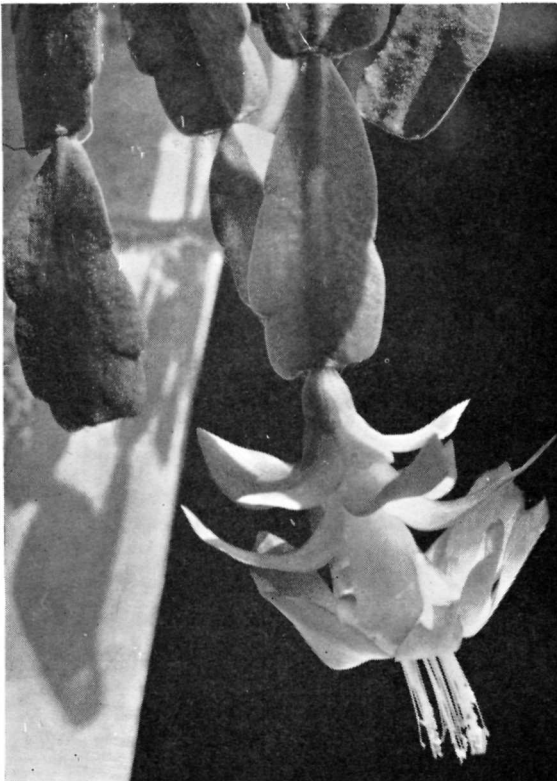
I have received several letters since I mentioned the damage to greenhouse glass caused by the deafening noise and vibration of low flying aircraft coming and going to and from London Airport. It makes one dread the thought of the new supersonic planes with which we are going to be confronted in the future. We are given to understand that they will be no worse than we are experiencing at present, as high speeds will not be reached over the land, but can we be sure of this? Who is going to compensate the market gardeners with acres of glass, if damage is caused?

What a lot of things we cacti and succulent lovers have to contend with, but I am sure our plants give us enough pleasure to overcome our difficulties.

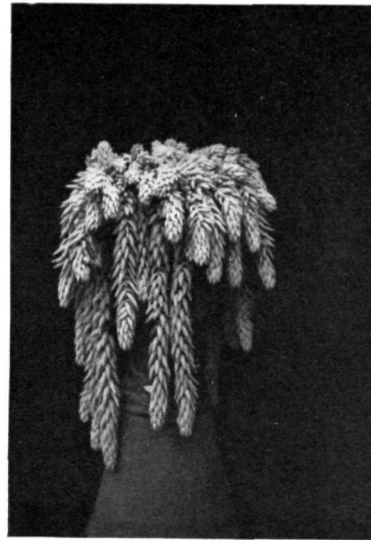
Beginner's Corner



SEDUM MORGANIANUM. Popularly known as the "Burro's Tail" or "Ass's Tail", this is an ideal plant for a hanging basket or for a high shelf where its long tails can hang down. On a flat shelf the tails will get damaged by the other pots. These "tails" consist of trailing stems of closely packed pale green stemless fleshy leaves growing all round the main stem forming a "rope" about 1 in. to 1½ in. thick, bearing flowers at the tip. These plants do need careful handling as the tails are rather fragile and easily broken off, but otherwise are not difficult to grow, and are propagated by leaf cuttings.



OROSTACHYS SPINOSUS. This plant originates from Eastern Asia and bears a decided resemblance to a sempervivum, forming a cluster of dainty rather tight rosettes. The leaves are of a slightly greyish green and have, as the name implies, spine-shaped tips which, however, are soft to the touch and not prickly. The flowers are yellow, borne on spikes in summer, but even when not flowering, a single parent plant surrounded by offsets is very attractive, though it will also form larger clumps of rosettes. A very porous soil is appreciated by this plant which can be easily propagated by rooting the young rosettes.

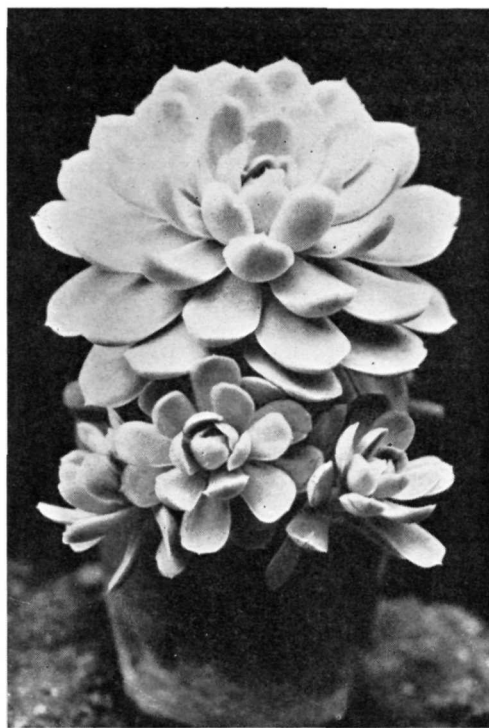


ZYGOCACTUS TRUNCATUS. The well known "Christmas Cactus" has flat, thin, spineless joints which hang over the side of the pot. Coming from the tropical rain forests of South America, this plant requires quite different treatment from other cacti. Complete drying-out, and also full sun should be avoided. A suitable soil mixture consists of two parts of leaf mould and one part of coarse sand. A little feeding is also appreciated. The deep-pink, rather fuchsia-like flowers are freely produced from the tips of the joints at the beginning of the year, but with a little extra warmth they may be induced to flower for Christmas. After flowering a rest of about six weeks is beneficial, but the roots should still not be allowed to go completely dry. This is an excellent house plant, but once budded, it should not be moved until the flowers are opening because the buds will probably drop off.



MAMMILLARIA MAGNIMAMMA from Central Mexico is a globular greyish-green plant covered with conical tubercles, which give young specimens a rather "pineapple-like" appearance. There is abundant white wool both in the axils and the areoles, which are on the tips of the tubercles. The three to five spines are of unequal length and may be straight or curved backwards. Older plants produce offsets and make clusters. The creamy yellow flowers are produced in a ring around the top. A rich open soil with plenty of water in summer and warm, dry conditions in winter are required. Propagation is from seed. Offsets should not be removed as the scar exudes a milky sap and does not heal readily. This is a very variable species with a large number of varieties.

ECHEVERIA ELEGANS. This attractive plant is of a branching shrubby growth, bearing the usual Echeveria type of rosette of whitish-green fleshy leaves, with a dusty bloom. The red and yellow bell-shaped flowers are borne on tallish stems in April and May, but the form and texture of the leaves makes these plants a very lovely sight at any time of the year. They are easy to grow in a reasonably porous soil, but will stand quite a considerable amount of watering during the summer months. Naturally, like all plants with a bloom on the leaves, they should be handled with care to avoid marking, and the water should preferably not be allowed to rest on the leaves. Like other plants of this genus it can be propagated by leaf cuttings.



ECHINOCEREUS SALM-DYCKIANUS has a somewhat stiff but semi-prostrate stem which soon freely branches from the base. An abundance of large funnel shaped yellowish-red flowers are produced from areoles high up the stems and these open by day. A rich, sandy, humus-free soil on the acid side is required. Plenty of water should be given in the growing period, but this plant should be given a light position and dryness in winter to encourage the formation of plenty of flower buds for the next season. Propagation is from seed or by cuttings which root readily if taken in summer.

Some Cacti of North-Eastern Brazil

by D. R. Hunt

IN August 1966, at the end of a four months' visit to Brazil made possible by a bequest to the Royal Botanic Gardens, Kew, from Mr. N. Y. Sandwith, head of the American section of the Herbarium until his death in May 1965, I made a brief excursion to the interior of the States of Bahia and Pernambuco to see the vegetation type known as *catínga* or *caatinga*. In contrast to Amazonia, with its dense evergreen forests and plentiful rainfall, the interior north-east of this vast country, where it juts into the Atlantic Ocean south of the Equator, is subject to intense droughts of long duration in the 'winter' months between April and September. The extensive level plains and ranges of hills are rocky, stony, or sandy, often with little or no soil, and support only scrub forest or thickets of deciduous spiny trees and shrubs, cacti, and ephemeral herbs which spring up during the rainy season.

Much of our knowledge of the cacti of this area has come from the tours of exploration made between 1910 and 1932 by Dr. J. N. Rose, co-author with N. L. Britton of 'The Cactaceae' (1919-23), by the German botanist Philipp von Luetzelburg, author of the im-

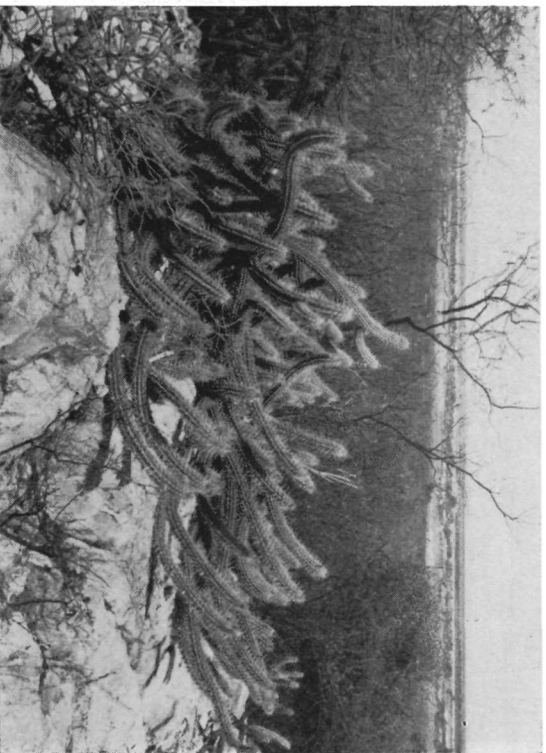
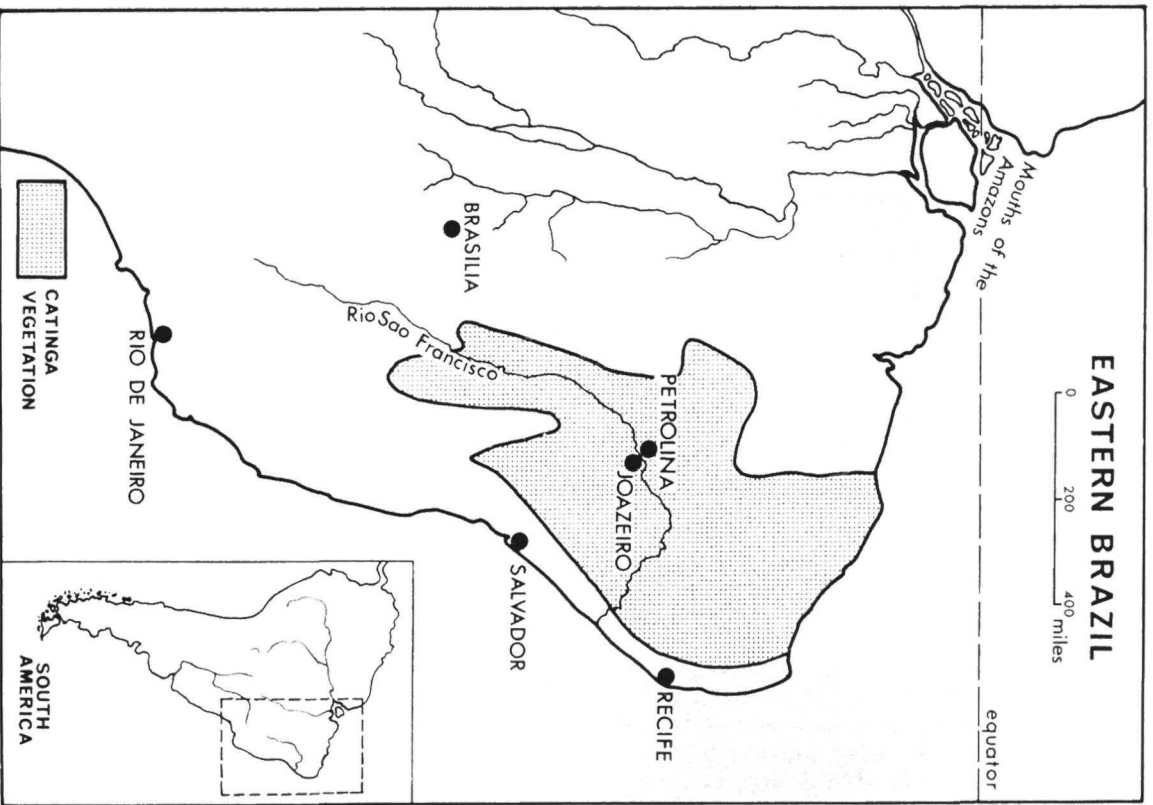
portant "Estudo Botânico do Nordeste" (1922-3), and by another German botanist, Dr. E. Werdermann, whose "Brasilien und seine Säulenkakteen" (1933) was translated and republished in 1942 under the title "Brazil and its Columnar Cacti". Several new species were discovered by Dr. Leo Zehntner, a German-Swiss scientist who worked at the Horto Florestal of Bahia at Joazeiro for some years around the time of Rose's visit in 1915, making important living collections and herbarium material.

Joazeiro is situated some 250 miles from the sea on the broad São Francisco River where it forms the State boundary. On the opposite bank lies Petrolina, the small town which I selected as centre for my brief stay. It had, I was told, a good clean modern hotel, a regular air-service, and surroundings full of cacti.

Airlines seem to have an unhappy knack of arranging flights at inconvenient times, and I had to leave my hotel in Salvador, capital of Bahia and a former capital of Brazil, at 4.30 a.m. for the airline taxi to the airport fifteen miles away. The DC3 took off at dawn to land its few passengers at Petrolina in good time for

Catinga vegetation beside the Rio São Francisco, nr. Eclusa, Pernambuco. Zehntnerella in the foreground





“Xique-Xique”, *Cephalocereus gounellei*



Melocactus zehneri

breakfast at the Hotel, which proved to be surprisingly clean and efficiently run for a small-town Brazilian establishment, its two storeys of simple concrete-floored rooms opening off a central patio with a pond surrounded by potted plants and caged birds. Decidedly dull meals were compensated for by good supplies of ice-cold beer, but nonetheless the Brazilian breakfast of coffee, stale bread and rancid butter does not seem calculated to fill one with exuberant enthusiasm for the day ahead.

In fragmentary Portuguese I managed to put over to the proprietor the idea that I wished to hire a jeep or taxi for the three days of my stay, and he very promptly obtained for me the services of a prosperous-looking gentleman with a large Willys jeep called a 'Rural' (accent on the second syllable). Having agreed an appropriate fee, I was then taken out each morning and afternoon along a different route from the town.

On the first afternoon we drove out along the dirt main road to the north, which eventually leads to Recife, and stopped at a range of low hills (or *chapada*) some fifteen miles from Petrolina. Here, growing on sandstone outcrops with other spiny plants I found six species of cacti, including three tall columnar kinds. The largest of these was *Cereus jamacaru*, whose scientific name is taken from a corruption of the vernacular 'mandacari' (with accent on the final 'u'). Specimens twenty feet or more in height are a characteristic feature of the catinga landscape. Another large arborescent species common around Petrolina is *Cephalocereus piauhyensis* (perhaps a form of *C. glaucescens*), whose numerous golden-yellow spines contrast attractively with its bluish ribbed stems. Fiercely spined and a plant-collector's nightmare is the shrubby, decumbent-stemmed *Cephalocereus gounellei*, probably the commonest cactus in the area. It has fleshy white flowers with a pinkish-brown tube and outer perianth segments. A variant from rocky places was described by Britton and Rose as *C. zehntneri*. Its expressive local name is 'xique-xique' (shee-kay-shee-kay), also the name of a village on the Rio São Francisco. One of the few *Opuntias* found in the catinga is *O. inamoena* (Latin: disagreeable) which has no spines (but plenty of glochids) and is browsed by cattle. It has attractive orange-red flowers and yellow fruits, and is known locally as 'quipa'. (The species was described by another authority as *O. quipa*.) I was delighted to find *Melocactus* specimens of all sizes growing in crevices in the sandstone rocks, and one large plant with magenta-pink flowers. This genus is in such need of careful study that I hesitate to give an identification of this species, but as it is the common *Melocactus* around Petrolina and Joazeiro it is almost certainly the *Cactus zehntneri* of Britton and Rose, *Melocactus zehntneri* (B. and R.) Backeb. The local name is 'cabeça de padre', priest's head.

