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ILLUSTRATIONS SHOWN IN BRACKETS.

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# Exhibition of Cacti and Succulents

(Organised by the Cactus and Succulent Society of Gt. Britain)

JUNE 23rd and 24th, 1953

at the

ROYAL HORTICULTURAL SOCIETY'S  
NEW HALL

Greycoat Street, London, S.W.1

Tuesday, 12 noon to 6 p.m.

Wednesday, 10 a.m. to 5 p.m.

**Admission**—To Members of the Cactus and Succulent Society and Fellows of the Royal Horticultural Society, on presentation of Membership Tickets.



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## COMPETITIVE CLASSES OPEN TO MEMBERS.

- Class 1** Three Echinocactanae.  
" **2** Three Coryphanthanae (includes Mammillarias).  
" **3** Three Cereanae.  
" **4** Three Echinocereanae.  
" **5** Three Cacti (any genera).  
" **6** One Specimen Cactus.  
" **7** One Mammillaria Rhodantha Type (any variety).  
" **8** Cacti raised from seed sown by Exhibitor on or after 1st January, 1950, (giving date of sowing).  
" **9** Cacti raised from seed sown by Exhibitor, more than three years old.  
" **10** Three Cacti (any genera) in pots not larger than 3in. internal diameter.  
" **11** Miniature Garden of Cactus plants to cover space not greater than 18in. x 18in. (other succulents or inappropriate ornaments will disqualify).  
" **12** Three Mesembryanthemums.  
" **13** Three Haworthias.  
" **14** Three Gasterias or Aloes.  
" **15** Six Euphorbias.  
" **16** Group of Cacti and/or Succulents to cover table space of 4ft. x 3ft.  
" **17** Three Succulents other than Cacti.  
" **18** Six Succulents and/or Cacti.  
" **19** Six South African Succulent plants in pots not larger than 3½in. diameter.  
" **20** Group of new and unusual plants to cover table space of not more than 3ft. x 2ft.  
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(For Juniors under 18 years Shield Trophy.)

In any Class it is not essential that all the plants shown should be different species, but the number of species shown will be taken into consideration.

## APPLICATION FORM.

CACTUS AND SUCCULENT EXHIBITION

to be held at the

ROYAL HORTICULTURAL SOCIETY'S NEW HALL

Greycoat Street, London, S.W.1

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Entry form to be filled in and returned to the Hon. Secretary, Mr. K. H. WALDEN, 152, Ardgowan Road, Catford, London, S.E.6, not later than June 13th; it would greatly facilitate the work of the Exhibition Committee if forms were returned at an earlier date.

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and enclose Entrance Fee(s) of s. d.

I undertake to abide by the Regulations as set forth in this Schedule, and declare that the plants shown have been in my possession for at least six months.

Exhibitor's Signature .....

Address .....

72% full scale



THE  
**CACTUS**  
AND SUCCULENT  
**JOURNAL**  
OF GREAT BRITAIN

Established 1931

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Vol. 15

JANUARY, 1953

No. 1

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## SOCIETY NEWS

1953

January

No Meeting.

February 3rd 7 p.m.

Annual General Meeting.

March 17th 6.30 p.m.

K. W. Harle : Raising from seed (film show).

April 14th 6.30 p.m.

Plant Exchanges (Covent Garden Evening).

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C A C T U S  
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ESTABLISHED 1931

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EDITORIAL

So we commence another fresh year! A Coronation one which should be earmarked as a landmark in our subject.

This number gives many indications of progress. It will be notable for the completion of the Schwantes' MSS. with the re-publication, suitable for book form, of the illustrations accompanying this remarkable document so that members can, at its conclusion, bind the pages into a single book which will be unique as to its subject.

It is no infringement of modesty to acclaim that since the war we have produced a Journal that is the world's best and is the standard which has been set for any publication of its kind.

The Editor is now in receipt of cuttings from the world's press on cacti and succulents, and particular attention will be drawn to the extraordinary things that are said on our plants, indicating the hazy knowledge the world has of our activities and the extraordinary importance people place on themselves and their plants.

The Editor takes the opportunity of this New Year number to welcome the formation of the Essex Branch of the Society. Mr. Heathcote and his associates are an enthusiastic company, and they can count on our co-operation in their efforts.

Perhaps the most topical subject at this time is the membership. Throughout this number will be found exhortations to renew your membership. This really does help the executive, the treasurer and the Council in particular, as without speedy renewals it is very difficult to be able to shape the work for the forthcoming season. It is on your promptitude that depends what you receive for your subscription!

One kindly member recently opined that the Editor always liked to see members together enjoying themselves. It has always been his endeavour to provide material that they can extend their enjoyment in their pleasure and their hobby and, last but not least, he hopes that a happy and successful year in 1953 will increase the enjoyment they will experience. It is a joy to him to know that members do so, and he is not afraid of hearing from members, even when they think he is entirely wrong! Prosit 1953 !!!

## CACTUS CULTURAL NOTES

By A. BOARDER

Another growing season approaches and no doubt brings a resolution from all growers of cacti to endeavour to grow their plants and flower them better than ever before. The turn of the year always seems to give us all fresh hope as to success with our plants, but I get my biggest thrill from the thoughts of seed sowing once again. Although I have been growing cacti for very many years and raising from seed for at least thirty years, I find that my enthusiasm never decreases and I can assure readers that I look forward with as much zest as I have ever done to the raising of fresh plants from seed. However much interest one gets from the actual growing of cacti, I am positive that only by raising from seed and watching the slow development of the tiny plant to its flowering size can one obtain the maximum pleasure. Many years ago it was written that to try to raise a collection of cacti from seed was a very slow process and the project was generally discouraged. Today there is a different outlook among collectors and so very many more people are raising their plants from seed. If any member has never tried this fascinating pastime I recommend it most strongly.

In my articles last year I made a special point of giving the whole directions for raising cacti from seed, so that if one cares to look back through the four Journals of 1952, one can find all the information necessary for the successful raising from seed. My own seed sowing followed closely on the lines as described and proved one of the most successful that I can remember. I raised hundreds of plants from a February sowing which were large enough to pot up into 2-inch pots by the September of the same year. These plants could have been grown on to quite large plants if I had used more artificial heat and light. The providing of more warmth is not, in itself, sufficient to keep small plants growing through the first winter. Some artificial light must also be provided. There are certain types of lamps which I feel sure would enable us to grow cacti all the year round if this was necessary. I do not consider this is so, as it is possible to grow plants to a reasonable size by the time the days shorten, say by the middle of November. Seedlings should be kept as plump as possible after this date and, if it is possible to provide a little warmth, the plants should have a very little water now and again in the winter. Therefore the plants which you raised in 1952 should not have been allowed to shrivel up in any way, as if this does happen the cacti will take much longer to get really started in the Spring. Whilst the adult plants should have been kept on the dry side for most of the winter, the previous season's seedlings should have had an occasional drink.

The question most frequently asked by growers at this time of the year is, "When shall I start watering my plants?" There can be no general answer to this question as so much depends on where the plants are kept. Another consideration which is often disregarded is whether the plant appears to have made a start to grow already. It is a fact that in any collection it will be noticed that some of the plants show signs of new growth much sooner than others. If I find that a plant is making new growth as early in the new year as February, I have no hesitation in giving that plant some water providing always that the weather is right. I cannot remember any winter when I have withheld water from all of my plants for more than say, a couple of months at a time. So often during the winter we get warm spells and I often give a little water to the plants which I think need it. Do not misunderstand me, however, I do not water sufficiently during this period to start a plant into active growth. It is absolutely impossible to give actual dates when watering should be stopped or commenced. No two houses are quite alike in their conditions and so a great deal has to be left to the individual grower, who must use his own discretion on the matter.

January is by no means an idle month for the cacti grower as there are the seed catalogues to study. How eagerly we scan the new ones each year, hoping to find that rare plant we have been looking for and with what hopefulness do we send off that list, often to be sadly disappointed when we hear that the kinds we wanted have either not arrived from abroad or have been sold out. Not that this always ends the disappointments, as so often after a year when we examine a particular plant we find that instead of, say, *Epithelantha micromeris* which we have been cherishing, the plant turns out to be just another *M. bocasana*. If you are fairly new to the hobby of seed-raising, do not be too ambitious at first by trying all the rare and difficult ones. Remember that very often the fact that a particular plant is rare in collections may be because it is very difficult to grow. There are so many ordinary types to choose from without trying all the *Ariocarpus* and *Solisias*. Not that all the more well known ones are always easy from seed. I found last season that one of the common plants, *Lemaireocereus pruinosus*, although they germinated very well, had a tendency to damp off at the collar far more quickly than most other types grown under the same conditions. Some people have trouble with seedlings of *Astrophytum myriostigma* as they rot off near the ground level as soon as they are about half an inch high. I find that it is a good plan to water the seedlings with a fairly strong solution of permanganate of potash about once every ten days as a preventive to damping off.

I usually try a fresh experiment each season and last time it was with a form of covering for some of the seeds when first planted. As I have stated before, there is no need to cover most of the cacti seeds. Some are rather large, however, and it was with these types that I tried a new method. I sifted some sharp sand through a perforated

zinc sieve and then sifted this again in a fine wire gauze sieve so that all the very fine sand was removed. This left me with tiny stones just under an eighth of an inch in diameter. When the larger seeds were sown I lightly sprinkled a thin layer of these small stones over the seeds. A single depth of stones only was used and I found that it did have a tendency to keep the seeds down on the soil when they started to germinate. Also the stones helped to prevent loss of moisture and prevented the formation of algae and moss. As I always water with a spray the small stones did ensure that the seeds were not disturbed by the water. On the whole I consider that the experiment was well worth while and in suitable cases I shall repeat the method.

It will be noticed that some plants will show signs of flower even before January is out, especially some of the *Mammillarias*. Many of mine are in flower in the middle of November, when these notes were written, and I know from past experience that there will not be a month throughout the winter when at least a few *Mams.* will not be in flower. When it is seen that any plant is commencing to flower it is advisable to give a little water. The fact that one or two show signs of growth does not mean that all the collection must be watered. Make the most of all fine days to open the windows well during the middle of the day, but see that they are closed before the sun actually sets. Once the sun has set with the windows open, most of the warmth will have left the greenhouse and the heating apparatus will have a harder task than if some of the sun's warmth had been trapped in the house.

After your seeds are safely sown you must consider the question of re-potting. As you no doubt already know, I re-pot all my plants each year at least once. I know that this can be a very big job, but I feel sure that it repays you well for your trouble. It does not need much imagination to realise that, after a year of watering, the soil in a fairly small pot can hold but little nourishment. Also, the roots can be kept in a far more healthy condition by this annual change of soil. Root bug always thrives in a pot which is never emptied and cleansed. The actual re-potting has been described by me on previous occasions, but a little information on the actual requirements of the plants may not come amiss at the present time. It cannot be over emphasised that cacti are plants and need practically the same elements as other and more ordinary plants. Cacti need considerable quantities of nitrogen, phosphorus, sulphur, potassium, calcium and magnesium. Also required, but in smaller amounts, are iron, manganese, sodium, chlorine and silicon. In addition are the trace elements such as copper, zinc and boron, which are necessary in very small quantities. This may sound a bit confusing to the amateur, but, as a matter of fact, many of these elements are already present in good loams. Some of the others can be added to the potting soils to make up the necessary growing medium. It is now possible to buy soil for cacti which has been specially treated and sterilised and so save the grower much trouble. As I have remarked before, the John Innes potting soil, although containing all the nutrient necessary for cacti, is rather too close in texture and does need more roughage in the form of small broken brick, granulated charcoal, or small stones to increase the porosity of the soil. A suitable soil will allow all the surplus moisture to run through it, as stagnant water in a pot will cause the roots of a cactus plant to die in a very short time. When a considerable quantity of roughage has been added to the soil it must be realised that some extra fertilisers must be added to make up the loss caused by the increased bulk and subsequent loss of nourishment. It is, of course, no good using decent sterilised potting soil if you use dirty pots. Make sure that no pot is used until it has had a thorough cleansing. I find it a good plan to start on all my larger plants. Not only is it well to get the hardest task over first, but the larger pots will come in for other plants once washed. While you are moving the plants for re-potting it is well to see that any staging receives a good disinfection. Much trouble can be saved later on in the season if this is done when most of the pots are moved. Don't forget to leave sufficient space at the top of a pot to enable you to give enough water at a time. An old cacti friend of mine was always so careful to bring up the soil to the top of the pot so that it was practically impossible for him to water the plant, but he always used to say that he must avoid what he called a moss setting. I am sure that many of his plants never had a good watering from the start of the season to the end. Use your discretion as to how much space is left at the top so that the larger the pot the more room must be left for the necessary water.

When re-potting try to visualise the plant in a few months ahead. Will it look out of place in the pot or will it be just right? This may mean so much if you intend to show your plants during the coming year. It is a good plan to try to display some of your plants at a local flower show. It is by this means that so many newcomers to our hobby are found. At most shows it is very surprising how a group of cacti catch the eye of the public. Few people can easily pass by a good group of cacti. At one show last year I was asked to make a display and for a change I decided to exhibit *Mammillarias* only. I was able to fill a table seven feet by five with 135 different *Mams.*, all in flower and seed pod. This display caused quite a sensation as although most visitors had seen many ordinary types of cacti, such as *Opuntias* and *Echinopsis*, scarcely any had any idea that there were cacti which were as beautiful as the *Mammillarias* shown. I was well repaid for all my trouble by the obvious pleasure it gave, apart from the surprise award of a medal for the best honorary exhibit.

The offer of free seeds in the last Journal brought many applications. Over sixty letters arrived in the first two days. The more popular kinds were in short supply, and to make them go as far as possible I counted the seeds and sent out about six of those kinds. I am sorry some were disappointed. Good luck with them all.

## NOTES ON EUPHORBIAS

By W. DENTON

(A lecture, London ; October 21st).

*Euphorbias* from the Canary Islands are comparatively easy to grow, such as *aphylla*, *balsamifera*, *canariensis*, *atropurpurea*, etc. ; not so attractive in appearance as the spiny sorts, but still look well in a general collection. Then there is *nivulia* and *nerifolia* from India, nice leafy plants. Every one knows *splendens* from Madagascar, a good flowering variety that should be in every collection; *neumanniana* is not so common, but could be described as a yellow flowered *splendens* and is very showy; both should be given a little water in winter and kept in the warmest part of the house.

By far the most popular are the South African species of which there are hundreds, all shapes and sizes, some difficult to grow and hard enough to tax the skill of the most enthusiastic. If you are able to import some of them, you will see how different they are from those cultivated here ; *caput medusae* never has those long tails that you see on our specimens; *ornithopus* would never be recognised as the same plant; *inermis*, *wilmanae*, *fasciculata* are others that alter entirely. There is a struggle for existence under dry conditions, very often growing in hard stony ground in the most exposed places, subject to the intense heat of the sun and with very little water. No doubt light is a most important point and the clear atmosphere cannot be found here. This has often been brought home to me when looking at photographs of the veldt showing these plants in their native habitats. Again, they are not in flower pots, which makes all the difference to their growth. Most develop hard, turnip-like roots that penetrate the ground deeply, giving them firm anchorage and enables them to take advantage of what moisture is available and store it in their stout roots.

Imported plants rot very quickly; I find the best way is to pot dry and then plunge into a propagator, leaving the top light off. Try to keep the temperature round sixty-five degrees and water the surrounding peat, or whatever you use as plunging material, as much as you like. The moisture penetrating the pots is sufficient to encourage root action. Bottom heat is advantageous when rooting cuttings and Vermiculite is very good for this. Naturally, all cuttings should be well dried for a week or two before attempting to strike; when first cut they should be dipped in powdered charcoal, sulphur, or one of the powder hormones. Do not forget the parent plant you cut from, this should be treated the same as the cuttings and the flow of the milky latex stopped and not allowed to run down the stem of the plant. In using Vermiculite, take cuttings out as soon as roots have formed. There is no nourishment in this material and the roots formed are very tender and break easily. It is important to use clean pots; I lost the roots of a nice plant this year through using a pot not perfectly clean. The fibres cling to the sides of the dirty pot and could not be detached without breaking.

Some of the tall columnar types like *cereiformis*, *morinii*, etc., grow fairly fast and it is necessary, after a few years, to cut them down, especially when the growing point touches the glass.

The leafy sorts require a slightly richer mixture, and I have even used a little hop manure with advantage. The carrot-rooted sorts like *squarrosa*, *suzannae*, etc., should have a little more loam and always very good drainage. It is difficult these days to find pots to take these large rooted plants comfortably. In the past I have used land drain pipes, which can be obtained from builders in various sizes, cut down to the required depth and the bottom cemented up, leaving a good drainage hole.

When you have had a *Euphorbia* for a number of years, you will notice, in some cases, that they become very brown and rusty in appearance at base and get much thinner in the lower part of the stem. I have come to the conclusion that this is the natural order of events. In 1931 I imported, from Blossfeld of Potsdam, a nice plant described as No. 110, similar to *horrida*, and collected from the same habitat. This is a fine plant now, but early spring I was concerned with the bad appearance and colour of the stem and I thought it was going downhill, but it has grown a fine head of about thirty seeds. Another one is *pulvinata*, some of these stems turned so brown decay seemed to be setting in; this is free growing variety with many heads; it was a specimen plant in a nine-inch pot which I smashed to do as little damage as possible, but I found the older brown stems were perfectly sound and full of sap. I now have three small plants, but would much prefer to have kept my original specimen; *stellaespinia* is another.

When talking about *Euphorbias*, by far the most popular is *obesa*. It is a difficult plant, but I think it got a bad reputation years ago with people trying to establish imported ones; this is always a difficult job with any of the imported species. It will not stand damage to the roots, that, and the sudden change of environment, was no doubt the cause of the loss of many fine specimens. Anyhow, it is not now possible to import this as it is on the prohibited

list. It is very free seeding, but, being dioecious, you have to have a male and a female for pollination purposes, then, with care, you are able to obtain your own seeds. Seedlings are a very different proposition, they grow freely and, in two or three years, make ideal specimens that you may hope to keep for many years. But do be careful with the water pot. Wait till you see signs of growth in the spring.

Raising the seed is a very interesting job. Unfortunately, they hybridise very freely and if you do not take the necessary precautions, then give them to friends, in years to come you will hardly know what you are looking at. I do feel we should try to keep our plants true to type and grow them hard, this gives us spines of a good colour and stems that are not merely green and sappy. Imported seed from wild plants, or from our own when carefully isolated while they are in flower, is the proper method. The advantage with *Euphorbia* seeds is that they are large enough to properly space out when planting and so permit a longer time for the seedlings in the seed pans. With most *Mesemb.*, for instance, it does not matter if you damage a fine root, but this is not so with *Euphorbia* seedlings, if you damage a root in transplanting it takes a very long time to recover and in some cases they never will. Therefore, seedlings should remain much longer in the original pans or pots, they can be spaced half to three-quarters of an inch apart and transplanted in the second year. I have always found it an advantage to soak the seed for a few hours before sowing; drop them in a cup of water and discard any that float on top as these will not germinate. Plant point downwards, about a quarter of an inch deep. When up, great care should be taken to provide a little shade, they burn very easily and become, as our American friends say, bronzed. If this happens growth ceases for a long time, sometimes they will not grow again at all.

Anyone who is not able to provide ideal conditions and lives, like I do, in a large town, *Euphorbias* are the answer, they will stand a partly shaded greenhouse and dirty atmosphere much better than cacti. Naturally, you must do your best by way of keeping the glass as clean as possible and always use rain water which can be stored in a tank under the staging, but cover in the top to avoid dirt and algae. It is surprising how the attention to such small details like this makes all the difference. Give air on all occasions, even in winter we have a few mild days which the plants will appreciate.

I recommend to anyone interested, that fine work by White, Dyer and Sloane. I regard this as the *Euphorbia* grower's Bible. It will help you with the naming of your plants and you will avoid, when making purchases, buying plants you already have. Just one instance of the common plant *cereiformis*. Synonyms of this are given as *E. erosa*, *odontophylla*, *polygonata*, *echinata*, *cereiformis* var. *echinata*, *submammillaris*, *Friesia erosa*. If you have either of these names, compare them and you will find they are the same plant.

Another advantage with *Euphorbias* is that you are seldom troubled with insect pests. I have never seen a mealy bug on any of my plants, though other people tell me that they have. Green fly sometimes appears on the leafy tips of some varieties, but this is soon disposed of with a spray of any of the approved insecticides. I have known scale, but, if taken in time, it is soon scraped off. Root bug I have never seen.

Give your large specimens a treat in midsummer and plant them out in the garden, in pots of course. They will appreciate this and make nice firm growth and stand the winter under glass much better.

The following are the names of a few plants that I possess now, of which I have had long experience; I have arranged them in three groups; first, plants that should grow anywhere in a greenhouse and of very easy cultivation; second, not quite so easy to manage; third, the sticky species :—

1. *cereiformis*, *morinii*, *mammillaris*, *alcicornis*, *antisiphyletica*, *canariensis*, *echinus*, *globosa*, *mauritanica*, *nerifolia*, *nivulia*, *resinifera*, *pulvinata*, *tetragona*, *virosa*, *ornithopus*.
2. *beaumeriana*, *caput medusae*, *clava*, *ferox*, *horrida*, *polygona*, *polycephala*, *meloformis*, *pentagona*, *stellaespina*, *tuberculata*.
3. *obesa*, *squarrosa*, *gorgonis*, *schoenlandii*, *bupleurifolia*, *fasciculata*, *droegeana*, *eustacei*, *pugniformis*, *suzannae*, *wilmanae*, *tuberosa*.

It is reputed that the latex from lots of these plants is poisonous, but, although I have worked with them for many years with no ill effects, it is still a safe and proper method to wash your hands after handling them.

Whenever you need to cut down a mature plant remember that it is too much of a strain to do this in one operation. Spread the cutting over three weeks, cutting a small wedge about a third through, introduce a small sliver of wood and well powder and leave to callouse over for a week. Cut through another third the following week and the third week sever completely. Severe cutting will often result in the plant dying back, but this method will obviate it. The top piece is often hard to root. Leave to thoroughly dry for three or four weeks, then tie to a stick. Insert in the soil, but on no account should it be buried to any depth. It may take three months to root, possibly longer. The safest way is to double pot; you are then able to keep water away from the actual plant. but you can water the outer pot as much as you like.

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## MEXICO

By HOWARD E. GATES

The new central highway from El Paso, Texas, to Mexico City is truly the high road. It dips below four thousand feet only in a few short sections and rises to nearly eight thousand in two places. It follows an upland mesa route between the great Sierra Madres of the east and the west.

The first day and half's route through Chihuahua wound over the long slopes between small ranges of mountains, but seldom entering them. This is mostly cattle country with small towns except for the large city of Chihuahua which sets beside a river, usually dry, between small ranges of hills in which are rich mines. Native trees are seldom seen except along the infrequent rivers. There is a large area beyond Chihuahua around the town of Delicias, which is under irrigation. While there are many kinds of cactus in Chihuahua, they are mostly small types in the mountain ranges and seldom noticed while travelling the highway.

In the next State of Durango, vegetation is more plentiful and there are stands of larger arborescent *Opuntias*. Near the city of Durango, *Opuntia durangensis* is plentiful and in the autumn its fruits are sold in the markets and on the streets for eating fresh. Just west of Durango is Sierra Mercado, known locally as the Iron Mountain. It is an immense hill of highly coloured iron and manganese ore. Cactitians know it as the type locality of *Mammillaria mercadensis* and *xanthina*.

As we were approaching Durango just after dark in a light rain, a farmer decided to drive a few cows across the highway. This resulted in a fatality amongst the cows and a badly crumpled fender for us. A light truck took us in tow and as we passed the police outpost at the edge of the city, a policeman riding a bicycle and waving a flash light, took up the task of leading the caravan to a hotel named for Pancho Villa. Pancho was a revolutionary leader in this territory some thirty-five years ago. Today his memory is honoured here in his birthplace, though other districts consider him a glorified bandit leader. It took three days to repair the fender damage, so we became quite well acquainted with Durango, a city of some seventy thousand persons.

As with most Mexican cities, it is compact and does not cover nearly as large an area as our cities of similar size. The buildings are usually of brick or the sun dried bricks known as adobe and covered with stucco. The residences as well as commercial buildings follow the usual Mexican custom of coming to the side walk line, with the garden located in an interior courtyard or patio. The windows are barred with iron or wooden grills. In the newer residential sections, the better homes are set in gardens which usually have low walls or combinations of walls and metal fences on the property lines. The cathedral is a twin-towered building several hundred years old. Another prominent building is known as the New Church because it is only seventy-five years old. The residents are proud of their monument to The Flag, which is an imposing shaft set on the toe of a hill at the edge of the city. Below the monument is an excellent park numbering amongst its features a swimming pool built to Olympic specifications. Nearby are elaborate and colourful stucco buildings containing the dressing rooms and pumping equipment. In the heart of the city is a large market building where nearly everything needful for human existence may be secured at one or more of the stalls.

Going on from Durango, the highway passes through territory with increasing rainfall. Consequently there is a still better vegetation. As it was near the close of the summer rainy season there were flowers everywhere. Pink Cosmos and orange yellow *Coreopsis* were abundant. There is more farming here than farther north. Some of the cities we passed through are located near large mines and are notable for great heaps of mill and smelter refuse in their outskirts.

Near Zacatecas, we stopped for lunch at a quaint new, yet very old, tourist resort. It is featured by about thirty great conical structures built out of clay and rock, which are said to be Indian granaries several hundred years old. Originally there was but a single door at the ground level and a hole in the peak through which the grain was poured. Now they are being converted into apartments for tourists. Each one is large enough for a living room and two large bedrooms on the ground floor and two bedrooms on the second floor. Around them are gardens planted to *Pachycereus marginatus*, *Echinocactus ingens*, *Ferocactus latispinus*, *Opuntias*, *Agaves* and *Yuccas*. In the public dining room are elaborately carved and very old tables and high backed chairs.

A short distance beyond the city of Leon we turned off the highway for a few miles to the Commanjillo Spa. Here we found a large hotel building set in a grove of trees, with several swimming pools in the grounds before it. Behind the building at the foot of the hills is a large hot springs formation with water and steam bubbling out in numerous places. We were especially interested in a hedge planting of large *Lemaireocereus* with individual plants reaching a height of twenty feet. Unfortunately they were not in flower or fruit, so the species was not determined.



On the way back to the highway, we photographed small native trees bearing large white flowers with a maroon centre spot. Later we found them to be quite widely distributed. The native name of it was too much of a tongue-twister for us to remember. As we neared Queretaro, we saw for the first time large stands of tall native cactus other than *Opuntias*. These were *Myrtillocactus geometrizans*, and *Lemaireocereus queretaroensis*, usually on low hills where the soil was too rocky for cultivation. Both kinds attain a large size with many branches. As we passed by Queretaro we saw a long line of masonry arches built in colonial days to carry an aqueduct into the city. Many of the old cities have this form of aqueduct. Morelia has an excellent example.

Beyond Queretaro we soon began to climb up from the mesa country into mountains. Higher and higher we went until we came to pine forests. On many of the high ridges were little clearings where the Indians have corn patches. Some are so steep it seems as though the farmers must hang on with one hand while they work with the other. Mexican farmers do not keep the weeds out of their fields. Probably this is a good custom as it prevents erosion. We found a great many types of houses in Mexico. In this section there were homes of adobe brick topped with red tile roofs.

We entered Mexico City from the west, passing from Toluca over El Desierto de los Leones. Strangely, this section is not a desert and there are no lions. It is a mountain range covered with pines. Since it is a national park with numerous resort areas it is a favourite Sunday and holiday resort for the metropolitans. Bicycles, usually of British makes, were very numerous. Many of the young men are members of cycling clubs. Girls and women are seldom seen on bicycles.

We found accommodation at a hotel on the Pasea de la Reforma which is the grand boulevard leading at an angle from the rectangular heart of the city to the great recreation grounds around Chapultepec Castle. In the centre of this boulevard is a narrow bed filled with cactus, mostly *Ferocactus* and *Echinocactus* accented by *Pachycereus marginatus* and a few white haired *Cephalocereus senilis*. On both sides of the cactus bed are four lane highways flanked by broader parkways filled with grass, large trees, monuments and benches. Outside of these recreational parkways are two lane driveways giving access to the adjoining buildings. The boulevard may only be crossed at intervals of about four blocks, where circular islands filled with plants and monuments guide the traffic in a continuous whirling flow into usually six radials plus the lateral service streets. The stranger soon realizes that Mexico City's drivers are either the world's best or most reckless. To complicate matters, pedestrians pay no attention to traffic signals nor traffic officers. Also it is most disconcerting to drive a few blocks on a street and find that its name has changed. Very few streets run their full course under one name. As is the case in most Mexican cities whose old narrow streets are inadequate for present day traffic needs, many of them are one way. Parking problems vary with the city and portion of the street. Sometimes parking is permitted on the left or only on the right, or sometimes on both sides. Mexican cities formerly had a reputation for noisy traffic as the drivers sounded the horn at every intersection and on the slightest pretext elsewhere. Now most of the cities strictly prohibit the use of the horn and street signs read, "No toca su klaxon. Usa su frenes."

Mexico City has had a tremendous growth in recent years. Its very old buildings are intermingled with modern many-storied structures of most advanced design and built to the strictest of specifications. It might be said that many of them are built on boats. Originally, Mexico City's site was a lake bed. This was drained, leaving a very unstable terrain to build upon. To prevent settling, earth enough to balance the projected building's weight is excavated and the hole lined with concrete as the first step in the construction of a multiple storied building. Space does not permit the telling of the vendors of little potted blooming orchids, of the great six to eight foot funeral wreaths, the boys on bicycles carrying a couple of bushels of bread rolls in the upturned brim of a great palm leaf hat, or many other interesting things.

There are few cactus to be seen in Mexico City's environs as the altitude of seven to eight thousand feet is too high. Even though Mexico is the native home of four or five hundreds of kinds of cactus plants, certain elevations, types of terrain and areas with certain rainfalls must be sought.

We turned off the main highway north east of Mexico City near Pachuco and passed over the continental divide at Mineral del Monte. Here we found a pine-covered ridge of mountains honeycombed with mine tunnels. On the farther slope we passed through a large valley with several towns and numerous farms. The fields of sunflowers and other types of wild flowers were very attractive. Farther on the slope gradually steepened until we descended to a forest of *Myrtillocactus geometrizans* and *Lemaireocereus dumortieri* with some scattered *Opuntias*. The *dumortieri* especially were interesting as the short trunks soon branched into a candelabra group of many short spined, erect, angular branches. At last a long winding grade brought us to the bottom of a tremendous canyon. Quite a river of water meandered in the bottom between farms of oranges, avocados, corn and miscellaneous products. On the steep banks of the canyon and down to the bottom but never on flat ground, were thousands of *Cephalocereus senilis*, usually called the Mexican Old Man Cactus. This was the consummation of a cactician's

fondest hopes, yet it was rather disappointing. The Old Man were all the way up to twenty-five or thirty feet high, but only the top few feet was white hairy. Lower, much of the hair had weathered away and the remainder was dirty and dark. The Cephalium, or part where the flowers and fruit are borne, appeared as an extra hairy, darkened and elongated oval spot on one side, a short distance below the tip of the branch. The commonest form of this plant is a simple column, but many of the older ones had several tall branches arising from the base and closely paralleling the central column.

In several places on the lower slopes and ridges were *Echinocactus ingens* colonies ranging from small almost globular plants to great barrels five or six feet high. All of the larger ones were constricted with several horizontal bands and the lower spines were weathered away. The bulges between the constrictions brought to mind the memory of some portly gentleman who wore his belt too tight. Scattered through the undergrowth, were *Dolichothele longimamma*, *Mammillarias parkinsonii* and *sempervivi*. Some six feet off the ground a four-headed *parkinsonii* was growing in a crack in a horizontal branch of a tree. Of course this oddity became the subject of a kodachrome slide.

As we arrived late in the afternoon, it was necessary to seek lodgings in a roadside village in the canyon bottom. The combined kitchen and dining room in the cafe was dark and primitive, but the meals were tasty and the room for the night was clean and the bed very comfortable. This was the only place in Mexico where we were tricked. On the way into the canyon, we had given a ride to two native pedestrians. When settling accounts in the morning, we found that these two men had eaten their evening meal and charged it to our account.

Then back into Mexico City for another night and off again on the Vera Cruz road. In the vicinity of Mexico City, the continental divide forms a great N and it is crossed twice on the route to the east coast. The first crossing on the eastern edge of the great bowl in which Mexico City is cradled, is amongst the rugged pine-covered mountains at over ten thousand feet, just a few miles north of the perpetual snows of Ixtaccihuatl Volcano. The eastern slope leads downward into the great valley in the heart of the State of Puebla. In passing through an apple and pear growing district, the roadside was dotted with colourful stands of the women fruit sellers. A few miles west of the City of Puebla, a country district was dotted with great numbers of churches with no great population to be served. Enquiry disclosed that in colonial days, there was a large Indian population in this district. Wherever the missionary priests found an idol, they destroyed it and erected a church. One of the churches rests upon an ancient pyramid that had been covered with earth. There is said to be a church for every day of the year in this district of Cholula.

Though Puebla is given in our books as the type locality for many cactus both large and small, a traveller will pass through without seeing any save an occasional *Opuntia*. It seems as though the early botanists selected good spots for their headquarters and carelessly ascribed their finds to the headquarters rather than the actual spots where the plants were found. Beyond Puebla, the highway follows valleys between ridges of low hills to the second crossing of the divide which is a low ridge at Cacoloapan. On these ridges are some *Opuntias* and scattered *Mammillarias* of several kinds, including the very beautiful *collina*. It is globular and covered with short, snowy white spines. No large *Cereus* were seen except in and near Cacoloapan where scattered colonies of *Lemaireocereus stellatus* grew on the hills and were planted for fruit bearing hedges around the homes. The greenish fruit ripens in the fall and is freely sold for food in the open-air market under the native name that sounds like Chaw-co-nist-lay.

The country beyond the continental divide is lower and became increasingly arid as we followed the highway to Tehuacan, which is given in our books as the home of more large cactus than probably any other spot in Mexico. Nothing of any consequence to the cactician other than scattered *Opuntias*, *Mammillarias* and a few colonies of *Ferocactus robustus* was seen en route. This last forms immense clusters compactly filled with several hundred four to five inch heads. Both the flowers and fruit are yellow. One plant formed a circular mound about eight feet in diameter and several feet high.

Tehuacan is a city of some twenty thousand set in a broad agricultural valley with no cactus in sight. So it was with considerable misgivings that we sought lodgings at little Villa Granada in the mineral springs resort area in the north edge of the city. A large tile floored twin bed room with tile bath, opened out on to a wide veranda facing a beautiful garden containing half a dozen kinds of palms and many plants we do not even know at home. There was a big swimming pool, constantly replenished with a stream of clear water flowing from a mineral spring.

In the morning we passed on through the city and across the valley on the road to Zapotitlan de las Salinas. Within a few miles we started to ascend a winding road over the hills and cactus began to appear. First there were good stands of *Echinocactus grandis* with scattered *Mammillaria mystax* and *Coryphantha pallida*. Two boys with a flock of feeding goats came our way and, as we talked with them, we noticed one of the goats reach over into the crown of a giant *Echinocactus* to pick out a ripe fruit, chew it up and discard the woolly remains. A little farther on and in the canyons as well as on the hills we found the gigantic *Cephalocereus tetezo*. These have short trunks

surmounted with numerous erect branches each bearing a crown of longer and weaker brown spines. Beyond the first ridge we came into a rugged canyon whose walls were forested with the single-stemmed *Cephalocereus hoppenstedtii*. Though not as hairy as the Old Men, their whitish spines made them stand out in sharp contrast to the dark hill sides. In the bottom of the canyon were scattered plants of *Myrtillocactus schenckii* which are more erectly branched than *geometrizans*.

We went on over another ridge and down another canyon to the fairly broad valley in which lies Zapotitlan. En route we frequently paused to look at groves of arborescent *Yuccas*, *Agaves*, terrestrial *Bromeliads* as well as numerous small cactus. These included clusters of *Ferocactus robustus*, the clustered but larger headed *Ferocactus flavovirens*, and the single headed but very colourful *Ferocactus nobilis*. In the shelter of shrubs, were *Mammillaria mystax* and a straw-coloured clustering one with elongated heads that we could not place unless it is a variety of *Mammillaria elongata*. Around the town of Zapotitlan de las Salinas, we found colonies of *Lemaireocereus hollianus* and also hedge rows of them around the farms. At home we know this as a rather weak and slender branched pot plant. Here it was growing to twenty feet tall with numerous straight branches to six inches in diameter. Its few fruits were on the very tips of the branches and they were the largest cactus fruits I have ever seen. Some were three and a half inches in diameter and four and a half inches in length, well covered with clusters of long spines. When ripe the red pulp within the thick walled cavity was almost a liquid, so it is probably not a good fruit to sell on the markets. On a slight knoll in the valley beyond Zapotitlan was a colony of gigantic *Beaucarneas*. The immensely swollen base of the tree trunks, often four to five feet through, soon tapered and divided into branches each crowned with long slender drooping leaves above which stood the many branched, but very small flowered inflorescence stems. My kodachrome of this colony with a few giant cactus in the background and the colourful mountains outlining the distant canyon under the summer clouds in the sky, I consider the most beautiful of all those I made in Mexico. While seeking a good position to photograph the *Beaucarneas*, I came upon a dense colony of *Mammillaria sphaelata* plants. The individuals consisted of rounded, often clustering small heads covered with short, light-coloured spines with darker and slightly longer centrals.

The road led on enticingly down the valley toward distant mountains and even though I knew we had not located half the interesting things of the district, the lateness of the day demanded that we turn back if we were going to get over the grades and the rough roads that lay between us and a good bed in Tehuacan.

In the morning we photographed the grounds of Villa Granada with special attention to a yellow flowered *Poinsettia*. The Vera Cruz road lured us northward along the arid western slope of the Sierra Negra until it turned and boldly took over the wooded mountains to the east. At the very summit appeared a magnificent vista of the valley leading to the tropical low lands. The slopes were well covered, but the bottom, apparently in a rain shadow was rather arid. It took some four miles of winding grade to reach the bottom. Here we found a few scattered colonies of an arborescent giant cactus too far from the road to be properly identified. In the cotton textile manufacturing town of Rio Blanco we found a park packed with cypress trees trimmed into strutting peacocks, flying birds, burros, rabbits, dogs and umbrellas.

Closer to Orizaba we found many teams of oxen ploughing in the fields. A large and powerful breed of cattle are used for oxen. Their necks were fitted with yokes. Though the ploughs were steel shod and sometimes steel beamed, none had more than a single handle. As we rolled along over smooth asphalt pavement, it seemed strange to pass many packers using head bands to enable them to carry great sacks of produce on their backs to market. We photographed three men, each carrying huge sacks of onions. Beyond Orizaba the country became more tropical and a heavy green growth was everywhere. There were many plantations of bananas and sugar cane. Palms were abundant. The orange groves were attractive, but the fruits are always greenish and never attain the high colouring of those grown in more temperate climates. Near Fortin de las Flores, whole fields were given over to the cultivation of Gardenias for the cut flower market. At Cordoba, the country became so tropical we thought there was no point in going farther in our search for interesting cactus and turned back to spend another night in Tehuacan.

(To be continued)

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We had a very interesting evening on the 18th November, when many members brought along photographs of plants and, while they were being shown, made interesting and instructive comments on them.

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Have you renewed your subscription to the Society? If not, please remit direct to the Treasurer, E. W. Young, 35 Castle Drive, Ilford, Essex, as soon as convenient. The prompt receipt of subscriptions greatly assists this honorary officer and enables the Council to plan ahead matters of interest to all members.

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## FRAME CULTURE

By G. G. GREEN

Now that the growing season has, for many collectors, ended, the usual theme at this time of year is the winter care of cacti and succulents. However, as readers will gather from perusal of past articles of mine, winter makes little difference as far as interest is concerned as there are so many winter-growing and flowering species that sustain one during the ensuing months of outward drabness.

These welcome species are, of course, mainly confined to the succulents as the great majority of cacti have now been tidily tucked up and coaxed to rest until the general awakening in spring.

Conditions of growth during the past year will undoubtedly govern to a great extent the means that are taken to ensure that those and other succulents get this much needed rest, and most of the various methods have been expounded in this Journal before.

Cold-house, window-sill and heated greenhouse collections need different treatment, both in winter and summer, but it is of a fourth, the garden frame, that I should like to speak of this time.

It is due to a suggestion by the editor, Mr. Shurly, that I bring what experience I have had with these cold and heated frames to these pages.

As most of the members in the London area will know, the editor grows many of his plants in frames, which I understand are open to the elements for the greater part of the growing season, with what can only be described as admirable results. The plants when I saw them a year or so ago, certainly looked to be enjoying this hardy treatment as well as they should. The new growth was much sturdier, root systems obviously stronger, and the colour more near the natural than is generally the case with indoor grown specimens.

Frame-growing is, of course, quite an old method in the propagation and culture of cacti and succulents, especially by those commercial growers of today who can boast of more than a couple of years experience of these plants. It is a method that is superior to anything else providing certain conditions are in force, and it is also one of the cheapest and most economical especially to those who cannot afford the expense or space of a greenhouse. Rates and conditions of growth vary to a great extent, depending on the geographical position of one's home and the type of frame in use, but results are generally much better than those of greenhouse plants. Why is this so? The reasons are pretty obvious when one considers the matter a little. The plants have been exposed to fresh air and unadulterated sunshine, or what passes for it in this country, with no draughts and, best of all, *constant* moisture at the roots.

Pots sunk in ashes or sand need very little in the way of artificial watering as the medium used will retain moisture over a long period. The soil in the pots will, in fact, never dry right out with the result that the plants do not receive a check just as they have got going nicely, and growth is therefore more uniform and robust than is often the case in greenhouses where watering is sporadic.

The question of whether to leave the lights off during rain showers is dependent on one's proximity to a large town. It would be inadvisable to let the plants be washed by a dilute form of nitric or sulphuric acid mixed with soot, as this is what rain in industrial areas consists of. In such a situation it is better to water the plants heavily with tap water that has been left in the can for an hour, after planting in the frame, using a rose.

This moisture will then last for weeks besides being much kinder to the plants.

The best type of frame is, without doubt, the metal variety with glass sides. In these the maximum amount of light is acquired as well as being much easier to erect and maintain than brick ones. Most wooden-sided frames are useless, for after a year or so they begin to rot or breed woodlice and need constant repainting and repairing.

Brick-sided frames are substantial and warm, but give a permanent shadow on one side which means that plants placed here are apt to become drawn and weedy through lack of light. (White-washing of the inside will help to reflect light). Their big advantage though, is the fact that they last for years with only the lights to repaint and repair.

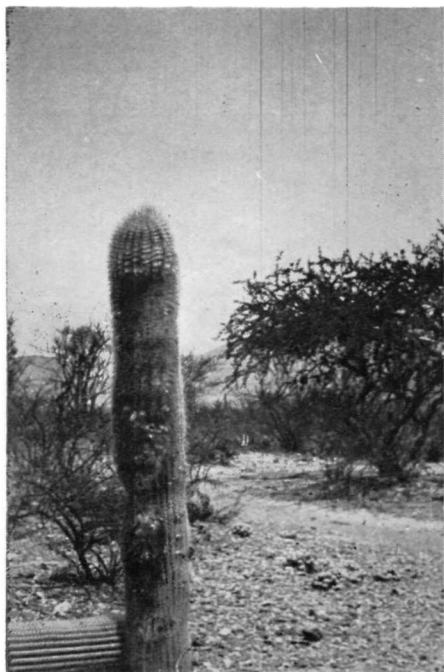
The metal types can be raised to a convenient height on brick walls so that stooping is eliminated, and become in fact miniature greenhouses with removable roofs. They are sold in very convenient sizes and are extremely easy to erect, especially in the case of the glazing. Glass is fixed by means of metal clips, making this side of the job a mere detail.

The ashes or sand should be level with the base of the metal frame and be about twelve inches deep. If the frames are built up on brick walls, the inside could be filled with rubble or stones and the sand placed on the top of these so that good drainage is obtained.

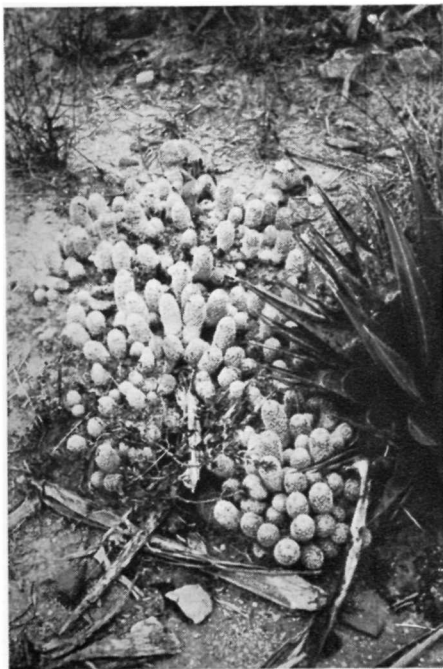
Where it is possible to govern the position, the ends of brick or wooden frames should point east and west,



*Cephalocereus hoppenstedtii* near Zapotitlan de las Salinas, Puebla



Tip of *Cephalocereus hoppenstedtii* branch showing the cephalium



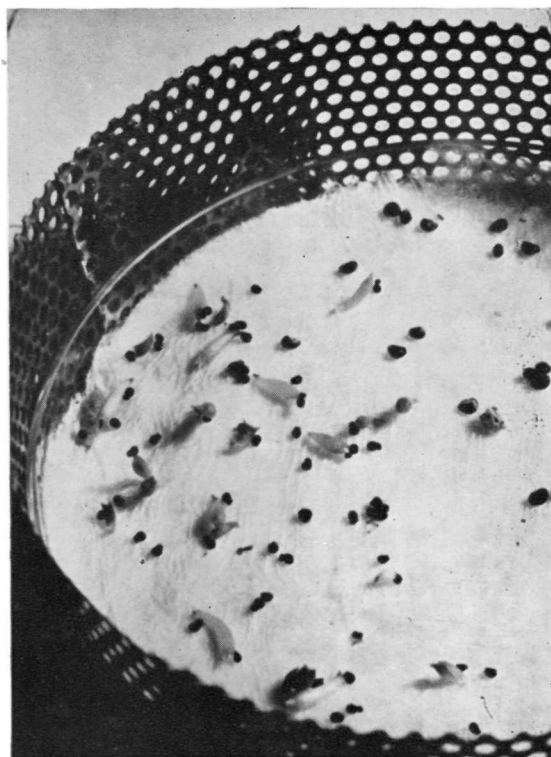
*Mammillaria* cluster of the *elongata* group near Zapotitlan de las Salinas, Puebla

Photos by Howard E. Gates to illustrate "Mexico."



Petri dish

Dr. E. E. Elkan



*Cereus peruvianus monstrosus* seedling germinating on gamgee tissue



Brick frame

G. G. Green



*Opuntia lindheimeri*

C. Backeberg



*Nananthus cradockensis*



*Titanopsis schwantesii*

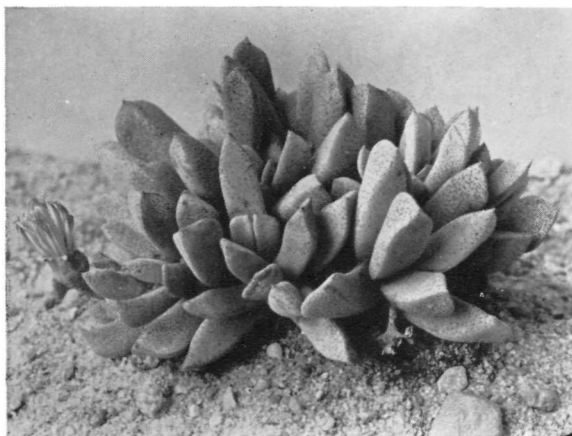


*Aistocaulon rosulatum*



*Deilantho peersii*

Four photos from Professor Schwantes' "The Cultivation of the Mesembryanthemaceae."



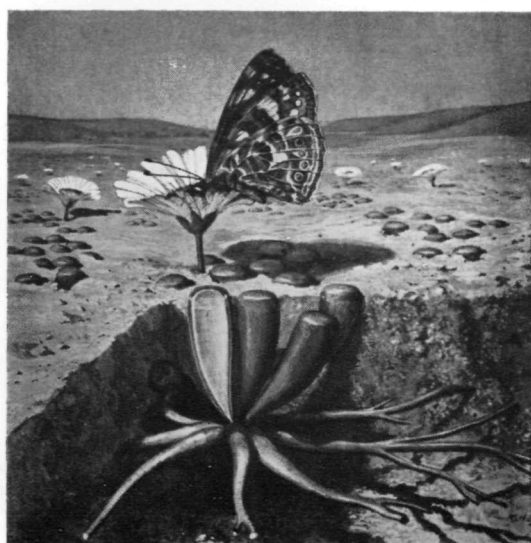
*Prepodesma orpenii*



*Pleispilos magnipunctata*



*Fenestraria rhopalophylla*



*Fenestraria rhopalophylla*  
(Marloth, Flora of South Africa, Vol. 1)

Four photos from Professor Schwantes' "The Cultivation of the Mesembryanthemaceae."



though this is immaterial for the metal ones. The pots may be sunk to within half an inch of the brims, the taller species being placed on the north side so as not to overshadow the smaller ones.

There is no reason why the succulents should not be mixed with the cacti, though it would be more convenient to keep them separated if stemless *Mesembryanthemums*, etc., are included, as these need different treatment.

Planting out times here in the north are usually during early May for potted plants and June for young seedlings in pans, etc. They are left in the cold frames until the end of September, and all the year round in heated ones.

The heating of frames, whether of brick or metal, is not an easy task and depends on certain available circumstances. Where no heated greenhouse is adjacent, electricity is the only efficient means and usually takes the form of tubular apparatus, immersion heater and hot water pipes, or the latest hot wire system. Hot water apparatus can be extended from the greenhouse if the frames are situated near the boiler, which simplifies the heating arrangement considerably. Where no heating at all is possible, many different species can be left outdoors by covering the frames each night during the winter with hessian, matting or sacks, or any such available material that will help to keep out the frost, and removing each fine day. The one important thing to remember about winter frame-growing, apart from this protection, is ventilation. Unless the lights are raised a little whenever the weather permits, there is the danger of damping off occurring. Dry cool air is not harmful to plants that have been brought up hardily this way, but the cold moist conditions prevailing in closed-up frames is fatal. We have wintered *Opuntias*, *Echinopsis*, *Rebutias* and many succulents in frames where the lights have been permanently raised at the back for about four inches though covering with matting was carried out each night.

Most collectors will, however, bring in their plants either to the house window or greenhouse for winter and much of the above will be merely interesting. It is in the summer that the chief use of frames for growing these plants is important, and I suggest that those who have not yet tried it should do so if at all possible and see the difference in growth. Young seedlings grow sturdily and need only a fraction of the attention that greenhouse grown plants require. There is no need for shading in any form if the lights are raised each day as the fresh air circulation and full light is just what they require.

The one danger seems to be that from cats and birds and where this is imminent, pea netting should be draped over the open lights as protection.

It will be found upon lifting the plants for removal to the greenhouse or window sill, that the roots of some species have grown through the hole in the bottom of the pot into the sand or ashes. These should not be broken or damaged, but should be kept covered with soil, either by standing in a larger pot containing soil or sunken in the staging gravel until they can be re-potted next spring.

Watering should also be continued for some time as it will not help the plants to be suddenly cut off from the moisture that they have been used to in the frames. Where it is the practice to discontinue all watering during the winter months, this should be done so gradually, though I believe it is better to keep the soil very slightly moist at the base so that the root tips do not die off.

! ! !

"Birmingham Post," 8th October.—There is, too, the "mother-in-law's tongue," one of the cactus family, which grows to a length of 2½ feet and has a Latin name nearly as long, but is more economical than its human namesake, for it needs liquid refreshment only eight or nine times a year.

"Halifax Courier," 18th October.—Lithops is a variety of cacti—fiery red *Rochea Falcata*, with its hundreds of little flower heads on the large main flower. This type is classed as an inflorescent.

"Manchester Guardian," 31st October.—Plants which come into bloom only once every seven years, and that for fifteen minutes at night, when they give out a celestial fleeting smell.

"Birmingham Mail," 28th October.—A member of the epiphyllum family—the night blooming cereus.

"Gardener's Chronicle," 8th November.—Cactus collecting, growing, hybridizing, and grafting is an international disease; once contracted there is no known remedy for it (quotation Wood's *Grow Them Indoors*).

"Manchester Evening Chronicle," 17th November.—Folk grow cacti—querrulous neurotic-looking plants with spikes and knobs and white beards, branching out unexpected or blooming in a rather nervous pallid way. Some might say they suited the times.

"Bolton Standard," 20th November.—On wintering cacti—reduce amount of water supply, decreasing the periods between watering.—They go through the winter with much reduced sap in the cells—A completely dry plant cannot be destroyed by frost, but a perfectly bone dry plant will also take too long a time to recover in the new season.

## GROWING LITHOPS

By Captain H. J. DUNNE COOKE

And what fun it is! And how they repay the little care and knowledge required! But *both* are required.

It really isn't necessary to be a botanist or to worry about the multiplicity of names with which these charming little plants have been cursed. They put on a nice new suit for us each year and flower quite freely.

As one has to have some sort of name for a plant, I have adopted Professor Nel's book as a guide and have no intention of being controversial or saying whether I agree or disagree with his verdicts. This article is for the grower and *not* for the botanist! I append a list of the species (or supposed species) and have placed together those which I think too similar in behaviour for the beginner (shall we say?) to grow more than one of; I have underlined those which I, personally, consider the most desirable—from a grower's point of view.

I think it is so very interesting to trace the connection through the huge *Mesembryanthemum* tribe, from *Conophytum* (*pillansii*, *edithae*, etc.) to *Ophthalmophyllum* to *Lithops* (*divergens*, etc.) and then to *Dinteranthus* (via *L. van zijllii*) to *Lapidaria*, *Argyoderma* and so on. Even the great Dr. N. E. Brown himself gave to *Conophytum pellucidum* the name *Lithops marlothii*!

I always try to grow my plants as "near nature" as possible; I don't try to make them do things which they would never do in the wild. I never try to hurry them. If you don't approve of that, don't read any further! We all have our own little idiosyncrasies and that's mine; I don't "cultivate" my plants. And I've been congratulated by many people who have actually *collected* such plants and seen them growing in their natural habitats. And *then* I feel proud.

*Lithops* can easily be raised from seed and you'll be very surprised at the variation from one "native" capsule! Water is their principal enemy, even in the seedling stage and they should take several years (with maximum SUN) to become decent plants. In some of their best known habitats, they've had no water for years—but they still survive, make good plants and flower!! LIGHT is what they want, not heat; they do not mind a bit of frost at all, if they are bone dry and have plenty of LIGHT. In cultivation, they require perfect drainage and porosity (even the pot should be highly porous), although they frequently grow in pure clay in their sun-baked deserts with intense light. A large plant imported or otherwise, can be cut up, dried off in the usual way, and each piece rooted to make two or more plants. They *will* root in a dry compost, with no water at all! Most species like lime, in some form or another; some actually *require* it (such as *L. vallis-mariae*).

The *porous* pot should be deep and very well "crooked" and *any* very porous compost is all right; sift the dust out of your sand, with a fine sieve, and I generally incorporate lime in the form of broken up eggshells and/or broken Bath or Portland stone (I grow some in this alone!) The pot should be topped with small stones, of any sort, to come two-thirds of the way up the actual plant, to keep its collar dry.

As a very general rule, one can say that this genus requires no water from Christmas until the time that last year's pair of leaves are *completely dry*; this does *not* apply to *L. optica* or its variety *rubra*, which grow near the sea and whose outer pair of leaves rarely (if ever) disappear completely. But give them a rest of at least four months.

Start the plants up with a soaking from the bottom and repeat in about a month's time in normal weather; then I break all the "rules" and water them overhead, with a syringe, in late July, August and September. *L. pseudotruncatella* generally flowers here in early August and the others follow on until late October; *L. optica* and its variety *rubra* generally want to flower in December and the buds don't open. The flowers are either white or some shade of yellow and some are very large; but the colour of the flower does *not* constitute a specific difference—I have both white flowered and yellow flowered specimens of *L. helmuti*.

Some people say that the members of this genus do not hybridise, but I should hesitate to give an opinion—there is such a tremendous difference in the general appearance of specimens of the same species; they can be plain or marked, dark or pale, with a few really outstanding exceptions (*L. inae* and *L. van zijllii* for instance, are *quite* unmistakable). *L. dendritica* has the largest flower—over two inches, yellow.

If you are fortunate enough to get hold of any freshly imported plants, try to get them in April or May and try to get them with one pair of leaves; clean up the plants with the utmost care, or do not do it at all; pot in absolutely dry compost, shaking well down around the roots; dip the pot in water a quarter of the way up, drain and leave for a month or until there is one pair of leaves—even if that takes a year! Drought will never kill them and some people don't even pot up until there is only one pair of leaves. This applies to *most Mesembs*. Look out for pests for two years, even if an entomological certificate accompanies the plant or plants.

I am a plantsman, grower, plant lover, horticulturist—what you like; I am *not* a botanist or scientist. Growing plants is my hobby and recreation—not my business or profession. I use the horrible names, which the genuine botanists (and, *most* unfortunately the pseudo and would-be botanists!) concoct in the worst, doggerel Latin, because I have no choice. With the descriptions (in bad Latin also), these are supposed to enable every educated grower, throughout the world, to recognise his plants and exchange notes thereon. They frequently fail to do so

and even the qualified botanist and, *far more*, the pseudo botanists are to blame; they don't, or won't, co-operate with the growers or grow the plants themselves.

The profession of Botanists (and it is a profession, requiring years of study and *Herbarium experience*) is encroached upon in the most scandalous way. One does not go to a lawyer to have a tooth pulled out or a tailor to have a pair of shoes mended. Why should a parson, a farmer or doctor of medicine think that he is competent to describe a plant accurately and give it a name. A bricklayer does not allow a carpenter to lay bricks, etc., etc.

Linne, who founded modern botanical nomenclature, intended the specific name to give some slight indication of the nature of the plant, which was expanded and enlarged upon in the Latin description (the universal language of the civilized world of the day). He certainly did *not* intend it to be a tribute to the name of, even, the plant's discoverer. For many years now, the botanists have lapsed sadly in that respect and one comes across such fearful monstrosities as *Meyerophytum meyeri*, in which both the genus *and* the species do honour to some otherwise unknown missionary !!

In my own humble opinion *all* such names should be ruled out and I am glad to hear that, in future, a person's name can only be used *once* and, then, it must be the name of the actual discoverer and collector of the plant. Also, in my opinion, all wrongly named plants should be re-named and I hope that they will be, e.g., a plant with a definite surface *cannot* be called—*truncatum*—meaning cut-off, sheer or flat!!

My recreation is spoilt by useless arguments about the wretched names; the love of this contentious bickering is the curse of growers of succulent plants and make us the most disliked of all horticulturists and actually prevents many people from growing them.

#### Lithops collection

*aucampiae, lesliei* or *venteri* (one).

*bella*.

*brevis, dinteri* or *marthae* (one).

*bromfieldii* or *insularis* (one).

*comptonii*.

*dendritica* or *gracilidelineata*.

*divergens* or *helmutii*.

*dorotheae*.

*eberlanzii* or *erniana*.

*franciscii*.

*fulleri* or *julii* var. *reticulata* (one).

*fulviceps*.

*geyeri* or *herrei*

*gulielmi, kuibisensis, kunjasensis, schwantesii, triebneri* or *urikosensis* (one).

*inae*.

*julii* var. *pallida* (*lactea* or *opalina* are this).

*karasmontana*.

*lineata, nelii* or *ruschiorum* (one).

*marginata* (I do not think I've seen the right thing).

*marmorata*.

*mennellii*.

*meyeri*.

*olivacea* (unmarked; when marked, it could be *geyeri, herrei* or *marmorata*!)

*optica*.

*optica* var. *rubra*.

*otzeniana*.

*pseudotruncatella* (the species itself is better than any of its varieties).

*salicola*.

*steineckiana*.

*terricolor*.

*turbiniiformis*.

*vallis-mariae*.

*van zijl* (now a *Dinteranthus*).

(I have never seen a plant like Nel's pictures!)

*villetii* or *weberi* or *deboerii*.

*wernerii*.

## CACTI IN SOUTH AFRICA

By H. HALL

Nowhere in S. Africa are there really good representative collections of cacti to compare with British and European collections generally, so far as my observations during the past five years are concerned. That the climate in many parts of the Union is eminently suited to their cultivation outdoors goes without saying. Our sunshine average rivals that of California and vast areas have a very low rainfall.

Though cacti are excluded from the subjects cultivated in these botanic gardens at Kirstenbosch (only indigenous plants being dealt with here) I have tried to grow a few in my own garden for old times sake and have drawn certain conclusions therefrom. Firstly, I must point out that our rainfall is fairly high, about 55 inches per annum, most falling in the winter months from May to October. Thus there are long wet spells of low temperatures and high humidity although we never reach freezing point. The summers are dry and hot at times. Most of the S. American species I have tried will live better than the Mexican, Texan and Californian species, that quite a number require shade in summer, though this may be, in part, due to the root trouble caused by the wet winters. In simple terms, I find very many sorts too difficult because of the cool wet winter months, the exact opposite of their natural climates, in most cases.

However, in my travels throughout the Union I have seen splendid specimens here and there, some in the most unexpected places, some where one would never dream of meeting them. They do get around! Of course, most were in a much drier climate than our own here, situated as we are in the shadow of Table Mt., and especially those places in the eastern half of Cape Province where the summers are wet and the winters dry. On one occasion in Kingwilliamstown I saw a long border of *Echinopsis multiplex* which had become so crowded that each plant had formed a large humped-up mass forming a long ridge for about 15 yards. I was informed that it was an unforgettable sight when in flower. Plant hunting on the Little Karoo three years ago we called at a small, lonely farm for water. Under a large fig tree I saw a huge cluster of *Echinopsis multiplex* planted, many years before, in a sawn off oil drum, the latter almost rusting away. I begged a piece from the farmer who seemed mildly shocked that anyone should be interested in such a thing. It had been there as long as he could remember, he said, utterly neglected. Dried up flowers lay all over it. He pressed his boot against the cluster, dislodging three side growths which were all larger than any plant I had ever seen of this species before. Hanging up in the branches of the fig was a very old plant of *Aporocactus flagelliformis* with scores of yellow stems also well covered with recently withered flowers. "No," he said, in answer to my enquiry—"I never water them; if it rains they get a little then." The Karoo air is very dry and the rainfall about ten inches if lucky.

In a garden in Somerset East I saw some very fine specimens, well cared for and labelled, and including some fine *Echinocactus grusonii*, *Oreocereus* and *Ferocactus*. *Hylocereus undatus* is often met with trained up the shady side of houses. At Hermanus, a couple of hours run from Cape Town, a large plant is draped over a garden wall as though it wanted to escape from the confines of the rather narrow garden; in full sun this time, somewhat yellowed but very fat and vigorous. Its proximity to the sea may account for its vigour, the humidity evidently playing some part in its welfare.

As for the *Opuntia* tribe, many S. African farmers shudder at the sound of the name for there are places in the eastern Province where they are still a threat to the farm lands and bushy hillsides. Vigorous control measures have restored a great deal to useful agriculture however. There is something rather sinister at the sight of dead skeletons of *O. vulgaris* and probably other similar species, lying around and others standing in various grotesque attitudes. In the eastern Cape Province it was estimated that at least one million morgen of land were infested in 1940. More than a dozen species were considered to be pests, including *O. aurantiaca* and *O. imbricata*. There are, however, species or varieties still cultivated for stock feed in areas of safely low rainfall and last year I saw vast fields recently planted with what appeared to be *O. robusta*. A single joint six feet apart in the rows which were about ten feet wide. This was a long way from the infested areas of the eastern Province. *Opuntia monacantha* is one of the commonest in gardens and becomes gay with yellow flowers in summer. Once I saw a hedge of *O. brasiliensis* near the sea about 300 miles east of the Cape. There the rainfall is more evenly spread through the year. It was about six feet tall and formed an impenetrable fence, but I doubt whether it would be so luxuriant away from the sea where the climate changes appreciably.

The finest specimens of *Chamaecereus sylvestrii* I have ever seen are in a garden some 20 miles from Cape Town, the rainfall considerably less than ours. I might add, as well as very many perfect specimens of other American succulents. The *Chamaecereus* formed compact mounds of neat stems about a foot across, as also did clumps of *Mammillaria gracilis* and *M. pusilla*.

Probably the commonest of all cacti in gardens is *Cereus peruvianus* in one or other of its forms. It thrives perfectly and will endure slight frost where the winters are dry. Some specimens are so familiar to me that I often make a slight detour on summer evenings to pass by and admire their out-thrust trumpets. If one is near a street lamp they become quite enchanting after dark, reminding me of those wonderful specimens I knew on the Riviera some twenty years ago.

I enclose a photograph of a rather old specimen of *C. peruvianus* which I took rather late one Sunday morning in the middle of Cape Town. At that hour the flowers were already half closed, of course, and one branch leans somewhat drunkenly over the pavement.

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## THE STARTING LINE

By Dr. E. ELKAN

The fact that commercial firms offer an abundance of different cactus seeds gives us a chance to pursue the entertaining hobby of seeing them start in life. The seeds, not the firms. There are always a few over, whatever we are trying to grow. Allow me to suggest what can be done with them.