Dr. Zehntner was also commemorated by Britton



Cephalocereus dybowskii

and Rose in the name of the monotypic genus *Zehntnerella*, which Dr. Werdermann combined with *Leocereus*. *Zehntnerella squamulosa*, which is perhaps the same as the *Cereus squamosus* of Guerke, occurs in abundance on sandstone and quartzite outcrops in Bahia and Pernambuco. It is an arborescent species of medium size allied in its scaly flowers with *Leocereus* and the *Trichocerei*. The flowers are small, brownish, densely covered with small scales hairy in the axils, and the nectar chamber is plugged with staminodial hairs as in *Denmoza*. (Mr. A. F. H. Buining tells me that flowers of plants thought to be this species which he examined in southern Bahia earlier this year lacked the plug of hairs.) The local name of the plant, shared with other columnar species, is 'faxeiro', or 'faxeiro prêto'.

During the return drive to Petrolina we stopped to examine three more species: *Acanthocereus albicaulis*, a little known and not particularly attractive scrambler with slender, strongly spined, greyish stems; *Opuntia palmadora*, which has very unpleasant tenacious spines and, unlike the thicket-forming *O. inamoena*, produces an erect trunk (*O. catingicola*, described by Werdermann, is doubtfully distinct); and another arborescent *Cephalocereus* (*Pilosocereus tuberculatus* (Werderm.) Byles and Rowley), with few-ribbed, tuberculate branches in a symmetrical candelabra-like crown. (The last word has by no means been written on the classification

of the columnar Cerei. For the time being I take a broad view of *Cereus* and *Cephalocereus*, avoiding the necessity of using the various controversial and probably ephemeral generic names introduced by Backeberg and Buxbaum, although in this instance there is no valid alternative to the name *Pilosocereus tuberculatus* short of making a new combination, which is not called for at this stage.)

The following morning we took the road to Eclusa, an almost deserted village on the river thirty miles upstream from Petrolina. In days when the river had been the major means of transport between the interior of the States of Bahia and Minas Gerais and the coast there had been a lock by-passing rapids at Eclusa. Now the lock is disused and the river seems to have found its own way round it. I was interested to find an Asclepiadaceous tree, *Calotropis procera*, native to Africa and Asia, planted here for the flossy seeds, used like kapok, and nearby a shrub of the bind-weed family, a species of *Ipomoea*, which was being visited by enormous bees. Too heavy and clumsy to enter the flowers by the tube, they alighted on the outside, punctured the tube, and stole the nectar without paying the plant the usual courtesy of pollination in return!

Not far from the village I picked my way through the thorny scrub to examine a low ridge with a quartzite dyke backbone. The dyke itself was character-
"Mandacarú", *Cereus jamacaru*



Cephalocereus piauhyensis

istically densely colonized by *Zehntnerella* and the rocky screes on either side with other species I had seen the previous day. While photographing the fruit of *Zehntnerella* I was alarmed to hear a deep growling and half expected to come face to face with a puma or jaguar, but it was only a tiny newly-hatched vulture, groaning and wheezing very asthmatically as if browned off with the warm weather and its hard bed. The local species of vulture does not bother to build a nest, and would be hard put to find suitable material if it did.

It was not until the return journey that I found any cacti new to me. A slender reddish stem quite well camouflaged among the thorny shrubs, all leafless at this dry time of year, proved, when I called a rapid halt, to be *Tacinga funalis*, that curious scrambling relative of the *Opuntias*. It was the only specimen I saw and fortunately in flower. The spineless stems extend for several feet or yards, occasionally jointed, and are as thick as those of *Kleinia articulata*. The green flowers have long-exserted erect stamens separated from the short recurved perianth by a ring of hairs. Contrary to the statement of Britton and Rose, who first described the species, that the flowers open in the evening or at night, the flower I observed was fully open at 2.30 in the afternoon. Another form, *Tacinga luetzelburgii* Kupper, mentioned by Luetzelburg in his book, was never described. From southern Bahia Werdermann described a red-flowered species, *T.*

atropurpurea, also said to be night-blooming. Backeberg and Voll described a similar plant as *T. zehntneri*, later reduced by Backeberg to a variety of *T. atropurpurea*. The generic name is an anagram of 'catinga'.

Within a few yards I found several sterile plants of *Cephalocereus rhodanthus* (*Arrojadoa rhodantha*), recognized at once by the ribbed and jointed stems with a collar of longer bristly spines terminating each joint, from where flowers had been produced in previous seasons. *C. penicillatus*, which I did not see, has more slender stems, and *C. leucostele* (*Stephanocereus leucostele*), another species with collar-like cephalium, is white-spined with pale greenish flowers.

Excursions in different directions the following day did not produce anything new except a plant of *Cephalocereus rhodanthus* with a single pinkish red flower, and a very fine flowering tree of the pea family Leguminosae, a species of *Erythrina*, leafless but a mass of brilliant scarlet flowers. Like nearly all the plants of this type of vegetation it was very spiny, but the spines were of a quite different nature from those of the cacti, being built up of numerous concentric layers of cork in the form of a cone, about a inch in diameter at the base, surmounted by a short spine. The purpose of spines in desert plants is not, I believe, primarily protective, but an adaptation to dry conditions; for although little rain falls in these areas there are heavy dews, and sharp-pointed spines have the effect of trapping particles of moisture and promoting condensation of water from the air.

For the final morning's drive I determined to go as far as possible to the south-east, across the river by the long concrete bridge to Joazeiro and then along the road which leads ultimately to Salvador. The ride was not altogether enjoyable as various stretches of the road were being made up and tarred, and we suffered alternately choking dust thrown up by heavy road-making vehicles and indelible wet tar sprayed on the windscreen where the tarring machines were at work. I called a halt near the small village of Flamengo, where the rocky landscape was dominated by the columnar, *Espositoa*-like stems of *Cephalocereus dybowskii*. This is one of the species which develops a fine lateral cephalium, from which it takes the local name reported by Dr. Rose, 'cabeça branca', white head. The plants were very numerous, from six to twelve feet tall, much-branched from the base. Growing with them were a spiny terrestrial bromeliad, *Opuntia palmadora*, *Melocactus zehntneri*, and other spiny plants. On some alluvial flats nearby I found a large *Pereskia bahiensis*, a rather ordinary-looking spiny tree twelve feet or more tall, with long arching branches, leafless and sterile, and finally another *Pereskia*, species unknown a dense spiny shrub eighteen inches tall, quite different in habit from the other.

As I had to catch the afternoon plane back to Salvador, we drove hurriedly back to Petrolina where I thanked



Zehntnerella squamulosa

and paid off my driver, had lunch, packed up my collection and luggage, and was driven round to the little airport building in good time to join the few other passengers. We waited and waited. Eventually the news spread round that the plane wouldn't come today; it was 'quebrado', 'broken'. Deeply pessimistic about making my connections to Recife and London, I returned to the hotel, but rather to my surprise I was summoned first thing the following morning and told the plane was 'mended'. In due course it arrived and by midday I was back in steamy Salvador, in good time to make my connection the following day to Recife.

With the co-operation of the airlines and customs authorities in Recife and London, I was able to bring my parcels of plants and cuttings to Kew unhindered. Excepting the larger *Pereskia*, all the species seem to be establishing themselves successfully, thanks to Mr. Macdonald's skilful attention.

DAVID HUNT, M.A., who is making a name for himself as one of our younger botanists, is in charge of American Botany at The Herbarium, Royal Botanic Gardens, Kew. He started collecting cacti some ten or eleven years ago, when still a schoolboy, and it was from these plants that his interest in botany first derived.

The Establishment of Imported Plants

By M. Brady

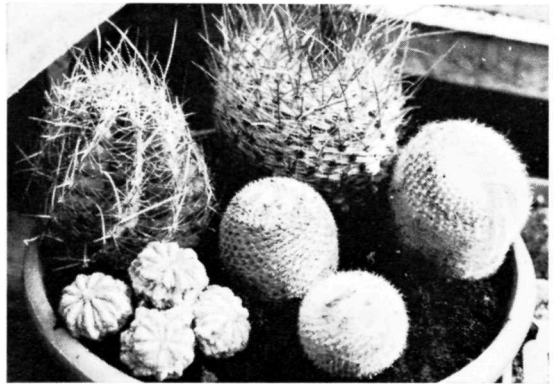
THE acquisition by dealers of imported plant material is becoming increasingly difficult. As previously fruitful areas are denuded and as the barriers against indiscriminate exportation of material are erected progressively by countries awakened to their responsibilities by the activities of zealous conservationists, long standing sources of supply are disappearing. The result is that the prices of plants, even to the shrewd collector, are increasing to the point that the price of failure to root a batch of imported material is becoming almost prohibitive. It is therefore imperative that such material as does arrive here, particularly that material which is sent by our friends overseas for study purposes, is rooted with the maximum efficiency and with the minimum of waste. Such material as we are now receiving may well be the last authentic material we shall see in this country for some time and it is therefore incumbent upon those of us who receive it to establish it and eventually distribute, for the benefit of our colleagues and the hobby at large, cuttings, plants and, with, let us say, some reservations, seed.

In order to appreciate something of the problems of establishing these plants one must first consider the drastic severity of the processes to which they are continuously subject en route to our collections. In considering these processes it must be clearly borne in mind that the interests of the collector in habitat are for commercial and other reasons, sometimes at variance, in the last analysis, with the interests of the ultimate recipient of the plant. The expeditioner is having to travel increasing distances as the years go by, as the areas within reasonable striking distance of tracks, highways and dried up river beds are worked out. The problems of travel and subsistence throughout a long arduous journey, together sometimes with the severest physical and commercial limitations, inevitably dictate that the collector has to work at the greatest possible speed over huge areas of territory.

The plants are extricated from crevices between rocks and stones, prized from rocky ledges and, in some instances, cliff faces. Some plants are lopped off almost at ground level and, in some cases, large clumps are broken up or fall apart on being prized from the ground. The collected material is packed into vehicles as it gradually accumulates and is eventually transported to a base or more likely to a plant hygiene station such as El Paso in Texas where the plants are sprayed or fumigated in the interests of international plant hygiene. The plants are then either transported to the wholesaler's premises or delivered, after packing and crating, to the port of despatch in the case of an overseas destination. In some instances it is known that the plants are dried as much as possible in the hot

sunshine to reduce the weight for carriage purposes and to make the plant fully dormant to withstand the hazards of packaging and further travel. The majority of the plants are despatched to the world's dealers of which we now understand the Japanese are the foremost. One collector told me that he had received in one season 10,000 orders from Japan.

The dealers sometimes, but not always, attempt to clean up the plants and lightly trim the roots before setting them in a rooting medium. Eventually the plants are packed off to the amateur collector who is then faced with the problems, and they are sometimes formidable, of gently tempting these plants to resume their interest in life.



Plants set in rooting pan

The plants ultimately arrive in this country partially, if not totally, devitalised and dehydrated, bruised with probably some areoles torn away, the roots broken, split, squashed or non-existent. Some plants from the less reputable dealer will have patches of soft rot, and may have been badly scarred or otherwise damaged in habitat by insects and borers. Some will also have become distorted or lop-sided by growth in cramped or restrained growing conditions. It is therefore against the background of this astonishing series of events, misfortunes and limitations, that the first steps in cultivation have to be taken. It is indeed a tribute to the resistance, adaptability and durability of our plants that they survive at all.

Let us now consider:—

- (a) Dealing with dealers
- (b) Preparation for rooting
- (c) The rooting medium
- (d) Rooting
- (e) Potting and establishment

(a) Dealing with dealers

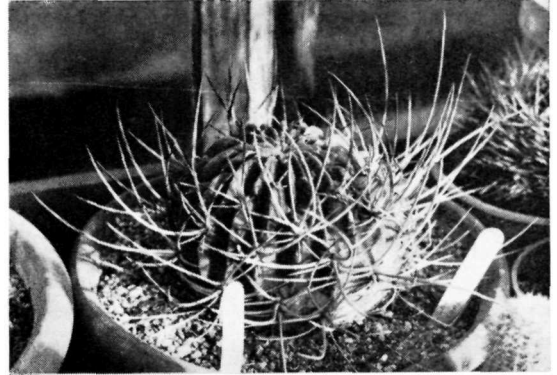
When pricing his plants the dealer has to allow for the inevitable losses and has also to strike a balance between large imperfect plants on the one hand and smaller, but near perfect, plants on the other. His prices are therefore a complex function of rarity, size shapeliness, extent of scarring and damage, rooting prospects and sometimes his knowledge of the purchaser's idiosyncrasies! When publishing lists, therefore, dealers seem unwilling or unable, with one or two exceptions, to define reasonably the pricing standards to which they are working. It is for this reason principally that, with the exception of the I.S.I of California and Mr. Cowper's firm I would not advise anybody to buy imported material by post. To do so will, in the long run, bring disappointment and disaster, particularly if the dealer does not speak English well and you are incapable of accurately specifying your requirements. Remember it is in the dealer's interest to shift as much material as he can for the highest price and that he often tends to underestimate the difficulties of establishing some of the material which he sends out. If you have to buy by post, then be aggressively specific when ordering. State clearly the size of plant, condition expected and whether rooted by the dealer or not. If you want a cluster or group say so and, above all, make it absolutely clear that you will not accept substitutes of any description. It is as well to bear in mind that in the event of your being dissatisfied with plants from a continental dealer you may have some difficulty in returning them.

If you are not satisfied with the plants you receive, send them back if possible, specifying the reason for your action. It is neither fair nor reasonable to demand your money back upon the demise of a plant, if this takes place six months after purchase.

Always buy plants you can inspect in preference to indulging in a postal transaction. When buying from a nursery ask to inspect the roots and base of plants before buying them. Beware of plants which are severely shrunken and uprooted and which you find by careful questioning have been in the dealer's possession for several months. Allow in your calculations for the likelihood of losing most if not all, of *Melocacti Discocacti* and *Echinocactus polycephalus*. Before buying plants which have been potted by the dealer tip them out and inspect the roots, in this way you will receive many surprises!!

(b) Preparation for rooting

Examine the plant with the greatest care in order to gauge the extent and location of any damage, however slight, which the plant has sustained. Start by judiciously cutting back with a square cut from a sharp knife any split, crushed or decayed roots, removing only the absolute minimum of root. Remember the more roots you cut away the more difficult rooting can



Lobivia longispina v. nigra

become until a point is reached at which, in the case of some difficult species, it becomes impossible. What happens if your plant arrives with a long stout tap root of the kind frequently seen on *Copiapoas* and some *Euphorbias*? Having wrestled with this problem for some years I have found the solution to be radical, simple and effective: this consists essentially of cutting the tap root off 2 or 3 inches below the plant body. Drastic though this measure is, it will be found that the plant will usually root perfectly satisfactorily in time and during the period of establishment will develop a vigorous fibrous root system which is well within the scope of the cultivational limitations and can be fitted into a pot of normal proportions. I have in my collection several very large *Copiapoas* which were treated in this way several years ago and they have grown on successfully since, one plant in particular, *Copiapoa Lembckii*, having flowered last year.