Those that have been put on soil or on Vermiculite are lost to sight. The coloration of most seeds is such that it provides perfect camouflage. You would have to be a bird to see them. But you can keep your seeds in sight in the manner suggested in Figs. 1 and 2. Petri dishes, as used by bacteriologists, can be bought cheaply in laboratory glassware shops. Into the floor is fitted a disk of gamgee tissue (cotton wool between two layers of gauze, obtainable from the chemist). The gamgee, after being fitted, is soaked with water containing a few drops of 1:1000 Chinisol (to prevent the formation of mould). The seeds are then spread out on the gamgee, their name, date of 'sowing,' etc., is written on the lid with a wax pencil and the dish is closed. The dish is then put into a seedbox or some other place where it gets a little bottom heat, and the seeds will sprout in from one week *ad infinitum*. This means that some will only germinate long after your death. The seed swells a little, the capsule bursts and the seedling appears, looking at once so big that you can never understand how it had room in the seed. In some cases, where the root appears first, you can clearly see the root hairs and the little cap covering the root tip. When the seedlings have reached this stage they will be grateful for a little soluble fertiliser in their watering fluid (Mullard's nutritive powder does very well) and their growth will be eased if a ring of perforated zinc is inserted between the dish and the lid. You can now continue watching your seedlings until you think it really time to transplant them into soil where they will soon start being fat and healthy-looking cacti, a credit to the painstaking foster father.

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OFFICIAL VISIT TO HOLLAND AND THE DUTCH BULBFIELDS. The National Gardens Guild has now completed arrangements for its fifth post war tour—4th to 11th May, 1953, inclusive.

Besides enjoying Holland's floral beauty during the bulb season, many interesting towns and places are to be visited, including Arnhem and the Battlefields, and the International Flora Exhibition at Heemstede. The very full programme of morning, afternoon and evening functions also includes three Civic Receptions and an Anglo-Dutch social gathering at the Amsterdam headquarters.

Further details will be sent on application to the Secretary, The National Gardens Guild, 152 Edgwarebury Lane, Edgware, Middlesex.

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On the 10th December, 1952, before an audience of approximately 150 persons, the Howard E. Gates slides and lecture, read by Mr. E. Shurly, were given at the Ilford Town Hall, under the auspices of the Ilford Horticultural Society. The event created considerable interest, and the formation of the new Essex Branch was announced and there is every sign of its success. Mr. C. E. L. Gilbert staged a considerable exhibit of cacti and, after the closure, the audience crowded round the plants and evinced considerable curiosity and interest.

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Have you renewed your subscription to the Society? If not, please remit direct to the Treasurer, E. W. Young, 35 Castle Drive, Ilford, Essex, as soon as convenient. The prompt receipt of subscriptions greatly assists this honorary officer and enables the Council to plan ahead matters of interest to all members.

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## SPANISH SUCCULENT COLLECTIONS

By C. BACKEBERG

Before the Spanish Civil War there were in Spain many collections of succulents, mainly of cacti as the cactus-mode had reached that country from Germany. Great Britain, France and Italy followed later and in the two latter countries the growing of succulents for commerce and private collections is still at its peak.

In those days it was possible to have an intensive hobby in Spain and one, Carlos Faust created the Succulent Garden of Mar y Murtra, near Blanes, on the Spanish Riviera at Costa Brava (Mar y Murtra was a good name for that region. In Catalanian language it means "Sea and myrtle." The Faust Garden was planted at the shore between the blue waters of the Western Mediterranean and the dry myrtle-covered hills of the coastal region of the Costa Brava).

The civil war had stopped the development of the succulent hobby in Spain. It paralysed the plans of Faust who had bought a large terrain. Three different to be united as a tripartite garden. But of his capital there was not enough money left free for his work, therefore, the whole plantation was neglected for a long time, and as Faust was ill during the last years his work was nearly abandoned. A month before I arrived at Blanes the old man had died. One of the great initiators of succulent studies in Europe facilitated by a great acclimatizing garden had gone for ever. But one should not forget his work even if it did not succeed as its creator intended it, and so I, who came from the Marnier Gardens, where the objects of Faust's ideas was completed in an ideal manner, feel obliged to honour the memory of that unlucky and idealistic man of Blanes.

Today one does not know about the future of the Faust Garden. There is a committee in charge of it, but I am in doubt whether one can do much in that extensive area, without enough capital at disposal. It would be worth while for there is a great living material of considerable importance, but a new planting-plan must be projected and water supply must be increased for there is a lack of water. This fact, of course, give the *Opuntia* plantations the typical habit and their environment the true aspect of a cactus-desert, but this is not always ideal for a representative garden. Maybe that it is impossible to increase the water supply. In any case this is the greatest difficulty and the most pressing need in that garden. We know the need at Les Cedres! A long period of sunshine and dry weather with high summer temperatures is the preliminary condition of a rapid and typical growing of all succulents to their full beauty. Without watering, the result will always be a limited one, for show collections must always show the optimum of habit-beauty and this is not possible without watering, if only occasionally when there is too much dryness. It may be that the plant itself does not suffer and survive as it would in the wild state, but we know that the habit in the wild is not always a model of the real beauty of the species. So it is not certain yet if the Faust Garden will ever reach the condition of which its creator was dreaming.

Nevertheless this garden has its history and has given many impulses. Berger has worked there and many *Opuntias* were planted by his inspiration. This proved to be important to me after La Mortola has gone the same way as the Faust Garden. I could find in Blanes still a number of species lacking in Les Cedres and necessary for the new working up of the *Opuntia* group.

In Blanes worked also for some time Mr. Sventenius, now in the Canary Islands, one of the most active collectors and initiator of the acclimatizing garden on those islands specialising in the rather odd flora of that archipelago.

The late Harry Maass, a famous garden-architect, had written once a nice report of the Faust Garden in its heyday in the "Gartenschonheit."

Mr. Narberhaus had worked with Mr. Faust and had gone from Blanes to Barcelona where he is now managing a quite modern plant and seed business.

Now Dr. Fon y Quer is in charge of the Garden and he also specialised in the Canary Islands flora. He is the "ace" of the Spanish botanists, and has done as much as he could to modernise some parts of the garden, mostly in the third part, along the sea, where the visitor has a fine vista over the wild cliffs of the Costa Brava and of the old ruins on the top of the surrounding hills, built in the time of the Moors and still earlier.

In this garden I saw many *Opuntias*, old specimens full of flowers and fruits and most typical of their species. A careful determining work was done and, now I hope, at least the *Opuntias* are all correctly named. This was necessary, for they are perhaps the most important component of the Faust Garden for the succulent botanist. By numbers, a duplicate collection was transferred to Les Cedres to avoid what happened in La Mortola, the loss of important material from Berger's time. Now the *Opuntia* material is conserved in two parallel collections.

Some species which were not represented in Blanes I found in the famous Parque Montjuich, of the city of Barcelona, where Mr. Panella is working, an active man in our line, to whom I am obliged for so much aid he gave me during my stay in Spain. He was also a friend-companion in my "photo-raid" along the coast to Montserrat, the little State of Andorra and the Southern Pyrenees—that wonderful landscape which could be called the "Switzerland in Spain."

In Montjuich also the plants were determined and a fully numbered collection detached for Les Cedres.

And, last but not least, I have to mention that man to whom I owe that I have seen all these collections and to whom I am obliged for the material I could bring from there, for all his kindness in my photo-work and his invitation to one of the most modern fincas of Spain—Pinya de Rosa, of which he is the proprietor—Don Fernando Riviere de Caralt—one of the leading business men of Barcelona, and today also the leading succulent patron in Spain. In his wonderful finca, situated on the cliffs of Costa Brava, he has planted many succulents in the modern rockeries of his property. He has built modern greenhouse and cultivation departments and there will also be planted a modern *Opuntia* garden as I proposed to him.

I spent some very nice days in Pinya. For me it was one of the outstanding facts that I discovered there a new genus and one of the tall trichoceroïd plants of the highlands of Bolivia and Northern Argentine. The first time I discovered such a genus and species not in the wild but in a European garden, being there unknown for many years. This plant was certainly known to me from my travels, but it seemed that hitherto nobody could identify it because the flowers were not seen. The large specimen which produced the flowers at the Costa Brava came from South America decades ago. This was the only one until Mr. Riviere and Faust bought two of them. In Pinya de Rosa I saw the flower and could determine and describe this odd discovery.

I hope there will be good co-operation in the future between our work at Les Cedres and the activity of Mr. Riviere and Mr. Panella, the two "pillars" of succulent botany and studies in Spain.

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Mr. Boarder states in the October Journal that he has been unable to set seed on *Acanthocalycium violacea*. I have flowered two plants of this species every year since about 1939 and although I have tried pollination, neither have ever set seed. This year I had a seedling plant flower for the first time and the two flowers were pollinated from an almost dead flower from one of the old plants. Two seed pods developed. The reason may not always be due to the sex of a plant that no seed is set. The life of these flowers is short, and it is likely that the pollen is not ripe for distribution at the same time as the flower is at its best.

K.H.W.

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**ESSEX BRANCH.** A new branch of the Society has been formed with its headquarters centred in Ilford. The secretary will be Mr. A. W. Heathcote, The Cottage, 1 Walden Road, Hornchurch (Hornchurch 3942). Notices will be sent to members in and around the district with particulars of meetings, etc. It is hoped that all will be able to attend. We do feel that the formation of this branch will enable members who cannot come to our monthly meetings at the R.H.S. to meet one another, thereby furthering the object of the Society, viz., the promotion of the knowledge and interest in the cultivation of cacti and succulents.

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The Dinner celebrating the Society's 21st Anniversary, took place at La Coquille, St. Martins Lane, London, on the 27th November. More than fifty persons attended. The toast of the Society, and later, the Visitors, was drunk and warmly applauded. After dinner the Proctor Kodachromes and lecture were given, the lecture being read by Mr. Shurly and the projector ably handled by our Chairman, Mr. Edwards. A hearty vote of thanks was accorded to the National Cactus and Succulent Society who were good enough to loan the slides and lecture to us for the occasion.

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## PROGRAMME FOR 1953

The matter of the programme for 1953 has given the Council reason for considerable thought. For some years now it has been noted that members are more interested in lectures informing them how to grow their plants, rather than information which will enable them to understand their plants more.

Consequently, the Council has drawn up a programme for 1953 with this in view. Further, it has been planned so that the various subjects will be topical and at the times when they are causing interest among the members.

On February 3rd we have the Annual General Meeting at which the various officers are elected. It is up to every member to attend to voice his opinions, as it is the supreme occasion when their views can help the executive in their task. The time of the A.G.M. is 7 p.m. This is different to the times for all other meetings during the year. Hitherto it has been the custom to start the lectures at 6 p.m., because the R.H.S. shows finish at that hour. It is thought advisable to start the meetings at 6.30 p.m. This is half an hour after the Show, and permits members to have friendly discussions for half an hour before the meeting commences and, further, gives more members the opportunity of attending the meetings.

On March 17th, Mr. K. W. Harle will give a talk on "Raising from Seed," accompanied by a film show. April 14th will be the occasion of Plant Exchanges (the popular Covent Garden Succulent Evening) which, in the past, has been the occasion of very open and friendly contacts with other members and the exchanges of various surplus plants enabling each member to enhance his own collection and by the exchange enhance the collections of other members. All members are asked to bring along their surplus plants.

On May 12th there will be a talk on the "Outdoor Culture of Plants." The speaker has not yet been selected, but it is hoped to obtain someone with actual experience. The most modern trend is to select and find out plants that stand outdoor treatment, whether all year round or summer only. The more natural is the treatment, the better the plants.

June 23rd is the date for the Summer Show. At the meeting in the evening the subject will be "Watering, soil, light and air," given by Mr. G. D. Rowley, whose experience at the John Innes Horticultural Institution will give us the low down on this important subject. Too often do we depend on recommended cultural treatments without any definite knowledge of why. Conditions under which our plants are grown vary from member to member for obvious reasons. If we understand the basic reasons for certain treatments we shall be able to handle our plants with more understanding and with more successful results.

On July 28th there will be a talk on "Pests and Diseases." The speaker has not yet been selected, but will be announced in due course. August 25th will be the occasion for a further Plant Exchanges evening as explained for April 14th. These dates have been chosen as most suitable when surplus plants are available.

September 22nd is the date for the Autumn Show. In the evening the lecture will be "South African Succulents," by Mr. J. Brown. This is quite an occasion as we have the benefit of the vast experience of this well known exponent of the subject.

October 20th, Mr. P. V. Collings will advise us on "Preparations for the Winter." November 17th, our Chairman, Mr. A. J. Edwards, will help us in regard to "Heating," a subject he is professionally more than capable of dealing with. The lecture will not be technical, so that every member will get new light on this important subject.

December 1st is intended for a lantern lecture, the subject of which has not yet been selected.

It will be seen that all phases of the cultivation of our plants are covered and dealt with at suitable periods during the season. It remains to be seen whether the Council's deductions are what the members wish, but the programme provides a complete course of easy understanding of the underlying principles which govern successful cultivation of our plants. All of us have not green fingers, but real understanding of the basic principles can make up for the very useful intuition that some growers seem to have, bicycle pumps and other impedimenta included!

It is hoped that there will be small table shows at the meetings on March 17th, May 12th, July 28th, October 20th, November 17th and December 1st, by members bringing up plants for this purpose when every effort will be made to help members to identify their plants and to deal with any queries that may be raised.



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## REPORTS OF MEETINGS

**December 2nd, 1952 ; K. H. Walden and S. J. Pullen; Propagation by cuttings.**

Mr. Walden : It is sometimes quicker to have a mature plant from a cutting and one is also sure of having a plant identical with the plant from which it was taken. Some plants do not easily produce seed, and cuttings, therefore, are the only alternative. A plant which is not too presentable may be cut down and the top re-rooted.

A plant which has been affected by root or stem rot may provide some material for a new plant if caught in time, but with such cuttings it must be ensured that there is no trace of rot. Remove all such defects and cut back to sound clean flesh. Patience is sometimes necessary to get cuttings to root. I once had a *Mammillaria* rot right through except for a small portion up one side; I cut off this sound part and treated it as a cutting.

The best cuttings are from sound healthy plants. Stems that are hard and woody will not root as roots will not grow from dead wood. Better results would be achieved by cutting back to sound living flesh and let the plant make a perfectly new root system.

Use a small pointed knife to detach offsets from a plant, do not pull them off haphazardly. If the cutting is removed from a good plant, cut it from a place where its loss will be least noticed. There is no need to spoil a nice looking plant for the sake of a cutting. You will get less spines in your fingers doing it the proper way. When preparing the cutting, use a sharp clean knife, a stainless one is preferable, but a razor blade may be used for small cuttings. Make a straight horizontal cut as flat as possible and put the cutting on one side to dry out. Do not forget to treat the cut on the parent plant by a little dab of charcoal dust or sulphur to assist healing and help to stop excessive bleeding which occurs on some plants, though this sap does dry and help to seal the wound. The time necessary for drying off the cutting depends on the area of the cut surface, the type of cutting and the temperature. Do not hurry the insertion of the cutting, it is more likely to rot if not properly calloused.

Various mediums are used for rooting cuttings ; sand, gravel, granite dust, ashes, burnt clay, Vermiculite, and even suspended over water. I do not think it matters what you use provided it is a material which, though holding a small quantity of moisture, does not allow the cutting to stand with wet feet.

Put a few crocks in the bottom of the pot and fill to one inch from the top with sand, not too wet, and with about half an inch of dry sand on top. The cutting will set much better on the dry sand. Do not plant the cutting deep in the sand. Clip off some of the lower spines so that good contact is made with the rooting medium. It is safer not to water over the top of the soil, excessive moisture between the plant and the rooting mixture may set up rotting.

For difficult plants it is wise to plunge the pot containing the cutting into another container of sand. You can water the outer pot as much as you like and the rooting mixture will, through the porosity of the inner pot, get sufficient moisture for rooting.

The best time to take cuttings for rooting is in the summer when there is sufficient natural heat available, but a little bottom heat assists rooting. It is not necessary to give full sun, though a fully light position is best. When roots appear, pot the cutting in an open compost and do not leave too long in the sand. Long new fibrous roots do not take kindly to shifting, particularly with Vermiculite, if this is kept moist the cuttings will make long roots and they can be removed from Vermiculite without damage, but, unless care is taken in potting up, the roots can be easily damaged. A safe precaution is to allow the medium to dry off a little and, if it is Vermiculite, leave as much of it adhering to the roots as possible. Some people mix fertiliser with Vermiculite. This is only necessary if the cuttings are intended to remain in the mixture for some time after rooting. There is no nutriment in Vermiculite, and it is wiser to put into nutritive mixture when the roots appear.

Mr. Pullen : It is not generally known that *Gasterias* will throw small plants from leaves (Mr. Pullen demonstrated this from plants with small offshoots). *Gasteria lilliputana*, a fairly recent discovery, breaks up very freely and can be divided into separate plants.

*Echeverias* are quite easy to propagate and you can behead plants with little difficulty, but still treat them well and they will usually throw offsets from the old stem, which will readily root. *E. carunculata* does very well with me (a plant was demonstrated), yet it is stated never to throw offsets from the stem.

One method I use with *Echeverias* is, after cutting off the head, I put it into an inverted flower pot (demonstrated). The air with only slight light I have found encourages the growth of roots. Let the cutting dry off. Never pot until roots are showing and do not water till the cutting and roots have been potted for some weeks. A little bottom heat helps. Root in coarse soil, but when potting use better soil.

*Pachyphytum hookeri*, if left alone, will do its own propagation as its leaves drop off and throw up small plants round the pot. Our old friend *derenbergii* throws out blooms and new plants on stalks after about twelve months. I take them off as they root very easily.

*Haworthias* are very easy to propagate by taking off the offshoots. *cuspidata* offshoots and roots very freely.

It is much quicker and easier to propagate succulents by cuttings than sow seed which are seldom true to name.

It is interesting to note that the "Cape Argus" (South Africa), in an article "How to start Succulents," gives two recipes of soil to suit different kinds of plants. One is two parts of clean builder's sand with one part of leaf mould, the other, six parts of builder's sand, three parts of leaf mould, one part of clay soil, one part of old cow manure and one part of brick dust. Of course, this is for plants cultivated in South Africa, their native country, and would hardly be suitable for here with such different climatic conditions.

LISTS RECEIVED. T. N. Blackburn, Woodplumpton, nr. Preston. Eight paged list of cacti, *Mesembryanthum* and other succulent plants.

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No. 2

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## SOCIETY NEWS

### 1953

May 12th 6.30 p.m.

A. Boarder : Outdoor Culture of Plants.

June 23rd 6.30 p.m.

SHOW.

July 28th 6.30 p.m.

G. D. Rowley : Watering, soil, light and air.

Discussion : Pests and Diseases.

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EDITORIAL

First let me apologise for my editorial in the January issue. There I stated would be found the completion of the Schwantes MSS. It should have stated that the volume, No. 15, would see the completion of the Schwantes MSS. It certainly was intended there should have been insets towards this end, but it was necessary to complete the extra long index to volume 14, probably about the longest index to any cacti periodical. Other matters had to be held up and I was unable to complete the Preface to the MSS. in time. The title page, list of contents, list of illustrations, were ready. Postage then came into the picture as well as the index to the MSS. The Journal itself was already printed so that I had no opportunity to amend the editorial. However, various insets accompany this issue of the Journal and I hope to reproduce all the pictures accompanying the MSS. before the end of the year, in a form that can be embodied in a book.

Mr. Rowley's article in this issue is of particular interest and I have used a whole page of the illustrations because I feel they are so necessary.

This number also includes the beginning of a monograph on the *Ophthalmophyllum* by Dr. A. Tischer. It is indeed a fine opportunity to record this important work and we are very grateful to Dr. Tischer for his kindness. Some photos have been sent me by Dr. Tischer and they will appear in the next issue. I have to thank Mrs. G. Peters for undertaking the translation of the monograph.

Earlier it looked as though I should not be able to complete this issue without writing some articles myself. I happened to mention this in Council and, with his usual generosity and helpfulness, Mr. Boarder offered a further article. Fortunately (not intended to apply to Mr. Boarder !) I have been able to complete the issue, but I have received an equally extremely interesting article from Mr. Boarder in regard to his own history in cacti. It was intended to help me, as a fill up, but the article contains a very great deal that I know will interest members and it will be reproduced later.

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Mr. J. Calle, 28 Avenue des Gobelins, Paris 13e, France, the editor of the French Journal "Cactus," is desirous of completing his collection of our Journals and if any member has any of the parts not mentioned as available on the inside of the front cover of this number, would they write and offer them direct ?

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## CACTUS CULTURAL NOTES

By A. BOARDER

By the time you receive this Journal you should be well into the beginning of another growing period. I have no doubt that you will have many plants in flower already and many more will be in bud. No matter how dull and long the winter, many plants never fail to flower by this time. Very early in the season one looks for the occasional bud, but as the season passes, the appearance of buds mean nothing out of the ordinary and they are just taken for granted.

Before January was out I noticed that a *Mammillaria longiflora* seedling was in bud. This plant was from a sowing of seed in February, 1952, and now, in February, 1953, has two prominent buds showing. Each year I have raised this species I have found that I am able to get it into flower in fourteen months from the actual seed sowing. On the new pamphlets for the Society there is a photograph of this plant which I had raised many years ago, and it has brought me one or two queries as to whether the dates shown are correct. I can assure readers that on every occasion when I have sown seeds of this plant, I have been able to flower them within the fourteen months. I have just made a further sowing of the same species and I will guarantee to have some plants in full flower in April, 1954. There are, of course, several other *Mammillarias* which can be flowered the year after sowing the seeds and many of these have been mentioned by me in previous articles. When I first raised this plant I had it under the name of *M. ocamponis* and it was suggested then by some members that it was a *M. longiflora*. When making comparisons since the war with other seedlings of *M. longiflora* the resemblance of the two has been very marked. This year I have been able to procure some more seeds of the so-called *M. ocamponis*. These look smaller than my own saved *M. longiflora* seeds and so I shall look forward eagerly for their development so that I can check up once again.

It is strange how difficult it is to be sure about a particular plant name. I have several *Mams.* in my collection which I have raised from seed, which do not appear to resemble the correct plant according to Craig and other describers. In these cases of doubt I keep the plant under whatever name I raise it under and, if still in any doubt, I try to get seed of the same plant from a different source so that, in time, I have a double check. Many small seedlings do not take on the adult form immediately and it is possible to find that although a number of seedlings may look alike at first, they become very different as they grow on.

All growers with a greenhouse should have their seeds planted by now. It is not too late by any means, but the earlier sowings are much more easy to get through their first winter if they are of a size which can be potted up or, at least, have been transplanted and well settled in their new containers before the end of October. On the other hand there is no sense in sowing seeds before you are able to get some warmth, as, although not absolutely necessary, it is a fact that seeds of cacti germinate much more quickly and safely at a temperature of 70-75 degrees than are likely to at 50 degrees. The end of May is not too late for seed sowing, but if they can be planted before this you will have less trouble later on.

The re-potting of all plants should now be well in hand. It is a very good idea to start on those plants which already show signs of new growth. I like to start on the larger plants first and, as I have so many to do, I have often to begin with some of those which do not actually show new growth. The soils recommended by me and the directions for re-potting have been described by me before, but there are one or two points which it will be well to emphasise. See that all fresh pots are well scrubbed before use and remove all old earth from the roots. Remove all damaged roots and if a plant is found which does not appear to have any healthy roots left this plant must be placed on one side for special treatment. It is absolutely no use potting this plant up like the others as in all probability it will only start to rot at the base, especially when you start to water it. Any plant without roots must be examined carefully to see if any of the base is damaged. Sometimes a plant forms a hard brown skin at the bottom and, although it is not impossible for such a plant to put out fresh roots from this, it is a fact that if the old hard skin is cut away to new healthy growth, this part will be far more likely to make new roots. When such a plant has been found it should be placed where it can be watched. Place the plant on some Vermiculite and when the weather is right it can have a light spraying with warm water. Although the rooting compost must not be dry all the time it is more dangerous to keep it constantly wet. If Vermiculite is used as a rooting medium the plant can be lifted up now and again to watch for the start of new roots. When a good system of new roots has been formed, the plant can be potted up correctly, but it must be placed away from the main collection, for careful watering, for some time. It is surprising how long an old plant will take to really get going again when the old roots have died.



Once the plants start to flower it is a good plan to make a note of them, as this happens, for record purposes. A card index system is very useful for recording such information. If seed is required from any plant it may be necessary to pollinate the flowers with a small camel hair brush. Some plants are self sterile when they must be assisted in some way. Try to keep to the same species or you may get many hybrids among the seedlings. Even if you do not require the seeds for sowing I think that it is a good idea to pollinate as many flowers as possible because if the flowers are not so attended to they will not produce seed pods. I consider that seed pods, especially on such plants as *Mammillarias*, are very ornamental indeed. This is always noticeable during the winter months when flowers are so scarce. This display of coloured fruits has been the main attraction in my greenhouse the whole winter and the best plants for this are the types which used to be known as *M. pusilla* and *M. multiceps*. I have five different types of these which I have had as *M. multiceps*, *M. multiceps* var. *texensis*, *M. multiceps texensis major*, *M. stellaris* and *M. castaneoides*. Some have white spines, some yellow, while the whole plant has a bluish look in others. Whatever their right names, they do make a wonderful show with their berries. These types have fruits which last for about a year and I do not know any other type of *Mam.* which carries its fruits unbroken for so long a time. On one of them now named *M. prolifera* I have counted over a hundred fruits. The plant, a six-year old from seed, has many heads now and each head has been well covered with fruits. These types are rather common and some people may despise them, but no others come up to them for fruit display.

Be careful with all watering of newly potted plants ; it is far safer to keep them only just occasionally moist than to water too often. You must watch the weather and the new growth on a plant to make certain how much and how often to water. As much air as possible must be given all the time now and the question of any shading will have to be left to the individual. If the house is in a very exposed and sunny position and the owner is likely to be away from home during most of the day, it may be necessary to shade slightly. I do not like any form of semi-permanent shading for as sure as the stuff is put on the glass the weather will change and no sun is seen for weeks. The ideal would be to have light blinds which could be rolled down during the very hottest part of the day and then they can be removed when the sun loses its power somewhat. Some of our cacti are not too happy when exposed to the strong sun in an unshaded spot, and such plants are best placed in the shade of a larger plant. In their native habitat it is possible that the only seedlings to reach maturity are those which grow within the shade of a larger plant.

For those growers who are keen on *Mammillarias* I must recommend the various varieties of *M. rhodantha*. These plants are usually simple, that is, they do not make off-sets. I like them partly for this reason and partly because many of their spines shine beautifully in the sunshine. They grow in a very symmetrical manner and a well-grown specimen is a joy to see. One or two plants I raised from seed in 1946 are now about  $4\frac{1}{2}$  inches across and six inches high. I have many varieties including, *chrysacantha*, *pfeifferi*, *pfersdorffi*, *fulvispina*, *rufispina*, *pyramidalis*, *droegeana*, *crassispina*, *sanguinea*, and one or two which answer to no particular variety, but have some slight difference. Now I know that in all probability many of these names are incorrect, but they do tend to enable me to keep the seedlings from them in their right places. The difference in the plants is mostly in the length and colour of the spines. Most of the radials are white, but the centrals are from white, through the yellows to brown and then to shades of red. The red ones are particularly handsome. Some have quite short spines whilst others have very long ones and one or two have inter-twining ones similar to *M. pringlei*. The flowers are all dark magenta and generally come late in the year. The fruits are fairly large and dark red or plum-red. They only last in colour a few weeks, when they lose sap and dry up.

Several members have again had red marks (rust) on some of their *Opuntias* especially the *microdasys* species. This rust is encouraged by cold damp conditions and, apart from trying to keep the greenhouse as warm and dry as possible, it is difficult to prevent these tiny spots of rust from appearing during the winter. The only thing which seems to control this trouble is Tulsan. It is bought in powder form and mixes with water. Only a little need be mixed at a time and it can be applied with a fine spray. Another pest which has caused much trouble is the larvae of the Mushroom fly. The fly is very tiny and can run about among the pots at a fast speed. It lays its eggs on or near the base of small plants and the larvae which emerges eats into the soft tissues of young seedlings. The plants are sometimes found lying on the top of the soil without any roots or base. The larvae are almost transparent and can only be seen as a rule with the aid of a magnifying glass. They are very difficult to kill when in a plant, but the fly can be controlled with D.D.T. A good spraying with Sybol occasionally will help to rid the house of the pest.

Remember that plants in living rooms must not stand directly on a saucer, some pebbles should be under each pot so that any surplus moisture can drain away.

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## CULTIVATION OF SUCCULENTS

By W. DENTON, B.E.M.

We are now looking forward to the growing season after one of the worst winters I have known for many years. I am afraid I have had quite a few casualties as I expect most growers will have had who manage a fairly large collection. The December fogs have been responsible, no doubt, especially for people in the neighbourhood of large towns.

After all, one soon becomes tired of cleaning and washing down greenhouse glass, but it must be done because light is the most important thing of all with the cultivation of succulent plants. A certain amount of re-potting should have been carried out by now. If you are dealing with a collection of cacti, you are able, more or less, to deal with the whole collection at once as most of these plants are summer growers and could be dealt with in March or even earlier. This is not the case with the succulent collection, however. *Cotyledons*, *Echeverias* and numbers of *Euphorbias* could be dealt with now, or even earlier. Stemless *Mesembs.* are a different proposition. *Lithops* should not be interfered with till May and even later. Some *Cheiridopsis* do not become active till late in the year. *Conophytums* should be left till August and cuttings of these will root well in September.

You will remember in the Journal of last July I complained that my *Lithops* were not doing so well and that there was very little appearance of flowering. I also stated that root bug was very bad and that I found I should have to do a certain amount of re-potting. I carried this out in the latter part of June. To my surprise, the whole of these plants took on a new lease of life and within a few weeks nearly all were showing buds. Even the famous *optica* showed a little colour in the bud and this is always the last to flower and in many years you never see the sign of a bloom. I note that Dr. Schwantes, in his remarks on the cultivation of the genus, recommends that they should be kept a little warmer than most in winter to encourage the earlier formation of the plant bodies, hence helping to make for a better and earlier show of flowers. I think this is well worth a little attention by all of us who are interested.

To come back to the potting for a few moments, I see no reason to alter the compost I have used now for some time. John Innes mixture with added sand and additional lime rubble to suit particular varieties. Always use perfectly clean pots with one good crock in the bottom and then about one inch of lime stone grit, introduce a small crystal of paradichlorobenzene (obtainable at "Boots") to help keep away root bug. Care should be taken in removing plants from the pots not to damage them. If in doubt, break the old pot; a light crack or two will separate without any damage to roots or branches. There is no other way to deal with, say, a decent specimen of *Euphorbia caput medusae* with the branches hanging down the side of the pot. Remove carefully most of the old soil and you will notice that many of the old roots are dead, particularly with *Mesembs.* This is in the natural order of events with numbers of these species, *Lithops* and *Conophytums* especially. Remove these old dead roots and re-pot into entirely clean soil, using a pot one size larger, if necessary. Do not over pot, a small plant in a large pot is never satisfactory, it is better to allow our plants to make use of existing soil quickly and re-pot more often, thus preventing a larger body of soil becoming stagnant.

*Haworthias* should be re-potted about May although, with me, they do not start to grow before mid-summer and even later. A certain number of the roots of these die off annually and should be removed and then shifted to clean pots, not necessarily of a larger size. It is as well to remove some of the offsets to keep them a reasonable size and not a mass of small pieces.

I promised to say something more about the genus *Titanopsis* in answer to several requests. You will remember last year I stated that I had a plant of *Titanopsis hugo schlechteri* which had been in my cultivation for three years and I had great hopes it would go on being healthy for the fourth year and explained my reason for this. To my regret I have now lost this plant. Having occasion to write to Dr. de Boer about several matters, I raised this question with him. He tells me he has a plant of *Titanopsis setifera* fifteen years old and that his method is to give this a resting period in summer and encourage growth to take place in late autumn. This gentleman is a well known continental grower, whose opinion should be treated with respect, so I propose to modify treatment accordingly and see what happens. My own plant of this particular variety I have had many years longer than this, and this, with the famous *calcareae*, I find no difficulty with. It is the others that are hard to manage and I believe will always be short-lived plants. I am certain of one thing, they must be cut up frequently and that when they are in good health and vigorous. It is so easy to be deceived with these and other *Mesembs*, they appear to be alive

even when the roots are dead. Although the tops seem to be alive and green, you are not able to root them when action from the root is stopped.

Last August I had given me a large plant of *Conophytum luisae* with dead roots. This is not one of the stemless varieties, but one which, after a few years, makes stems quite four inches long. There were about fifty branches and the end growths seemed alive and healthy. I carefully cut these back to what I thought healthy tissue and potted them. Half went into Vermiculite and the others into ordinary sandy soil. Conditions were right for rooting. The time of the year and bottom heat available. The result of this was that I only succeeded in rooting four out of the lot. This proved to me that as soon as the roots die changes take place in the structure of the plant and it becomes difficult to root the apparent live pieces.

Now is a very suitable time to take cuttings if you wish to increase your stock. *Fenestrarias*, *Nananthus*, *Titanopsis*, etc., are easy subjects and start off well in Vermiculite; take care to re-pot in ordinary soil as soon as roots begin to form.

The advantage of Vermiculite is that you can remove your cuttings for examination without damage.

*Stapelias* should be carefully overhauled now and if there are any signs of the dreaded black spot, be ruthless and cut clean out. It is easy to root a few of the new young growths and these make more satisfactory plants and flower freely. I believe this is another genus that should be divided frequently to obtain more vigorous plants.

If available, bottom heat is an advantage and I believe the whole of this interesting Family, *Stapelieae*, could do with a little more warmth than we generally provide.

You will notice that the *Conophytums* now begin to show a purple hue on the stems; this denotes they are going to rest and should not be given any water for the next few months. A good investment for these is a frame outdoor, one on brickwork that you could fill with sand to within nine inches of the top light. Plunge your plants in this and keep the pots cool as they like full sun on the actual stems. Leave the light off in favourable weather, they do like plenty of air. What is taking place is that the new stems are on the way and being nourished by the sap in the old ones. A very interesting group of plants these for people with restricted space, as they only require small pots and can always be relied upon to give you a few flowers provided you keep to a few simple rules that have been given in our Journal many times.

I have said nothing about seedlings in these notes, but our back numbers have a wealth of information about this. Mr. Boarder's remarks about seed raising apply equally with succulents and you could do no better than follow his instructions. I am in perfect agreement with his methods. A little shade for young seedlings and plenty of air for all is a golden rule.

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## MEXICO—continued

By HOWARD E. GATES

Upon our return to Mexico City, we joined the Sunday morning throng at the floating gardens of Xochimilco. At one time these gardens grew upon floating masses of debris in a lake. Now the territory is drier and the floating islands became anchored to form rich vegetable and flower gardens, intersected by numerous canals. Every Sunday morning the Indians decorate the fronts of their flat-bottomed boats with arches and fanciful designs done in bright coloured flowers. From four to a dozen chairs are in each of the boats which are poled down a broad canal between the gardens and back again. Other flat-bottomed boats carry photographers and salesmen of bright serapes and novelties. Boats carrying orchestras drew up alongside and for a small sum would render a serenade. Small dug out canoes were packed with crushed ice in which drinks were imbedded to cool. Other canoes were filled with vendors of flowers and fruits. Small purple orchids were sold as cheaply as the commonest flowers at home. A distinctive feature of this area are the rows of tall trees resembling Lombardy poplars which line the canals. Another is an abundance of tiny plants floating on the water. On shore nearby were cafes and a market place with an abundance of attractive and usually very colourful merchandise.

For a couple of hundred miles west of Mexico City, the road stays high in the wooded mountain country, through this area were many flowering trees and shrubs. Occasionally *Agaves* were noted on the slopes. We did not see any cactus other than occasional *Opuntias*.

We never regretted that we took time to turn off the main highway to Uruapan and the youthful Paracutin Volcano. Most of this side road winds through many conical hills, every one of which appears to be a volcanic cinder cone. These hills are covered with a pine forest which forms the basis of a lumbering industry. The squared timbers are lashed to the sides of burros and with the ends trailing, are carried to town. We found accommodations at the

Posada Bugambilia. Probably you will recognize its flowery namesake in the pronunciation rather than the spelling. Just outside of the city is a national park surrounding the place where the Devil is said to have stumbled and fallen. Where his elbow hit the ground, immense springs gush forth to form a beautiful river. In spite of the elevation, this district is tropical. Coffee grows in the park and the trees carried *Bromeliads* and blooming orchids.

Since part of the road to Paracutin is very rough and the bridges merely logs laid together, we preferred to hire a taxi for the trip to the volcano. In most of Mexico, taxi-cabs may be secured for a flat rate of about a dollar an hour regardless of the number of persons. We arrived at the lava flow about an hour before dusk as the volcano is most spectacular at night. A village of two thousand persons was almost completely buried in lava shortly after the volcano sprung up in a cornfield in 1942. In an air line, this village was some two miles from the crater. At the time of our visit there was a continuous rumble and a pillar of smoke ascended into the sky. I took the short trip over the lava flow to where the large church had been buried to the base of its steeple. On the way I noted corners of houses and garden walls protruding from the edge of the lava. Many of the tourists rode on ponies up toward the crater where the rocks are still warm and the rivers of glowing lava seem almost under foot. This and the floating gardens are two places that really live up to the advertising.

Uruapan is the centre of the inlaid Mexican lacquer work. The Indians rough out wooden bowls and trays in their mountain homes. In numerous home industry establishments in the city, the bowls are completed and covered with a heavy coat of lacquer. The designs are cut out of this base coat and lacquer of various colours inlaid to complete intricate designs of birds and flowers.

Upon returning to the highway we headed westward again. Speaking of highways reminds us that we must not miss mentioning the motor bus systems of Mexico. It is a big business that extends everywhere, even to the back country roads. There are all sizes, shapes and colours in first, second, third and mixed classes. Along the top of many buses is a rack for carrying freight. If a farmer has a few sacks of produce, a crate of chickens or a bundle of baskets to go to market, he merely takes them to the nearest bus route and his freight is carried on top while he rides inside. On Sundays and holidays, so many people line the roads waiting for the buses, one wonders where enough will be found to carry them all.

East of Mexico City we saw many farms planted to broad leaved dark green *Agaves*. These spread widely with drooping tips. Over in this territory to the west we found great plantations of a narrower, gray-leaved and more erect species being used for cultivation. The plants were regularly spaced about ten feet each way in rows and often the dangerous terminal spine was trimmed off the leaves. We were told that *Agave* plantations were so profitable that if a native owned two thousand plants or more, he could afford to own and operate an automobile.

Guadalajara was rather a disappointment to us even though it is the second largest city of the Republic. We found it to be just that. A large city without spectacular features set in a broad valley devoted to cattle raising. The most interesting spot was the suburban village of Tlaquepaque, a centre of Indian pottery making. The work is done in numerous small establishments by hand. No stencils are used and even the decorating of great six foot urns is done by freehand painting. We found the workmanship good and the prices unbelievably low.

West of Guadalajara is the great canyon known as Las Barrancas, whose engineering and construction difficulties delayed the building of a motor highway from the west coast for many years. In the bottom of the barranca we passed some gigantic plants which appeared to be *Pachycereus pecten-aboriginum*. Then west of the barrancas, we passed through a lava flow in which were *Pachycereus*, *Cephalocereus*, *leucocephalus* and a smaller *Cereus* that we did not recognize. *Cephalocereus leucocephalus* is interesting in that it produces a goat's beard cluster of woolly spines on the cephalium side of the branch..

Tepec we found to be a progressive city on the edge of the coastal tropical district. We were unfortunate in our hotel assignment. The room was on the second floor just over the bar room, and half a block away was the cathedral whose bells rang intermittently all night in connection with ceremonies for the Day of the Dead. In the morning we passed many persons bearing wreaths of natural or paper flowers to decorate graves.

Between Tepec and the port of San Blas, we got our first glimpse of wild *Poinsettias* in blossom. They appeared to be nearly as large as the kinds we cultivate in our gardens. The road to the shore wound down through a wet tropical jungle characterized by several kinds of graceful palms. A few giant cactus grew on low hills rising above the jungle. Along the shore were groves of coconut palms and several large resort hotels.

From San Blas northward, the highway lies about twenty miles inland at the upper edge of the jungle and yet outside the mountains. Three times we had to ferry and twice to ford rivers. At the widest river the ferry was attached to cable and nudged across by a motor boat. At the other two, transit was accomplished by men pulling on cables. As each ferry was able to carry only two vehicles, sometimes there were delays in crossing.

About seventy-five miles south of Mazatlan, *Pachycereus pecten-aboriginum* became abundant and there were a few *Acanthocereus*. One of the striking features of western Mexico was the great abundance and variety of morning

glories. To one accustomed to the more arid peninsula of Lower California, it was strange to see them draped over the tops of giant cactus and tall trees. Mazatlan is a city of forty thousand setting on a small peninsula jutting into the sea. Rugged hills form headlands protecting small bays on several sides and a good commercial harbour on the south. It is just a few miles south of the Tropic of Cancer and was the warmest place we visited on our whole month in Mexico. We had a large fifth floor bedroom with its own private balcony overlooking the Bay of the High Waves. We noted there were only a pair of sheets and a thin spread on each bed. At our request the maid brought us blankets, but we never used them. In fact most of the nights we were not even under a sheet. The hills behind the city are quite well covered with trees and shrubs. The only two cactus I could find were *Pachycereus pecten-aboriginum* and *Acanthocereus occidentalis*. However there was a furry broad-leaved weed whose leaves clung so tenaciously to clothing that they would tear to pieces before they could be pulled off. Possibly this was the cause of an itch that caused my legs to swell and be irritated for six weeks.

When we were ready to leave Mazatlan for Durango on Monday morning, there was not a litre of gasoline at any service station in town. As it was noon before we were able to purchase the sixty litres we needed, we were forced to stay over for another night. The hard surfaced road gave way near Concordia to a well graded dirt road and as we ascended into the mountains this in turn became a single track road cut into the mountain sides and climbing right up over ridges. The tropical jungle of the low lands gradually gave way to a dense growth of other types of trees and shrubs. As we ascended we passed through areas with Poinsettias, various *Agaves* and *Bromeliads* and after hours of travel came into an immense pine forest on the summit and eastern slope of the Sierra Madre of the West. The dot on the map marked El Salto proved to be a lumber company town of some ten thousand. From this point a splendid new highway led through upland grazing country and scattered farms to Durango. We consider the two hundred miles from Mazatlan to Durango to be the most scenic of any day's travel in Mexico. This road is the only uncompleted section of the Matamoros to Mazatlan cross country highway. Even though it will soon be paved, it will never be a very high speed road on account of the many grades and sharp curves.

The loquacious traveller always seems impelled to make some remarks for the benefit of those who follow his footsteps. The roads indicated on our maps as all weather highways are well engineered and good. The usual speed limit is about fifty miles an hour though a long straight stretch in Chihuahua is posted with an eighty mile limit. Straying cattle which wander over the highway at will are greater hazards than the traffic. The supplying of gasoline seems to be the monopoly of a government-owned corporation. Consequently there are never three competing service stations at an intersection. In country districts, service stations are widely spaced and in cases a hundred miles apart. Consequently it is never advisable to pass a service station unless the gas tank is at least half full. Repair garages and auto agencies are only found in the larger cities and towns. It is well to carry a few small parts as fan belts, spark plugs and breaker points in addition to a good jack and tyre repair materials. All of the cities are connected by air lines. Travel by air is more popular in Mexico than it is in this country and cheaper.

Tourist accommodations vary in type and price. All the larger cities have both hotels and auto courts that are acceptable. All places catering to tourists have dining rooms with palatable food. However the service is often inefficient and slow, and breakfast is often too late to permit a real early start. Lunch hours are usually one-thirty to three, and dinner from seven-thirty on. Even though lodging rates are set by the government tourist bureau, the rates along the main north and south highways and in Mexico City are much higher than in the cities off the main route. The splendid accommodation at Tehuacan cost only one third what similar ones would cost in Mexico City. Acceptable lodging and eating places are spaced so far apart that the botanist who wishes to spend much time in the back country will find it better to carry his own camping equipment for occasional use.

We had no trouble with light-fingered gentry, but we were advised to always keep the car locked. Automobiles are seldom stolen but accessories, baggage and any thing loose may disappear. Owners of convertibles, whose tops may be slashed open with a knife are often unfortunate. Many of the hotels have garages or enclosed patios where cars and equipment are safe.

Travellers cheques are acceptable in all cities as well as American dollars, but the traveller's cheques usually bring a little higher net in exchange. Bank money orders and personal cheques are much harder to negotiate.

We met one young woman in deep distress because she was having to pay for many things that were supposed to have been included in the costs of her "package" tour. Purchasers of such tours should be careful to ascertain just what is included and to have proper receipts or tickets verifying them.

Many persons are affected for a time by the high altitude of Mexico City. Their troubles are usually featured by stomach disorders, though others are only troubled with shortness of breath or extreme nervousness when fatigued. Those who eat food and candy sold by the street stands or are careless in their selection of drinking water may contract the Tourist's Disease, which is a term for bowel disorders. Most of the windows in bedrooms are not screened. In some places it is well to spray against mosquitoes before retiring.

## OPHTHALMOPHYLLUM Dtr. et Schwant.

By Dr. A. TISCHER

(Translated by Mrs. G. Peters)

The genus *Ophthalmophyllum* was set up in 1927 by Dinter and Schwantes in Moeller's *Deutsche Gaertnerzeitung* p. 64, by separating it from *Conophytum*. The type species given was *O. friedrichiae* (Dtr.) Dtr. et Schwant. In Schwantes' system *Ophthalmophyllum* is in Sub-tribe 17; *Conophytinae*, within Tribe 1: *Ruschiae*, also within the Sub-Family 1: *Ruschoideae*.

The, at first, only slightly known differentiating characteristics dividing them from their very near relatives *Conophytum* N. E. Br. are clearly described by Schwantes in "Kakteenkunde" Jg. 1934, page 58. Typical of all species of *Ophthalmophyllum* is the nearly cylindrical to skittle shaped growth of each individual body which is either not at all, or only slightly compressed at the sides, the relatively soft fleshy appearance of the body and the presence of the marked and enlarged "windows" on the upper side of the free lobe tip. But they differ still more from *Conophytum* by typical characteristics in the structure of the flower. Schwantes mentioned particularly that with *Ophthalmophyllum* the lower part of the calyx tube and the corolla tube are more or less intergrown, whereas with *Conophytum* both tubes are separate right down to the base. Most recent observations of the flowers have resulted in still further different characteristics to those of *Conophytum* flowers, so that, by now, we are able to detect the different species by means of the flowers.

Now we are able to arrive at the typical characteristics of species :—

Stemless succulents, single plants consisting of 1-2 bodies, or by offsetting, forming clusters; internodes very short, single stems more or less cylindrical or skittle shaped, 1.5-5 cm. high, 1-2 cm. in greatest diameter, on the sides not at all, or only a little compressed, at apex more or less short two tipped (bilobial), lobes more or less rounded, in a few species an indication of a blunt keel across the slit. The upper part of the lobes bears a more or less large connected "window," or else a number of closely placed large dark spots ("miniature windows") which sometimes run over the edge of the upper part; the stems are of soft flesh, the surface is more or less hairy, or somewhat rough. The colouring of the bodies is purple red, brownish red, ochre, dark olive, yellowish green, light green to grey green; flowers with two bracts; fruits evenly enclosed; calyx and corolla tubes relatively short and wide, below more or less grown into each other, corolla segments numerous, towards the centre very much shortened and narrow (staminodes?), white, independent of the colour of the outer corolla segments, flowers white, pink or purple, filaments the full length of the corolla tube, projecting out of the corolla tube, 6, very rarely 4-5 stigmas, thread like, style O, or only short; fruit deepened bowl shape, in the centre usually somewhat skittle shaped in elevation; disk at the upper edge of the ovary mostly strongly developed, dark to olive green; flowers expanding in the day time.

The flowers of *Ophthalmophyllum* differ from those of *Conophytum* in the following characteristics: the partly intergrowing of the calyx and corolla tubes below, the bowl like deepening of the fruit at the upper side, disk above the edge of this bowl, the presence of numerous staminodial corolla segments and the comparatively long stigmas with, or without a very short stem.

Up to date, there have been described seventeen species of *Ophthalmophyllum*.

The habitat of this genus is known to be an area bordered by a line from Steinkopf to Van Rhynsdorp in the north, in the west above Nieuwefontein-Alwynsfontein—thirty miles south of Pofadder-Kakamas-Keinos-Warmbad-Steinkopf. But it is quite possible that they could be found outside this area. There is the possibility that there may still be more species to be found besides the number already mentioned.

Very little is known about the climatic and soil conditions of the *Ophthalmophyllum* in their habitat. The collectors have reported that they are especially hard to find when in their resting stage. Near Warmbad they occur in fine sandy soil and in the resting stage they shrink together very much, so that only the trained eye can detect them by tiny soil indentations, but they re-appear during the growing stage. In their habitat they can stand a long drought. The habitat of the *Ophthalmophyllum* are the driest in the South African floral district.

In cultivation it is possible to keep the plants alive for many years. With right handling and treatment they keep their natural shape and colourings and it is not hard to get them to flower. The blooms are relatively impressive and cover most of the body and the top of the plant completely. They have numerous petals and their development and opening takes several days.

To obtain typical plants it is necessary to place them as near to, or under the glass, as possible, in the lightest and sunniest place. The soil should be fine sand, mixed with a little, not too heavy lime, or finely powdered bricks or mortar and about one-fifth of fine leaf mould.

As *Ophthalmophyllum* have only a very tiny root system, the watering must be done from the top, but only on sunny days, so that the soil can dry out quickly. In the rest stage, which, in Europe, is about from the middle of May to the middle of August, they must be kept absolutely dry. During this time they cover themselves with

the dried up skins of the old body in the same way as *Conophytum*. In this stage the stem shrinks considerably towards the base, so that they appear much shorter compared with their growing times. If one places a few small stones or pebbles around the base of the stems, the plant seems to disappear in time, similar to its natural behaviour in its habitat. The "windows" become, at this stage, quite dull and are partly covered by warts. From about the middle of August and onwards you can start to water the plants, a very little water is sufficient, at most once a week. The stems start to swell quite a lot and thereby split the old skins.

With sufficient sun, which is expressly needed at this time, they regain their natural colouring and the "windows" are again clearly visible. The flowers appear mostly at the middle or the end of September. From the end of October onwards, *Ophthalmophyllum* must be kept completely dry until at least the end of March. Where they are kept in the winter must be light and cool (about +10 Cels). From the end of March onwards one can, on sunny days, carefully water the plants at fortnightly intervals until the end of May. *Ophthalmophyllums* will survive the most severe drought. I will, therefore, experiment if the resting stage could be, in Europe, drawn out from October till August. The only danger for *Ophthalmophyllum* is overwatering. With the right treatment one can keep them satisfactorily in our collections. I have already grown successfully an *O. friedrichiae* since 1923. The plant has, in this time, hardly altered at all.

*Ophthalmophyllums* are, in the resting stage, real "mimicry" plants, which, in their native land, are very difficult to detect. The same effect can be attained here in our collections by surrounding them with stones or pebbles nearest to their own colour. When visitors come to see my collection, I ask them to tell me how many plants there are hidden amongst these pebbles and stones in the *Ophthalmophyllum* box. They are always set to solve a very interesting puzzle.

#### Description of the known Species

##### 1. *O. acutum* (L. Bol.) Tisch. comb. nov.

(*Conophytum acutum* L. Bol. in L. Bolus, Notes on *Mesembryanthemum* III, page 189).

Plant inverted skittle shaped, 1.1 cm. long, at the transparent tip 7—9 mm. in diameter, centre about 10 mm. in diameter, slit 3—4 mm. long, bracts 3 mm. long, vagina 1 mm. long, calyx transparent, corolla white, up to 1.3 cm. long, 8 mm. in diameter, 26 segments, in four series, pointed, 4—5 mm. long,  $\frac{1}{2}$  mm. wide; stamens 19, in two series, affixed on top of the tube, filaments white, 3—4 mm. long, anthers yellow, disk a little granulated, 0.5 mm. high, 3 mm. in diameter; ovary a little hollow on top, in the centre arched slightly skittle shaped, style 1.5 mm. long, stigmas thread like, papillate, 4 mm. long.

Habitat: Distr. Van Rhynsdorp, near Bokkraal, Bushmanland, one hundred miles south-east of Springbok (Jacobsen).

##### 2. *O. caroli* (Lav.) Tisch.

(*Conophytum caroli* Lav. in L. Bolus: Notes II, page 378; Kakteenkunde 1935, page 86; L. Bolus in Notes III, page 209).

Plant simple, 2.2 cm. high, 1.2—1.8 cm. in diameter, compressed cylindrical, bilobial on top tower shaped, lobes flat and windowed, surface papillate, beneath the old skins green, on top purple brownish, windows transparent green, calyx and crown tubes 3 mm. long, at base 1.5 mm., intergrown, calyx tips 1—4 mm. long, corolla segments 23—27, spadelike, blunt on top or notched, white, inner ones numerous, staminodial, white; ovary concave on top, in centre slightly raised skittle shaped; 6 stigmas, 10 mm. long; style 0.

Habitat: Bokkraal, Bushmanland.

The inclusion of this species in *Ophthalmophyllum* is rightly established. Calyx and corolla tubes are 1.5 mm., intergrown, the numerous inner corolla segments are staminodial and white, typical of this genus, the ovary is indented bowl shaped on top, the stigmas are relatively long and without a style.

##### 3. *O. dinteri* Schwant.

(Jacobsen, Succulent Plants, page 226).

Plants simple (or —2?), stem 1.8—3 cm. long, 1.5—1.8 cm. in diameter, slightly compressed cylindrical, at apex short bilobial, lobes flat rounded on top, sometimes slightly slanting, slit continuous, surface bare, slightly papillate, stem dark copper to purple brown, lobes at apex transparent dark green, windowed, there are a few transparent dark green spots on the edge of the window ("miniature windows"), calyx and corolla tubes 4—5 mm. long, for 3 mm. intergrown, calyx with six tips, 3 mm. long, 45—55 corolla segments in 2—3 series, spade like, —1.2 cm. long, 1.5 mm. wide, white at base, apex magnificent lilac-purple, the inner segments are much shorter and narrower, changing into a large number of white staminodes; filaments exerted; ovary 3 mm. deepened bowl shape above; disk at the upper edge of the ovary, slightly elevated, narrow, dark green; 6 stigmas, fine thread like, 8—10 mm. long, light green.

Habitat: Great Namaqualand, south-east of Warmbad, near Vaaldorn and Eendorn, Kriegskuppe south east of Vaaldorn and most likely further easterly as well.

4. *O. friedrichiae* (Dtr.) Dtr. et Schwant.

(*Mesembr. Friedrichiae* Dinter in "Neue und wenig bekannte Pflanzen Sudwest-Afrikas," page 41 ; Monatsschrift der Deutschen Kakteengees. 1920, page 132 ; *Derenbergia Friedrichiae* (Dinter) Schwant. in Zeitschr. fuer Sukkulentenkunde 1925, page 138 ; *Lithops Friedrichiae* N. E. Br. in The Gardeners' Chronicle 1926, 1, p. 102 ; *Succulenta* 1927, p. 74 ; Moeller's Gartnerz. 1927, p. 64 ; *Conophytum Friedrichiae* Schwant. in Zeitschr. fuer Sukk. kunde 1927/8, p. 27 ; Gard. Chron. 1927, p. 372 ; L. Bolus : Notes on Mes., 1, p. 37 ; Zeitschr. fuer Sukkulentenkunde 1924, p. 42 and 60 ; Jacobsen ; Die Sukkulente p. 168 and Succul. Plants, p.226).

Plants mostly 1—2 stems, body in structure, surface and colour like *O. dinteri* Schwant., fruit enclosed ; calyx tube 4—5 mm. long, 1.5 mm. with the corolla tube intergrown, slightly compressed, not enlarged, —4 mm. in diameter, brownish green, with 6—7 points —3 mm. long, succulent, reddish brown ; corolla tube 6—7 mm. long, slightly compressed, white, 40—50 corolla segments, in 3—4 series, spadelike, 1.2 cm. long, —1.5 mm wide, white, in the centre a larger number of white staminodes ; filaments numerous, attached to the base of the tube, white ; anthers small, yellow, slightly exerted ; 6 stigmas, 6—7 mm. long, on 2—3 mm. long style ; ovary 2 mm. deepened bowl shaped, above inside flat ; disk on the edge of the ovary, slightly directed upwards, dark olive green.

Habitat : Great Namaqualand, near Warmbad and west of Warmbad.

(To be continued)

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## SUCCULENTS

By G. G. GREEN

March is usually the busiest time of the year for most of us, as there is so much to do in the greenhouse cleaning up, sowing seed, taking cuttings and so on.

Moving things around and re-potting specimens often brings to light some of the hidden beauties of the plants that may have been forgotten during the winter months. The charm of delicate new growth on the white succulents such as *Cotyledon orbiculata* var. *oophylla*, makes a lovely plant even more beautiful. Now that the seeds have been harvested the plant is setting about making new shoots from the many branches, and the mauve tipped young leaves with their light dusting of bloom are extremely attractive. Most of the *Cotyledons* are bright in flower and it is surprising how much colour can be obtained from only a few specimens.

Careful pruning and cutting back now will ensure a compact, shapely specimen later on. Any tendency to "legginess" should be drastically curtailed by cutting at the required height, using the pieces cut off for future specimens.

The wonderfully coloured family of *Echeverias* will have had some members in flower throughout the winter and will continue for the rest of the year. Many will also be throwing out the offshoots that can be taken now and rooted in sand and peat. *Echeveria elegans*, one of the loveliest of all, seems to flower better when these offshoots are growing strongly, and if potted in a shallow pan, makes a beautiful specimen.

This is a species that hardly ever grows out of hand, being neither too big nor too cumbersome even when some years old, and the freedom with which it produces offshoots, provides one with a clustered specimen in a very short space of time.

The great majority of the *Agaves* are robust growers and soon become too big for the small house, but there are a few that grow much more slowly and maintain a compact shape and size that encourages their inclusion in the smallest of collections. Some of these are also very showy and prettily marked, especially *A. victoriae reginae*, with the triangular, white veined leaves ; *A. filifera* which has narrow leaves edged with curling fibres that are most interesting, and *A. parrasana* with short wide leaves heavily armed with brown, curving teeth. A good rich compost, and re-potting every second year in the same sized pots helps to keep these plants within bounds.

A genus with long sword-shaped leaves, very attractively marked in mottled lines and extremely elegant in appearance, is the *Sansevieria*. This member of the *Haemodoraceae* family from Africa is not commonplace amongst collections, mainly, I believe on account of its habit of rotting during the winter, at soil level. They are, however, very easy to grow and will endure very rough treatment so long as no moisture is present from November to March, either in the soil or on the leaves. Being hollow where they protrude from the soil, moisture can very easily settle in this tube and so rot the leaves. In most species, the horizontal stems are always buried in the soil with only the leaves emerging, and they grow better when planted in shallow pans in a soil consisting of one part loam, two parts coarse sand and one part leafmould with half a part of crushed charcoal added.





Fig. 1. Compost trials with succulents at Bayfordbury.

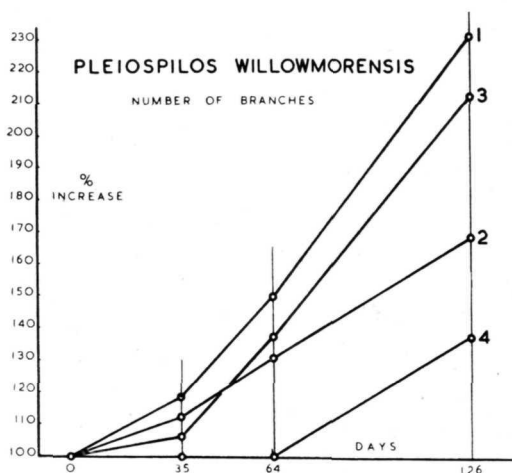


Fig. 2

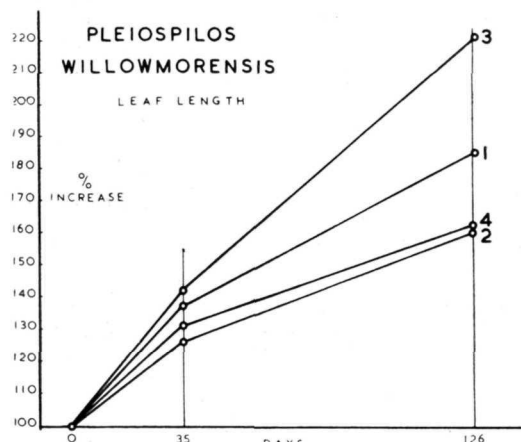


Fig. 3

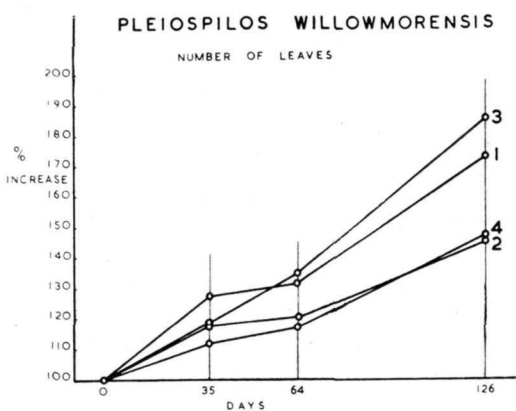


Fig. 4

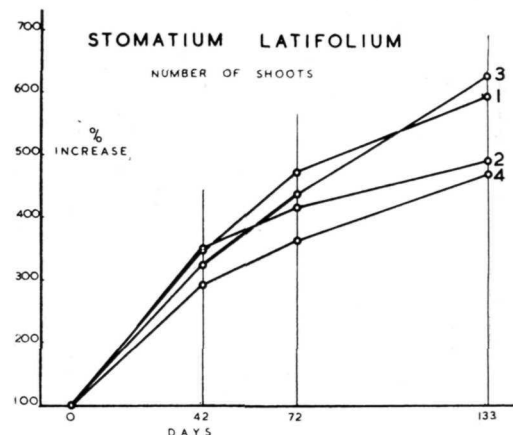


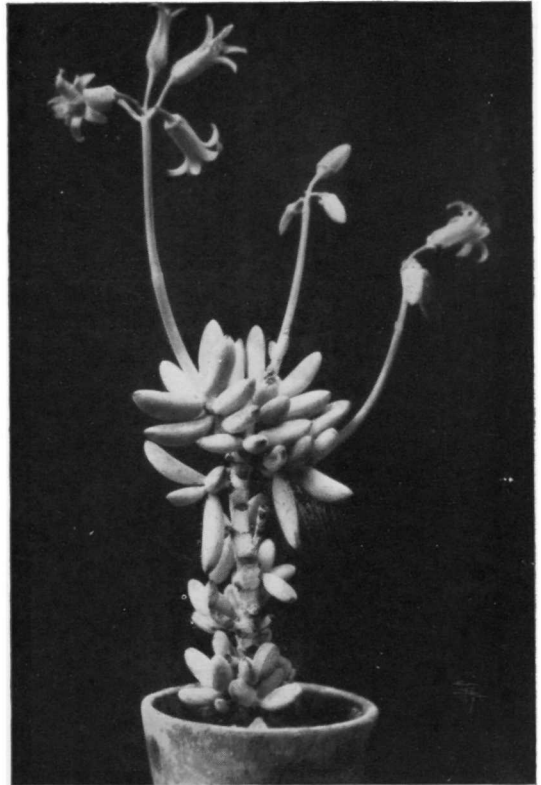
Fig. 5

(See page 40)



*Cephalocereus senilis*  
(near Venados, Hidalgo)

H. E. Gates



*Cotyledon orbiculata* var. *oophylla*

G. G. Green



*Gymnocalycium tobuschianum*

C. Schick



*Agave victoriae reginae*

G. G. Green



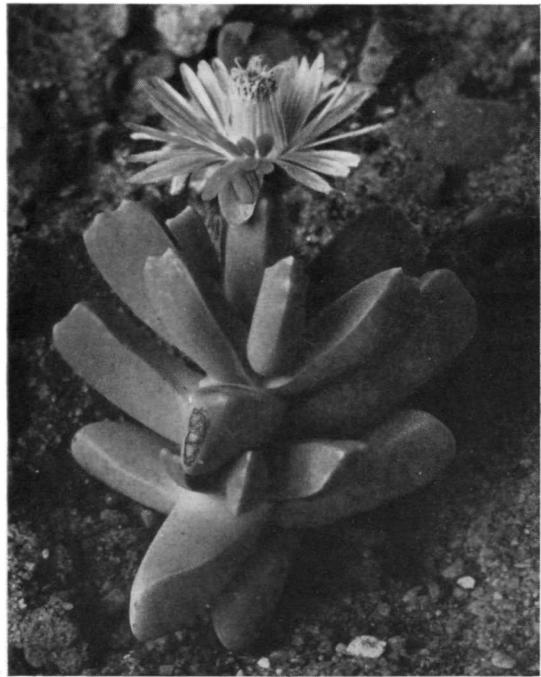
*Stomatium ermininum*



*Herreanthus meyeri*

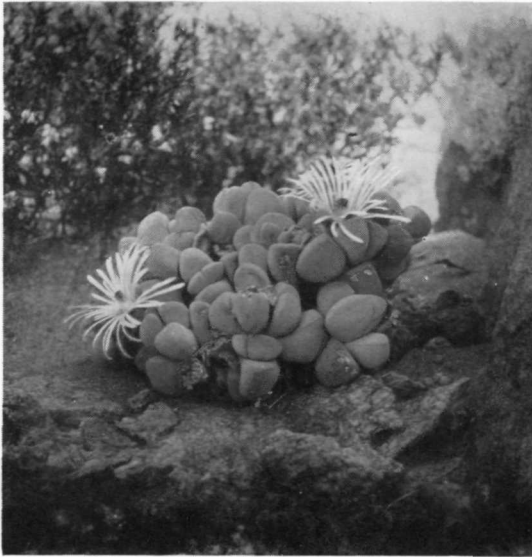


*Juttadinteria deserticola*



*Dracophilus montis draconis*

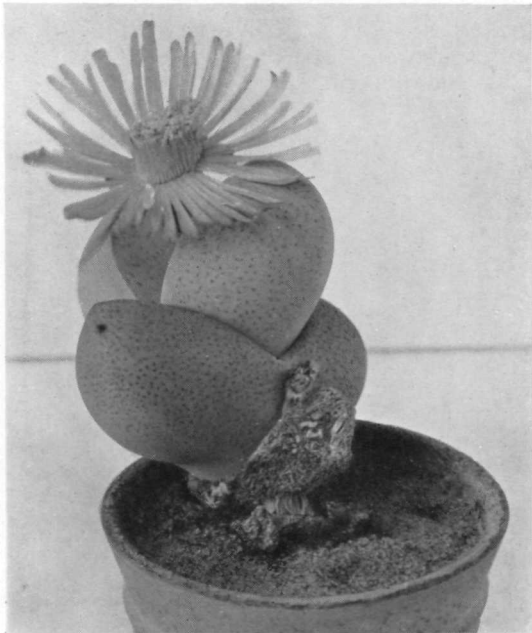
Four photos from Professor Schwantes' "The Cultivation of the Mesembryanthemaceae."