Patches of soft rot in the root-stock or body must be completely cut away if the plant is to survive. If minute specks of orange coloured rot are seen in the roots or the root-stock, one is faced with a dilemma. Contrary to some textbooks it is my experience, shared by many I now learn, that to cut drastically into the root-stock or body of a shrunken, almost devitalized, plant means the demise of that plant. Most plants in this condition, except in very exceptional circumstances, seem unable to muster the resources essential for the establishment of roots once parts of the body are cut away. One has therefore to decide whether to risk the demise of the plant by chasing to the bitter end every speck of orange rot or to hope for the best and attempt to root the plant as it stands. Your decision will depend on the genus, size and condition of the plant and it is therefore not easy to generalize. In my case I square off the root-stock, taking off the absolute minimum of root and dry the base of the plant thoroughly. For a reason which I cannot explain many plants seem to overcome this infection in time by sending roots down the side of

the vascular ring within the body of the plant. Many scores of plants now established in my collection have overcome this type of difficulty perfectly well although one or two plants were lost and others took quite a long time to issue roots.

After trimming roots and cutting away rot, very lightly dust the cut surfaces with Flowers of Sulphur. A heavy dusting of this material appears, in the case of some species, to inhibit rooting. Never attempt to dry the cut surfaces as suggested in some textbooks by turning the plants towards the scorching sun close to the glass. The practice also advocated of spraying the roots of the upturned plants has also been found not to contribute towards the rooting procedure. Lay your plants on their sides in a warm shady position and leave them alone for two or three weeks by which time the wounds will have calloused over. In this state it is not unknown for some plants to break into bloom and it has been noted by many that the emergence of a bloom on these unrooted plants sometimes signifies the demise of the plant.



Gymnocalycium spegazzini

(c) The Rooting Medium

Whilst this is an important constituent in the process of establishing our plants, it should not be thought that the selection of it is either difficult or complicated. It is unfortunately the case that over the years too much emphasis has been placed on the mixing and handling of complex composts and other materials for which outrageous claims have been made. The result has been a tendency on the part of beginner and some experts to attach insufficient importance to the other essential aspects of cultivation.

The mediums in use are numerous and vary widely in cost and effectiveness. The ideal rooting medium is one which conforms to the following requirements:—

- (i) It should permit a fairly consistent level of moisture to be maintained without the need for frequent watering.

- (ii) It should not dry out rapidly.
- (iii) It should be light in weight in order to permit air to reach the plant roots and to permit rooting plants to be gently removed and replaced without damaging the roots.
- (iv) It is an added advantage if the medium is heat retentive.
- (v) It should preferably for most species have an acid reaction.

It will be seen that such materials as Vermiculite and Peat broadly conform to the foregoing and in fact are cheap and highly satisfactory materials to use. After some years of experiment. I have found that there is nothing whatsoever to be gained by mixing sand, gravel or grit, or any other inert materials, in with the Peat or Vermiculite. These materials can be used exactly as delivered. The writer's tendency is to use peat and, in particular, sedge peat, this being a black, finely constituted material from which it is relatively easy to disengage the delicate roots of a plant before re-potting it. Other forms of peat which consist of large fibrous chunks suffer from the disadvantage that the roots penetrate these lumps and then tend to break off when the plant is moved.

The murderous mixtures recommended in the textbooks of yesteryear take one along the road to ruin in that they consist in the main of inert materials which do not retain moisture and provide a hostile reception for those all important and extremely delicate roots and root hairs which first emerge.

(d) Rooting

Spring and early summer are the very best times in which to induce the rooting process and as the season wears on the chances of success are progressively reduced. There are exceptions to this, particularly the Euphorbias, and these plants will root splendidly in September, after having stubbornly refused to move earlier in the season. Beware, therefore, of trying to water Euphorbias into submission in the early part of the season. These plants in most years start rooting in the autumn and therefore require careful attention once the root tips are seen to be emerging.

The problem of rooting imported material is principally whether or not to use artificial heat. This is indeed a controversial topic in that some swear at it where others swear by it! That our plants can be successfully rooted in a propagator or on top of soil warming cables is clearly established and many people get extremely successful results from so doing. It is the writer's experience, however, after trying these procedures, that in the long run there is little or nothing to be gained by the use of artificial heat in that, in reasonable conditions, these plants can be rooted perfectly well without it. Whether or not you use heat and whatever compost you use, remember that the potting up of imported plants before they have been properly rooted is absolutely inimical to success and will result

in most, if not all, of your plants being lost. The plants should essentially be set in the medium in such a way that they can, when necessary, be gently lifted out of it for inspection and replaced without damage to newly emerging roots.

My system consists simply of using two 15 in. diameter very shallow earthenware pans filled to the brim with very slightly moist sedge peat. The pans are set on a plank which spans a gangway at the end of the greenhouse: the plants are gently and loosely set into the peat so that it comes slightly above the soil mark on the plant (see Fig. 1). A double sheet of polythene is then draped loosely over the pans. The position in the greenhouse should be lightly shaded but never in a position exposed to burning sunshine. Exposure of this kind severely inhibits rooting and can easily scorch the plants.

Keep the peat very slightly moist and try not to let it dry out for long periods. The plant often uses its very last resources to put out one or two extremely delicate filament roots and if they are allowed to shrivel away through lack of moisture it is frequently the case that these plants cannot be induced to root again.

Gather together in one pan those plants which are starting to root and collect the stubborn subjects together in the other pan. The peat holding the rooting plants must be kept rather more moist from now on and should be gently and systematically watered with Boots Compure K in order to facilitate the development of the root system.

Keep the polythene sheets over the plants during rooting as shade and to maintain a slightly moist climate around them. Newly rooted plants are adored by root mealy bugs. These little terrors devour the succulent root tips at an astonishing rate. Watch out for them.

There are some plants which take a long time to root. The writer, for example, took nearly two years to root an *Aztekium ritteri* and I am afraid that the only answer to this problem is one of patience.

(e) Potting and Establishment

The plants, once they are well rooted, can be potted up and will grow successfully in one of the many composts available. Here again, whichever compost is used it is essential to the establishment of the plant that a gentle and even flow of moisture be maintained to the roots. It must also be borne in mind that, for reasons beyond our control, some plants, after potting up, lose their roots and have to be rerooted. For this reason, therefore, I think it is essential that plants be potted up in their first year of establishment in a medium which is very light in weight and will not be affected by the action of watering. A mixture of half sedge peat and half sharp sand with the addition of the John Innes based fertilizer at the rate of 6 oz. per bushel together with a sprinkling of Gypsum has been found to be ideal. This compost which is known to most

collectors retains an even level of moisture over a long period and the plant is easily detached from it should an emergency arise. Root mealy bugs can run riot during the establishment period and the plants should therefore be watered twice before the first winter with Malathion.

If established plants, for no apparent reason, receive a check in growth, do not hesitate to tip them out of the pot as they may have either lost their roots, been attacked by mealy bugs or your compost may not have been properly moistened.

Plastic pots are the best possible containers for establishing plants and should be used whenever possible.

During the first winter the plants are extremely vulnerable and they should be kept well away from draughts or leaking spots in the roof. Some plants require a cold dry winter place and an unheated greenhouse is ideal if not essential for plants of *Utahia*, *Pediocacti*, and many others.



Oreocereus hendricksianus

Remember that some imported plants once established are very hungry feeders indeed and can quickly exhaust the nutriment in the soil. It is for this reason principally that the spination rapidly declines and the growing point becomes green and distorted. Within the first year therefore the plants should either be fed with an appropriate fertilizer or repotted. Some *Lobivias* and *Euphorbias* are particularly vigorous and relish the addition of leaf mould or well rotted sheep manure in the compost.

The potted plants should very gradually be introduced to conditions of brighter light over the first year. Do not, under any circumstances, put your plant into burning sunshine immediately after rooting. If you do you are almost certain to damage the emerging or developing roots.

Remember that many plants grow in shade in habitat and cannot therefore stand full sun. Some of the *Gymnocalyciums*, *Parodias* and *Rebutias* fall into this category.

The following plants have been for me very difficult, if not impossible, to root:—

Melocacti with cephaliums
Discocacti
Echinocactus polycephalus
Echinomastus johnstonii
Tephrocacti—limited number

and should be avoided by all but the doughtiest or wealthiest collectors. Plants which can usually be rooted with ease are as follows:—

<i>Mammillarias</i>	most
<i>Lobivias</i>	all
<i>Echinopsis</i>	all
<i>Escobarias</i>	some
<i>Ferocacti</i>	most
<i>Rebutias</i>	all
<i>Thelocacti</i>	most
<i>Copiapoas</i>	most, depending on size.

Finally, be as generous as you can with the offsets of your plants and with the seed, disseminating them as far as you possibly can in order to procure the distribution of reliable material and plants in short supply.

Experiences with a Heated Frame

By W. F. Maddams

MR. Palmer's article in the November 1966 issue of the Journal prompts me to record my experiences in housing cacti and other succulents in a heated frame, partly as an example of a somewhat more elegant and sophisticated system and partly in the hope that it will encourage a wider adoption of the system, particularly by those unable to extend as far as greenhouse accommodation. I make no claims for originality but I think I may say that I applied considerable thought to the details of the arrangement, which has entirely come up to expectations.

The virtues of the frame for housing a collection of cacti were enthusiastically extolled some fifteen years ago by the late Mr. Shurly. An excellent example of what can be achieved is provided by Mr. Boarder, who has constructed a large frame from concrete members. This is heated by electric cables and contains many boxes of seedling cacti; it is illustrated in the May 1967 issue of this Journal. It was with this knowledge in mind that, a few years ago, I set out to find a solution to the common problem of accommodating an ever-increasing collection in a grossly overcrowded greenhouse. One pertinent factor was that I had hopes of finding more room for the collection elsewhere within a reasonable period of time. The need was, therefore, for an arrangement which would provide some extra space for a modest capital outlay; on this basis, a frame was selected in preference to a second greenhouse.

Having made this basic choice I was then able to consider the advantages and disadvantages of the system and some essential factors in the layout. It was evident that a frame is bound to be more economical to heat than a greenhouse with an equivalent staging area because the ratio of surface area to useful working area is so much smaller. At the other end of the scale, it is clearly much easier to ensure good ventilation on hot summer days because the whole roof can be removed or, if fixed, raised on hinges. On the debit side I marked the fact that one cannot get at



the plants in bad weather, although this seemed unlikely to prove a serious drawback. Other probable disadvantages seemed to be that there would be a restriction on suitable heating systems. The headroom would be limited, excluding columnar cerei and similar plants, and unless the frame were raised on a base working with it would entail continuous bending. At that stage, having decided that it would not be a 'do it yourself' job, I had no idea of what was available commercially.

I further narrowed my choice by opting for a wooden structure and one with glass sides, to give maximum light intensity. I chose wood in preference to metal because of its smaller heat loss in cold weather and for ease of fastening the electrical cable heating system. I selected this latter as a simple, inexpensive and trouble-free way of providing heat during the colder weather. The point had now been reached when ideas had to be translated into practice and it was simply a case of consulting catalogues. The choice proved not to be extensive but it sufficed. I selected a model with five foot and four foot sides, giving twenty square feet of working space. It has two

hinged lights attached to a central ridge bar some twenty one inches above the base, the sides dropping to about nine inches at their lowest point. It is made from soft wood and I followed the manufacturer's recommendation that it should be treated with a lacquer type of preservative to seal the pores and prevent decay.

It was then possible to settle the various other details. I decided to mount it on a brick base, to raise it about one foot nine inches above ground level. In the event, this proved to be a happy solution to the problem of disposing of a quantity of stones which had been dug out of the garden over a period of years. These were used to fill up the inside of the brick base to within a couple of inches of the top. They were covered with a layer of concrete, leaving a small gap all round between this and the brickwork so that excess water may drain away. In turn, the concrete is covered with a thin layer of sand and the pots stand on this. The base of the frame was screwed to fillets of wood let into the top course of bricks, to secure the structure in high winds.

A simple calculation showed that a four hundred watt heating cable could be ample to maintain a temperature of about 45°F. during cold weather and the eighty foot length of cable giving this heat output proved convenient for running some of it in the sand covering the base and the remainder around the inside perimeter of the frame. The temperature is controlled by a conventional rod thermostat. A four foot fluorescent tube is suspended from the central ridge bar and is controlled from a switch inside the nearby greenhouse. The fact that electricity was already available in the latter did, of course, minimise the expense of the additional electrical fittings.

The frame was completed in the autumn of 1962 and it is now possible to assess how it has come up to expectations and has withstood the elements. It was to have a baptism of fire, so far as the heating system was concerned, during its first winter. This was the occasion of the great freeze; temperatures of around 10°F. were commonplace and 2°F. was recorded one night. However, no difficulty was encountered in maintaining the temperature in the mid-forties; I realise that the heating system is entirely dependent on the continuity of electricity supplies and, in that respect, I suppose we have been fortunate in having no cuts. In cold weather it is our practice to cover the frame with sacking and old mats overnight and this materially improved the heat insulation. The average cost of heat per winter has proved to be of the order of thirty shillings, which is certainly economical by comparison with a greenhouse of equivalent staging area.

On the other hand the total capital outlay was some thirty pounds, which bears rather unfavourable comparison with its greenhouse equivalent. The work on

the brick base, which was done professionally, accounted for nearly one third of this. The structure has proved to be quite waterproof and less susceptible to draughts than the adjacent greenhouse. The fixing bars on the hinged lights allow only limited movement but, in hot weather, they are raised above horizontal and held in position with wooden supports. The temperature is then very little above the external temperature and the drying out of the pots is less marked than in the greenhouse. At one time or another most types of globular cacti and some of the other succulents have been grown successfully in the frame and it has also housed a propagator for seed raising. My only adverse comment on the design is that the slope of the roof is not so great as is desirable. Rain does not drain away so rapidly as I would wish which, ultimately, will presumably shorten the life of the wood, and the deposition of atmospheric grime seems more marked than on the greenhouse roof. It has proved a worthwhile investment, one which I would not hesitate to repeat in similar circumstances. More generally, I hope that my comments have given a balanced picture, to enable others to decide if frame cultivation is a good proposition in their particular circumstances.

Round Robins

THE Council of our Society have been discussing the possibility of forming a number of 'Round Robins' for the study of various aspects of our hobby.

For those who are unfamiliar with this form of Study Group let me say that a Round Robin consists of a smallish number of people (say 5—7) in various parts of the country, and even various parts of the world, who decide to study some particular genus or some particular aspect of our plants, pooling their experiences and information gained by means of a circular letter to which each member adds his own results and comments before passing it on to the next member of the group. By this means results of experiments and experiences can be compared and a great deal of interesting knowledge and information can be made available to others. An example of this is the recent booklet on *Gymnocalycium* published by the group working under the leadership of Ron Ginns, under the aegis of the S.P.I.

What is now required is for members interested in any particular genus, or aspect of Cactus and Succulent growing and in particular those prepared to organise and run a Round Robin on any particular subject to let the Society know.

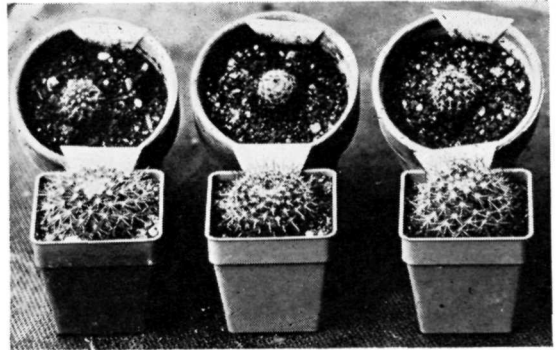
It is hoped eventually to find someone who is prepared to act as a General Organiser of these Round Robins, but in the meantime the Editor will be pleased to receive the name and address of any members interested together with any subject in which they are particularly interested and would like to study more closely.

An Experiment with Plastic Pots

by D. V. Brewerton

IN recent years we have seen the use of plastic pots being introduced into more and more collections. Several well known Nurseries are using them in increasing numbers, departmental stores retail cacti in plastic pots of the most vivid hues, and the local florists obtaining their plants through the wholesale markets display their wares in both plastic and clay pots. It would seem that the plastic pot is here to stay, and now that square pots of this material are available, many cactophiles are finding the space saving and neat appearance of these pots a great asset.

In the summer of last year, I obtained a quantity of small seedlings from a fellow member. From these, three pairs of plants, of equal size, were selected. The plants concerned in the experiment, as shown in the photograph, are, from left to right, *Mammillaria calacantha*, *M. brauceana* and *M. nelliett*(?). They were placed in 2 in. clay and plastic pots, using J.I. No. 1 compost. For the remainder of the year, and up to March of this year, they received identical treatment in position, watering and heating through the winter months. Watering was discontinued at the end of October and started again on the day before the photograph was taken, that is, the middle of March. The result of the experiment is very obvious, and I think, quite outstanding. The plants in the plastic pots do not appear to be lush, the tubercles are not widely spaced, and there is no evidence of a constriction in the body of the plants which might indicate a too rapid growth.



A similar result, using plastic pots was obtained with a *Notocactus concinnus*, a *Neoporteria* and several species of *Echinofossulocactus*, but as no clay pot control plants were used, they have not been included in the photograph.

My conclusion is that these small plastic pots have a very definite advantage over clay pots of a similar size for inducing strong healthy growth in seedlings. I have been using 4 in. square plastic pots for almost a full year, with a wide range of cacti and other succulents and have noticed no harmful effects. It is necessary to exercise great care when watering, and to keep a cautious eye open for signs of excessive growth, although this has not appeared so far. The use of this type of pot seems an ideal method of producing good sized plants, particularly of cacti, in the minimum time, after which, if desired, they can be grown on in the conventional clay pot, when the rate of growth will be reduced to what we consider normal.

Secretary's Notes

An Affiliated Society.

The Committee of The Ickenham and Swakeleys Horticultural Society agreed to affiliate themselves to this Society as from January 1st 1968. They have the honour of being the first Horticultural Society to take this action. A Cactus and Succulent Group has been formed within the Society and its members will benefit from the affiliation. Any Horticultural Society with a similar group is welcome to apply for affiliation. Members could assist by spreading the word at local Horticultural shows.

The Lambeth Branch.

Mr. W. Fraser, founder of this newest Branch of the Society, has had to hand over the reins to Mr. W. Heatley. Mr. Fraser entered hospital recently for major surgery, and expects to be away for 12 months or more. The Lambeth Branch would welcome more support from local members. Please apply to Mr. Heatley for details of meetings.

Change of Programme.

The meeting of the Society on September 12th will now be a talk on 'Epiphyllums' by Mr. Harry Auger. The talk will be illustrated by photographs of plants in Mr. Auger's own collection. The Slide and Tape lecture by Mr. Gordon Rowley originally arranged for that evening has been cancelled as Mr. Rowley is unable to be present.

The June Show.

A happy air of friendly rivalry was very apparent at the R.H.S. Hall on the evening of Monday 12th June—staging night for the largest competitive exhibition of Cacti and other Succulent plants seen at Westminster for many years. Thanks are largely due to those Branch Secretaries who encourage their members to exhibit. The William Denton Memorial Trophy (from the London Cactus Club) will be awarded each year to the Branch aggregating the most points at the two Shows. With such keen competition in June, I feel we can look forward to an even larger Show on August 31st.

Correspondence

To the Editor :

Most cactus growers have, I expect, never heard of *Cereus pedunculatus*. From the name, it would appear to be closely related to *Cereus jamacaru* and *C. peruvianus*. However, they could not be less related, since *Cereus pedunculatus* is a sea-anemone, an animal, and *Cereus jamacaru* is a cactus, a plant.

I discovered this fact while reading through the Observer's book of Sea and Seashore, by I. O. Evans. The name occurs twice (p. 141 and plate 34, no. 4) so the possibility of a printing mistake is largely ruled out. Perhaps if there are any marine biologists among the readers of this magazine, they could enlighten me as to whether it is just a slip-up by the author, or whether it is in fact a taxonomic mistake. If it is, it might have serious repercussions, and further confuse the naming of cacti.

A. G. Rivett, Banstead, Surrey.

To the Editor :

I was interested to read W. F. Maddams' letter in the last journal with reference to seed raising, and while I agree with all he says, I would like to go a little further.

Having raised the seedlings, my depression is caused by the seeming lack of interest in others, who are not interested in exchange.

In 1966, I wrote to Mr. Boarder asking if he could help in providing names and addresses of persons who had surplus seedlings for disposal. He kindly sent me three (all he had), all of whom I wrote to. One replied and we made satisfactory arrangements.

It does seem to me that it is deplorable that, out of the large membership, there are only three persons sufficiently interested to forward their names to Mr. Boarder.

The natural complement of being able to grow nice seedlings to me, is to be able to exchange them for others not in my possession.

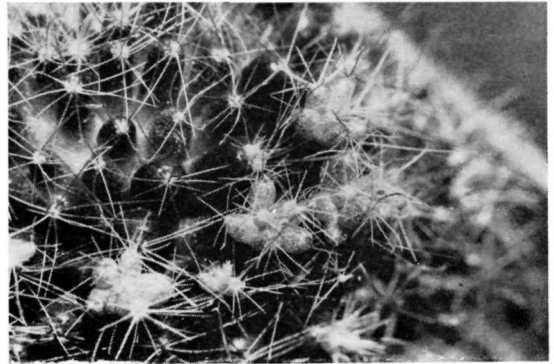
If what Mr. Maddams surmises is true, that only few of the seeds sown, survive their first year, then this, perhaps, is the answer. Even so, surely there must be a few people who do manage to raise some.

J. A. Bastow,
St. Margarets, Whittingham Lane,
Broughton, Preston, Lancs.

Oddities

Strange goings-on in the greenhouse

The aim of this series is to report unusual growth forms observed in members' collections. Members are invited to send contributions to the series, preferably including a photograph or line drawing. If any morphologists among our readers can provide an explanation of these phenomena, the Editor will be pleased to hear from them.



No. 6 *Aberrant branching in Mammillarias*

by L. E. Newton

The branches and flowers of a *Mammillaria* normally appear from the axils of the tubercles. Occasionally, however, a plant may produce either branches or flowers from the tips of the tubercles. *Mammillaria wildii* is particularly prone to this behaviour, and is shown here. This is certainly not the first record of this mode of branching, for published reports will be found in the literature of the last century.

Cactus buds are paired; one produces spines and the other produces a branch or a flower. In *Mammillarias* and related genera the second of these buds is displaced, and lies in the axil of the tubercle. The appearance of branches or flowers on the ends of the tubercles has suggested to some that the two buds have failed to separate during development of the plant. However, the writer has sectioned a plant of *M. albescens* with these branches and shown that there was also a bud in the axil (reported in the German Journal for June 1964). It seems, then, that the bud which normally becomes inactive after producing the typical spine cluster has resumed growth. Why?

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Show Results, June 13 and 14, 1967

Class

- | | | |
|-----|---|---------------------------|
| 1. | Nine Cacti (any genera). 4 entries | |
| | 1st J. E. Taylor | 2nd Mrs. M. Caswell |
| | | 3rd R. H. I. Read |
| 2. | Six Cacti (any genera). 9 entries | |
| | 1st R. F. Clark | 2nd C. Parker |
| | H.C. G. Richardson | C. Mrs. S. G. Sharman |
| | | 3rd K. Grantham |
| 3. | Three Cacti (any genera). 14 entries | |
| | 1st L. Jeffries | 2nd Mrs. T. Watt |
| | H.C. C. G. Brown | H.C. C. Parker |
| | | 3rd E. G. Canham |
| | | C. Miss D. Maxwell |
| 4. | Three Cacti (any genera). (Novices class.) 14 entries | |
| | 1st L. Jeffries | 2nd A. E. Lodge |
| | | H.C. Miss I. Potton |
| | | 3rd J. Denney |
| 5. | Six Mammillarias. 9 entries | |
| | 1st W. F. Maddams | 2nd J. E. Taylor |
| | H.C. Mrs. M. Caswell | H.C. Mrs. B. Baldry |
| | | 3rd G. Richardson |
| 6. | Three Mammillarias. 13 entries | |
| | 1st Mrs. T. Watt | 2nd R. H. I. Read |
| | | H.C. K. Grantham |
| | | 3rd G. A. Page |
| 7. | Three Rebutias. 8 entries | |
| | 1st L. Jeffries | 2nd W. F. Maddams |
| | | H.C. J. Pilbeam |
| | | 3rd J. E. Taylor |
| 8. | Three Lobivias. 6 entries | |
| | 1st J. E. Taylor | 2nd J. Pilbeam |
| | | 3rd Mrs. T. Watt |
| 9. | One Cactus and one other Succulent. 11 entries | |
| | 1st L. Jeffries | 2nd Mrs. S. G. Sharman |
| | | H.C. R. H. I. Read |
| | | 3rd K. Grantham |
| 10. | Cacti seedlings. 2 entries | |
| | 1st W. F. Maddams | 2nd |
| | | 3rd Miss I. Potton |
| 11. | One Mammillaria elongata. 14 entries | |
| | 1st L. Jeffries | 2nd A. E. Lodge |
| | H.C. Miss D. Maxwell | H.C. E. G. Canham |
| | | 3rd M. R. Lambert |
| 12. | Three Opuntias. 7 entries | |
| | 1st A. E. Lodge | 2nd K. Grantham |
| | | H.C. G. G. Leighton-Boyce |
| | | 3rd C. G. Brown |
| 13. | Three Agaves. 2 entries | |
| | 1st P. R. White | 2nd D. V. Brewerton |
| 14. | Three Plants in Liliaceae. 6 entries | |
| | 1st R. H. I. Read | 2nd P. R. White |
| | | 3rd D. V. Brewerton |
| 15. | Three Succulents other than Cacti. 8 entries | |
| | 1st C. Parker | 2nd K. Grantham |
| | V.H.C. R. H. I. Read | C. P. R. White |
| | | 3rd J. D. Harding |
| 16. | Three Succulents other than Cacti (Novices class). 8 entries | |
| | 1st L. Jeffries | 2nd B. C. Marshall |
| | V.H.C. J. G. Brown | H.C. P. R. White |
| | | 3rd H. P. Porter |
| 17. | Four South African Succulents. 6 entries | |
| | 1st Mrs. S. G. Sharman | 2nd K. Grantham |
| | | H.C. C. Parker |
| | | 3rd Mrs. T. Watt |
| 18. | Miniature Garden. 4 entries | |
| | 1st Mrs. B. A. Baldry | 2nd B. Stack |
| | | 3rd A. E. Lodge |
| 19. | Group of Cacti and/or other Succulents. 3 entries | |
| | 1st W. F. Maddams | 2nd K. Grantham |
| | | 3rd A. E. Lodge |
| 20. | Three Cacti and/or other Succulents (Juniors class). 6 entries | |
| | 1st B. Stack | 2nd J. Andrew |
| | | 3rd J. Wright |
| 21. | One Imported Cactus. 7 entries | |
| | 1st W. F. Maddams | 2nd K. Grantham |
| | | H.C. R. H. I. Read |
| | | 3rd R. F. R. Clark |

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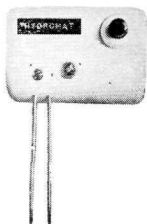
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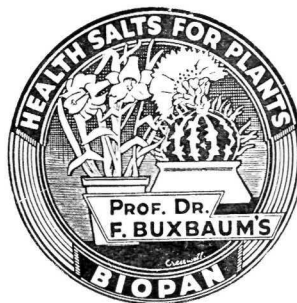
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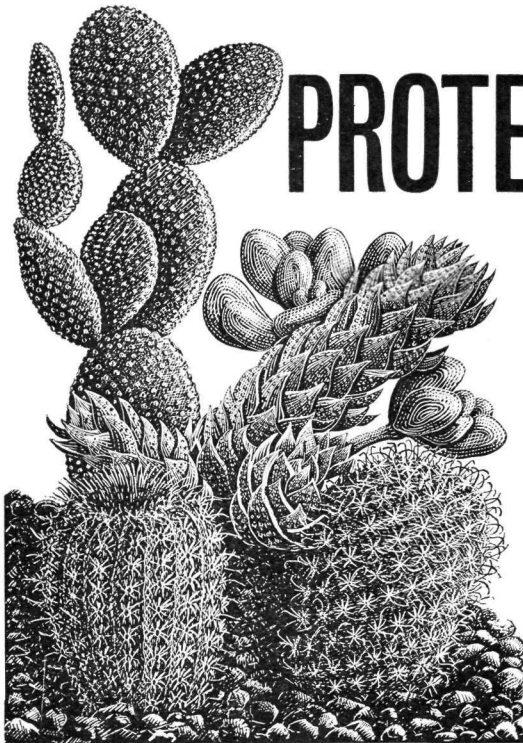
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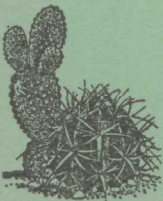
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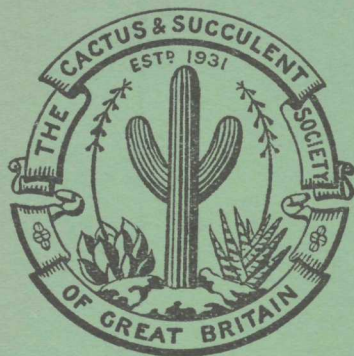
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THE CACTUS AND SUCCULENT JOURNAL OF GREAT BRITAIN

Vol. 29

November 1967

No. 4

Editorial

WE are fortunate to be able to publish in this issue an item which I hope will be of use and interest to many of our readers. I refer to the bibliography compiled by my predecessor, Len Newton. We had hoped it might be possible to arrange that this occupied the centre pages of the Journal so that it could, if desired, be extracted and filed as a separate booklet. However this could not be managed, but it is hoped to have printed a number of extra copies of the bibliography and should readers desire extra copies these can be obtained at a small charge from the Editor. I cannot quote the exact price at present. (probably 6d. or 1/-).

I am happy to see that our correspondence column is growing. I hope that many more of our readers will feel inspired to put pen to paper on matters which interest them.

I have had a few replies from members who are interested in round robins and prepared to take part, but not nearly enough. So come along! I am sure many of you spend a lot of time examining your plants in detail. Surely it isn't too much trouble to make a note of your findings and pass them on to other members via a round robin. And don't forget, this is also a means of contacting other members with a particular interest in the same plants as you yourself.

E.M.D.

Cultivation Notes

Cacti—A. Boarder

THIS year has been a very good one for our plants, not only have there been very many flowers on most of the cacti but the seed pods which have developed appear to be more numerous than in other years. It has often been stated that it is the amount of sunshine one year which regulates the number of flowers one can expect the following year. I do not agree with this statement entirely. I am more inclined to the belief that it is the amount of growth made one year which brings flowers the following year. In the genus *Mammillaria* it is certain that one will never get a large number of flowers unless the plant has made plenty of growth the previous year. The number of rings of flowers will indicate how much fresh growth has been made since the previous year's crop. Other genera are not quite the same; for instance all the *Astrophytums* will flower at the new areoles as they are formed at the growing centre of the plant. Several other genera such as:—*Parodias*, *Notocactus* and *Gymnocalycium* flower at the top of the plant and can do so on growth made early in the same year as they flower. The number of seed pods which have formed may be due in some instances to the number of bees which have found their way into the greenhouse. There is no doubt that the presence of many colourful seed pods enhances the appearance of a collection throughout the following winter. Even if seeds are not required it is advisable to encourage their formation by artificial pollination so that as many pods as possible may be obtained.