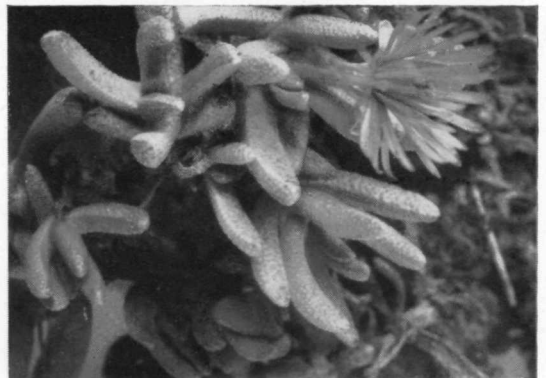
*Namibia cinerea*



*Lithops sp. Kavisberge*



*Dinteranthus microspermus*



*Chasmatophyllum musculinum*

Four photos from Professor Schwantes' "The Cultivation of the Mesembryanthemaceae."

They make ideal window or room plants withstanding big variations in temperature and long periods of drought, and always look stately and extremely attractive. A single plant consisting of one pair of leaves, if planted in a six inch pan, will fill it with leaves in the course of a couple of years.

The easiest species to grow are *S. cylindrica* with thick, rounded leaves marked with pale yellow blotches, *S. guineensis* having wide leaves sharply tapering, and *S. zeylanica* with long sword-shaped leaves marked in pale green.

A smaller plant with variegated leaves and pretty purple flowers is the bulbous *Scilla paucifolia*. This species, though not a succulent, is nevertheless well worth including in the collection as it is always in leaf and flowers twice or three times a year. It is a low growing and compact plant, the bulbs growing above the surface of the soil which can be rich in leafmould, and the green, furled leaves with the paler markings enclose the slender flower stems. It needs plenty of water when the flowers appear, and very little after these have died.

Re-potting the more uncommon of my *Crassulas* caused me to wonder on how much room would be required to house a complete collection of this large family. The idea seemed very attractive, but impossible, needing as it would, much more than could be afforded, though the delight one could get from such a collection would be unbounded. Most people have to be content with growing only the smaller species and it is surprising how many of these one could specialise in.

Some of my own favourites are considered common by others, but I get the maximum delight from such species as *C. rosularis* with its bronze foliage and sweet scented flowers, *C. socialis* and *anomala* which vie with each other in producing the biggest show of bloom, *C. falcata* and *perfoliata* with their vivid scarlet heads of tiny blooms, and the low growing types such as *perfossa*, *deceptrix*, *rupestris* and *perforata*. Planted in round pans these latter soon form cushions of growth with masses of the tiny flowers that last for weeks, forming a very attractive border to the staging. A soil that includes leafmould and gravel or crushed oyster shells seems to suit them admirably and they need re-potting only every three years.

The same compost suits the less hardy species such as *C. congesta*, *columnaris*, *tecta*, *teres*, *barbata* and *barkleyii*, which planted in pans, like to be placed on a shelf on the least sunny side of the greenhouse, or in the window bottom. The fine gravel that covers the soil keeps in the moisture and also prevents caking and overheating whilst allowing the stems to root easily as they lie on the surface. Shallow trays in which they stand are always kept moist so that the pans never dry out.

Some of the *Gibbaeums* which were given extra lime, in the form of half portions of crushed limestone, last year, are now beautiful in their coatings of white meal, or shiny with the fine velvety hairs. Of these, *G. pubescens* is the most attractive with its "shark's mouth" formation of white leaves and brilliant purple flowers that have lasted over three weeks during February and March.

*Gibbaeum dispar*, *pilosus* and *luckhoffii* were given this extra lime together with extra leafmould, but less loam, and the growth seems much stronger and finely coloured than is usual.

Flowering at the same time as *G. pubescens* was *Nananthus crassipes*, a really handsome plant with its roughened spatulate leaves and bright rose-purple flowers. This species, and most of this genus, need watering only from the bottom by soaking, so that the surface never really gets wet, in order to prevent rotting. They seem to resent re-potting and it is better if they are also planted in pans where they can grow undisturbed for a few years. More sand than usual with a good proportion of leafmould suits them well, whilst a position on full sun is also advisable.

Planting in these shallow seed pans, say of six inch diameter, enables the collector with little room to spare to be able to have a considerable selection of stemless *Mesembryanthemums* in a small space. One pan should hold four or five plants and are easily handled in order to soak by standing in water. Only those species that require water at the same time of year should, of course, be planted together in order that one can control the growth properly.

The *Cheiridopsis* have flowered better this year than ever before, some species, including *C. cigaretifera* and *marlothii*, bearing their bright yellow blooms just after Christmas. This was due, no doubt, to the many bright days we have had, but the watering of these plants during our winter has to be done very carefully and only by immersion of the pots, though they are really very hardy and grow well in the cold house. Light and air seem to be the most important factor, but the flowers rarely open unless the skies are clear.

Amongst the succulents are many species of epiphytic plants that enjoy a more humid atmosphere than the cacti. These are extremely interesting and beautiful when in flower, especially the genera of *Epiphyllum*, *Zygocactus* and *Rhipsalis*.

At the time of writing, early March, *Rhipsalidopsis*, *Schlumbergera* and a few *Epiphyllums* are already in flower, bringing a sort of official start to the season.

These epiphytes love a soil that is nearly all leafmould and coarse sand with rough charcoal added to keep it sweet. The more porous it is, the better, and constant spraying when growth commences helps considerably in forming new wood. This is a subject, however, that one could talk about at length and I must leave it for a future occasion.



The last two are very similar in habit, but differ significantly in floriferousness, *S. latifolium* having more than twice as many flowers as *S. bolusiae*—a fact that came to light incidentally in making the counts.

Four composts were made up as representative of four extremes :—

	SOIL BASIS			CONDITIONERS	FERTILISERS
	LOAM	PEAT	SAND		
1 HIGH NUTRITION (John Innes Potting Compost + double basefertiliser—J.I.P.2).	7	3	2	Nil	8 oz. J.I. Base Fertiliser + 1½ oz. Chalk per bushel.
2 HIGH POROSITY (John Innes Potting Compost + half its bulk of extra sand)	7	3	2	Extra sand 6	4 oz. J.I. Base Fertiliser + ¾ oz. Chalk per bushel of <i>original</i> (i.e. before adding extra sand).
3 HIGH NUTRITION + POROSITY	7	3	2	Crushed Brick 1½ Granulated Charcoal 1½	Crushed dust-free Bones ¾
4 CONTROL — LOW NUTRITION	4	4	4	Crushed mortar rubble 4	Nil

No. 3 mixture corresponds approximately to Mr. A. Boarder's original recipe\*\*, and was in fact supplied for this trial by a well-known sundriesman, so may be taken as typical of the best commercial cactus compost. No. 4 is the well-worn textbook recipe, and may be considered representative of the "muck and mystery" school. The mortar rubble, so dear to the hearts of cactophiles since Bradley's unfortunate recommendations of 1718, was collected from the ceiling of the Curator's Office, at Bayfordbury (while he was out). The loam for the first three mixtures was partially sterilised by heating to 180° for 10 minutes.

The seedlings were planted on May 11-12th in 3-inch pots and arranged in blocks of 16 (see fig. 1), 4 in each of the 4 composts. Each block was repeated four or five times, the order within the blocks being randomised.

#### MEASUREMENTS

The next problem was to decide how best to compare the growth responses of the seedlings. With plants that grow six feet in a year this is easy : you hardly need do more than look at them to see if some are better than others. With succulents the variations are not spectacular. Indeed, they may be so slight that only analysis of the figures reveals them. The criteria finally adopted were :—

	For the FICOIDS	For the CACTI
VEGETATIVE PERFORMANCE	1. Amount of branching or offsetting. 2. Leaf number 3. Leaf length	1. Overall height
REPRODUCTIVE PERFORMANCE	4. Floriferousness 5. Length of flowering period.	(No flowers)

Measurements were made at approximately monthly intervals throughout the summer, the last and most informative being on October 10th. The seedlings varied somewhat among themselves at the start, but a statistical check-up showed that none of these differences was significant.

\*\* I understand Mr. Boarder himself uses J.I.P.½—that is, the soil basis of the Seed Compost plus the fertiliser basis of the No. 1 Potting Compost. He deserves great credit for being one of the pioneers of scientifically designed composts for succulents.

In addition to the measurements, estimates were made of the general state of health of the plants, with special reference to signs of bloating, pallor, high colouring, etc., and a final grading made at the end of the year by concealing the labels and picking out the plants judged to be best as saleable specimens.

An attempt to estimate root activity was unsuccessful. This is difficult without destroying the plants or at least shaking them out of their pots at intervals. Records were kept of the emergence of roots through the drainage holes into the moist ashes of the staging below, but no correlation could be found with the size of the plants or the richness of the soil.

## RESULTS

The outstanding discovery concerning all the plants on trial was the improvement in growth due to improved nutrition. Composts 1 and 3 gave plants consistently better than 2 and 4, not only as regards size, vigour and surface "bloom," but in floriferousness also. The differences here were sufficiently marked to enable one to separate most of the rows visually into two types—high and low fertiliser content. Bloating and rank growth at the expense of flower production was not observed. On the contrary, those plants bloomed most freely that had produced the largest area of green tissue. A check-up for winter hardiness on Jan. 18th, 1951, showed that the losses were nil for composts 1 and 3, and 1 plant each (0.3%) for 2 and 4: clear proof that the better fed were no more sensitive than the starved.

Of the four species used, the *Cereus* gave least usable information and the *Pleiospilos* most. Its large leaves and rarity of branching made it especially suitable for scoring. Here composts 1 and 3 gave a just-significant increase of branching over 2 and 4, and a marked increase in leaf length (Figs. 2, 3). Unfortunately flowering began late in the year and there were too few blooms to justify scoring. No significant differences were obtained between compost 1 and compost 3, so both may be regarded in this case as equally good. Similarly numbers 2 and 4 were not distinct among themselves.

The first three mixtures scored over the control in many ways. Uniformity of growth was a marked feature with composts 1, 2 and 3, but in 4 the specimens not only varied among themselves in size and vigour, but also in colour, some flushing purple while others became chlorotic with typical symptoms of excess calcium. *Stomatium* was the most sensitive indicator, although *Pleiospilos* also showed occasional yellowing. The occurrence of weeds in soil 4 was even more striking. Only rarely did any appear on the sterile soils of 1, 2 and 3, but in 4 the growth of weeds and moss was so dense that had they not been removed at intervals some of the plants must surely have been choked. Of course, the advantages of sterilised loam are apparent only when pots and benches are clean as well, and would be wasted where glasshouse hygiene is not practised.

The *Cereus* showed least reaction to soil differences, and in order to get adequate data from stem succulents, trials of this sort would have to be extended to three or four years, I think.

## CONCLUSIONS

What conclusions, if any, can be drawn from this little experiment? To me it has emphasized the following points:—

1. Succulents that are strong-rooting and of robust habit respond favourably to balanced feeding when grown in small pots.
2. Drainage is important, but can be overdone. Addition of inert matter like grit, gravel and rubble wastes precious space by taking the place of soil.
3. Failure to sterilise the loam necessitates regular weeding.
4. Uniformity of growth is encouraged by using the better soil mixtures.
5. Excess calcareous matter can be harmful.

The next step should be further trials to compare composts 1 and 3 with a wider range of succulents, including some known to be less adaptable to the English climate. The optimum balance of food and porous material is still to be determined, and depends not only on the soil formulae, but the size of pot, and re-potting procedure.

The costs of labour and glasshouse maintenance are so high nowadays that any saving of time in bringing succulents to marketable size would be a boon to growers. And with succulents as popular as they are today, who can deny that such work is long overdue?

I should like to thank Mr. A. Calvert for help with the statistical analyses, and Mr. L. S. Clarke for the photograph.

## FOR FURTHER READING

"Composts and Soil Sterilisation for Pot Plants" and "Soil Ingredients of the Composts" in C. D. DARLINGTON, "The Fruit, the Seed and the Soil" (1948). Ed. 2, 1949. Oliver & Boyd, Edinburgh.

LAWRENCE, W. J. C. & NEWELL, J. "Seed and Potting Composts" (1939). Revised 4th Edn, 1952. Allen & Unwin, London.



---

## A NEW COMPOST FORMULA

By C. E. L. GILBERT

From when I first commenced growing cacti I have felt the need for an improved soil compost ; some very good growing mixtures were known, but they, in my judgment, all fell short of perfection.

Like many another collector and grower, I have given much time to experiment and grown plants in varied soil mixtures, but not with much success—till, almost by chance, I made what seems to be an interesting discovery. The nutritive side of a good compost, to be sufficient for our plant needs and improvement, lies in the non-nutritive side, i.e., sand, brick dust, charcoal, lime, etc., the portion responsible for keeping the whole in a healthy condition. I concentrated thereon and, some years ago, happened to incorporate an amount of breeze granules, the residue of a quantity of breeze blocks I had used for construction purposes, into the remains of compost in use at the time, enough for a ten inch half pot. The larger pieces I used as crocks. Into this half pot was planted a number of small pieces of a badly decayed plant of *M. elongata stella aurata* with which I had despaired of doing anything, they had refused to root in sand and I had a mind to destroy them. They were given no further thought till the following spring when, upon turning them out, I was amazed to see the amount of roots formed, furthermore, the compost disintegrated, falling completely away, with the roots quite undamaged, forming tresses about ten inches long. The cuttings had also made considerable growth and now looked very healthy.

I carefully examined the compost and noted its pleasing texture, also it was very clean and fresh looking, just the kind of soil to use again for re-planting.

During the ensuing spring and summer, following up this encouraging result, batches of various cuttings and plants were potted up in compost with varying amounts of breeze granules, with continued success, in fact, I have yet to find varieties of cacti or succulents that do not respond well.

This added breeze gives benefit to all sections of plant growth, including seed raising, in fact, we now incorporate this breeze in varying amounts into all our plant composts. I can only conclude that we have a greatly improved medium to the previous popular use of brick dust, etc. I find that any manufacturer of breeze building blocks, made with clinkers and cement, has large quantities of broken blocks and dust that they are only too pleased to get rid of. These blocks, themselves, are quite inexpensive, but get only blocks that break up easily, those of poor quality that crumble, others are quite useless.

The following good qualities I have noted in compost with added breeze of from half to one third.

Absorption of mixture perfect. A three-inch pot of dry compost, placed in a shallow tray, quickly absorbed water, the compost acting as a sponge, the excess quickly drained off upon removing pot from tray, the pot dried off in the next few days.

Effect upon soil. All soils perfectly clean and healthy. Marked freedom from caking. Pots of growing plants, banged gently down on a hard surface, disintegrated the soil completely and allowed ample air into the soil.

Re-potting. The soil crumbles upon touch and completely falls away from the roots. Where pots were root bound the roots uncurl and are quite undamaged, little dead root noted.

Expense is negligible.

Soil surface. Little caking and freedom from moss and algae.

Plant growth. Improved growth with all plants, the colour and vigour of spines much improved.

Effect upon health of plants. I have cut my losses to less than ten plants, including one-year-old seedlings, in quite a hundred thousand plants. This winter all my most rare and valuable plants look well including the difficult ones, i.e., *M. plumosa*, *Ariocarpus*, various *Pelecypora*, etc., especially *Parodias*, of which I have a great many, a marked freedom from plant or root rot.

Propagation. Cuttings and seed do very well, rooting greatly encouraged. All my seedlings, though seeds were planted late last year, are more advanced than any previous batch planted.

I warn cacti enthusiasts who wish to experiment to go cautiously until they are satisfied, as I have no assurance that the chemical contents of breeze does not vary with the various makers. I can only speak for my own source of supply.

---

The lecture "Outdoor Culture of Plants," on May 12th, will be given by Mr. A. Boarder.

## GYMNOCALYCIUM TOBUSCHIANUM Schick spec. nov.

By C. SCHICK-FREIBURG (Germany)

Simplex dein basi proliferans, depresso-globosus vel breviter columnaris, griseo-viridis ad 8-9 cm. diametro, costis 8-11 tuberculis praeditae transverso sulcatae, areolae 6-8 mm. magnae, primo dense albo-lanuginosae, aculei radiales, castanei ca. 9, ad  $1\frac{1}{2}$ -2 cm. longi, centralibus 1-3 rubescenti ad  $1\frac{1}{2}$ -2 cm. longi. Patria Argentina apud Capilla del Monte.

Stem at first simple, later shooting at the base, light green, low growing, 4-5 cm. high, 8-9 cm. in diameter. Apex covered with whitish-grey, overlapping spines. Ribs 8-11, somewhat wavy formation, flattening out towards the base,  $1-1\frac{1}{2}$  cm. high. Areoles 2 cm. remote, egg shaped or round, 6-8 mm. long, with a whitish-grey woolly felt covering. Spines horn coloured, usually 9 radials  $1\frac{1}{2}$ -2 cm. long, slightly recurved, the upper two short and lightly wavy. Centrals 1-3, not very distinct from the radials,  $1\frac{1}{2}$ -2 cm. long, directed upwards. All spines are curly, flattened at top and with a light groove, prickly. Flowers and fruit unknown.

Habitat : Argentina, near Capilla del Monte.

I received several specimens of this species from Capilla del Monte in the year 1922. They are healthy and thriving and have survived the cold winter of 1944/1945 in the open without shelter, even with a temperature of 15 degrees Cels. The plants have not yet bloomed, but have sparingly offsetted at the base and the lower parts of the body. Even in a sunny, very warm summer it was impossible to encourage this species to flower.

I name this species in honour of Mr. Hermann Tobusch, of Chicago, watchmaker and jeweller in that city, who, through his cultivation of many rare and unusual species, as well as in the promotion of collecting and culture of cacti and other succulents, has earned for himself great credit.

---

### NOTE FROM DR. A. TISCHER

In the article on "The Systematics of *Conophytum*" the following corrections and additions must be made :—

On page 32, under Sub-series I ; after *C. bilobum* (1952; 32) add (Marl.) N. E. Br. (y 27/37) ; to be included after that, *C. cauliferum* (N. E. Br.) N. E. Br. (y 26/28) ; *C. citrinum* L. Bol (y 27/38) ; *C. compressum* N. E. Br. (y 37/38).

*C. obtusum* should be transferred from Sub-series 2 to Sub-series I.

On page 57, Series 3, *Wettsteinia* Schwant, *C. longipetalum* L. Bol. (y 10/11) to be deleted and included on page 80 under Series 5, *Cataphracta* Schwant, after *C. johannis-winkleri* (Dtr. et Schwant.) N. E. Br. (y/10). L. Bolus mentions, in her original description of *C. longipetalum*, that the stigmas have no stalks. From this we have to come to the conclusion that this species in a nocturnal flowerer. Also the relatively short stigmas and the short style indicate a night bloomer. L. Bolus includes *C. longipetalum* in her Section *Subrisum*. In the system of Professor Schwantes, this species must, therefore, be included in the Series *Cataphracta*.

Page 82 : the description of Sub-genus 4 to be corrected to : *Berrisfordia* (L. Bol.) Schwant.

---

### LISTS RECEIVED

F. Schwarz, Apartado 347, San Luis Potosi, Mexico : plant list of 585 cacti and succulents, prices from ten cents to a dollar ; also a seed list, also of 585 species of cacti and succulents, prices from ten to fifty cents per 100—for those who can get a permit to import and can secure currency !

E. H. Hepworth, 142 Ellison Road, Streatham, London, S.W. 16 : Fourteen page list of cacti and succulents, seeds, uncommon succulent and non-succulent plants, and accessories.

E. Thiebaut, 30 Place de la Madeleine, Paris, 8e, France : eight-paged mimeographed list of seeds of cacti and succulents in hundreds, thousands and upwards !

## REVIEWS AND NOTES

At last the long awaited book by our contributor, Mr. G. G. Green, has appeared. It is an extremely well prepared book of 238 pages, with 18 colour plates, 166 black and white photographs of plants and twenty illustrations in the text. This well-known expert on the growing of our plants amply covers the subject, if it is at all possible in 238 pages. It is a task he has admirably executed and the book will be a very welcome addition to our libraries. He gives plenty of cultivation advice, also on propagation, pests and diseases and innumerable other matters that will intensely interest all who collect and grow cacti and succulents. He also undertakes the onerous task of listing and explaining the numerous genera with which we are concerned. What particularly interests me is that, by illustrations in the text, the author tries to explain the differences between certain genera that are very confusing. In this respect it is very reminiscent of that very fine book by Mrs. Higgins, "Succulent Plants Illustrated." A very well worth while effort which should be in the hands of all who want to know and grow cacti and succulents. It is published by Faber & Faber Ltd., 24 Russell Square, London, W. C.1., price 36/-.

Another long awaited book is "Succulent Plants," by A. Bertrand, the President of the French Cacti Society. It is a book of 112 pages, with 16 colour photographs and 20 monochrome plates, each of one or more plants. Prepared in a similar way to his well-known "Cacti," the author deals adequately with succulent plants, their habits, cultivation, propagation and their enemies. He then proceeds to give the various genera and species under the various Families in which succulents occur, each genus having a description and a list of species, intended to inform the reader of those plants more usually met with. It is refreshing to see that the most recent books are endeavouring to give some intelligible picture of the whole ground rather than just being another cultivation book, most of which contradict each other in some respects. The book can be obtained from Crosby Lockwood & Son Ltd., 39 Thurloe Street, South Kensington, London, S.W.7, price 16/-.

Mrs. Pryke Howard has generously presented the Pryke Howard Cup for competition at our Shows. The award will be for twelve succulents in pots of not more than three inches diameter.

Junior members are reminded of the notice in the October, 1952, Journal, that Mr. Edwards has presented a Junior Challenge Shield to be competed for by juniors up to the age of eighteen.

Our Essex Branch has lost no time getting down to business. They had their inaugural meeting on the 13th January and the minutes of this meeting indicate the industry and foresight of the moving spirits responsible for its formation. They announce their First Show for July, there will be 22 classes covering all phases of plants in which we are interested. The secretary is Mr. A. W. Heathcote, The Cottage, 1 Walden Road, Hornchurch, Essex.

Mrs. M. Stillwell, 18 St. Andrews Crescent, Windsor, notifies us of the participation, once more, of our Bucks and Berks Branch in the Royal Windsor Rose & Horticultural Show in the private grounds of Windsor Castle on July 10th and 11th. Members interested should write Mrs. Stillwell direct. It is suggested that groups of members or branches, might like to arrange an outing there on the days of the Show.

The Bolton Cactus and Succulent Society announce their annual Show on October 2nd and 3rd, with 24 classes. Members within easy reach of Bolton should write to their secretary, Mr. E. Rawlinson, 8 Alder Street, Great Lever, Bolton. The Editor has been asked to judge the Show.

It is with interest that we learn of the formation of an independent cactus society in Scarborough. The address of the secretary is Mr. H. Gibbon, 14 Mount Park Road, Falsgrave, Scarborough.

Mr. A. Boarder, Marsworth, Meadway, Ruislip, Mddx., our Exchange Secretary, has some more seed for distribution. Quantities are very limited, but comprise the genera *Cheiridopsis*, *Hereroa*, *Delosperma*, *Argyroderma*, *Nananthus*, *Pleiospilos*, *Huernia*, *Caralluma* and *Stapelia*. Members only, interested, should write him direct, enclosing stamped addressed envelope. Remember please, Mr. Boarder cannot enter into correspondence with members when distributing the seed.

Once more it is found necessary to remind members that when borrowing books from the library that they should return the books as early as possible, within a fortnight if at all possible. Other members are waiting for the books and, in some cases, there is a long queue waiting for some of the books.

## ANNUAL GENERAL MEETING

### REPORT OF THE COUNCIL, 1952

The Council has to report a considerable increase in membership during the year.

The Monthly meetings at the Royal Horticultural Society Hall were well attended (average over 50 members) and some interesting discussions followed the lectures given. It would be of great assistance if more members would volunteer to give their views and experiences at meetings. Difficulty is experienced in obtaining speakers for these meetings. It will be noted that all the lectures given during the year were by Officers of the Society.

The two Shows held were quite successful despite the lower number of entries. June, 87 (1951—133), September, 67 (1951—73). We should like to thank those members who assisted the Officers at these Shows. It is hoped to re-arrange the Schedules for 1953 to encourage the exhibition of less mature plants. Difficulties with transport are appreciated, but could be overcome by members co-operating in their areas for the collection and conveyance of their plants to the Hall by one vehicle.

The Branches continue to maintain an active interest and have increased their membership. An additional Branch has been formed at Essex. Members are reminded that every assistance will be given in the formation of Branches.

At the request of the majority of members, Meetings will commence at 6.30 p.m. at the R.H.S. Hall during 1953, though the room will be available from 6.0 p.m. for informal discussion.

Increased use has been made of the Library and books have been added during the year.

Over 3,000 packets of seed have been distributed to members during the year at no individual cost other than postage.

Despite continuous rain on Sunday, 8th June last, an interesting time was spent at Mr. Kenneth Harle's Nursery at Lower Basildon, and we thank Mr. Harle and his staff for their interest and hospitality.

The 21st Anniversary Dinner, held on 27th November, followed by Procter's coloured slides and descriptions, loaned to us by one of our sister Societies, was attended by 53 people and was a successful evening.

The Journal, of which we are proud, has been increased in size during the year and we thank Mr. E. Shurly, our Hon. Editor, for producing the same. We should also like to convey our very best thanks and appreciation to the contributors of articles and photographs.

We have also to thank the Royal Horticultural Society for their help during the year, also the Press for inserting notices of Shows, etc., from time to time.

We trust that members will continue to support the Society in its aims to maintain an interest in and encourage the cultivation of cacti and other succulent plants.

!!!

"Farmer and Settler," Sydney, Australia: Garden ornaments like these (a photo of an *Opuntia*) may look attractive, but they are a menace. They should be killed. (Coming from Australia the threat can be understood!)

"Melbourne Argus," Australia: People were now eating cactus. Cactus was also being used as a cure for rheumatism. Plate cactus fruit made 'excellent jam and fruit salad,' and the pads tasty bean substitutes. *Ficus Opuntia* cactus could in ten years grow enough bean substitutes "to feed a brigade."

There is to be an International Horticultural Exhibition at Hamburg from the 30th April till October. In addition to the usual horticultural displays, there will be classes for *Sempervivums*, *Bromeliads*, *Crassulas*, *Echeverias*, *Cacti*, *Phyllocacti*, *Mesembryanthemums*, Succulent Plants of various species and forms, and *Sanseverias*. If any member is interested, please write to Tourist Board of Hamburg, Lombarsbrucke 1, Hamburg, Germany.



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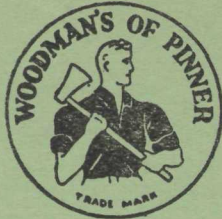
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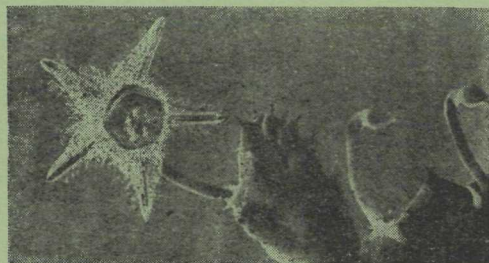
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No. 3

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---

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## SOCIETY NEWS

1953

- July 28th 6.30 p.m. Discussion : Pests and Diseases.  
Aug. 25th 6.30 p.m. Covent Garden Exchange Evening.  
Sept. 22nd 6.30 p.m. SHOW.  
J. Brown : South African Succulents.

### Branches

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Vol. 15

JULY, 1953

No. 3

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EDITORIAL

† WILLIAM C. DENTON †

It is with the deepest regret that we have to record the passing of Mr. William C. Denton on the 1st April, 1953, at the age of 66.

He was a member of our Society since its formation and a member of the Council from its early days, and latterly rendered valuable service as Assistant Secretary. For some years he acted, with Mr. Boarder, as judge at our Shows.

His interest in cacti and succulents commenced at a very early age. Graduating from the cultivation of Dahlias, he was attracted to South African succulent plants and cacti. He found difficulty in cultivating cacti owing to the sooty atmosphere of London spoiling their appearance and clogging of the skins, and he mainly turned his attention to stemless *Mesembryanthemums* because of the annual renewal of their bodies. Later he added *Euphorbias* to his interests. He became a past master in their cultivation and few people could excel him in this art.

He was presented with the British Empire Medal by his late Majesty, King George VI, for his efforts in dealing with dangerously damaged gas mains in one of the worst bombed areas of London during the war.

Those who were privileged to make his acquaintance found him as generous as anybody could be as he believed in showing and sharing his treasured plants whenever possible. His advice was sought by a very large number of people, and his encouragement of novices was well known. His gentle manner endeared him to all of us and we shall miss him sadly.

Departing once from his usual practice of growing typical plants, he did raise a hybrid of *Euphorbia* which became known among his friends as *Euphorbia dentonii*. He is known to have distributed quite fifty cuttings from this plant as, in addition to believing in the distribution of plants to others, he felt that if he lost his own plant he would know where he could replenish his collection with it. Many members have, in their collections, this plant as a memorial to him.

---

As will be seen on page 52 of this issue, Mrs. M. Stillwell has been good enough to continue the good work of Mr. Denton in this Journal. Mrs. Stillwell is well known for her knowledge and experience in cultivating succulents and, as is well known, she has won numerous prizes with her plants at our own and other Shows. If anybody can fill Mr. Denton's place, we feel sure that Mrs. Stillwell will be a worthy successor.

---

Illustrations to the articles by Howard Gates and Dr. Tischer will appear in a later issue.

## CACTUS CULTURAL NOTES

By A. BOARDER

What a grand display we have had on our Cacti this year. Wherever I go I hear the same remark, whether I go north or south. The old idea was that flowers were only produced after a good ripening from plenty of sunshine the previous year. I have proved so often that this has little to do with the amount of flowers we may expect. I know that I have already had more flowers than ever before, and some kinds have flowered which have not done so before for me. This is always a bit of a thrill and I usually only have to say that such a plant has not yet flowered when 'hey presto' a flower appears. I had raised some plants of *Dolichothele* from seed a few years ago and none had flowered. This year, however, one or two are well budded. The flowers are very large, but all are yellow. My *Stenocacti* have flowered very well. I have had six different species in bloom. These plants are interesting with their very thin, wavy ribs. There does not appear very much difference in the plants I have and the flowers were rather similar, borne right in the growing centre. The colours were mostly mauves with a darker stripe on the petals.

I have had a seedling plant which I could not decide whether it was a *Notocactus erinaceus* or *crinaceus*. The name was too indistinct on the packet, but now that it has produced seed pods I know it to be *Malacocarpus erinaceus*. The *Notocactus* produce their ripened seed pods the same season as they flower whereas the *Malacocarpus*, with soft fruits, form the pods the year following the flowering. I used to get a great deal of pleasure when noting new plants in bud, but now I am keen to get seed pods to develop, as I know how attractive they can be all the winter months on some of the plants. In the hot weather it is a good plan to spray well all the plants in the greenhouse, especially when many are in bloom. I think that this assists the growth of the pollen and so aids fertilisation.

I have been asked once or twice lately how to get the *Epiphyllums* to flower well. These were once known as *Phyllocactus* and their flowers are large and colourful. I have found that the best way to get a plant to flower, if it has not done so for years, is to re-pot into a good soil, such as the John Innes Potting Compost, No. 1, and add some roughage to increase the porosity. Cut away all the very old wood and then water well as often as the soil dries out. Each year cut out all wood over two years old as I find that most flowers are borne on newer wood. If only one-year- and two-year-old wood is left on the plant, not only will there be more flowers, but more new wood will be produced which will flower the following year. Some people recommend that the plants should be placed out-of-doors and be kept quite dry all the summer. My own plant, which flowers well each year, is kept in my unshaded greenhouse all the while and gets no special treatment. Each year it not only flowers but produces seed pods as well.