Mentioning greenhouses brings to mind a point I have considered on several occasions and that is, how many of our members have a greenhouse and how many just keep their plants in the house either on a window sill or a table in front of a window? I do not see how I shall ever find this out. The only way I might get an indication of this would be to ask for a show of hands at one of our meetings. This could give a general idea as to how the percentage is related. I know that my writings on culture are mainly aimed at the members who have a greenhouse and I would be grateful if I could discover what percentage of them exist in the Society.

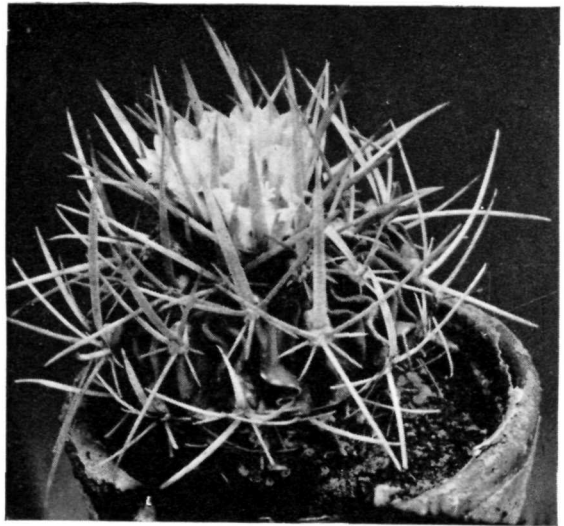
I read in last month's journal of the fears of Mrs. Stillwell about the damage likely to be expected from jet aeroplanes and one might expect a number of cracks in the glass if nothing worse. I have found a good idea for treating cracks which may be found useful by other members. When a pane receives a crack it is not always convenient to change the whole pane. In the past I have forced a little paint into the crack and this has functioned fairly well for some time. Lately I tried another method and find it very good. Where a crack has appeared near the base of a pane in the frame or greenhouse I have carefully run a little Evo-stic down the crack. There is no need to allow this to spread over the surrounding area but keep the streak as thin as possible. This not only stops the piece of glass from slipping down but it also prevents any rain water

from dripping through. If the house or frame has large panes of glass this will save quite an expense if a new pane can be avoided.

I find that my plants in plastic pots are still making good growth and I find that more and more people are using them. It is as well if many try their hand at using these pots as it is possible that in time few clay ones will become available. Of course there are points to be remembered when one uses these pots. Without doubt they hold the moisture better than a clay pot and one must remember this when watering. People who object to using plastic pots say that a plant can be over-watered in such pots. This is so, but any plant can also be over-watered in a clay pot and it just needs a little care to overcome any danger from this watering. Incidentally I have heard another complaint from a member and that is, cacti grow too quickly and one cannot find space for them in the greenhouse. Well this is a new one to me as the usual complaint is that the cacti do not grow fast enough. I have found on several occasions that a plant which refuses to grow in a clay pot, no matter how it is repotted or treated, immediately responds to a plastic pot. I have a few tricky plants which I have induced to grow and flower by using plastic pots.

Most of my *Echinocereus* have flowered this year as have the *Echinofossulocactus*. The latter plants have flowers which are not very large and most appear to be a whitish with violet stripes. The flowers always come at the top of the plant and often have difficulty in opening properly because of the stout spines at the top of the plant. They soon develop and ripen their seeds and although the pod soon bursts the seeds usually remain at the top of the plant for gathering. They are fortunately fairly large and so collecting offers few problems.

Some *Mammillarias* always give me considerable difficulty in raising them from seed. Year after year I have tried with certain species and although others grow well under the same conditions these few refuse to do so. I find that the following have always been liable to die off after some months of germination; *M. pennispinosa*; *M. aurielanata*; *M. blossfeldiana*; *M. microcarpa*; *M. shurliana*; *M. dioica*; *M. mainae*; and a few others which have strongly hooked spines similar to several of those mentioned. I have eventually raised a few of the above but then I may only get one or two to survive. One I have which is the lone survivor of several seedlings is *M. guelzowiana*. Most of these plants come up fairly well from seed but it is in the first year or the first winter that they fade away. I know that I have lost some of these seedlings from the attacks of the *Sciara* fly. These tiny flies lay their eggs in anything damp and the resultant larvae feed on the soft tissues of seedlings. As the almost transparent worm-like larvae eat from the bottom of a plant it is impossible to tell if a plant is being attacked until it



Echinofossulocactus caespitosa

collapses, leaving just the skin and spines. I have tried to kill off these pests by various means and although the flies can be killed with D.D.T. or Malathion powder, I have yet to be sure that I can cope with the larvae when they are inside a plant. The watering with Pestex may be the answer, but I am rather doubtful about using this on very young seedlings. At the moment I am trying to kill all the flies off before they can lay their eggs.

The two shows of the Society this year were the best since the war. It is very gratifying to the judges and to the council to see this increase in numbers and quality. It certainly has been very marked this year. I am inclined to believe that some of the new exhibitors are members who have joined this Society when the London Cactus Club ceased operations. We welcome these members heartily as they had proved to be very good growers and the influx of such members appears to be showing gratifying results and our Society is going on to new strength in consequence. We must also remember that this Society has gained in another way. I refer to the splendid gesture of the London Cactus Club in donating all their cups and trophies to this Society. and I trust that some of their previous members will be winning the trophies at our shows now that they have joined the Society.

I was very interested to read about the frame which Mr. Maddams described in the last journal, especially the cost of it. My own frame which he mentioned is 20 ft. long and almost 7 ft. wide, and cost me £23, with an extra £9 10s. for heating. With a few extras such as leads to the frame the total cost was £35 10s. Naturally there was a lot of work involved but by doing everything myself I must have saved many pounds. The actual framework is composed of concrete

re-inforced bars and I had to make 75 separate members for this, each with a small hole to enable an aluminium pin to join all together. The 12 lights are about three feet square and each has only two panes of glass fitted with wooden fillets for easy repair if necessary. The frame was made in 1954, and has been of great assistance to me in raising thousands of seedlings from the pricking out stage. The upkeep has been negligible as the concrete bars need no treatment and all the timber of the lights has only had a good application of Cuprinol once or twice ever since. There is no putty for the glass and no painting to become perished.

By the time this journal reaches you the main watering will have ceased. Any watering from now on will depend on the position of the plants and the temperature maintained. For all the plants kept in the house, especially in a living room, it is essential that they have a little water occasionally; at least once a month and perhaps more in suitable weather, and if central heating is used. I believe that most of the smaller roots of plants will die if they are kept too dry at a warm temperature for many weeks.

The plants kept in a greenhouse where the temperature may vary from 40°—50° F., some water may be given when the weather is mild. Not enough must be given to encourage fresh growth but just a little perhaps once a month to keep the roots alive. I watered most of my plants and now and then during last winter and found benefits from it. I must state that the temperature in my greenhouse last winter was mostly about 50° F., although on some occasions it went lower. If one chooses suitable days for a slight watering

I feel sure that it will be beneficial. Naturally one would not water during severe weather, but most winters provide us with several mild spells.

All plants will benefit from a good cleaning up at the beginning of the winter. Each one should be taken up separately and examined for pests. First remove the label and scrape away all the top half inch of soil. Any weeds or moss should be removed and the base of the plant inspected for pests. Then top up again with some fresh soil, replace the label and stand the plant in a spot where it is apart from those untreated. Any which appear to have their drainage hole blocked should be seen to so that the hole is quite clear.

Look out for drips from the roof and seal off with Evo-stic. Watch for draughts at the sides of lights and some of the sealing strip as used for doors and windows in the house can be fitted. The greenhouse can be made almost air-tight against frosts and cold winds as long as one is able to supply fresh air on suitable occasions with the aid of small ventilators.

See that the glass of greenhouse or frame is cleaned properly so that the maximum amount of light can be obtained. If there are any small seedlings they can be placed where they can get extra warmth. I still find that my "Monster" blue flame heater is the most dependable and with my additional spare tanks for extra paraffin able to siphon in fresh oil to the lamp, it will function for four days and nights without attention. I know that electricity can also do this task but one must always have the fear that during very severe spells when warmth is most needed the electricity may be cut off or at least reduced in power.

Cultivation Notes

Other Succulents—Mrs. M. Stillwell

I ALWAYS feel that the autumn is one of the busiest times of the year in the greenhouse. I always do a lot of repotting at this time as many of the succulents, particularly the *Crassulas* and *Mesembryanthemums* are in active growth and benefit from being potted on. It is also a good time to examine your plants carefully for mealy bug which always seems very active at this time. I try to remove as many plants as I can from shelves etc. and wipe over the woodwork and the bottoms of the pots with a cloth dipped in either strong Dettol or surgical spirit; this helps to kill off any pests that are hoping to hibernate in the crannies for the winter. Make sure to give the undersides of shelves and staging the same treatment. Try to be ruthless and discard all diseased plants that may carry infection to others.

The *Conophytums* are flowering well this year and the brilliance of the mauves and yellows make a very pleasing picture. My *Conophytum wettsteinii* is once more completely covered in flowers and is one that can

always be relied upon to give a good show and another little gem with a deep purple flower is *Conophytum fenestratum* with a bronzed transparent body. All the *Conophytums* should have their old skins carefully removed at the beginning of the growing period. It is a tedious job if you have a fair collection but the plants look much better for the little extra care. There is no need to repot for several years unless the plant is touching the sides or not looking up to standard. The majority of mine are in clay pots, but the obstinate ones I put in plastic, when they usually respond.

The *Ophthalmophyllums* are also flowering well. I have two plants in 4½ inch pots which I know are over fifteen years old, so they are fairly slow growing. The *Pleiospilos* have also flowered well. Last year most of these were repotted and the old dead leaves removed from the base. These can be very hard and often difficult to remove without really taking the plant out of the pot. One of the nicest is *Pleiospilos*

similans with the large flat tongue-shaped bodies. The *Glottiphyllums* have also produced plenty of flowers and many of these have a delicate perfume reminding me of Mimosa. If you are growing from seed, be sure to keep them firm and compact right from the start, as a lush *Glottiphyllum* is ruined, and takes a long time to grow into a true-to-type plant. Let them bake in the sun in the summer and give only just enough water to prevent shrivelling and they will become firm and often turn beautiful shades of mauve.

The *Gibbaeums* are now in active growth and will require a little water during the winter when many of them will be flowering. I like to report these about September. The *Nananthus* and *Aloinopsis* start to grow in the late summer after staying dormant for several months. After flowering they often look a little sick, but with the arrival of their growing season they soon produce a number of new leaves and regain their former beauty.



Glottiphyllum praepingue



Cotyledon wallichii

Cotyledon wallichii produces its new leaves from September onwards. It may not be generally known, but this plant is said to be very poisonous; in fact if animals eat it in the wild, they soon die. In growth it is always an attractive plant especially when it reaches adult size. Water carefully when growing and keep dry when the leaves turn yellow and drop. *Cotyledons* can be very varied, many having large showy flowers in shades of orange, yellow or red. *C. jacobseniana* is a dainty small half-shrub forming clumps, glabrous green and with very attractive terminal reddish green flowers which are borne very freely. *C. undulata* is of course always very popular, but if allowed to flower, soon loses its lower leaves and a lot of its beauty, and it will probably be better to start again from a cutting. Personally, I pinch out the flower buds as they appear, in an effort to keep a short compact plant with those beautiful wavy edged farinose leaves.

C. teretifolia whose leaves are covered in dense white hairs can be very attractive especially when young. It prefers semi-shade and careful watering to prevent too much lush growth.

I have one rosette of *Sino-crassula yunnanensis* about the size of a penny which has in the course of flowering developed a large flat monstrous growth nearly a foot high and about four inches wide. The actual head of bloom is fan-shaped and a mass of flowers. I have taken colour transparencies which I hope to show at a later date. Quite remarkable that such a small rosette produces such a large head of flowers.

The dwarf *Crassulas* have become very popular of late and dozens can be housed in quite a small space. They are rather prone to mealy bug and should not be treated with Malathion or similar products or the leaves will probably be damaged. I have found surgical spirit fairly safe to use. It can always be sprayed off afterwards if you are in any doubt. The following little gems are some that I would recommend, although they may not all be easily obtained, but that is half the fun of collecting. *Crassula deceptrix*, *C. alstonii*, *C. arta*, *C. susannae*, *C. grisea*, *C. hystrix*, *C. mesembryanthemopsis* and of course *C. comptonii* with its delightful yellow, scented flowers. If growing them in plastic pots, be careful with the watering as they can soon become too green and lose their compactness and richness of colour. *Crassula barbata* is a beautiful rosette form with white hairs. It rests in the summer and requires a slightly higher temperature in the winter. It dies after flowering, but usually makes offsets.

Let us hope that the winter will pass quickly and without being too severe.

A Bibliography of Key Works for the Identification of Succulent Plants

by L. E. Newton

INTRODUCTION

As the literature on succulent plants continues to grow, it becomes increasingly difficult and laborious to locate references to a particular plant or topic. The most pressing need of most growers is a means of identifying their plants, but many useful papers lie buried, and often forgotten, in old journals. Some of the older books on groups for which there is no recent literature may also be unknown to new converts to the hobby. The chief aim of the present work is, therefore, to act as a guide to the taxonomic literature on succulent plants.

Publications have been listed if they possess one or more of the following features:

- an identification key,
- good descriptions,
- good illustrations,
- a good bibliography.

The items listed include both botanical monographs and non-technical picture-books. The exclusion of any book or paper from this work does not imply that it is of no value. Succulent plant literature is now so voluminous that this guide must necessarily be very selective, and the decision whether or not to include a particular title was not always easy. Some out-of-date works are included, even where a more modern work is available. Thus many English cactophiles will find the illustrated key in Marshall & Bock's 'Cactaceae' (1941) easier to follow than the German keys in Beckeberg's more recent books.

Regional floras will, of course, include the succulent plants of the region concerned. No attempt has been made to list these, and only a few references to floras are included. Details of regional floras will be found in the guides by Blake & Atwood¹ and Frodin².

With the growing importance of Cytology and other fields in modern taxonomy, it was felt that it might be useful to list references to such work on succulent plants. Again, these are select lists, and further references are cited in the papers listed.

This bibliography covers publications up to the end of 1966. The problem of keeping up to date with new discoveries and taxonomic changes may be solved by referring to the two periodical indices covering succulent plants.^{3, 4} There are now numerous periodicals devoted to succulent plants, mostly published by societies, and they include frequent reviews of new publications. It is intended to publish supplements to the present work from time to time.

The author is grateful to Mr. G. D. Rowley for reading through and commenting upon the typescript.

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IMPORTANT CURRENT PERIODICALS

If one counts the small mimeographed bulletins produced by many local societies, especially in the U.S.A., and by branches of some of the world's major national societies, there are well over forty currently published periodicals devoted to succulent plants. This list is confined to those in which descriptions of new species or other important taxonomic contributions have appeared. The date is the year in which publication commenced. The current title is given in each case, but earlier volumes of some journals were issued with different titles. CACTACEAS Y SUCCULENTAS MEXICANAS.

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- BOKE, N. H. Various papers on Histogenesis. *Am. Jour. Bot.* Vol. 31 (1944) onwards.
- BUXBAUM, F. Morphology of Cacti. 223 pp. in 3 parts. 450 figs. Pasadena 1950-1955.

We extend hearty congratulations to Dr. H. M. LOUISA BOLUS on the occasion of her 90th birthday. As many readers will know, Dr. Bolus the ex-curator of the Bolus Herbarium, University of Capetown, has been one of the foremost workers on the whole Mesembryanthemum family this century. Her interest in those plants goes back 60 years and since 1927 she has steadily published new genera and species under the general heading "Notes on Mesembryanthemum and some allied genera".

Evidently, the study of the Mesembryanthemaceae is conducive to longevity because we recall, among

others, the long and fruitful careers of Dr. N. E. Brown and Professor G. Schwantes.

LEN NEWTON needs no introduction to most of our members but for those who have joined recently he was my predecessor as Editor of this Journal, but had to give up this job when he also resigned from his post as a Lecturer at Erith Technical College to take up a post at the University of Science and Technology at Kumasi, Ghana. He has always taken a keen interest in collecting books on Botany and especially on Cacti, and must have one of the finest collections outside the specialist libraries.

Mammillarias and their Localities

by F. G. Buchenau

SEÑOR Buchenau paid a brief visit to England, in early June, en route for Germany and gave a talk to the members of The North Surrey Branch of the Society at this time. His comments and colour transparencies greatly impressed the audience and it was suggested that a report be prepared, to make the information generally available. Señor Buchenau kindly supplied extensive notes and it is on these that this article is based; an attempt has also been made, inadequate though it is, to summarize the details of his colour transparencies.

In his introductory remarks Señor Buchenau said that he was very glad to be in England again, to renew friendships made about a year and a half previously when he had spoken at a meeting in London. He conveyed the greetings of the officers and members of the Mexican Cactus Society, and especially of the President, Dr. Helia Bravo. The Society, probably the smallest one of its kind, has only fifty active members; the ordinary Mexican regards cacti as a nuisance and of no value. However, despite its small size the Society promotes some very useful work because of the enthusiastic and competent people within its ranks. Apart from Dr. Bravo these include Professor Matuda, who specialises in the other succulents, Señor Mejorada, whose interest lies in the *Ferocacti*, Dr. Meyran and Señor Fitkau, who concentrate on the genus *Mammillaria*, and Mr. Dudley Gold who can be described as an all-rounder.

Señor Buchenau went on to explain that some introductory material was required to appreciate fully the plants to be seen on the colour transparencies. This background discussion would not be of a particularly technical nature. The first point to appreciate is that Mexico is a very large country. This is where maps can be deceptive; it may appear to be about the same size as the British Isles, but it is larger by a factor of six. This can be appreciated by making an imaginary journey by land rover, working north from the southern border with Guatemala. On such a journey, averaging three hundred miles a day, (and this is quite a feat in view of the winding nature of the Mexican highways) one needs seven days to reach the northern border with the U.S.A. On this schedule of three hundred miles per day, you will find that there is very little time to stop to look for cacti.

One must also get rid of the idea that these plants are to be found growing everywhere. It is quite possible to drive sixty, eighty or even one hundred miles without seeing a single *Opuntia* or *Cereus*, the two really common genera, yet one will suddenly reach a locality where they are to be seen in profusion. Despite this, you will find that, at this locality and

others, the range of plants is very limited. In all probability there will be two types of *Cerei* one or two *Opuntias*, a single *Ferocactus* species, one *Coryphantha* and a couple of *Mammillarias*, although once in a while three or four species of this last genus will occur at a particular locality. As a general rule, so far as *Mammillarias* are concerned, one can expect to find one or two species at a given spot whereas they will be absent from the next range of hills. After driving, ten, twenty or thirty miles, plants will appear again; these may well be the same *Mammillaria* species but another one will be encountered quite often.

Señor Buchenau explained that, of recent years, he has been accustomed to making descriptions of *Mammillaria* species found at various localities, without reference to the descriptions given in the literature. Having compiled a number of these and then gone back to the original sources, he finds that there is agreement in some cases but not in others. These data indicate also definite ranges of variability. For example, suppose that at locality A a particular species has 15-16 radial spines; there will also be a few with 14 and 17 and the variability range will be 14-17. Moving to locality B, twenty miles distant, this same species may well occur, but now with the radial spine variability range 18-22. Señor Buchenau has grown on in his garden various collected plants; because the climatic conditions at his home are different from those in many of the habitat areas, he supposed that the collected plants would change their characteristics as they grew in cultivation. This has not happened, even for plants raised from seed from collected material. Those from locality A with 14-17 radial spines still conform to this figure and those from locality B retain the 18-22 range.

This is a rather important discovery because it means that the population of each locality can be regarded as stable and uniform or genotypic in its characteristics and represents a closed or ecotypical stock. The same discovery has been made recently by Mr. Cowper in his studies of the complex embracing *MM. wilcoxii*, *wrightii* and *viridiflora* as reported in the October, 1966 issue of The Mammillaria Journal. This means that the same behaviour is observed for quite different groups of species in widely separated areas.

If the population of each locality can be regarded as a closed stock, and the evidence for this is very strong, then it means that localities have a singular importance in the description of species. Unfortunately, in this respect, the literature is poor and even misleading at times. For instance, the statement "collected in the State of Hidalgo" is useless because this alone has an area greater than that of Scotland. On the other hand, if a species such as *M. elegans* is collected at various

localities differing characteristics will be found at each locality; these may be small or large and can only be assessed by collecting at the various localities. The variability of characteristics for species such as *MM. elegans* and *centricirra* is much greater than one would suppose from a study of the literature. Some of the forms definitely do not fit with the original descriptions of these two species. This poses a real problem for all of us; do we enlarge the existing descriptions to allow for this greater variability or do we describe these extreme variants as new species?

Considerations of this type have led Señor Buchenau to the idea of regarding the different forms as a group or complex. He extracts or synthesises from his descriptions the characteristics which are general or uniform to all members of the complex; these are called the group characteristics. His first work was on the *M. elegans* complex which should be regarded as an "aggregate species" in the sense it is used by Mr. D. R. Hunt. The same principle has been applied to the *MM. rhodantha* and *confusa* complexes, for which there are not only forms and varieties but also differing yet related species, and the principle works well here.

In order to avoid misunderstandings, Señor Buchenau took care to explain that this approach of his had nothing to do with formal scientific thinking; he is pleased to leave this side of things to the botanists. His method is essentially to place a newly collected plant into one of the complexes, on the basis of its detailed characteristics including fruit and seeds, taking into account also its geographical relationships to similar species. Once one has a reasonable amount of data for each complex it becomes possible to see if a particular plant should be regarded as a form—a variety or a species. In other words, given adequate variability data the problem of what constitutes a variety or a species largely resolves itself.

Señor Buchenau then illustrated these ideas in a practical way by showing colour transparencies, some taken in habitat and some in his garden, of the various species he considers make up the *M. spinosissima* and *M. duoformis* complexes. The habitat photographs were of special interest because many of the audience had the opportunity to see for the first time the near-incredible conditions under which some of these plants grow. Many of the species considered become quite columnar with age and some were to be seen growing inverted from rocky overhangs, suspended in space.

M. spinosissima is common in cultivation but it is evident that the plant which most of us grow does not conform to the original description of Lemaire which calls for 12-15 central spines. As Señor Buchenau pointed out those he has seen in Europe usually have appreciably fewer centrals. These latter are also found in habitat and it is evident that the species is far more variable in this respect than has been recognised hitherto. Having accepted this point, one is then faced with the

problem of where to draw the dividing line to establish the next species in the complex. For example, the as yet undescribed *M. michoacanensis*, which is quite common in collections in Europe, is clearly closely related to *M. spinosissima* but is it really different enough to warrant species status? This same question can be put for the little-known, *M. pitcayensis*. Also in this complex, but recognisably different, is *M. meyranii*; this species was described in the 25th Anniversary issue of this Journal and is now gradually becoming available. The recently described *M. backebergiana* comes into this group because of its spination and columnar habit. Señor Buchenau pointed out that this species was more freely available in Great Britain than was generally realised, because all the plants he had seen under the name *M. fertilis* were, in fact, *M. backebergiana*.

Also included in this complex are two familiar plants, appreciably different from *M. spinosissima* but recognisable as being of this affinity when one works through the intermediate species. They are *MM. nunezii* and *solisii*; the latter is now often regarded as *M. nunezii* v. *solisii* and Señor Buchenau goes further by merely considering it as a form of *M. nunezii*. Likewise, he is firmly of the opinion that the names *M. guerreronis* v. *subhamatam* and *M. zapilotensis* are not justified as the occurrence of some hooked or bent central spines appears to be a purely random process. *M. guerreronis* may appear to be some distance removed from *M. spinosissima* but, with the approach adopted here, it is clear that it is one of the more distant members of the complex.

The other group of plants shown and discussed was less familiar to the audience but, here again, they had the opportunity to see very fine transparencies of some new species recently collected and described by Señor Buchenau. They all belong to the *M. duoformis* complex, the name used to describe the plant we usually know as *M. heeriana* or *M. hamata*. The former is not acceptable and Señor Buchenau considers that the plants so named are not completely compatible with the incompletely described *M. hamata* of 1837. Because they do tally with *M. duoformis* Buchenau uses this name for the principal species of the second complex he discussed, all the members of which have strong hooked central spines. The audience were much impressed with photographs of the two recent discoveries, *MM. erythrocalyx* and *magnifica*, particularly the latter which has strong, golden-yellow spines and, in maturity, makes an imposing columnar plant. It will certainly be much in demand once it becomes available.

In his closing remarks Señor Buchenau said that it was heartening to talk to an audience who were so obviously enthusiastic, and to find so many people from a comparatively limited area who were prepared to come and listen to a fairly serious talk on Cacti. He

hoped that some of the audience would develop their interest in Mexican cacti to the point where they would subscribe to the Mexican Cactus Journal, and so help to extend the field work. This Journal "Cactaceas y Succulentas Mexicanas", although published in Spanish, contains an extensive English summary. The annual subscription is £1 and it should be sent to Mr. Dudley,

B Gold, Apartado Postal 979, Cuernavaca, Morelos, Mexico. After Señor Buchenau had answered a number of questions, the Society Chairman, Mr. S. W. I. Young, thanked him on behalf of the North Surrey Branch members and visitors from the Croydon Branch N.C.S.S. and expressed the hope that he would return to give another talk in the not too distant future.

Plant Description

We have received from Mr. J. R. McClurkin of Santa Monica, California, the following notice from the Nomenclature Committee of the Cactus and Succulent Society of America. As many of our members have been worried in the past about discrepancies and incompleteness in plant descriptions, we feel that any steps to rectify these deserve support, and we have therefore decided to publish the notice in full. Space precludes publication of the form mentioned in the second paragraph but the Editor has a supply and will be happy to send a specimen to any members interested. Obviously few members in this country will have the opportunity of describing plants they have collected themselves, but, as you will see, information is also desired of plants growing in cultivation. (Ed.)

THE Cactus & Succulent Society of America, Inc., has realised for some time that, owing to the discovery of many new species, our standard text, the Cactaceae of Britton and Rose, no longer adequately covers the field of cactus knowledge. The Society has appointed a Nomenclature Committee to secure and compile as much information as possible to assist in the eventual publication of a more complete text. This committee seeks your collaboration in the matter of securing accurate descriptions of typical plants, whether or not they may prove to be new species, since many of the descriptions we already have are lacking in important details. Furthermore, more accurate knowledge of distribution is desired.

The committee has prepared a blank form for the recording of data. The filling out of this form is excellent training in the art of observation and most cactus collectors necessarily become interested in botanical classification.

In carrying on its work, the committee is to secure typical specimens of cacti for the purpose of placing in herbaria. Also in the case of plants which are collected without flowers or fruits, it is desirable that they be grown on in order to eventually complete the data. Mr. Wm. Hertrich, Curator of the Huntington Botanical Gardens, and a member of this committee, has undertaken to place in the Botanical Gardens, plants which are sent in for this purpose.

Good photographs showing plants growing in their native habitats and giving details of their forms, flowers, fruits, etc., are even more valuable than written descriptions. Hence the committee desires such photographs, whenever it is possible to obtain them, to accompany these descriptions.

By securing a number of descriptions from different observers it will be possible to compile data of very great accuracy over the period of a number of years for which the work is planned.

An explanation of certain details of the description blank will doubtless be of value to collectors who are not acquainted with some of the technical terms used. Under the heading "General Information," details are called for which show the kind of habitat in which the plant grows in nature. The exact locality where the plant was found should be given as accurately as possible with reference to towns or natural landmarks. The committee can fill in the latitude and longitude if you do not know it. It is also desired to obtain data on plants growing under cultivation, which fact should naturally be stated if the description is of such a plant. In such cases the source of the plant should be given, its age, and full details on the cultural conditions under which it has been grown. A separate report form sheet should be used for each plant, and the committee will be glad to send you additional ones if you can use them. Where a number of plants are available, one average plant and not an exceptional one should be selected for description, and all parts of the description should be taken from that plant. An exceptional plant which appears a distinct variety is worth describing separately. It is desirable to draw a line through spaces on the form for which data is not obtainable.

Under "Plant Body" a description of the nature of the roots, whether fibrous, tuberous, woody, etc., and particularly information on the depth and spread of the roots is desired. Woody skeletons are found in the larger bush and tree forms. These are most easily observed in dead plants. The following points should be noted: Is skeleton fibrous, made up of rods, or does it take the form of a hollow cylinder? If the latter, give notes on diameter, wall thickness and shape, size and arrangement of perforations. "Areoles" are the dots or growing centres at which spines etc. are borne and from which new growth proceeds. The space for data on tubercles naturally applies only to those plants which have tubercles and the same may be said for axils which

also applies to tuberculated plants. A tubercle is an elongated process bearing an areole at its summit. Tubercles are found on Mammillarias and a number of other genera. An axil is the point where a tubercle joins the body of the plant. It may contain hairs, etc., or be a point of origin for flowers or new growth. The number of tubercles in a row and their arrangement, straight, spiraled irregular, etc., is important.

The distinction between "Radial Spines" and "Central Spines" is clear and obvious in some species, but obscure even to botanists in others, and in such cases only an approximate division into the two kinds can be made. In general, radial spines are those which grow from the edges of an areole and are held more or less close to the plant body, while centrals grow from the centre of the areole and are usually longer or stouter and usually project out from the plant body. The colour of both new and old spines should be given as it usually changes with age. Glochids are barbed bristles which occur only in Opuntias and related genera.

"Flowers." The time of flowering, whether night or day, is important in distinguishing various genera. The tube of a flower is the tubular portion below the separate petals. The Ovary is the part at the base of the tube which after flowering becomes the fruit. "Perianth Segments."—In a flower such as a rose there is a complete distinction between the sepals and the petals of the flower, but in cactus flowers there is usually a gradual grading from one to another and a definite distinction is not possible, so we include both sepals and petals under the name perianth segments; the outer segments corresponding to sepals and the inner to petals. The term "margin" refers to the edge of the perianth segments and the information here desired is whether the edge is a smooth line or whether it is notched or otherwise broken up. Under "stamens" the word "filaments" means the thread-like parts which bear the actual pollen containers which are called anthers. The position of attachment of the bases of these filaments is important. Stamens and pistils are said to be "exserted" if they extend beyond the rest of the flower and included if they are down within the flower, the distance being measured from a straight line drawn across the top of the wide open flower. The "pistil" is divided into a "column" and a "stigma" which is a specialised part on top receptive to pollen and usually divided into separate sections called lobes. Under "fruit" the various appendages such as scales, hairs, glochids, wool, etc. should be given and data secured by cutting a fruit across, noting the nature of the pulp, whether the outside colour extends clear through the skin, etc. The "hilum" of a seed is a mark left at the point where it was attached within the fruit. The "dehiscence" of a fruit means the manner in which it opens when fully ripe. Some fruits split irregularly, others more or less regularly in definite directions and still others open at the base as in the case of Ferocacti. Some dry up without opening at all.