If you would like a very attractive flowering plant I suggest that you get a *Wilcoxia schmolli*. This is like a thin type of *Aporocactus flagelliformis*, but the flowers are borne right at the top of the plant on the newest growth. The flowers are quite large for such a thin stem and I have had them even on the tops of the side shoots which were only about an inch and a half long. I have written before about the lovely flowers of the *Echinocereus*, and I have had a fine almost orange flower on *E. salm dyckiana*, a fine trumpet shaped flower. I thought that my *E. berlanderi* had flowered itself out last year when it had 19 flowers and set 11 fruits, but it has had about a dozen flowers so far this time, but it did not make very much new growth last year. I expect that the effort to produce the fruits did check the growth somewhat.

It is necessary to look over all the plants during the growing season as a few plants may need potting on. I found that a *Mammillaria plumosa*, which had been re-potted in February, had grown so much by May that I had to pot it on. The plant had reached the sides of a six-inch pot and would have become damaged if not moved. I placed it in a large half-pot and it looks better already. When potting on any plant which was re-potted early in the year it is not necessary to remove any of the soil. Just get the larger pot ready with a large crock in the base and then add a little potting soil so that the plant need not be disturbed too much. Place the plant on the new soil and run in some fresh soil around the inside of the pot, making sure that it is firmed well in, but not rammed down too tightly. The plant will then make renewed growth. If any plant does not appear to be healthy and growing at a time when it should be doing so, it is no use watering such a plant too much in the hope that this will make it grow again. You are more likely to kill the plant with such treatment. All doubtful specimens should be removed from the pot immediately and the roots examined. If the roots seem to have died you must cut away all traces of rot and then get a fresh clean pot. Place the crock and some soil in the pot and at the top make a hollow in which place some Vermiculite. The base of the plant should be in contact with the Vermiculite only and should not touch the soil. The plant should be sprayed well in warm weather and the soil can be damped now and again. Do not water too much and the plant should make new roots and then grow well again. If an old plant loses its roots it can take a long time to really get going well again. Do not try to make the plant grow quickly

by watering it a lot, as you must err on the dry side until new roots have been formed.

The seedling cacti from this year's sowing should be large enough to be transplanted and, if not already done, no time should be lost before this task is completed. I know that it is possible to keep seedlings in their seed pan all through the first winter, but I am sure that they will make better growth if they are moved. I have recommended the type of soil to use on several occasions, but for the new members I will repeat it. The soil for transplanting the seedlings into, should be the John Innes Seed Compost to which has been added, to each bushel, one and a half ounces of hoof and horn grist and three-quarters of an ounce of sulphate of potash. Put the seedlings an inch apart and as soon as they touch one another they must be moved again, either to two-inch pots or into another box, when they can have about an inch of space between each plant. It is not wise to give the young seedlings too much strong sun until they are well spined. You cannot expect such small plants to be able to stand too much sun for it is well known that most seedling cacti which grow in nature do so in the shade of larger plants.

I had the privilege at the Chelsea Show of being present at a Cactus Stand in an advisory capacity for a day, and I was struck by the fact that eight people out of ten said the same thing, that they liked cacti, but it was a pity that they only flowered once every seven years. I do not know who was responsible for this fallacy, but it persists so strongly that it is of little use trying to tell anyone that cactus plants should flower every year once they reach flowering size. There is no cactus which only flowers every seven years, and yet this belief is so widely held that I doubt very much whether it can ever be squashed. It is up to all cacti enthusiasts to do all they can to educate the general public as to the flowering qualities of cacti. It is a pity that ordinary photographs do not do cacti flowers credit and the colour process appears to be too expensive at present. The range of colours of the flowers in my greenhouse at the present time is quite remarkable.

I have just heard from a member who had occasion to remove some plants from their pots and found that the soil was quite dry although he said that he had been watering every three days. I was not at all surprised at this, as I know that very many cacti in greenhouses never get a proper watering all through the growing season. The plants cannot be expected to grow well if they do not get enough water. Most pots are so filled with soil that it is almost impossible to give the plant sufficient water at one go. There is not enough room at the top to hold the water which would be required to well damp all the soil in the pot. In such cases it is imperative that the plant is watered again almost immediately to make sure that enough water has been given. Once this has been done the plant can be left until the soil has dried out before the next watering is necessary. When that is, depends not only on the plant as to its growth, but also to the weather. I have had to water most of my plants in the greenhouse on each morning lately because the weather has been very hot. It does not take long for a pot to dry out completely in very hot weather and so, unless sufficient moisture is provided, the plant cannot grow and flower.

Take all the cuttings you require as soon as possible, as they root far more quickly when there is still plenty of power in the sun. Any plants which are required for exhibition should be placed where they can get special attention. Some may need a shampoo to clean up some of the white spines and hair. It is surprising how different a plant will look after a good clean up. Also do not forget the pots as well as if they are dirty it may mean the loss of a few points.

When I judged a large cactus show at Nottingham a short while ago, I was struck by the cleanliness of all the plants. I had remarked on the condition of a few of the plants when I had judged there last year, and it was very comforting to note that a great deal of notice had been taken of my remarks. It was a very creditable display and I was struck by the excellence of the *Rebutias* and *Lobivias* which I saw in flower; they certainly appear to be first favourites there. I have been rather surprised to see that several of my *Mammillaria rhodanthas* are in flower. As a rule they are late flowering, and I am at a loss to know why they should have come into bloom so early. They were all re-potted in the early part of the year and have made good growth. I am often asked if I would re-pot a plant if it was in bud. I can state that I never worry at all as to whether a plant is in bud or not, I do not think that it makes any difference at all if the plant is moved. I have just noticed a *Mammillaria sanluisensis* in flower, and this is a seedling sown in February last year. I think that I have managed to flower at least twenty different *Mams.*, the year after the seed has been sown. This is not possible with all kinds of cacti. A *Lophophora williamsii* which I raised from seed in 1948 has only just budded for the first time. Some of the *Coryphanthas* are also rather slow to flower from seed, and I find that it takes at least four years to get most of them in bloom. I have flowered *C. cubensis* when only two years old, but this is a small growing type.

I hope that many of the members who took advantage of the offer for free seeds have done well with them. Some were in such short supply that I had to count out the seeds, and even then there were not enough of the rarer kinds to go round. I am hoping to have some more seeds by the winter so that we can have another distribution in time for the spring sowing. Some members still forget to enclose a stamped addressed envelope, and this all adds to my work. To count out the seeds, name the packets, and sort out the orders for hundreds of envelopes takes more than enough of my time as it is.

## CULTIVATION OF SUCCULENTS

By Mrs. M. STILLWELL

It is with very great sorrow that members will see the name of Mr. W. Denton no longer heads this article. It will be no easy task to follow a man whose knowledge of succulent plants was so great and whose willingness to help others was so readily forthcoming.

We are now in the month of July when the majority of our plants are looking at their best. *Lithops*, which, incidentally, should have been re-potted where necessary in May, will be in their full glory and can take a fair amount of water providing the soil is really porous. I sift all the dust from mine and use only the coarse compost, sand and limestone chips. It is fatal to have a waterlogged soil. Do not be tempted to re-pot your *Lithops* after May or you will probably interfere with their flowering.

*Conophytums* should be ready for watering towards the end of the month when their skins will become papery dry and the new bodies will emerge once more. That is the time to re-pot and to clean up large clumps by removing all the old skins; if these are left on they are liable to encourage pests.

I have a very nice pan of *Titanopsis* including *calcareo schwantesii*, *luckhoffii*, *setifera*, etc. These are difficult plants to bring through the winter and also survive the cold weather. Here is what I have experimented with and found very successful:—one part John Innes (all dust removed), one part Cornish sand, one part limestone chips. They can be transplanted into this mixture this month with safety. Do not disturb the roots more than is necessary, it will not matter if a little of the old soil still adheres to them. Water very carefully round the plants and never wet the leaves. Place them in full sunshine and they will soon reward you with their true beauty.

*Stapelias* should now be well budded. Watch out for what I believe is known as the Sciarra Fly. It seems to prefer *Stapelias* to any known succulent, at least that is my experience. It is a very harmless looking insect, very like a miniature housefly. It flies very quickly from pot to pot and burrows into the base of the plants. Its larvae will, in a very short time, completely hollow out a *Stapelia* stem. The next time you find a *Stapelia*, *Huernia* or *Caralluma* collapsed, do not always think it was caused by over watering, have a look at the base and roots and, nine times out of ten, you will find the Sciarra Fly has been active. They are also known to attack seedlings and can often cause more damage than damping off disease. I do not know of any real remedy except to catch and kill them, which is a job that requires both skill and patience as they are so quick. Last year I hung a fly paper near my *Stapelias* where I had seen activity and in this way caught quite a number.

From pests let us get back to our plants. *Cotyledons* will provide you with a fine show of flowers this month. If your greenhouse is in the ideal sunny position they may have been a few weeks earlier. Two of the nicest and easiest to flower are *C. decussata* and *C. teretifolia*, the former with beautiful heads of scarlet bells which will remain out for several weeks, and the latter with orange flowers. The true beauty of the genus is undoubtedly *C. undulata* with its beautiful wavy edged leaves. I like to pinch out all the flower buds as they appear as I feel it blooms at the expense of the leaves which, to me, are far more worth while.

*Pleiospilos* should soon be ready to water. Make sure the bottom pair of leaves have been completely absorbed and are quite dry. I would recommend the same soil as for *Titanopsis*.

Now is the time to look a long way ahead to Christmas and the winter months. Try to prepare a few nice plants that can be used for table decoration when flowers are so scarce. I strongly advocate a well grown *Kalanchoe granata*, sometimes also known as *K. petitiiana*. It develops beautiful red leaves if given full sun and will keep in perfect condition indoors and retain its colour all through the winter. It can be put back in the greenhouse in the spring, looking none the worse for its experience. I have a large pot of *Crassula montis draconis* which rewards me with a mass of pink bloom at Christmas, this also comes indoors. Do not forget the much despised *C. lactea* which also provides a fine show of white flowers for the festive season. A little forethought now will provide you with a few flowers to cheer you up and your friends when you most need them. *Trichodiadema densum* is another very attractive plant that will greet you with its lovely show of bright pink flowers in December. Have a look round your greenhouse now and make sure that you have got a nice, well grown plant of each of these winter bloomers and you will be rewarded later on. All these plants I have just mentioned like plenty of sunshine. I find the more they are ripened, the better crop of flowers will result.

Give your *Haworthias* a little shade during these hot days, they will keep their fresh green colour better. I do not like to see a bronzed *Haworthia*. The *Gasterias* also appreciate a little shade,

Some of our more hardy types of succulent plants benefit greatly by being placed out of doors during the months of July and August. They make astonishing growth and develop a rich colouring. A few who enjoy this

treatment are :—*Crassulas argentea, tetragona, lactea, socialis, anomaloe, corymbulosa, multicava, sarcocaulis* and *schmidtii*; *Aloes arborescens, aristata, distans, brevifolia, variegata, mitroformis*; *Agave americana*; *Aptenia cordifolia*; all *Bryophyllums*; *Billbergia nutans*; *Delosperma echinatum*; all *Drasanthemums*; *Orostachys spinosus*; *Monanthes muralis*; *Othonna crassifolia*; *Oscularia deltoides*; a number of the *Echeverias* and most of the *Sedums*. Do not place outside any plant that has a delicate bloom on the leaves or any of the more tender plants that cannot stand the heavy rains which they would, no doubt, be subjected to from time to time. On no account trust the stemless *Mesembs.* out of doors as they make a tempting meal for the birds. While the plants are out of the greenhouse and more room is available inside, it is a good chance to clean all the interior glass. Our plants benefit so much from the ultra violet rays which are greatly lessened by dirty glass. This time of the year the stemless *Mesembs.* particularly need every bit of sun available to prepare for their autumn show of flowers.

July is an ideal month for rooting cuttings. Have a look round your plants and trim up those rampant growers whose branches are beginning to overlap everything else. Make this a careful operation so that the plant does not look mutilated when you have finished.

*Echeverias*, such as *gibbiflora, metallica*, that have grown leggy, may be cut off just below the head and re-potted. Do not discard the old stump, but place it under the staging, still in its pot, and keep watered when it will soon provide several offshoots. These, in time, can be taken off and rooted when large enough. Tall growing *Euphorbias* may also be beheaded if grown too high, but cut surfaces must be treated at once with powdered charcoal, or flowers of sulphur, in fact, it is a wise precaution to make a practice of treating all cuttings in this way to prevent rot attacking the base. I need hardly remind you that all cuttings should be allowed to dry and callouse over before being placed in the rooting medium. Vermiculite is, without a doubt, the finest thing for rooting the most difficult plants. Often a plant can be induced to root by just placing a thin layer of Vermiculite on the top of the pot of soil and the plant just stood on it, not actually planted. The roots will pass through the Vermiculite into the soil beneath and thus avoid the necessity of re-potting and disturbing the delicate, newly formed roots. Vermiculite is also very good mixed with your seed compost as it prevents the soil from drying out too quickly. I have a 4 ft. by 1 ft. bed of sharp sand under the staging in a shady position in my greenhouse which I keep damp by daily spraying. In it I place all my odd cuttings of the more common kinds that I know will root easily. Also any odd leaves from *Echeverias*, etc., are just laid on the sand. I would not advise this method for the more delicate types, such as the stemless *Mesembs.* or the *Euphorbias*, for these I prefer Vermiculite, but I have found the sand very useful for all odd cuttings and bits and pieces which would otherwise have been discarded. It is always nice to have a few rooted cuttings to pass on to one's friends. Many an ardent collector has sprung from those few cuttings given to him by a fellow enthusiast. I myself started in this way soon after I left school when I became the proud possessor of one single stem of *Kleinia articulata*. My joy was complete when the little bunch of leaves appeared from the top. I was well and truly under the spell of cacti and succulents. It is a disease from which one never recovers. Who wants to ?

For anyone who has a greenhouse that does not get its full quota of sunshine, *Haworthias* and *Gasterias* would be ideal plants to grow. It is well worth looking out for some of the rarer species, such as *H. bolusii* which has incurved leaves edged with beautiful white silky hairs. A similar plant, *H. setata*, has not quite such pronounced teeth on the leaf margins. The windowed *Haworthias* are also very attractive and fairly easy to obtain. *H. pilifera* has almost transparent leaves and will soon form a good cluster. *H. retusa* is a fine example of a window leafed succulent, the upper part appears to turn over at right angles to the lower part. The upper part forms the window. In their native haunts they withdraw into the soil in the hot dry weather and just their windows are left exposed to the strong sunlight. The two real gems are *H. truncata* and *maughani*, but the average person finds these more difficult to cultivate. For the beginner, I would recommend some of the easier growing species, such as *H. attenuata* var. *clariperla*, which has large white pearly tubercles on the backs of the leaves, or *H. fasciata* which also has the white tubercles arranged in rows across the leaves. Two other attractive plants which will grow tall with age are *H. coarctata* and *chalwinii*. I like to re-pot my *Haworthias* once a year and remove all the old dead roots which crowd the pot unnecessarily. Each plant makes a set of new roots annually. Remove the bottom row of leaves and the fresh roots will be seen pushing through. Use a good open soil as the tender types rot easily. Mealy bugs have a great liking for these plants and will bury deep into the heart of the plant, but these can soon be destroyed with a small brush dipped in nicotine and methylated. Shade your plant for at least twelve hours after applying this.

Beginners would do very well to start with some of the *Gasterias*. They throw a good flower stalk every year and are very easy to cultivate. *G. maculata* is a very nicely marked variety. *G. verrucosa* is crowded with rough silvery tubercles and *G. armstrongii* is one of the small growing ones. *Gasterias* make very suitable indoor plants and require very little attention.

## OPHTHALMOPHYLLUM Dtr. et Schwant—contd.

By Dr. A. TISCHER

(Translated by Mrs. G. Peters)

5. *O. fulleri* Lav. (L. Bolus : Notes 11, p. 472 ; Jacobsen ; Succ. Plants p. 226).  
Plants consisting of one body ; body broadly obconical, 2.2 cm. long, middle 1.5 cm. in diameter, lobes above 1.2 cm. broad, up to 1.2 cm. divergent, arched, free part inside and above somewhat hairy ; body soft, underneath green, above yellowish, calyx and corolla tube 8 mm. long, 2.5 mm. fused together, calyx with six points, brownish green, 6 mm. long ; 33 corolla segments in four rows, spatulate, 2 cm. long, rosy purple, inner ones transformed into numerous staminodes ; filaments projecting out of the tubes ; ovary concave above, disc on the upper rim, toothed, 3 mm. high, centre elevated 2.5 mm. conically, six stigmas, finely filiform, yellow, 1.4 cm. long.  
Habitat : Bushmanland, at Kakamas.
6. *O. herrei* Lav. (L. Bolus, Notes 11, p. 473 ; Succulenta 1933 p. 43 and 1935 p. 129 ; Kakteenkunde 1934 p. 60 ; Jacobsen, Die Sukkulente p. 168 and Succ. Plants p. 227).  
Plants consisting of one or several individual bodies, 4.3 cm. high, 2.2 cm. in diameter. Lobes 8—10 mm. high, 6—8 mm. divergent, below 10 mm. in diameter, at the apex 5 mm. in diameter, body soft tissue, surface lightly hairy, light to olive green in colour ; apex of the lobes with transparent windows ; flower stalk 9 mm. long ; bracts keeled, calyx and corolla tube 6—7 mm. long, 2 mm. fused together ; calyx points 5 mm. long, 25—30 corolla segments, spatulate, somewhat notched at the tip, 2 mm. broad, white to pale rose, transformed towards the centre into a great number of white staminodes ; numerous filaments projecting from the tubes ; ovary 2 mm. above, deepened like a bowl, in the crater somewhat raised, disc on the upper rim, 2 mm. high, consisting of six "glands" ; 6 stigmas, finely filiform, golden yellow, 1.1 cm. long.  
Habitat : Little Namaqualand, at Breekpoort, near Steinkopf.
7. *O. jacobsonianum* Schwant. (Jacobsen ; Succ. Plants p. 228).  
Plants consisting of one or several individual bodies ; body up to 3 cm. long, 0.8—1.8 cm. in diameter, depressed cylindrical, bilobed above, lobes 8 mm. high, compressed, roundish truncate, windowed above ; on the edge big dark green points, fissured across, 1 cm. deep ; body soft tissue, smooth, epidermis covered with little papillae, or hairy and feeling satiny to the touch, green, sides and above brownish, flowers with a long tube, 2.3 cm. in diameter, colour a superb lilac-pink.  
Habitat : Kenhardt Div. 40 miles each of Pofadder.
8. *O. longum* (N.E.Br.) Tisch. (*Conophytum longum* N.E.Br. in Gardeners' Chronicle 1930, 11, p. ? ; Jacobsen, Succ. Plants p. 153).  
Plants consisting of one or more bodies. Body long, cylindrical, lightly compressed, 3.5 cm. high, above 1.8 cm. in diameter, in the centre 1.5 mm. in diameter, bilobed above, lobes arched above, often rather obtuse, keeled, fissured through, lobes 1.5 cm. high, smooth, somewhat satiny, papillate, soft tissue, light green, sometimes just a faint suggestion of brownish tinting ; upper side of the lobes having windows, on the edge of the windows overlapping on the side of the body a few dark green longer spots ; calyx and flower tube 3—4 mm. long, for 2 mm. fused together, calyx with 5—6 brownish green tips, 3 mm. long, 43—45 corolla segments in 2—4 rows, —10 mm. long, 1.5 mm. broad, spatulate, tips somewhat notched, white, tips slightly tinged with pink, towards the inside becoming shorter and narrower, becoming transformed into numerous white staminodes ; filaments numerous, projecting out of the tubes ; ovary above somewhat deepened bowl like ; six stigmas, finely filiform, 8 mm. long, yellowish, no style.  
Habitat : Little Namaqualand, at Eenriet near Steinkopf.  
This species was first placed by N. E. Brown in the genus *Conophytum*, since at the time when first described the flower was not known. I have received from Brown an offshoot of his type specimen which has bloomed in the meantime. The flower shows itself to be a typical *Ophthalmophyllum* (fusing together of the calyx and corolla tube, bowl shaped deepening of the ovary above, white staminodes and the absence of a style). It must, therefore, be placed in *Ophthalmophyllum* and correspondingly re-named.
9. *O. lydiae* Jacobsen (Sukkulente 11, 1948 p. 35).  
Plants mostly with two bodies, seldom more ; body obconical, 22—25 mm. high, 16 mm. in diameter, rather compressed and broadened, above bilobate, upper side of the lobes rounded off flat rather obliquely, truncated, lobes 5 mm. high, fissured through, smooth, epidermis with fine papillae, body olive tinted, lobes



above almost transparently windowed, edge of the windows not clearly defined, beyond the edge several large transparent spots; flower stalk 15 mm. long, two obovate bracts, latter 8 mm. long; flower 20 mm. in diameter, 36 corolla segments, narrowed at the base, rounded at the tips, 8—10 mm. long, white, tips rather reddish.

Habitat: Little Namaqualand, at Steinkopf.

10. *O. maughanii* (N.E.Br.) Schwant. (*Conophytum maughanii* N.E.Br. in Gardeners' Chronicle 1930, 1, 516; Brown-Tischer-Karsten, Mesembryanthema p. 167; Kakteenkunde 1934 p. 60; Jacobsen, Succ. Plants p. 228; Kakteenkunde 1936 p. 157; and 1937, p. 162; Fedde, Rep. Spec. nov. Beihefte XLIII p. 225; L. Bolus, Notes III p. 206).

Plants consisting of 1—2 bodies; body 1.5—2 cm. high, 1.5 mm. in diameter, cylindrical or obconical; in the upper part often somewhat compressed, above bilobate, lobes 5 mm. high, somewhat arched above, not always fissured right through; body soft tissue, smooth, somewhat papillate, yellowish-olive tinted, with a rather dull window above on the lobes, corolla tube 6—7 mm., fused with calyx tube for 2 mm., more or less 75 corolla segments in 4—5 rows, spatulate, 1.3 cm. long, broad, white, bluntly pointed or somewhat notched, inner ones shorter and narrower, transforming into 20—30 staminodes; filaments numerous, projecting out of the tubes, ovary above  $\frac{1}{2}$ —1 mm., deepened bowl like, somewhat raised in the middle, disc on the upper edge of the ovary bowl, somewhat broadened, dark green, 6 stigmas, 3.5 mm. long, somewhat awl shaped, style absent.

Habitat: Kenhardt Div. at Poffadder, Keimas and Kakamas.

The above description of the flower was made from one of the specimens left me by N. E. Brown which I have kept in culture for many years. It shows the typical characteristics of the *Ophthalmophyllum* flower; partial fusing together of the calyx and corolla tubes, bowl shaped, also the rather flat deepening of the ovary, white staminodes, stigmas without a style. The placing of this species by Schwantes in *Ophthalmophyllum*, regarded by L. Bolus as incorrect, is completely justified and sufficiently well grounded.

11. *O. praesectum* (N.E.Br.) Schwant. (*Conophytum praesectum* N.E.Br. in Gard. Chron. 1930, 11 p. 8; Jacobsen, Succ. Plants p. 156; Kakteenkunde 1934, p. 60).

Plants consisting of one or more bodies; body 3 cm. long, 1.8 cm. in diameter, somewhat compressed, cylindrical, above shortly bilobate, lobes 7 mm. high, somewhat compressed, convex to almost truncate; smooth, somewhat papillate, ground colour green, above brownish, lobes above with a somewhat dim window; calyx tube 6—8 mm. long, fused together with the corolla tube for 2—3 mm., with 5—6 tips 4 mm. in length; corolla tube 6—8 mm. long; numerous corolla segments in several rows, 10—12 mm. long, 2 mm. broad, spatulate, above obtuse or slightly notched, lilac red, white staminodes, filaments projecting from the tube; 5—6 stigmas, filiform, 8—10 mm. long, style absent.

Habitat: Kenhardt Div. at Poffadder.

*O. praesectum* was described by N. E. Brown first of all as *Conophytum praesectum*. Schwantes, however, recognised the relationship to *Ophthalmophyllum* by virtue of the flower structure. Minute differences in the descriptions of the flowers given by Brown and Schwantes may be traced to the fact that Brown had only been able to observe a withered flower. The presence of white staminodes and the comparatively long stigmas with a very short pistil, as determined by Schwantes, decided unequivocally the relationship with *Ophthalmophyllum*. It would, however, be most desirable to have the flower described exhaustively afresh from a new original specimen.

12. *O. pubescens* Tisch. (Kakteen und andere Sukkulente 1938 p. 34).

Plants consisting of one or several bodies; body 3—5 cm. high, 1.8 mm. in diameter, slenderly cylindrical, towards the top somewhat narrowed, bilobate above, lobes somewhat turret shaped, 1 cm. high, somewhat flattened off towards the inside, above rounded, window extending over the whole lobe top; upper surface distinctly covered with satiny hairs including the window which, therefore, becomes somewhat dulled, fruits enclosed; calyx tube 6—7 mm. long, somewhat depressed, not much extended above, with 5 tips 3 mm. long; corolla tube fused with calyx tube for 3—4 mm. 6—7 mm. long, 35—40 corolla segments in several rows, below white, above pink, 1 cm. long,  $\frac{1}{2}$  mm. broad; numerous filaments somewhat projecting from the corolla tube; 4—5 stigmas, 1 mm. long on a style 8 mm. long.

Habitat: Bushmanland, at Argusfontein.

In the description, the stigmas are given as having a length of 1 mm., the style 8 mm. I am of the opinion that in the observed specimen the stigmas were adhering to each other, since elsewhere no such lengthy style has been observed in the genus *Ophthalmophyllum*.

(To be continued)

## THE GENERIC NAME *ASTROLOBA* Uit.

By A. J. A. UITEWAAL (Amsterdam)

From time to time I have been asked why I created the new generic name *Astroloba* (c.f. Uitewaal in *Succulenta* 1947 p. 537) to replace the illegitimate *Apicra* Haw. non Willd., which had been proposed for conservation (c.f. W. T. Stearn in *Kew Bull.* 1939 p. 329 and *Cactus J. Great Brit.* 8 : 28 (1939).) The following note will, I hope, make clear why the name *Astroloba* is preferable.

In *Succulenta* 1947 I pointed out that, should the name *Apicra* Haw. be conserved, confusion between the genera *Apicra* Willd. (1811) and *Apicra* Haw. (1819) would continue, so many accounts being headed *Apicra* Willd., although the genus *Apicra* Haw. was really intended. At the same time, I mentioned that under the generic name *Apicra* Haw. the specific epithet *spiralis* derived from *Aloe spiralis* L. had to be rejected and that new and complicated transfers of epithets had to be made. The simplest way of avoiding these difficulties was to discard the illegitimate name *Apicra* and replace it by a new, apt and unambiguous name, i.e., *Astroloba*. There seemed little reason for conserving the generic name of so small a group, which has little or no economic importance and is scarcely known even to growers and lovers of succulent plants. In view of the difficulties with regard to the nomenclature of the species which the conservation of *Apicra* would occasion, Mr. W. T. Stearn wrote me in March, 1950, when revising the proofs of Sanders' *Encyclopedia of Gardening*, 22nd edition (published in 1952) : "I have abandoned the name *Apicra* and it is your name *Astroloba* which has been adopted."

It may be of interest to explain now the reason why the epithet *spiralis* of *Aloe spiralis* L. would not be available under the generic name *Apicra*.

As I pointed out in *Cact. en Vetpl.* 2 : 90 (1936) *Apicra* Willd. (1811) is a synonym of *Haworthia* Duval (1809), both genera being based on the same generic character, i.e., the bilabiate perianth. Haworth, in his *Suppl. P. Succ.* 50 (1819), attributed the name *Apicra* to Willdenow, but, as his definition indicates, never saw the original description of *Apicra* Willd. in *Ges. Naturf. Freund. Berlin, Mag.* (1811) ; this explains Haworth's misapplication of the name. In defining *Apicra* as a genus with a regular perianth, unlike *Haworthia*, Haworth was really founding a new genus to which he should have given a new name instead of misapplying Willdenow's name *Apicra*.

When transferring *Aloe spiralis* L., *Spec. Pl.* 322 (1753) to the genus *Apicra* Haw. (1819) was proposed for conservation, the following difficulties arise :

The starting point of the trouble is Haworth's "New Arrangement of the Genus *Aloe*" in *Transact. Linn. Soc.* 7 : 1-28 (1804). Here on page 7, Haworth adopted the name *Aloe imbricata* (Aiton) Haw. for the plant named *Aloe spiralis* x *imbricata* Aiton *Hortus Kew.* 1 : 471 (1798), i.e., the true *Aloe spiralis* L. The name *spiralis* x *imbricata* was also used by Willdenow, *Sp. Pl.* 2. 1 : 191 (1799) which Haworth cites in addition to the *Hortus Kew.* Haworth thus disposed of Linnaeus's *Aloe spiralis*, of which the primary historic base is *Aloe africana erecta rotunda* . . . , etc., of Dillenius *Hort. Elth.* t. 13, f. 14 (1732). This left the epithet *spiralis* available for application to some other plant, following the unregulated procedure of one hundred and fifty years ago in nomenclatural matters. Haworth accordingly applied it to a new species ; evidently he did not consider his *A. spiralis* as having any connection with *A. spiralis* L., since he cites no synonyms for his *A. spiralis* and says that "this species has not been in any collection but my own."

Hence *Aloe spiralis* Haw. (1804) is a later homonym of *Aloe spiralis* L. (1753) being deliberately based on a different type.

In 1811 Willdenow further complicated the situation. He adopted the name *Apicra imbricata* for the plant which Haworth had called *Aloe imbricata* (i.e., the true *Aloe spiralis* L. non Haw.), but under *Apicra spiralis* he cited not only *Aloe spiralis* Haw., but also the short diagnosis of *Aloe spiralis* L., evidently believing that Haworth's plant was the true *Aloe spiralis* of Linnaeus' diagnosis, but not of Linnaeus' synonymy. Hence it is debatable whether one should consider the type of *Apicra spiralis* Willd. to be *Aloe spiralis* L. or *Aloe spiralis* Haw. Baker and Berger regarded Willdenow's use of the epithet *spiralis* as having been determined by Haworth's of 1804.\* This means, however, that *Apicra spiralis* (L.) Baker (1880) must be rejected as a later homonym of *Apicra spiralis* (Haw.) Willd. (1811), the two being based on different types.

Hence, if *Apicra* was conserved, another name would have to be found for *Apicra spiralis* (L.) Bak. (which is also Berger's *Apicra* No. 5), such a name might be a new combination, based on *Aloe imbricata* Haw. (1804) which is based on *Aloe spiralis* x *imbricata* Ait. (1789). The last was, however, published as an alpha (or type) trinomial for typical *Aloe spiralis* L. (1753), non Haw. (1804) and Haworth's *Aloe imbricata* is thus equally illegitimate, as Haworth should have adopted the Linnean epithet for the Linnean plant.

To preserve continuity with the older literature, we could adopt another epithet, that of Lamarck in *Encyclopedie Methodique* 1 : 89 (1783), who cites as synonyms of his *Aloe cylindracea* not only the *Aloe africana*

*erecta rotunda, folio parvo* . . . , etc., of Commelin and Dillenius, but also the Linnean name *Aloe spiralis* (1753), which he did not adopt. By modern standards *Aloe cylindracea* Lam., however, was a superfluous name when published and thus is illegitimate and has no validity for purposes of priority.

Hence there appears to be no legitimate name available for the *Aloe spiralis* L. when kept under *Apicra*.

I prefer to retain the oldest specific epithet, which was very easy to do under the new generic name *Astroloba*. Hence in *Succulenta* 1947, p. 53, in accordance with the International Rules of Botanical Nomenclature, I published the new transfer *Astroloba spiralis* (L.) Uitewaal, based on the true *Aloe spiralis* L.

\*The modern status of Haworth's *Aloe spiralis* (1804) and its synonymy :

*Astroloba pentagona* (Haw.) var. *spiralis* (Haw.) Uitew.

Syn. *Aloe spiralis* Haw. non Linn. (1753).

*Apicra spiralis* Willd. (1811) p.p.

*Haworthia spiralis* (Haw.) Haw. (1812).

*Aloe pentagona* var. *spiralis* (Haw.) Salm Dyck (1817).

*Apicra pentagona* var. *willdenowii* Baker (1880).

! ! !

Gardeners' Chronicle, London : American Aloe (*Agave americana*).

Auckland Star, New Zealand : Cactus will scald if watered with any moisture other than natural rain.

Derbyshire Advertiser, Derby : They are cacti living stones.

Christchurch Press, New Zealand : *euphorbia abysinnica* cactus.

Manchester News Chronicle, Manchester : Cactus collectors pay up to fifty guineas for a new variety.

V.H. in Gardeners' Chronicle, London : Five of these names are of doubtful origin, that is, they are not mentioned in *Cacti* by Borg, *Mammillaria Handbook* by Dr. R. T. Craig, nor *Cactaceae* by Britton & Rose.