The description of seedlings is of diagnostic value in some cases where it is a constant character differentiating species which become similar in age. Seedlings and juvenile forms can sometimes be observed in the field; more often under cultivation.

Where numbers, such as number of stamens or number of seeds in a fruit are asked for, only an approximation or average is needed where the numbers are large.

Dimensions should be given in the metric system wherever possible as it is now almost universal in scientific work. All dimensions should be actually measured, and it is just as easy to use a metric ruler.

Send reports, plants, photographs, etc., to NOMENCLATURE COMMITTEE, HUNTINGTON BOTANICAL GARDENS, SAN MARINO, CALIFORNIA.

Obituary

It is with regret that we record the death of Major W. J. (Bill) Fraser, on August 21st, 1967. Bill Fraser, though confined to a wheelchair for many years, was a man of great personal courage, possessing a dogged determination, and commanding the respect of all with whom he came into contact. His decision to undergo the surgical removal of both legs, rendered useless some years ago in a parachuting accident, was taken with the determination that he would one day walk again on a pair of artificial limbs and regain the independence which meant so much to him.

He will be sadly missed by all his friends, particularly at the South London (Lambeth) Branch, which he founded last year. He was a regular attender at the meetings of the Society at Westminster and represented his Branch at meetings of the Council.

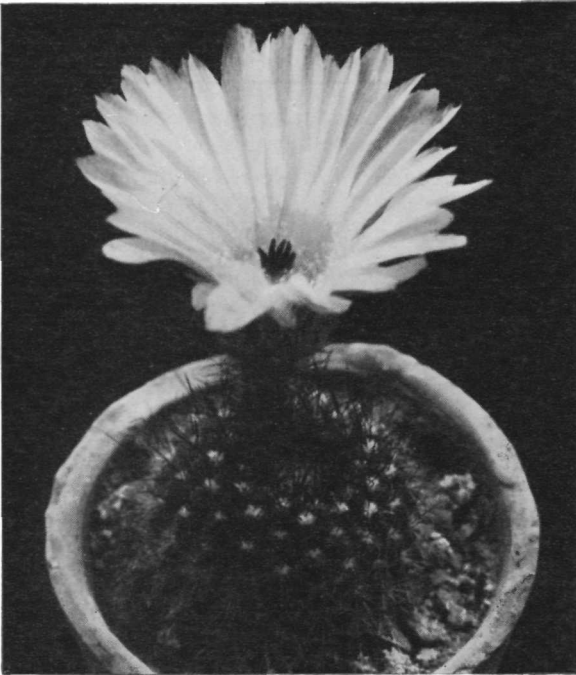
Mrs. Violet Fraser wishes to thank all the members of the Society who became his friends and for the many kindnesses shown to him. The sympathy of the Council and members of the Society are extended to Mrs. Fraser and to her young daughter. In accordance with his wishes, Bill's collection of plants have been sent to the Cheshire Home.

D.V.B.

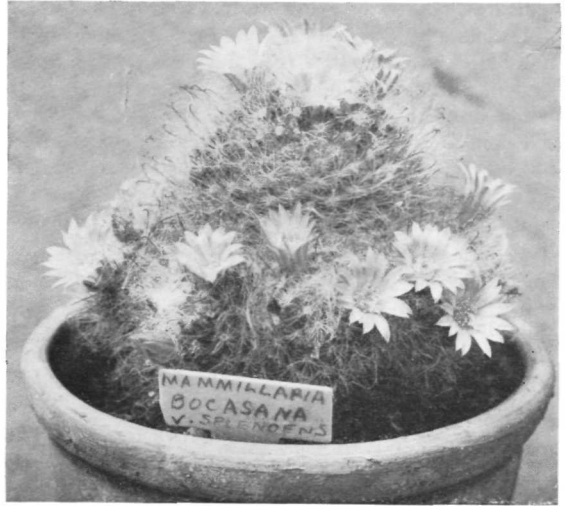
Beginner's Corner

W. I. Acton

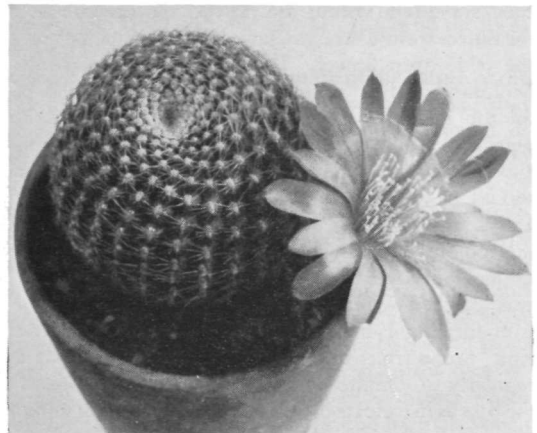
MAMMILLARIA BOCASANA is popularly known as the "powder puff" cactus on account of its many hairs and hair-like radial spines. The appearance is deceptive, however, as these hairs conceal up to four central spines, at least one of which is hooked. It is a freely clustering and spreading species, soon forming large clumps. The flowers are cream with a more or less pronounced pinkish mid-rib. Propagation is from seed or cuttings, and single tubercles can be rooted also but require a little patience as initial growth is slow. Another easy-flowering and readily grown *Mammillaria*.

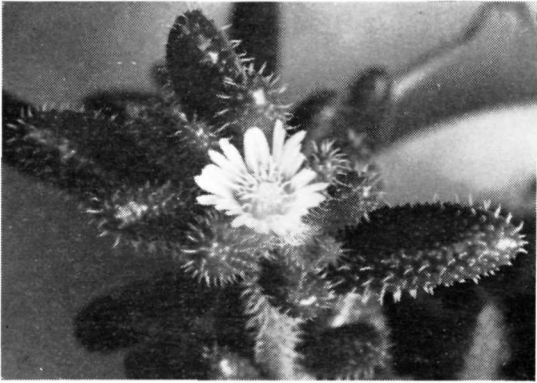


REBUTIA KRAINZIANA. When not in flower, this is very much like any other *Rebutia*; a small globular plant with low ribs and numerous short white spines. The true species, however, produces unmistakable flowers, relatively large for a *Rebutia*, in a striking orange-red colour. Unfortunately there are a large number of plants in commerce, presumably hybrids, which superficially resemble the species but prove disappointing in flower. Propagation is either from seed, or, preferably, from the offsets which are produced by older plants. This species is perhaps a little more tricky than other *Rebutias*, but cultivation should present no special difficulties.



NOTOCACTUS TABULARIS. A small, globular South American species with about twenty low, rounded ribs and many brownish radial spines. Relatively large, bright yellow flowers are produced by quite small plants and last about a week, opening daily. Propagation is easy from seed, which sets fairly readily. This species appears to be related to *N. apricus*, and like most *Notocacti* of this type, is resistant to several degrees of frost if kept dry in winter. On the other hand, adequate supplies of water are appreciated during the growing season.





GREENOVIA AUREA is a mountain plant from the Canary Islands closely related to the genus *Aeonium*. The leaves are bluntly-rounded with a bluish-green waxy coating and are arranged into cup-shaped rosettes. The plants require plenty of water in the growing season, but should be kept fairly dry in winter when the rosettes tend to close up and some outer leaves die off. Bright, golden-yellow flowers are produced in spring on branched inflorescences which arise from the centres of older rosettes. Unfortunately the plant is monocarpic and the individual rosettes die after flowering.



DELOSPERMA ECHINATUM is a shrubby plant from South Africa which has been in cultivation for many years. The bright green ovoid leaves are covered with small white bristles and are arranged in opposite pairs on the stems, which are also covered with the same small white bristles. The half-inch flowers are freely produced at the tips of the stems, the plant afterwards branching. In the type species the flowers are whitish, but in the more common and stronger growing variety *LUTEUM* they are bright yellow as the name suggests. *Delospermas* may be put out of doors in summer in a sunny, not too damp position. They require a rich porous soil with regular watering in the growing period and drier conditions with frost protection in winter. Propagation is from seed or cuttings which soon root and produce flowers.



COTYLEDON ORBICULATA is a vigorous growing, erect, branching shrub from Cape Province. The thick, roundish leaves are arranged in pairs on the stems. In the popularly grown variety the leaves are grey-green with a white waxy coating, although the leaf form is very variable and plants with green leaves are also known. This is an easily grown plant with no special requirements regarding soil, but too much water or inadequate light leads to elongated, pale-green growth.

CUPS AND TROPHIES — 1967

The Banksian Medal	K. Grantham
The Sir William Lawrence Cup for Cacti	L. Jeffries
The Evelyn Theobald Cup for Succulents	S. W. I. Young
The Joan Farrow Memorial Cup for Groups	K. Grantham
The Challenge Shield for Juniors	B. Stack
The William Denton Memorial Trophy for Branches	The North Surrey Branch
The P.V. Collings Cup for Euphorbias	S. W. I. Young
The Mrs. Pryke Howard Cup for Six S.A. Succulents	Mrs. S. G. Sharman
The Mrs. Luty Wells Cup for Three Cacti	Mrs. T. Watt
The S. J. Pullen Cup for Miniature Garden	Mrs. B. A. Baldry
The Sarah Cutler Memorial Cup for One Mammillaria	L. Jeffries
The Mrs. Hedges Cup for Succulents from Seed	Mrs. B. Maddams
The William Denton Memorial Medal for Stemless Mesembs	Mrs. H. Hodgson

Correspondence

Seek and ye shall find.

I write in anticipation of one possible comment on the bibliography which appears elsewhere in this journal. "It's all very well listing all these books and papers," members might say, "but where can I get hold of rare literature?"

Certainly, many of the titles listed are not readily available to most people. The Society's library has many of the books and succulent plant journals, but has few of the papers from botanical periodicals. Members within reach of London can arrange to visit the larger libraries, such as those of Kew Herbarium, British (Nat. Hist.) Museum, and the R.H.S. Similarly, librarians of Universities and large museums in other parts of the country will usually help the keen amateur. Members in more remote localities may have to rely on their local public library. This is not necessarily a dismal prospect, however, for the interloan service of British public libraries is very good. An obscure work is frequently obtained fairly quickly, even from overseas if necessary, if the borrower is prepared to pay a few shillings for postage.

L. E. Newton, Kumasi, Ghana.

To the Editor :

Most of us have come to accept gross inaccuracies in press reports of the various facets of our hobby; we merely smile at accounts which describe flowering *Agave* as a Cactus, and the like. However, there have recently been one or two reports relating to the alleged dangers of *Lophophora williamsii* in which the pseudo-comic element is replaced by one of a more serious nature. It is regrettable that these were inspired by people who should have known better and one cannot particularly castigate the Press in this instance because they were merely making use of what they considered to be bona fide news items.

Lophophora williamsii has been widely cultivated in this country for many years; I would not be surprised

to learn that the number of plants in collections runs into four figures. It has been seen on show benches quite frequently, not least in our own competitions in the R.H.S. Hall, without a guard being mounted over it. That it contains small amounts of the hallucinatory principle mescaline is widely known, possibly as much by well-read members of the public as by cactophiles. Here we seem to have a case of a little knowledge being a dangerous thing. If the instigators of these press reports had been better informed, they would have realised that very few people are likely to eat *L. williamsii*. It is difficult to imagine anyone becoming addicted to it because of its nauseating taste, which can be appreciated from a vividly written article on p. 114 of the July / August 1961 issue of the Journal of the American Cactus Society.

There is no evidence of a mescaline cult among drug addicts and, if there were, they would undoubtedly find ways and means to procure pure mescaline, which can be made synthetically, and would not eat *Lophophora williamsii*. It would be tragic if this matter became so grossly out of perspective that pressure was applied to ban the sale of this plant. It is particularly pleasing to see that one paper has treated the matter with a large dose of common sense. In *The Daily Telegraph* of 15th August, the columnist Peter Simple wrote, "If you boil the heads you get a hallucinatory brew, says an official of the Cacti and Succulents Society, explaining why it has decided to mount a strong guard on one of its plants which is to be shown in a Church Hall. If you were to boil the heads of all the people who, wittingly and unwittingly, are helping to increase the hysteria over the drug problem, you might or might not get an hallucinatory brew. But you might encourage them to turn their attention to some of the other more serious dangers which are now threatening this country."

One related facet of this matter is the deplorable ignorance of most people about succulent plants and this one finds quite frequently among specialists in other branches of horticulture. I well remember vainly trying to explain the difference between Cacti and the other Succulents to a person with a good deal of expertise in the more usual lines of gardening. All

we can do is to avail ourselves of every opportunity to contact the public and this is where the various Branches of the Society can and do take the initiative.

The North Surrey Branch has always been active in this direction. Our initial move of putting on displays at the Shows of the local horticultural Societies to attract new members and to dispel fallacies of the type I have discussed above, has proliferated. We now supply judges to deal with the appropriate classes in their schedules and there have been requests for speakers and short articles on the care of succulent plants. If this approach is pursued diligently and persistently, we shall eventually succeed in our aim of putting our plants in perspective so far as the man in the street is concerned.

W. F. Maddams, Banstead, Surrey.

To the Editor :

I was interested to read the short article by Mr. D. V. Brewerton in the August 1967 issue of the Journal on the comparison of plants grown in conventional clay pots and in plastic containers. The illustration certainly shows some remarkable differences, but do these comparisons really prove anything other than that one should not use two inch clay pots?

The crux of Mr. Brewerton's experiment is summed up in his words "they were placed in two inch clay and plastic pots . . . and received identical treatment in position and watering". This is important because he uses the plants in the clay pots as his controls but is this justifiable? The fact that both sets were watered equally ignores the fact that there will be a substantial moisture loss through the sides of the clay pots which will not occur with the plastic ones. What one needs to do, and this is near-impossible, is to regulate the watering so that the composts in the two sets of containers are always equally moist. It is an undisputed fact that the soil in a two-inch clay pot in a greenhouse on a warm sunny day will dry out in a few hours. It is evident that under the conditions of Mr. Brewerton's experiment the plants in plastic containers received adequate water and those in the clay pots did not.

If one defines a set of optimum growing conditions then it is clear that those in plastic pots were near to them and those in clay pots some way from them. Had Mr. Brewerton given considerably more water to the plants in clay containers he would have approached optimum growing conditions. In other words, I regard the plants in the plastic pots as the control ones, a norm against which to assess progress. I am sure it would be possible to grow small plants in clay pots as rapidly as those in plastic containers if one had the time and opportunity to water them as frequently as was required.

Mrs. Stillwell's article in the same issue perpetuates some mistaken notions about the growth of seedlings. Her comment on "massive seedlings at the Show"

indicate that many people simply do not realise what sort of plants may be obtained using optimum growth conditions. The seedlings to which she was obviously making reference are no larger than is to be expected for good growing conditions, bearing in mind that they could be as much as two and a half years old. This is true irrespective of whether they are grown in the conventional John Innes type compost or in one of the new no-soil composts. I understand that Mr. Boarder showed a six-month-old *Stapelia* seedling of considerable size at the Society meeting on 12th September, and he too emphasised that very good growth rates should be regarded as ordinary not extraordinary. Why Mrs. Stillwell has doubts as to the longevity of these plants I fail to understand.

Regarding the new no-soil composts, why is it commonly supposed that liquid feeds must be used with them? They are made to contain the same quantity of nutrients as their John Innes equivalents and are therefore capable of sustaining plant growth for an equal period, other factors being equal. The sooner the idea that one must use a liquid feed with such composts is quashed, the better it will be for us all.

E. G. Canham, Lower Kingswood, Surrey.

To the Editor :

I cannot allow the article by M. Brady—"The Establishment of Imported Plants," *Cactus and Succulent Journal of Great Britain*, Vol. 29, No. 3, page 53, to pass without comment. To me, the article shows the type of thinking prevalent in many of the early books where only the writer could grow plants, only his methods were correct. Statements such as "potting up of imported plants before they have been properly rooted is absolutely inimical to success . . ." and "plastic pots are the best possible containers . . ." are typical of this kind of thinking. I personally pot-up plants immediately I receive them and use clay pots in preference to plastic, but would not dare say that my methods are of use to every-one. I obtain something like 90% success, the ones lost being those for which there was only slight hope in the first place, i.e. plants very dehydrated, or half rotten.

One significant omission from the article is the use of rooting hormones. Whilst not being able to say with any certainty that the rooting powders work, it seems to me they do no harm, and since they contain a fungicide they may help in preventing disease. I therefore dust plant bodies with flowers of sulphur and plant roots with rooting powder. Plants which appear to be very dehydrated, or have a very dry, hard epidermis, I plunge into hot water for about ten minutes prior to any necessary surgery and dusting. The plants are then potted up into a very porous compost and given a light overhead spraying. The plants are given an overhead mist spray each day. Plants which are rooting should not be lifted in order to inspect the roots. Examination

Secretary's Notes

of the plant body, especially at the base and growing point will tell you whether or not the plant has rooted.

Feeding the plants immediately they have rooted seems to me to be wrong. I have found that plants grown hard (poor compost, little water, plenty of ventilation) and exposed to as much sun as possible have the strongest spines and good tight growth.

Finally his statements regarding Melocacti, Disco-cacti, etc. must be answered. The experience of myself and a number of friends has been that mature plants, with cephalia, can be rooted provided they are placed in a warm position and given plenty of moisture. I know of at least two dozen such plants, all rooted, all growing. Losses have been negligible. I am not suggesting that the merest novice should rush out and buy these plants, obviously only the so called experts will try their hand at growing them; the point I wish to make is that they are not so difficult that there will be almost 100% losses. On the contrary, almost 100% success appears to be the rule.

C. Williams, Fulwood, Preston, Lancs.

To the Editor :

I note with interest in the last issue of the Journal, (page 45), that Mrs. Stillwell had erected a new shelf for Lithops on the south side of her greenhouse where these truly desert plants can receive maximum sunlight. I did the same thing quite early this year and happily installed my Lithops. On the same shelf I placed eight species of *Gymnocalycium*, several types of shrubby *Mesembryanthemums* including *Faucarias*, a *Bijlia cana*, *Pleiospilos dekenahii*, *Echinus apiculata*, *Titanopsis calcarea* and *Cylindrophyllum tugwelliae*. The months of May, June and July were extremely hot this year and my plants on the new shelf began to suffer. Several of the Lithops were completely burned out, leaving only a dried husk. The *Echinus* began to scorch and had to be moved. *Bijlia cana* faded away, as did the *Cylindrophyllum*. On the other hand, the *Faucarias* showed no ill effects and have flowered well; *Titanopsis calcarea* looks very bronzed but in good condition; the *Pleiospilos* was moved to a cooler position before any real damage was done. The *Gymnocalyciums* appeared to be quite happy, although two have since shown signs of having been slightly scorched "on the sunny side". Can it be that Lithops are not as succulent as we have been lead to believe?

I hope that Mrs. Stillwell has not had similar results with her Lithops. I think it is likely that my shelf is too close to the eaves of the greenhouse and does not get sufficient ventilation, although there is an automatic opening light just above the shelf. This unusually hot summer is not likely to be repeated too often, but I will keep a very careful watch on any plant placed in the "hot spot" next year.

D. V. Brewerton, 26, Chester Road,
Seven Kings, Ilford, Essex.

Formal Notice is hereby given that the Annual General Meeting of the Cactus and Succulent Society of Great Britain will be held in the Lecture Room of the Royal Horticultural Society's Hall, Greycoat Street, Westminster, S.W.1., on Wednesday, 7th February, 1968, at 6.30 for 7 p.m.

Late Show.

The full results of the Show held on August 31st and September 1st are printed elsewhere in this issue, but I would like to comment on the first class display of plants shown. Many quite rare plants were to be seen, including *Jatrophas*, *Adeniums*, *Fockeas*, *Pachypodiums*, *Alluaudias*, a splendid *Nolina* and two extremely handsome specimens of *Melocactus*. The Show was a credit to this Society and was well reported in the gardening Press. The Branch competition proved most successful and should help to raise the standard of exhibits in future years. I wonder, however, what happened to the North London Branch. I know that they have some good collections in that area and I would like to see a few of the members at these Westminster Shows. What about it North London?

Annual Dinner.

I regret to have to inform members that there will be no Annual Dinner this year. Arrangements for this function have, in the past been made by our Treasurer, but he has been unable to attend to them this year. The Council was unable to find a substitute organiser with the result that no arrangements have been made. It is hoped that by next year we will be able to have matters well in hand in time for an announcement in the August Journal. It is expected that venue will be changed from the Shaftesbury Hotel to the Restaurant at the R.H.S. Hall in Westminster.

Meetings for 1968.

After suffering the overcrowded conditions in the smaller rooms of the R.H.S. during this year, it has been decided that in future the majority of meetings will be held on Wednesday evenings, when the Society will have the use of the Lecture Room. The average attendance at meetings during this year has steadily risen and it is to be hoped that this trend will continue. Interest in our plants is on the increase and members coming to meetings will be certain of listening to good speakers in reasonable comfort in the coming year.

IT IS IMPORTANT

that you renew your membership of the Society promptly. You will not receive your February Journal on time unless your subscription is paid.

Subscriptions, should be sent to E. W. Young, 29, Hillcrest Drive, Ashington, Pulborough, Sussex, as usual.

Correspondence—Cont.

The following comments regarding the Beginners' Corner in the August issue have been received from Gordon Rowley:

- (a) The "Christmas Cactus" (as illustrated) is now *Schlumbergera x buckleyi* (alias *bridgesii* of old); *Zygocactus truncatus* has more prominently lobed margins to the joints and a very oblique flower. It is also less commonly cultivated.
- (b) *Echinocereus salm-dyckianus* has rather short, stout joints and a long-tubed orange bloom; the plant figure is certainly not *salm-dyckianus*—perhaps *E. blanckii* or ally.

My apologies to any of our readers who may have been misled; this is what comes of changes in nomenclature and the use of prints and blocks already in my possession labelled as above (Ed.).

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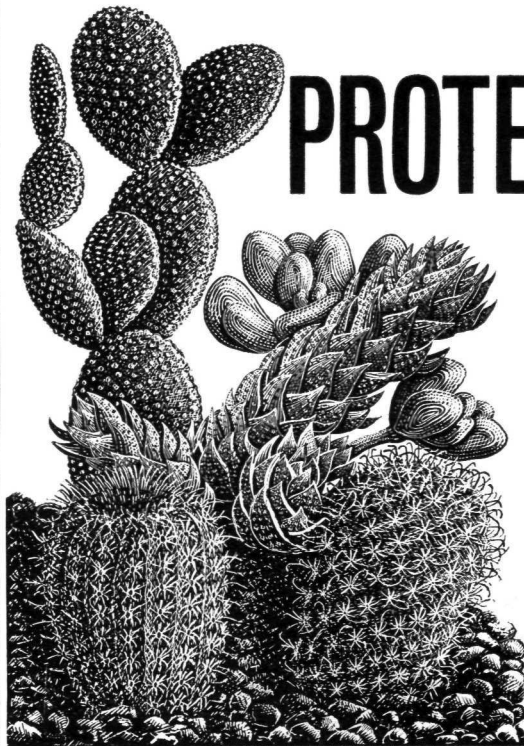
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Mit 730 Abbildungen, davon 62 farbig

Durch ihr bizarres Aussehen und die Schönheit ihrer Blüten bezaubern sukkulente Pflanzen seit jeher. Von den Sukkulanten sind zwar die Kakteen die bekanntesten, doch gehören zu ihnen auch die Vertreter zahlreicher anderer Familien und Gattungen, die fälschlicherweise häufig für Kakteen gehalten werden. Über Kakteen gibt es eine sehr reichhaltige Literatur, aber kaum etwas über die sogenannten »anderen« Sukkulanten, die ihnen an Schönheit und Kulturwürdigkeit zum mindesten gleichkommen, wenn nicht sogar sie häufig übertreffen. Von diesen Pflanzen und ihrer ungeheuren Formfülle besonders dem Liebhaber eine Vorstellung zu geben und ihn so zu beraten, daß er keine Fehlschläge zu befürchten hat, ist Ziel und Zweck dieses großangelegten und mit aller Sorgfalt ausgestatteten Buches des wohl besten Kenners der »anderen« Sukkulanten.

Das Buch macht mit allem bekannt, was über sie zu wissen nützlich ist: mit der botanischen Einordnung, der Herkunft und heutigen Verbreitung, den Lebensbedingungen am natürlichen Standort und mit den Ansprüchen, deren Kenntnis für eine erfolgversprechende Kultur zwingend notwendig ist. Die jeweiligen Kulturhinweise beziehen sich auch auf die

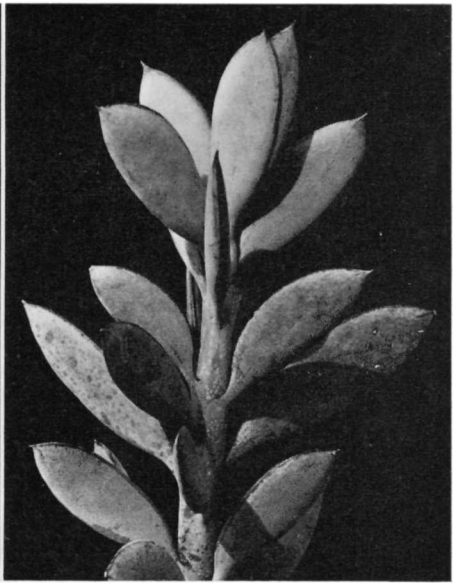
Vermehrungsmöglichkeiten sowie auf die Krankheiten, Schädlinge und deren Bekämpfung. Auch Hinweise für den Aufbau einer Sammlung fehlen nicht.

Den Hauptteil des Buches aber macht eine reichhaltige, nach Familien geordnete Auswahl aller für die Kultur geeigneten Sukkulanten mit knappen Beschreibungen aus. Bei der Auswahl hat man besonderen Wert darauf gelegt, daß auch seltenere Pflanzen besprochen und abgebildet werden.

Über 700 Photos, zum Teil farbig und in ihrer Mehrzahl vom Verfasser auf seinen Studienfahrten nach Südamerika, Afrika und Madagaskar am natürlichen Standort aufgenommen, sprechen überzeugend von der Schönheit und Vielseitigkeit dieser herrlichen Pflanzen.

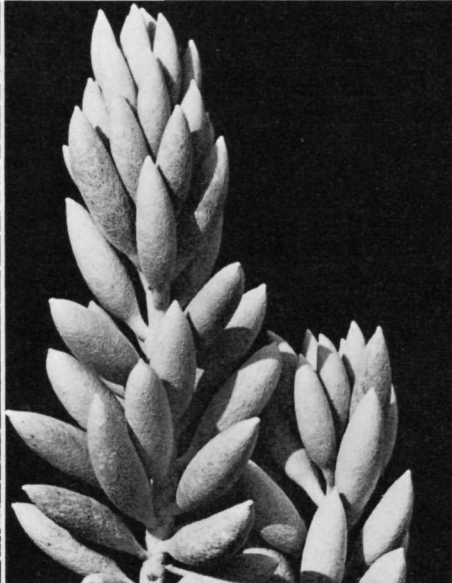
Das Werk soll in erster Linie die »anderen« Sukkulanten dem Verstehen nahebringen und den Kreis ihrer Freunde vergrößern. Darüber hinaus stellt es auch im Hinblick auf das in dieser Form erstmalig veröffentlichte, an Schönheit und Vielseitigkeit ungewöhnliche Abbildungsmaterial eine bisher nicht gegebene Informationsmöglichkeit für den Wissenschaftler und gärtnerischen Fachmann dar.

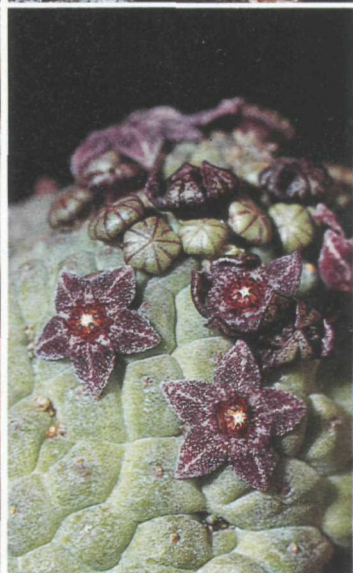
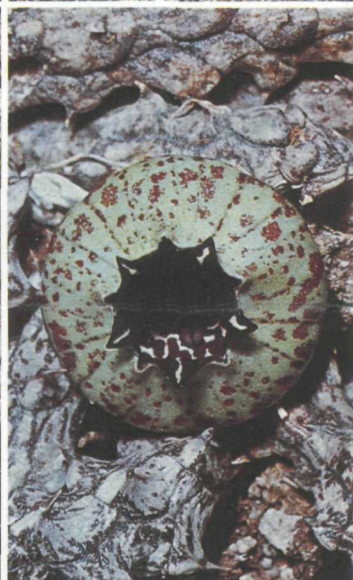
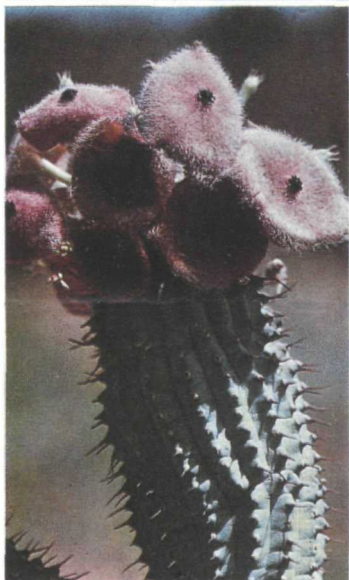
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PROBE-
TAFEL 78

- 1 (ol) *Senecio antandroi*
- 2 (om) *Senecio citrifomis*
- 3 (or) *Senecio crassissimus*
- 4 (ml) *Senecio ficoides*
- 5 (mr) *Senecio decaryi*, bei Ihosy
(Zentral-Madagaskar)
- 6 (ul) *Senecio haworthii* am Standort
(Richtersveld bei Karrachab)
- 7 (um) *Senecio haworthii* in der Kultur
- 8 (ur) *Senecio medley-woodii*





PROBE-
FARBTADEL 5

- 1 (ol) *Caralluma mammillaris*
- 2 (om) *Huernia hystrix*
- 3 (or) *Huernia zebrina*
- 4 (ml) *Hoodia dregei*
- 5 (mm) *Stapeliantbus madagascariensis*
- 6 (mr) *Stapeliantbus insignis*
- 7 (ul) *Stapelia flavopurpurea*
- 8 (um) *Stapelia longii*
- 9 (ur) *Trichocaulon kubusense*

INHALTSÜBERSICHT

ALLGEMEINER TEIL. Was sind Sukkulente? 11 – Die Heimat der sukkulenten Pflanzen 14 – Zur Morphologie der Sukkulente 19 (Stammsukkulente 20 – Blattsukkulente 21) – Die Kultur der Sukkulente 23 – Über Krankheiten und Schädlinge 33

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