Women's Journal, London : See that each plant has *not* got too much room. Strangely enough, they like to be cramped.

Observer, London : In the Commonwealth tent came a violently red bit of desert-land from South Africa, thorny with cacti.

Nottingham Journal, Nottingham & Yorkshire Observer, Bradford : Medusa's Head cactus.

#### COMMENDATION

Field, London : For their very good response to the question "How often should cacti plants be watered?"

ESSEX BRANCH. The little leaflet periodically issued by this lively branch continues to make interesting reading. In the third 1953 issue is a synopsis of a talk Mr. Collings gave them on "What I should have Done by Now." The fourth issue gives a talk by Mr. Gilbert on "Cactus Culture." The Branch is represented on the East Ham Corporation Horticultural Show Committee who are having classes for succulents this year. The Elm Park Guild have asked them for a speaker on succulents.

The secretary of the Bolton Cactus Society, Mr. E. Rawlinson, sends us notes of recent events. On October 18th last, Mr. T. J. P. Gibson gave a talk on "Making a Bowl Garden." On November 17th they had the first Howard Gates' Kodachromes and lecture. February 9th, 1953, Mr. G. G. Green gave a talk on Stemless *Mesembryanthemums*, and Mr. J. Cardwell gave a talk on Propagation and Repotting on March 17th. Obviously, a live, thriving organisation.

Mr. R. S. Corley writes that "coal or boiler ash has long been known by growers of Alpines as a highly useful constituent for tricky Alpines, especially those needing lime-free soil and quick drainage. Of course, the added lime content in breeze would be particularly appropriate for cacti." He emphasizes Mr. Gilbert's caution in regard to breeze, and states "Alpine growers say that any ashes used should be well weathered (say for six months) so that all injurious sulphur compounds are washed out before use."

Have you had your Photographic Plates from Neale's this year? They are keeping up the good work with fine illustrations and short, but extremely useful notes. This work is getting more and more valuable as time goes on.

## EPIPHYTES

By G. G. GREEN

Amongst the beautiful flowers produced by the cacti during the last month or so, probably the most admired have been those of the *Epiphyllum* or *Phyllocactus*, as they are commonly called. For brilliance in colour, elegance and beauty of form, they are certainly very hard to beat, and it is always very surprising that such unpromising material should produce so much in colour and beauty.

The *Epiphyllanæ* Tribe are nearly all epiphytes, growing in niches containing rich soil full of humus in the form of decomposed leaves, or on the trees of the equatorial forests where they cling by means of aerial roots and obtain nourishment from the warm moisture with which the bark is soaked. Under these conditions, in their natural homes, the plants are accustomed to shade from the strong sunshine, and it is well to remember this when cultivating them in our greenhouses.

One cannot hope to copy exactly the natural conditions with any great success, unless a house is given over entirely to these and other plants needing similar treatment, and where a humid atmosphere similar to that enjoyed by orchids, is obtained. However, by judicious and careful handling, most species in this rather large family may be grown quite comfortably in the same house as the other cacti.

Years ago, and in some public and private collections of today, many epiphytes were grown in a fashion similar to some species of orchids. The stems of the plants were bound to pieces of wood or bark and hung up in a shady corner, or fastened to the wall of the lean-to, with no soil whatever. Baskets, with moss packed round the pot containing the plant, and suspended from the roof were a common sight before the last war. In the Manchester collection at Alexandra Park, for instance, there are some very fine specimens of epiphytes growing in this manner, and a regular show of bloom occurs each season, together with a seemingly luxurious growth of the stems that hides the containers.

Many of the rare specimens to be seen here are, however, difficult to obtain elsewhere, and may be due perhaps, to the losses incurred during the war.

The more common species of the *Epiphyllum* and the *Zygocactus* genera will be found in almost every collection and though the cultivation of these is very easy, some people find difficulty in flowering them each year. Conditions of housing and staging certainly do affect the plants in varying degrees, though as a house-window plant, the *Zygocactus* is very successful. If the soil is a very porous mixture of old leafmould, sharp sand and crushed brick, with a little loam and charcoal added, growth should be healthy and strong.

Water should run very quickly through this compost, which means that root rot is then unlikely to appear. This is essential in the case of *Zygocactus* which flowers in the winter months round about Christmas and early January. These plants need water at that time of year, but if the soil is porous, no damage will occur to the stems or roots.

During the latter part of the year, *Zygocactus* need plenty of light in order that the stems should grow stiff enough to bear the large flowers, for a common cause of buds dropping off is due to weak, thin stems that have not had enough sun to ripen them. Plants will strengthen much better if they are plunged out of doors during the summer, either in an open frame or in a shady, but not dark corner of the garden. The fresh air and constant moisture thus obtained will encourage strong growth and the later formation of buds.

The pendant habit of the stems necessitates rather tall pots, and is one of the reasons why it is the practice to graft them on tall stems of *Peireskia* or *Selenicereus*. Small "standards" of well grown grafted specimens are very attractive indeed and much of the trouble regarding watering and potting is avoided as, generally speaking, *Peireskia* is very hardy and will take water all the year round.

Where the plants are kept indoors, a good spraying with tepid water once a week in summer will keep the stems healthy and strong, and also clean the pores and improve the appearance.

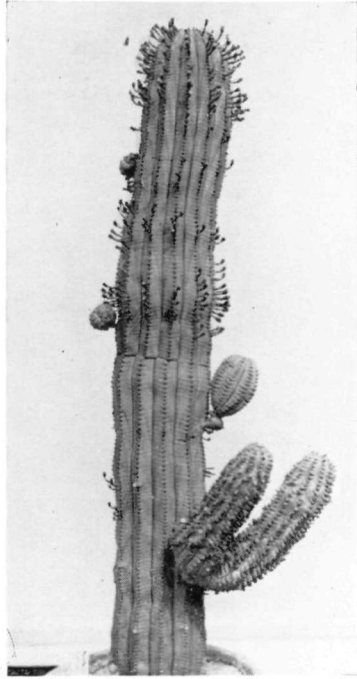
Apart from these two common sorts, there are a great many others of equal brilliance in flowers and interest. *Schlumbergera gaertnerii* is a great favourite for its flowers and are more brilliant than *Zygocactus*, which it resembles in appearance. The stems are broader, however, with golden brown hairs at the joints and more pronounced "teeth." The flowers are regular, or the same all round, unlike the former in which the top petals overhang the lower, and are a bright orange-scarlet in colour. It is not so hardy on its own roots, however, and grows much better when grafted on *Selenicereus*, flowering during March and April.

Grafted specimens grow quickly into thick, bushy plants and provide a brilliant show of freely produced flowers. In the *Rhipsalidanae* tribe, the most brilliantly coloured flowers are those of *Rhipsalidopsis rosea*, a plant with stems very much like a miniature *Zygocactus*. These are reddish green in colour and many jointed and branching, soon forming neat bushy specimens. They grow freely on their own roots providing the compost is open and coarse,



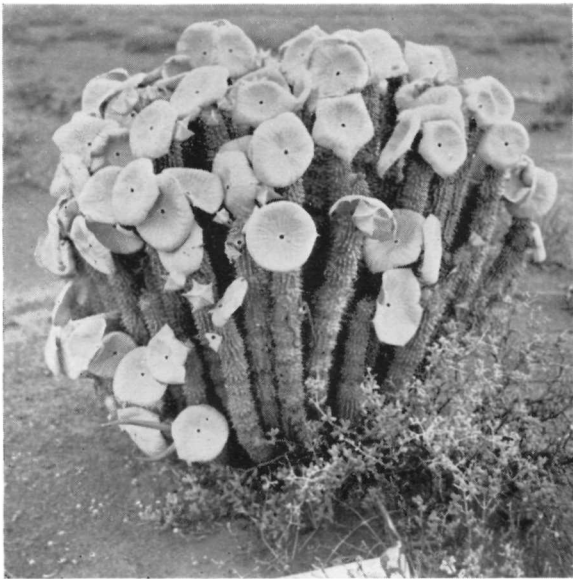
William C. Denton

Tudor Press



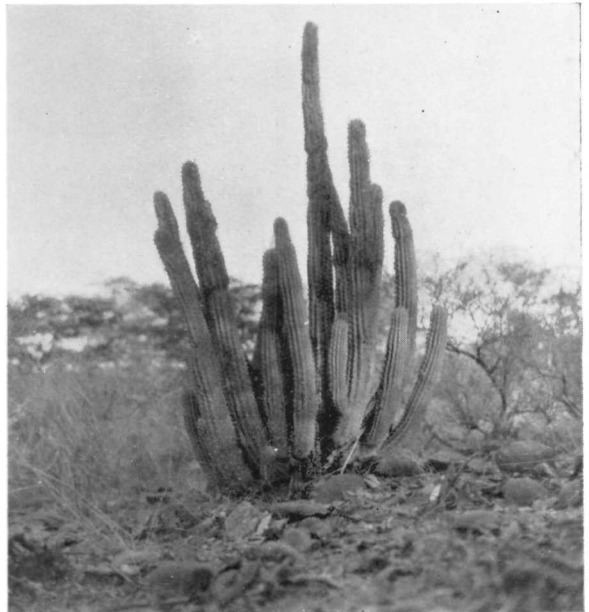
*Euphorbia dentonii*

J. Brown



*Hoodia burkei*

H. Hall



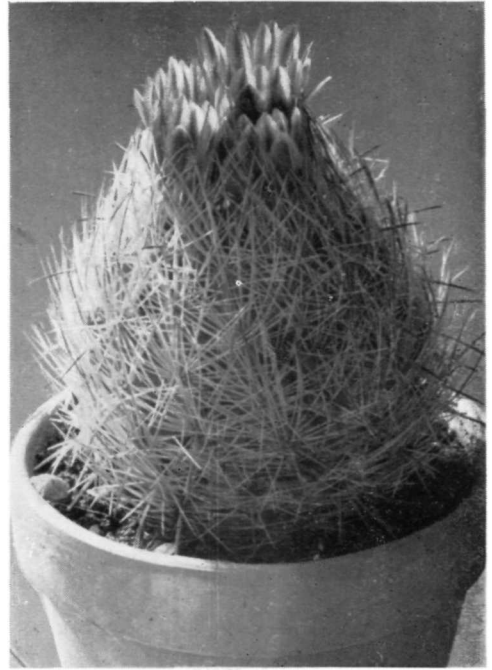
*Hoodia ?parviflora*

H. Hall



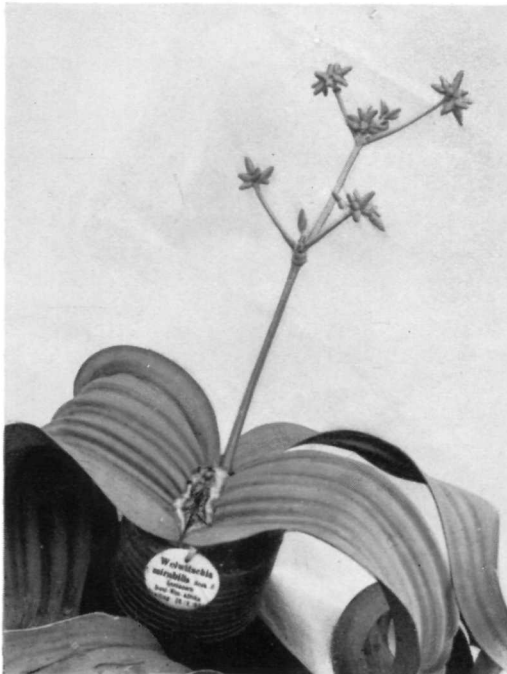
*Astroloba spiralis*

A. J. A. Uitewaal



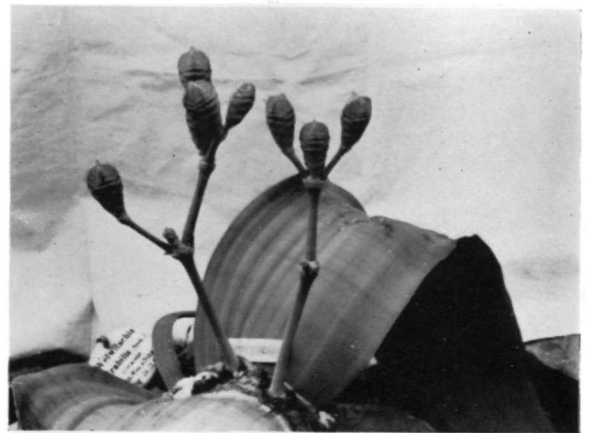
*Echinomastus mapimiensis*

C. Backeberg



*Welwitschia mirabilis*, male plant

H. Herre



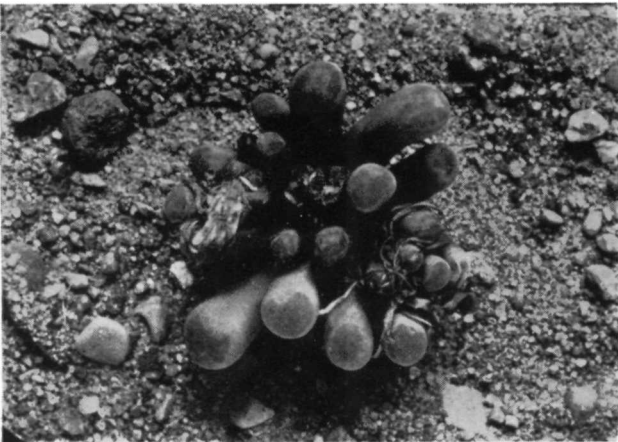
*Welwitschia mirabilis*, female plant

H. Herre



*Schwantesia* sp. nov.

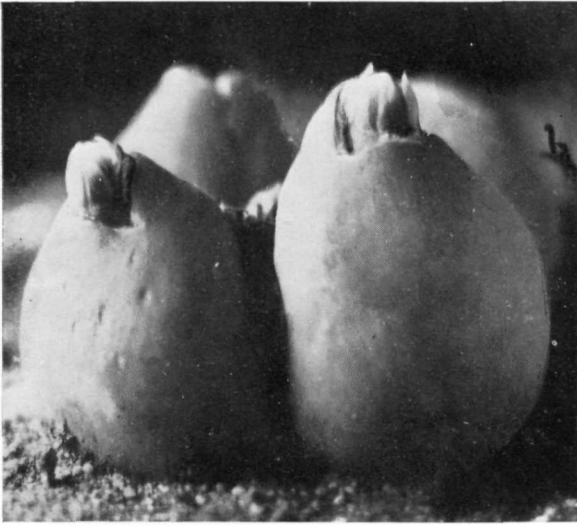
*Lapidaria margaretae*



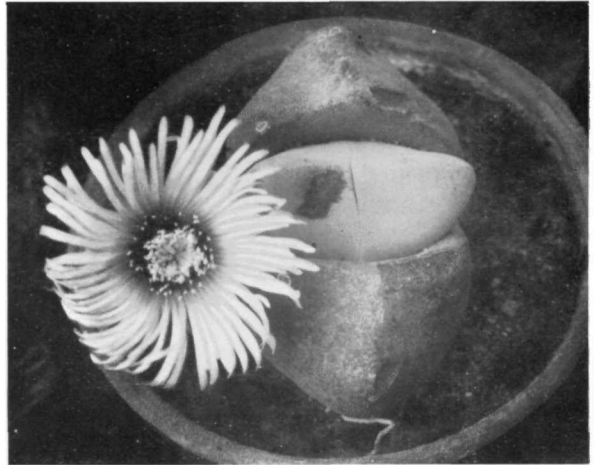
*Frithia pulchra*.

*Gibbaeum gibbosum*

Four photos from Professor Schwantes' "The Cultivation of the Mesembryanthemaceae."



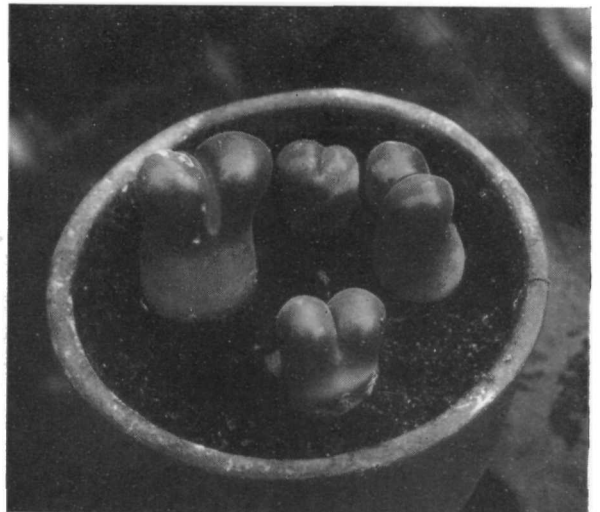
*Muiria hortenseae*



*Didymaotus lapidiformis*



*Conophytum minutum*



*Ophthalmophyllum friedrichae*

Four photos from Professor Schwantes' "The Cultivation of the Mesembryanthemaceae."



for they dislike intensely a soil that holds the moisture for any length of time. Joints soon fall off if this is the case and is a sure sign that the mixture is not right. Shade for the greater part of the year is needed if the stems are to remain true in colour, otherwise they turn very red and soon start to fall. By shade, I do not mean that the plants should not receive any light at all, but that the direct rays of the sun are not allowed to fall on them during the brightest part of the day.

Grafting on *Peireskia* seems to be the best method by which to ensure against rot, and also produces a more attractive-looking specimen. By placing the pots in seed pans and packing round with moss, plants on their roots grow very freely if the moss is kept moist. The lilac-rose coloured flowers are freely produced in spring.

*Hariota salicornioides*, sometimes referred to as *Rhipsalis salicornioides*, is a quaint plant with thin branches and swollen joints of a pale green colour, formed in whorls. It grows very freely on its own roots in the compost described, and like the others, needs shade during summer. The thin stems and branches bear no leaves but have white bristles at the areoles, and the flowers grow on the new joints. Though not showy, these small yellowish flowers are very attractive, being followed by transparent seed berries that turn reddish when ripe. Water should be given freely during spring and summer, with a little in winter, and spraying with tepid water is recommended. If joints fall it is a sign that either the soil is too dry, or that it needs changing to something a little richer, and the addition of half a part of good loam will probably strengthen the stems.

Cuttings from all these species may be taken at any time of year from the joints, excepting the *Epiphyllum* where it is always best to cut across the widest part of the stem. They can be inserted straight away in a mixture of equal parts coarse sand and peat, with a little crushed charcoal added, and sprayed occasionally until rooted.

Grafting of *Zygocactus*, *Schlumbergera* and *Rhipsalidopsis* should be done in May or June, using strong, well ripened stems of the previous year's growth. These are best whip grafted on *Peireskia* or *Selenicereus*, by cutting the base at an angle, on one side only, and tying with raffia to a like cut on the stock. A thin cane or piece of non-rusting wire will help to support the graft until united, if it is carefully tied to the stock before the grafting operation is carried out.

The raffia is more pliable if softened in water before use, and bruising of the scion will not be so severe. It is important that the two surfaces should fit together perfectly and that the base of the scion is in contact with a cut portion of the stock.

The plants should then be placed in a shady place, and the soil kept moist during the period of uniting.

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Mr. Gilbert asks us to correct the proportions of breeze to soil given in his article on a new compost formula. It should have been one-fifth to one-third, not half to one-third.

#### LISTS RECEIVED

E. Thiebaut, 30 Place de la Madeleine, Paris 8e, France : printed sixteen paged booklet with over seven hundred seeds of different species of cacti and succulents, also plants and sundries.

Speedwell Services, Watchett Works, Oakhurst Road, Southend : eight-paged printed booklet illustrating bowls suitable for bowl gardens.

S. V. Smith, 44 Quentin Road, Lewisham, London, S.E.13 : 26-paged mimeographed list of cacti and succulent plants and seeds.

Succulenta, Grote Poellaan 31, Aalsmeer, Holland : 28-paged printed booklet of seeds of cacti and succulents.

H. Cork, 73 Queenswood Road, Forest Hill, London, S.E.23 : printed list containing over two thousand books on botany, many of them containing matters of interest to cacti and other succulent collectors, including 67 exclusively on our plants.

#### REVIEW

Amateur Gardening Handbook No. 3, "Cacti and Succulents," by the Assistant Editor of Amateur Gardening, Mr. A. J. Huxley, W. H. & L. Collingridge Ltd., 2/10 Tavistock Street, Covent Garden, London, W.C.2, price 3/6 : This is a well presented book of ninety-two pages with eighteen drawings. It consists of introduction and chapters on what succulents are, cultivation, propagation, pests and diseases, the families of succulents and list of genera. An exceedingly well informed work aimed to assist the novice, but even advanced collectors will find much to be learned. A welcome departure from just another book on cultivation. There is little to disagree with, but, as the introduction points out, there are many points about our plants and their cultivation on which many collectors have different views. To be thoroughly recommended to all interested, or about to be interested, in cacti and succulents.

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## MORE ABOUT MEXICO

By HOWARD E. GATES

My article published in last year's Cactus and Succulent Journals, was of a trip made in October and November of 1951. This article concerns a more extensive trip made in May and June of 1952 in the company of Dr. E. Yale Dawson. Portions of this journey which were duplicated in the earlier account, will be omitted or passed over lightly.

There was a vast difference in the scenic beauties of the two trips. The first was at the close of the summer rainy season when streams were running merrily, the trees were all green and there were wild flowers everywhere. Apparently during our winter months there was no rain at any of the places we visited except on the east slope of the great mountain range facing the Gulf of Mexico. Consequently, in most places the grass was cropped to the ground and many of the trees were leafless. Most of the cactus do not wait for the rains but blossom in the spring and mature their fruits early in the rainy season. The leafless condition of so many trees made the cactus visible at greater distances so it was easier to find what we wanted to see. The presence of cactus flowers and fruits greatly facilitated our studies of the various kinds.

Our journey to Mexico City was accomplished over the central highland route from El Paso via Chihuahua, Durango and Queretaro. We merely passed through these cities. In Mexico City, we had pleasant visits with Dr. Helia Bravo and several of the cactus enthusiasts. A pleasant evening was spent in showing them kodachromes of Lower California, which place none of them had ever visited. We learned that the environs of Mexico City are not good for growing the larger types of cactus. It is not too cold as there are seldom killing winter frosts. On account of the high altitude and the cooling rains, the summer weather is not warm enough to induce a good growth. While caring for our own Mexican plants, it would be well to remember that the winters are dry and in the giant cactus regions the summers are hot and often rainy. As in most places that have summer rains, it really rains when it does at all.

In the heart of Mexico City is a large park covering more than ten city blocks called the Alameda. Across the street to the north of it, is the funeral flower market, a couple of blocks long. Here the designs and casket sprays are made on an assembly line basis as there are workers performing many different operations from the nailing together of the frames in the rear to the selling of the finished products at the sidewalk line. The two principal set designs are wreaths and crosses which appear to be made only in jumbo sizes about six feet across. Apparently they are not made to order, but are made ready and the buyer picks out the one he wants. Delivery is usually accomplished by tying them, back down, on top of a sedan automobile. Sometimes, a youth on a bicycle, will carry one while threading his way through dense traffic. Aside from the wreath and cross designs, nearly all other funeral flowers were arranged in casket sprays three or four feet long. Among the flowers used are gladiolus, carnations, daisies, violets, hydrangeas, roses, gardenias and orchids.

From Mexico City our route was eastward over the ten thousand foot pass at Rio Frio on the Puebla road. As the highway turned south on the eastern side, we had splendid clear views of Popocateptl's nearly eighteen thousand foot cone. During the dry winter, the heavy snow cap we saw in the autumn, had retreated to a point away above the timber line on the north and had almost disappeared on the southern face. A little to the north was the more massive but nearly as high Ixtaccihuatl, usually known as the "Sleeping Woman." From her feet on the south toward Popo, the lines of the summit ridge gradually rise to the high point of her breasts, then drop a bit before forming her head with her hair streaming down the mountain side to the north. These two mountains are a majestic sight at any season.

We did not enter the city of Puebla but turned off at Cholula and wound between its three hundred and sixty five churches on a short cut to the Christopher Columbus Highway which goes on to the border of Guatemala. It was not long before we reached an elevation low enough for the giant types of cactus. The most striking of the first group to appear was *Lemaireocereus weberi*, truly a giant amongst the giants. Numerous massive branches appear on the stout trunks at heights of six or eight feet. These turn directly upward as soon as they have cleared the older branches, then further branches will arise from the base of these branches. So gigantic are these plants, that the farmers often cut away the inner branches, leaving only the outer ring and use the resulting platform as a hay mow or granary where the feed is out of the reach of hungry cows, burros and goats. The fruits are two or more inches in diameter and edible after the heavy growth of spines has been removed. Near all the towns and villages were other species of *Lemaireocereus* which are grown for their fruits.

The next really notable one to appear was *Cephalocereus mezcalaensis*, now called by some *Neobuxbaumia mezcalaensis*. It is not a plant of general distribution, but is found in localized colonies over a wide territory. Usually the plants appear as massive, fluted, single, green columns arising to a height of about thirty feet. The nocturnal white flowers are campanulate, two to three inches wide, with reddish external longitudinal stripes. They appear at various points almost from the bottom to the top of the plant. The fruits are stout spindle shaped, green, tuberculate with weak bristles taking the place of spines. When ripe, the fruits split from the blossom end, usually into five segments which curl outward and backward until the inner white surfaces could easily be taken for flower petals. The dark brown to black seeds are embedded in a stringy white mass. Surely this cannot be a *Cephalocereus* for there is no sign of a cephalium. The fruits are widely scattered instead of localized, tuberculate instead of smooth and stringy rather than pulpy fleshed. Undoubtedly this plant deserves a new classification and possibly Backeberg's Genus *Neobuxbaumia* is the proper place for it.

Close to the village plaza is usually the public market. This is a colourful place and always worth looking over. Everything locally needed for human existence may be found in some corner of the market. In one market we bought bread in the shape of broad, flat picnic buns that had been baked in a dome shaped oven. These ovens are heated by burning wood within them which is raked out when the oven is hot and before placing the loaves to bake. The loaves are brought to market packed in great woven wicker baskets with broad green leaves packed in the open tops to preserve freshness and keep out dust. The kinds of cactus that are locally in fruit may usually be determined by observing the offerings of the neighbourhood farmers in the market. Dr. Dawson had a commission to secure large quantities of colourful beetles to be embedded in plastic articles. He found the markets more fruitful than the roadside fields as the beetles were often on sale for medicinal purposes. The markets appear to be social gathering places as well as sources of supply. They varied from place to place, both in the types of produce being offered and the costumes of the people. There were places where both men and women wore palm leaf hats of the same design. Others where the women were bare headed or wore head shawls. In some localities many wore shoes, others sandals and in still others every one was barefooted.

A profitable trip to Mexico could be made for the single purpose of photographing the many types of homes. The well-to-do often live in homes of cut stone or brick, either adobe or burned. These homes are roofed with tile ridges or sometimes flat. The walls may be stuccoed in many tints or left with the exposed earthen coloured adobe. In this section we found many country homes built entirely of palm leaf thatch. In the pine forests they were built of sawed lumber or of logs. Very humble homes and shelters beside the fields were roofed with over-lapping agave leaves put on in shingle fashion.

A large portion of our journey from Cholula to Oaxaca and then on to Tehuantepec, was through and over territory that was impassible until about five years ago, to anything except a burro train. The many rugged mountain ranges in this section go in various directions instead of forming any sort of a regular pattern. Consequently we were nearly always going up or down. In the lower elevations were usually some giant cactus, a rather heavy growth of tropical thorn forest and some larger trees including the widely scattered kapok. There were few places that could really be called tropical jungle even though in the summer and fall, everything is damp, lush and green. The dry winters cause the herbage to die and the leaves to drop on many kinds of trees, so that late in the spring much of the lowlands and moderate elevations were open thorn forest types. The most interesting of the larger *Cerei* are not found on the real lowlands but in an intermediate zone ranging from two to five thousand feet in elevation. Then above these is an oak forest belt in which are found numerous species of Mexico's more than two hundred kinds of oaks. It was most interesting to me to find that the most abundant stands of orchids were in the oak belt and that most orchids occur in territories with definite dry spells. Sometimes above the oak belts were narrow juniper belts and always at still higher elevations were forests of pines. Large cactus were scarce in the oak belts and non-existent in the pine forests.

The Mexican likes to farm the hillsides. In places these are so steep, it looks as though the farmer must hang on with one hand while he wields the hoe with the other. These hillside farms erode and wear out so the farmer must often move to another location. To prepare a new location, he first cuts down the large trees and then burns the brush which process destroys the humus that has taken hundreds of years to accumulate. North of Oaxaca is a large area of eroded land which once supported a large population but is now practically abandoned. Next to fire, the most destructive agents are the herds of goats which eat up or trample out many of the smaller plants. Even in the sparsely settled districts, goat damage has been tremendous.

Mexico is a land of contrasts. Great diesel trucks speed by human packers using head straps to enable them to carry heavy loads to town. In some sections large farming operations are performed with the most modern of

machinery. Here on the road to Oaxaca we found farmers cutting wheat with a sickle, tying it into bundles by hand, carrying the bundles on burros' backs to threshing floors where the grain was trampled out by burros and then tossed in the wind for winnowing.

Eventually we arrived in the valley that surrounds Oaxaca. To avoid the narrow and congested streets of the cities the national highway department is wisely bypassing them in its new highway construction. The bypass at Oaxaca swings up on the side of a hill which gave us magnificent views of the city, the valley and the mountains beyond. Over all were masses of threatening storm clouds, so after hunting successfully for some elusive gasoline, we hurried on up the valley and over a high mesa. We never outran the storm until we were over the mesa and well down the grade beyond. There we set up our tent and made camp for the night.

In the morning, we found we were high on the bank of the rugged canyon of one of the tributaries of the Tehuantepec River which we followed for quite a distance before climbing over another great ridge and some smaller ones before going down again into the main canyon towards Tehuantepec. In many places the highway was cut through solid rock on the mountain side. In the bottom quite a stream of water flowed between the sandy banks and villages were built wherever there was any farm land.

In this canyon we came upon some immense specimens of *Pachycereus grandis*. Possibly some *Pachycereus pringlei* of Lower California match this for sheer massiveness. The great branches arose very erect from the six to ten foot trunk. Near the tops were the typical *Pachycereus* fruit which looks like a chestnut burr. North of Oaxaca we had found plants of *Cephalocereus chrysacanthus* but here we found what appears to be another kind. It has more slender and taller branches rising from a short trunk with whiter wool in the fruiting portions. I'm not going to try to say what it is at present but it is worthy of further study on my next trip.

It might be well to say at this point, that it is my impression that the genus *Cephalocereus* of Britton & Rose must eventually be broken up into several genera. *Cephalocereus senilis* was chosen as the type species of this group and I have seen nothing in Mexico that closely resembles it except *Cephalocereus hoppenstedtii*. *Senilis* has a comparatively small flower, flesh to pink in colour followed by a small top shaped fruit. There is a more numerous *Pilocereus* group including *Cephalocereus palmeri*, *collinsii*, *chrysacanthus*, and others which have a much larger, more open pink flower followed by broad flattened fruits of dark red to purplish colours with reddish purple flesh. All of this group have a much depressed apical centre and may be said to have a flattened apple shape. Then there are types of *Cephalocereus* falling into other groups which will be mentioned as we come to them in this account of our journey.

We came across many colonies of the plant variously called *Cephalocereus* and *Pilocereus tetetzo*. The stout, tall columns rising above the small trees bore rings of top shaped fruits near the tips. Since Dr. Dawson has made mention of these in our Journal (Vol. XXIV page 176) under the name of *Neobuxbaumia tetetzo*, I will pass on. Often growing with these were colonies of an un-identified globular white *Mammillaria*.

To me the most interesting of all the large *Cerei* of Mexico, is the one originally described by Dr. Dawson as *Cephalocereus apicicephalum* and which Curt Backeberg has proposed naming *Neodawsonia apicicephalum*, a mono-typic genus. Our discoveries on this trip greatly extended the known range of this plant as we found numerous localized colonies in various portions of the Tehuantepec water shed. The flowers and fruit are borne at the very apex of the branches, deeply embedded in dense wool which completely caps the branch tips. Only the tips of the small pinkish flowers protrude and the fruit remains hidden until the swelling of maturity brings the tip and persistent perianth segments into sight. The fruits are top shaped, smooth with a few small scales covering small tufts of axillary wool. At maturity, the tips of the fruits split open exposing black seed scattered through the white rather dry pulp. After fruiting, the branches grow on through the cephalium and the old cephaliums persist for several years as woolly rings, spaced a few inches apart. In normal locations these plants are fairly heavy columns with a few upright branches reaching to about twenty-five feet in height. They ordinarily do not flower until they are at least ten feet high.

There was one location about fifteen miles west of Tehuantepec, where the plants were greatly dwarfed and flowered at about six feet. This colony was on a very steep canyon side made up of large irregular blocks of weathered limestone. Between the blocks were holes ten to fifteen feet deep, a fine place for rattlers which we did not even hear on the whole trip. The tops of the stones were weathered away to knife-like ridges which made climbing over them very slow and dangerous. If a person stumbled and fell, his knee would surely be cut to the bone. Around this colony were plants of *Cephalocereus tetetzo*, *Selenicereus*, *Nyctocereus oaxacensis* and *Pereskia konzattii*.

(To be continued)

## A NEW ECHINOMASTUS

By C. BACKEBERG

In "The Cactaceae," Vol. III, 1922 ; 148, Fig. 155, Britton & Rose published a photograph of a plant collected by Dr. C. A. Purpus from Cerro de Movano, Mexico.

This figure was published as illustration to the description of *Echinomastus unguispinus* (Eng.) Br. & R., but the American authors said in a note to the photograph, "it has more slender and less curved central spines than the type."

Obviously the true *Echinomastus unguispina* had been unknown to Britton & Rose, otherwise they would not have published their photograph under this name.

In the past year, F. Schwarz found an *Echinomastus* in the Sierra de Mapimi, which was sent to me under No. 91. Schwarz believed it to be near *Echinomastus durangensis* (Runge) Br. & R.

It was an important re-discovery, for this No. 91 was the plant photographed already by Dr. Purpus and published by Britton & Rose as *Echinomastus unguispinus*, but it is rather different by the slender and always brownish central spines and the more slender radials.

It is nearest *Echinomastus durangensis* (Runge) Br. & R., of which Britton & Rose said "This species is similar to *Echinomastus unguispinus*, but not so large, with more slender and lighter coloured spines, none of them strongly recurved. We know it only from a specimen collected in Zacatecas by Dr. Elswood Chaffey in 1910." But of *Echinomastus durangensis* K. Schumann said in *Gesamtbeschreibung der Kakteen 1898 ; 449*, "radials more than 30 . . . the upper longest, 3 cm. long, . . . all very stiff . . . grayish black . . . centrals 4, the upper 3 hardly to be distinguished from the radials, the lower porrect, shorter . . . all of an odd bluish grey-black colour and, seen against the light, reddish brown (i.e., the same colour as in *Pyrrhocactus catamarcensis* Backbg)."

By this the true *Echinomastus durangensis* differs very much from the new *Echinomastus mapimiensis* in which all spines are of a whitish colour, and only the central of a light brown colour, resp. the upper part in the upper centrals, their base in all centrals not so thickened as in *Echinomastus unguispinus*.

I have seen the true *Echinomastus durangensis* (Runge) Br. & R., collected by A. V. Fric, and which corresponded exactly to Schumann's description. I believe that the plant of which Britton & Rose were writing in their note to *Echinomastus durangensis*, i.e., the plant collected by Dr. Chaffey, is more like the new species, if not identical, than to the true *Echinomastus durangensis*, and that the photograph, given by Britton & Rose for *Echinomastus unguispinus*, i.e., of the plant collected by Dr. Purpus, is the same species as the new *Echinomastus mapimiensis*.

As to the circumscription of the genus, there have been many discussions already, if *Echinomastus* should not be united with *Thelocactus*. The American authors gave the name *Echinomastus* because of the spiny tubercles of the plants, i.e., the close spiny habit. Their differentiation is not very sharp, and in *Echinomastus* they say "seeds with a depressed ventral hilum," in *Thelocactus* "with a large basal hilum."

Both genera are not yet very well observed. Dr. Coulter erroneously mixed *E. beguinii* and *E. erectocentrus*, but *E. beguinii* has a naked fruit. It belongs to my genus *Gymnocactus*. If one regards a complete assortment of *Gymnocactus*, it is evident that also in habit it is a very closely characterised group, including *G. subterraneus* (*Rapicactus* Buxb.). It is the same with *Echinomastus*. If one sees together a collection of different species, as we have it at Les Cedres, it is evident that they are a "closely interrelated" group as Britton & Rose called it. All are very beautiful in spine colour, very densely spiny, or even spines interlacing, all with flowers which are less campanulate than in *Thelocactus*, not widely opening, caused by the spiny top of the plant, which is different to *Thelocactus*. This explains why I did not touch upon them in my classification of some genera by Britton & Rose, being careful in pronouncing a negative judgment as a kind of empiricism ; I prefer in such cases similar empiricism rather than any theoretical basis. May be that a really better knowledge of the members of *Echinomastus* will prove that they are really "closely interrelated."

An example of this method of judging : there are authors who have declined Britton & Rose's genus *Bartschella*. But they scarcely have judged well the basal connection of tubercles, nor the hollow in which the dried fruit remains and it seems that nobody has seen—and this is the decisive argument—that style and tube are coalescent in this genus, nearly the same as in *Aylostera*.

In writing my Monograph on *Tephrocactus*, which I have just finished, I have seen that there is still much confusion in regard to existing names and so much important data must still be conserved and this concerns the whole Family ; it seems to me to be of the utmost importance to conserve all knowledge gathered in our generation

(a secondary matter on what basis, so long as it is logical) than to prevent progress by theoretical discussions, i.e., discouraging such necessary work by a general uncertainty arising from the confusion by partially turning over well known systematic groups, as had been done recently with some *Mammillarias*. We should not overlook that any exaggeration in this line—however important investigations on evolution, etc., may be—prevents a practical use of a classification for determination, which is the most important task. If we classify by the characteristics of seeds, such classifications will remain without practical value for many, if only by the fact that very often no seeds are available.

It is obvious that the "reduction line of shoot-structure in flower character" was already the basic viewpoint in Britton & Rose's classification and I followed them along this line. Until today this was the surest and most practical possibility in determination work and we should not overlook that certain "group characters" are also important, in this respect, as they are given quite obviously in the *Echinomastus* group when it was separated from *Thelocactus* by Britton & Rose.

Here follows the description of the new species :

*Echinomastus mapimiensis* n. sp.

Singularis, ad 10 cm. altus, 8 cm. crassus; costis 13, tuberculatis; areolibus 13 mm. distantibus; aculeis radialibus ca. 22, ad 22 mm. longis, albidis,  $\pm$  curvatis, radiantibus, implicatis, 4 centralibus, ad 30 mm. longis, inferiore semi-fuscato; floribus ad 3 cm. longis, 2 cm. latis; phyllis perigonii albidis, in media parte brunnescentibus; ovario squamoso. Patria: Mexico, Sierra de Mapimi (F. Schwarz).

Single plants, up to 10 cm. high and 8 cm. in diameter; ca. 13 ribs, spiralled, grey-green, tubercled, with groove areoles on the tubercles; areoles about 13 mm. distant, roundish, at first somewhat felty; about 22 radial spines, whitish-hyaline, up to 20 mm. long, the uppermost the longest, sometimes up to 22 mm. long, somewhat curved to the apex, all radials appressed and interlaced; in general 4 central spines, 3 directed upwards, whitish, with brown tips, somewhat curved, up to 30 mm. long; 1 central spreading and a little bent downward, half of the length light brownish; all much more slender than in *E. unguispinus* and much lighter in colour than in *E. durangensis*; flowers at the apex, not widely opening because of the spiny apex, about 3 cm. long and about 2 cm wide, outer perianth segments olive with whitish margins, inner flower segments dirty white with tan mid-zone; style pale greenish; the many stigma lobes form a dense ring, yellowish; anthers cream, filaments greenish; ovary green and scaly; fruit unknown.

Type locality: Mexico, Sierra Mapimi, in half shadow, in good soil, in the flat positions at the foot of the hills.

Distribution: No other given by Schwarz.

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## HOODIAS

By H. HALL

The genus *Hoodia*, native to the warm, dry regions of Southern Africa, forms one section of the great *Stapelia* clan. They all have fat, leafless, thorny stems and, like the *Euphorbias*, emit a copious, almost colourless fluid when injured. Unlike the milky fluid of *Euphorbias*, so acrid and poisonous, the sap of *Hoodias* is even relished by the natives, and I have been shown several times how they actually eat the young stems. Their sap is very bitter, to my mind, but it is not permanently unpleasant. Incidentally, the related *Trichocaulons* are perhaps better known as edible plants amongst the natives, and some of these I have sampled, though I must confess that the taste, reminiscent of Liquorice, and said to be valued for allaying thirst, is not very exciting.

*Hoodias* are the giants of the *Stapelia* group, and vary from six-inch-tall species to five feet or more. Unfortunately they are notoriously difficult to establish but are a little more promising from seed. For a year or two the young plants show remarkable energy under good conditions then, for reasons unknown, they fade out. As, however, seeds are rarely offered for sale, due no doubt to the plants' refusal to live long enough to produce flowers and fruit, they are likely to remain scarce.

A few years ago we had a small specimen of *Hoodia dregei* in cultivation at Kirstenbosch which produced a few of its small, hairy flowers, but it seemed to have regretted the effort and passed away shortly afterwards. I have collected a number of specimens of about four species from time to time, but must confess that I cannot keep them healthy, though our cool, very damp winter is one of the problems for such sun-lovers, at the Cape.

The flowers of *Hoodia* are very striking indeed and once seen can never be confused with any other *Stapeliad*. They are saucer shaped and mostly flesh-coloured, without the remarkable patterns and colourations seen in most of their relatives, and the conventional five corolla lobes are reduced to short, pointed tips. Each flower remains open for about four days.

Generally speaking, *Hoodias* inhabit the hot stony plains and rocky slopes where the rainfall is comparatively low. They are never plentiful, for there are vast miles of the said hot plains without a trace of a *Hoodia* plant. Here and there, in well known localities, one comes across them, often as solitary, isolated plants, standing quite forlorn in the otherwise bare landscape. Unlike most of their *Stapelia* relatives which lurk beneath scrub or rocks, they usually stand out in the open to all the sun and wind and, in places, may be the only living plant for miles. But it must be remembered that the seed is wind borne, too, and they get arrested in their progress by bushes at times so that one does see specimens tangled up with the bush. However, I always feel that such plants look as though they would dearly love to be free and disentangled, to embrace the burning rays of the sun which they seem to love. Unlike many desert plants in South Africa, they do not exhibit the leaning over to the north as is so noticeable with things like *Euphorbias*, *Pachypodium*, and the young shoots of numerous other species. The flowers appear equally plentiful on all sides of the plants.

They have their natural enemies, for I have seen numerous plants whose stems were riddled by boring larvae ; their seed pods are also heavily parasitised.

It seems an impossible task to propagate them by cuttings, and I have never seen root formation upon branches broken off by animals, etc., and which may have been lying on the soil for a year or more. One would imagine that a plant with 30—40 branches from the base would have a few supplementary roots from some of them, but the root system appears to be confined to the original central stem.

When I was with the Bernard Carp Expedition to the Kaokoveld in 1951, I saw specimens of *Hoodia* standing over five feet tall, less densely branched than the more southerly species, the individual stems at least three inches thick, of a lovely glaucous pink colour. Their spiny ribs were as symmetrical as some of the *Cephalocerei*. Unfortunately, the time was winter and the dry season, though the days were quite warm. Frost, in that region, was quite unknown. In summer they would endure high temperatures and considerable humidity during the rains, being situated wholly within the tropics. These plants grew amongst scattered, deciduous bush near the Kunene River and very probably belong to the same species as described in "*Stapeliaceae*" by White and Sloane as *H. parviflora* N.E.Br. and which was discovered by Welwitsch about 1860 in Angola. We were camped on the south bank of the Kunene River and could gaze upon the mountains of Angola on the far side. As a matter of fact we hoped to cross over there, but the river was abnormally high and full of crocodiles, and we were not equipped with river craft. The light was fading as I took a photograph of one of these Kunene specimens, the central stem being over four feet in height and I send the picture because it is probably the only one ever taken of this species in that remote region.

To emphasise the beauty of a healthy plant in flower I submit a photograph I made on the Ceres Karoo in November, 1952. This specimen probably conforms to *Hoodia burkei* N.E.Br. which was discovered more than 100 years ago. It was known that a good shower of rain had fallen there a few days previously and, like most other Karoo vegetation, the plants had responded with amazing speed, filling out with precious water and producing their flowers. The individual flowers were more than three inches in diameter and produced in such abundance near the tips of the stems that they literally pushed free, as they expanded, the withered corollas of the earlier flowers. I judiciously removed a few handfuls of old corollas, of the texture of thin, dry parchment, to reveal more detail and improve the picture. The specimen was over 30 inches tall and, when viewed from above, the stems were quite hidden by the canopy of flowers.

I recall the faint but nauseating odour from the fleshy-pink flowers carried by the light breeze as I sat by the most illuminated side of the plant, the sun being obscured by thunder clouds. There were perhaps about 100 plants scattered over an area of about 20 acres, and roughly 130 miles from Cape Town, these being probably the nearest specimens to the Cape. It was noticeable that some plants bore smaller flowers than others, there was also slight colour variation, and quite a number had corollas much more incurved than the one illustrated here. Only colour photography can do justice to subjects such as these, and fortunately my companion, Mr. Ingemann, made some very fine colour pictures on Ciné film.

Incidentally, the thunder clouds were with us all the way to Calvinia which is situated about 100 miles further north and, I might add, provided us with muddy roads and swollen rivers for the three days we stayed there. On such rare occasions, when the Karoo is drenched and the untarred roads streaming with muddy water, one almost changes one's mind about drought-loving plants.

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## WELWITSCHIA MIRABILIS Hook. f.

By H. HERRE

It is a quarter of a century ago when the first seeds of this famous plant were put into the ground in the Botanical Garden of the University of Stellenbosch. As this plant immediately forms a long tap root, the seeds were planted into about three feet long drainage pipes which were closed at one side so that only a few holes were left. The soil used was a decomposed granite mixed with a certain quantity of old leaf mould. It took only a fortnight to three weeks for the seeds to germinate.

At first two cotyledons are formed while the two real leaves follow some time later. By that time the cotyledons fade and disappear. These leaves are the only leaves the plant ever has, they go on growing from the base throughout its life, wearing away at the tips and often becoming torn down the centre to the base.

The stem is stout, with a two lobed form and almost circular in section. It narrows downwards into a stout tap root. At the edges of the two lobes are two grooves, from each of which springs a leaf. The stem continues to grow in thickness and exhibits concentric grooves upon the top surface. In the outer (younger) of these grooves, the flowers appear in composed dichasia of small (male) or larger (female) spikes; they are covered by bracts which become bright red after fertilisation. The flowers are dioecious and are produced annually. At Stellenbosch it has taken us twenty-three years to show the first flower.

Male plants form up to two hundred small cones, each of which is about one inch long. They are ripe towards the beginning of January and show the yellow stamens ripening from the base to the top of the cone till the end of April. They also show a rudimentary gynaecium which is clearly to be seen. The female cones are much larger, about 3—4 inches long, but there are only about eight. They flower during the same period and if they are ripe one notices a drop of glistening fluid at the top of the hair-like stigma. At its home it is fertilised by a brown-red bug running up and down the plants. We have to do it by hand. In its home the seeds ripen during May, and as they are winged they are blown about and distributed by the wind. As there are heavy mists in its native habitat, the seeds germinate immediately and through the long tap root the young plants try to reach the underground water.

No doubt this plant belongs to those which grow on account of the underground water, and most of the plants are, therefore, found in old river beds where they will get it. If necessary, the root may grow to 20—40, even 60, feet long, but sometimes it is much shorter. As rains are scarce in its home, the young plants depend at first on the heavy mist which is formed there regularly. Thus they are slow growing, and old plants, with stems of 10—15 feet in diameter, will be very old and may reach one thousand years and more.

The plants are protected and a landscape containing them is shown on the 10/- postage stamp of South West Africa. There they grow about one hundred miles north of Swakopmund, and from there along a small strip up to Angola and also in Angola. In this strip of land they are not at all rare. Further in the north they grow also among grass polls and small bushes, and thus are not at all confined to a desert-like land. It was near the border of Angola that they were first found by the English traveller Thomas Baines in 1858. One year later the Austrian medical doctor, Friedrich Welwitsch, got it there, too. It was named *Welwitschia mirabilis* by Hook f. in 1863 (mirabilis=wonderful, strange). Today it makes a Family of its own (Welwitschiaceae) which is placed between the Gymnospermae (coniferous plants) and the Angiospermae.

Its native name is N'tumboa (N'=a click). The meaning of it is unknown. The natives use the dry parts of the leaves for fire making and the bigger stems as chairs. There is no other use reported.

Sometimes one will find a fungus living in the seeds which destroys them so that they will not germinate. The seed is then filled with black spores. Happily this fungus is, up till now, not widely distributed so that there will not be the danger that it may eradicate this most interesting plant.

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Space prevents us from producing some fine photographs illustrating Mr. Howard Gates' article on his trip through Mexico, commencing in this issue, also three fine photographs of *Ophthalmophyllums* illustrating Dr. Tischer's articles on these plants. They will be included in following Journals.



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## REPORTS OF MEETINGS

### May 12th, 1953 : Mr. A. Boarder : Outdoor Culture of Plants.

I cannot give a list of plants that will grow out of doors as some grow quite well for years and then a bad winter wipes them out and I get the blame.

Plants grown in living rooms can be placed out of doors from the 1st of June. Others may put theirs out early in May, but a frost may wipe them out, but plants grown in a house can be placed out of doors with advantage as plants grown in a room without sun never look as they should. Cacti will not do well without the sunshine that brings the flowers out. Some years ago I had to move ; it so happened there was a large circular bed where I put them and very attractive they looked all the summer until the greenhouse was built.

There are different ways of growing them outside, but if you have only a small collection beware when you put them back—they will have grown. If taken out of the pots, put a frame over them for protection against possible bad weather as you may get heavy rains and they want some protection, especially if the water does not drain away. Roots will grow through drainage holes and may block up the drainage hole.

Keep plants together if they are kept in their pots. Make a stand with holes in for drainage. Guard against slugs and birds. Slugs do not like anything rough, such as crushed coke. They can get in through the drainage hole. Meta fuel is useful, one tablet crushed up and mixed with bran or tea leaves and left in little heaps soon disposes of slugs. Hard skinned plants grow well outside, but do not put out tender things that will not stand up to pest and weather. Go steady ! Do not put plants from a cold north room into intense sunshine as the tender growing point will be checked. The skin may burn by such wrong treatment. Do harden off gradually and provide a little shelter.

Do not put plants out till the end of May or beginning of June when we have some idea of what weather to expect, but sacking will protect them if there should happen to be a surprise frost. Once your dahlia leaves and runner beans have blackened it is time cacti were inside, this usually happens about October. Cacti will not stand their feet continually wet, but if stood on coke breeze or gravel they should be all right.

If roots grow out of the pot they will be the healthy ones. I suggest you leave them until the following spring, when re-potting, for your attention as to cut them off suddenly is not wise. Place them on a little gravel, they need a drink and to harden. When plants are outside they dry up in fine weather and need watering, but give it to them in the morning, evening time makes them delicious to slugs ! If you see wormcasts, water with a strong solution of permanganate of potash. *Limax* helps provided it is kept dry.

Prepare the site outside by digging the soil out to a depth of eighteen inches and put in broken pots, broken bricks, even old tins, then put the pots in. Sixty per cent. of *Mammillarias*, *Notocactus*, *Echinopsis*, *Cereus* and *Epiphyllums* love the open air and *Opuntias* just go mad. Place small plants in front, with larger ones at the back.

Many like a fairly rich soil, but do not use fertilisers which make cacti sappy. They need the strength of the sun to harden them, so grow fairly hard. I have found that it is unwise to use manure for *Epiphyllums*. Many *Echinopsis* have grown out of doors for years. The spines must be a great protection from sun and frost for young growth.

The very best place where cacti can be situated is in the rockery, the very nature of its construction ensures that the plants will get good drainage. *Opuntia* roots grow freely round and round the inside of a pot till they are dizzy and it is the root system that enables them to grow well. Growing out in the open is fine for growth, so do not expect to get them back in the same sized pot that you took them from. Flowers appear on well grown plants. Growing them out of doors lets them have the perhaps most essential thing—plenty of air.

Do not put out *Mammillaria hahniana* or any of the white spined plants as, especially in town, they get dirty and sooted up, but if they do get dirty or sooted, clean them with a nail brush and a detergent.

Cacti like dews on which they thrive where their native sites are very dry. Spines help to condense moisture as well as protecting from sun and frost.

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On March 17th Mr. K. W. Harle was to have given a lecture on Seed Raising as well as a film. Unfortunately, illness in his family prevented this, but his nephew came along and showed us two splendid colour films, enlivened by the "Boss'" voice on the sound track. A very enjoyable evening.

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The annual dinner will be held in the autumn, probably October, when a second series of Kodachromes and lecture from Mr. Howard Gates will be presented. Details will be sent members in due course as it may not be possible for the October Journal to give adequate notice of the event.

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Vol. 15

OCTOBER, 1953

No. 4

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## SOCIETY NEWS

1953

Oct. 20th 6.30 p.m. P. V. Collings : Preparations for winter.

Nov. 17th 6.30 p.m. A. J. Edwards : Heating.

Dec. 1st 6.30 p.m. Lantern Lecture.

1954

January                      No Meeting.

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EDITORIAL

Once more we come to the end of another volume of our Journal, the fifteenth. The current volume has been notable for the conclusion of the very fine contribution by Professor Schwantes.

During 1953 I have added one feature to each issue of the Journal by the !!! notes. My purpose is to show how wrong ideas crop up and are maintained and to make you realise what absolute nonsense is published about cacti and succulents. It is remarkable that I have only been able to give one commendation during the year, i.e., to The Field. In this issue will be found the comment by the Torbay Herald about flowers strangling themselves and I make no apology for calling for help ! Of all the utter nonsense I have ever heard this takes the largest biscuit. We must always be on our guard not to make any statement that can be turned by the unlearned into a preposterous remark on our plants. Any reader would do a great service if they would write to their local papers correcting them if any wrong statement is made ; it is the only way to reduce the multitude of absurdities that abound in regard to our plants.

I have not had a too good flowering year. The plants that usually flower well with me have not done so well, but the year has been very notable for many plants that I have never flowered before, giving me quite a display. First of all, is a rather big *Opuntia microdasys*. It produced twenty-eight yellowish white flowers and was a sight for weeks. It is a common plant, but to flower so well is unusual. Another plant was *Trichocaulon meloforme* which presented me with a continuous flow of flowers for several weeks. The *Stapeliads* have very showy and very interesting flowers with which I am always intrigued. Another success was the flowering of all but one of my *Euphorbia obesa*, the process of pollination, with the result I have over a hundred seeds ! Many of my other *Euphorbias* have flowered very well indeed. For the first time I have been able to get foliage on some of my *Sarcocaulons*, a genus that is difficult to grow on. They are only some of the many interesting events with me.

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May we extend our congratulations to the President of the Society on the occasion of his silver wedding which was celebrated in July ? We wish him and his Countess many more years of happiness together.

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## CACTUS CULTURAL NOTES

By A. BOARDER

Although October brings many of our tasks in the greenhouse to a close, there are still several things to be done so that our plants may go through the winter fairly safely. The amount of water to be given from now on will depend on the weather and also the type of house or frame where the plants are kept. Some October months are quite warm at times and, when this happy state arrives, it is essential that the plants are watered as often as they dry out. Keep a close watch, however, towards the end of the month, as, if you remember, last year we had a very sharp frost about Oct. 17th, and, as a matter of fact, I recorded more frost than I did throughout the rest of the winter. If the weather turns dull and wet it is of little use watering, as the soil does not get a chance to dry out quickly enough and the roots may suffer. If the Cacti are kept in an indoor position they may need more water than if the plants were in a greenhouse. If the plants are in a living room in a south position it is possible that they may dry out very quickly. This dry atmosphere is often the reason why such plants as *Opuntia microdasys* shrivel up and lose some pads. Many Cacti in the greenhouse will continue to grow well into October if the weather is kind and I like to see that as long as the plants are able to assimilate the moisture I continue watering with care. Give plenty of air still, and see that the windows are closed fairly early in the day. About half an hour before the sun leaves the greenhouse or frame is a good time to close down. Once the sun has left the house whilst the windows are still open, it is surprising how soon heat is lost.

If you have placed any plants outside for the summer, it is imperative that they are brought inside towards the end of the month of October. See that the drainage holes of the pots are quite clear of earth and try to clear the soil of any worms which may have entered. A watering with a fairly strong solution of permanganate of potash will generally do the trick. Plants which have been out in the garden may stand for the winter in a spare room and be kept quite dry. If the plants have been in a frame which it is not intended to heat in the winter they will be safer indoors. It is possible, however, to heat a frame with an oil heater if certain conditions can be obtained. It must be remembered that an oil lamp will not continue to burn well in an almost air-tight frame, and so some provision must be made for ventilation. Of course, if electric heating is used this obviates the necessity for ventilation, the electric heating tubes work well without this. If an oil lamp is used in a fairly small frame it may be necessary to make a hollow trench so that the lamp is as low as possible. This will ensure that as much heat as possible can circulate around the frame before much of the heat is lost on the top glass. Where plants are left for the winter in such a frame, the base should have been either floated over with concrete or the floor should have been well raised above the ground level as otherwise too much wet can enter the frame from below and the plants will suffer.

For those members with a greenhouse it will be a question as to when to start heating. For the most part the Cacti are better kept cool all the winter. There are some exceptions, such as the *Opuntias*, but any plant which requires a little warmth can be placed near the heater so that it gets the extra warmth. For most Cacti I am sure that a temperature of 40 degrees is quite high enough. If you try to maintain a temperature higher than this the plants may be kept growing and so lose their winter's rest. Where you have some seedlings of the current year's sowing, it may be possible to just keep these growing through most of the winter. At least, I consider that they should be kept plump and not kept so dry that they wither up at all. I have a separate frame in my house which is independently heated by an electric heater controlled by a thermostat. This ensures that I am able to keep the very small plants just plump without the fear that they may get a touch of frost. It should be well known that Cacti can stand a certain amount of cold as long as they are dry and the danger comes when a sudden sharp frost catches the plants in a damp condition. If you are not weather wise and cannot predict a frost, then play for safety and keep all on the dry side once frosts are expected.

One very important task at this time of the year is the collection of seed pods from the plants. I advise that the pods are taken off and placed in an envelope with the name on and then leave the envelope open so that plenty of air can reach the pods. They must not be allowed to get damp. During the winter months it will make an interesting task to clean the seeds from the pods and remove any husk and dust. If you think that you may have to keep the seeds for a long time, it is better to leave them in the pods as they keep for much longer periods this way. It is impossible to say how long cactus seeds will keep before losing their vitality. Some kinds I have kept for over ten years, but others have not lasted fertile for more than five years. Seeds are best kept in an airy cool place and should not be close stoppered. Many kinds of seeds will have been collected long before this as the pods on such as *Echinopsis* and *Lobivias* will split as soon as they are ripe.

I had several pods develop and ripen on my *Stenocactus* and found that by the middle of July the pods had burst and there was a danger that the seeds would fall out. *Echinocereus* pods also split, but, as with the *Echinopsis* and *Lobivia* types, the seeds are contained in a white jelly-like substance which prevents the seeds from falling. Although I have collected more seeds than ever so far this year at the time of writing these notes, July 27th, I have not seen



a single seed pod on one of my three *Mammillaria zeilmanniana* plants. This plant has so far defied all my efforts to supply seeds. I have had hundreds of flowers and in fact I do not remember an occasion throughout the spring and summer when flowers have not been open on these plants. I have used a camel hair brush and transferred pollen from one plant flower to the others but so far I cannot see a sign of a seed pod. They may be a type which produce the pods the following season as is the case with many species of *Mammillarias*, but last year I pollinated these plant flowers repeatedly and still nothing has happened. The three plants are seedlings and to the best of my belief are unrelated. I was able to set plenty of seeds on my *Lobivia aurea* and I do not think I have had any before. The *Echinocereus salm dyckiana* which flowered so well has set a seed pod, and also I have one on a *Wilcoxia schmollii*. A strange thing happened to this plant after it had flowered. The central stem had three flowers as well as some of the smaller off-shoots. After flowering it appeared that seed pods had formed where four flowers had been, but suddenly the top four inches of the plant died right away for no apparent reason and the three pods were lost. This is not a usual happening as, generally, if anything goes wrong with a plant the rot starts from the base of the plant. In this case the plant is well alive and fresh shoots are growing at the lower parts of the plant.

My *Mammillarias* have given a very fine amount of flowers this season and a few have flowered for the first time. I have a good sized plant of *M. zahniana* which came to me from a friend a few years ago without any roots on it. It took me a year to get fresh roots to form and then another year before the plant plumped up and really got going. This year the plant has flowered and I was very pleased to see that the flowers were quite large yellow ones. I had only had yellow flowers on *M. surculosa* and *M. baumii*, but later had a *M. flavovirens* flower with small pale yellow ones. The *M. zahniana* flowers were about two inches across and resembled the flowers of the *Dolichotheles*, except that the colour was paler. The plant looked fine with six flowers out at once and I am now waiting to see if any of my efforts at pollenisation were of any use. I have three small seedling plants of *M. sheldonii* and they have surprised me this year with the number and quality of their flowers, all through July there have been a few flowers on these and they are quite large in proportion to the size of the plants. Another rather fine one is *M. fraileana*, this is one of the strongly hooked difficult ones, like *M. microcarpa*, but the flowers are quite large and I was glad to see a flower or two on my young plant as this is one which I raised from seed saved from my original plant which was lost during the war. The *M. microcarpa* still give me trouble, as the roots seem to die off in no time for no apparent reason. The plants can be in the same box as other *Mams.*, which thrive and yet the *M. microcarpa* will not do well. I know that this plant likes some shade but even when this is given the plants lose the roots and go wrong after three years or so. I do not like to graft any plant but I shall experiment with this one on a seedling *Trichocereus spachianus*, to see if I can get the plant to grow like that.

Some growers resort to the grafting of seedlings to get them past the rather slow first year or so and then, when they have made good sized plants, they remove them from the stock and root them to grow on naturally. It always seems to me to be a wrong outlook on Cacti cultivation as it is natural for them to grow on their own roots and so it must be considered a sign of failure to have to resort to grafting. Even so I think I must try it out on the *M. microcarpa*, which for the past 3 years has defeated me. I can raise them well and they make excellent growth for a year or two and then lose their roots and fade out.

I am often asked by members when is the correct time to transplant seedlings from the seed pan. So much depends on the type of seedlings and the conditions under which they have been grown that it is quite impossible to lay down any hard and fast rule. Most seedlings make renewed growth once they get established after transplanting. For Cacti seedlings I consider that it is a good plan to move them as soon as they touch one another. Once this happens it will be noticed that the plants cease to grow. I generally transplant when the seedlings are about four or five months of age. This year I have been away from home so much that I have not yet found time to do this job, but I hope to be able to make a real effort in August. I know that I shall have lost over a month's growth but appointments pile up on me to such an extent that I find that I am away from home many more days than I am not. There must come a time soon when I shall have either to give up growing plants or cease giving so many lectures and judging, not only Cacti but fish as well.

If you have placed any form of shading on the glass of the greenhouse, this must be removed now. All the glass should have a good cleaning inside and out so that the maximum amount of light is obtained. One thing most Cacti will not stand is lack of light, and it is amazing how much light is kept from the plants by dirty glass. During the next few weeks an effort should be made to over-look every plant in the greenhouse. Start at one end and systematically replace every plant after it has been examined to see that it is free from pests. If a plant is left in the same position all the year round it may be that some parts of it are never seen, and it is in these places that pests may be lurking. I have found that an occasional spraying with Sybol has been advantageous, as it can kill red spider and control many other pests as well.

I am hoping that in the next Journal I shall be able to announce another free distribution of seeds which can be sent out in time for the next spring sowing.

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## CULTIVATION OF SUCCULENTS

By Mrs. M. STILLWELL

I always feel the month of October is the great Autumn Flower Show of the succulent world, especially among the stemless *Mesembryanthemums*.

*Faucarias* provide a wonderful splash of colour and are good plants for the beginner to start with. A few of the best are *F. tigrina*, *F. brittenae*, *F. grandiflora* and, of course, the beautifully marked *F. tuberculosa*. They all like full sun and plenty of water until they have flowered, then the watering can be gradually reduced to prepare for the winter rest. These plants make very little growth until the month of June and, therefore, only require a small amount of water to prevent shrivelling from March to June.

Many of the *Lithops* will, probably, still be blooming; here again they should be allowed to rest after flowering. They can be given an occasional drink during the month of November and then kept quite dry until the following May. They will completely dry up and, to the novice, appear to be dead, but on no account be tempted to water, as the root system will not be in action during the resting period and, therefore, rot will very soon attack the plant if the soil is allowed to remain wet. Never water your *Lithops* while it has more than one pair of leaves, wait until the old pair have completely gone.

*Conophytums* are also part of our Autumn Flower Show. I always get a tremendous thrill when the first flowers open on my *Conophytum minutum*, such a lovely deep mauve colour—hard to describe. Many of the *Conophytums*, the flowers of which are the least attractive and are usually described as straw coloured or sooty yellow, are compensated by a beautiful scent. One of the nicest of these is *C. leviculum*. I also have another with a strong perfume similar to a narcissus, but as yet I have not found its name. I was showing a friend round the greenhouse one evening last year when we noticed this beautiful scent and, after smelling everything that showed any likelihood, we finally traced it to this small *Conophytum* which had two rather weedy looking yellow flowers.

If you are interested in plants that have a pleasant odour, I would suggest you try to obtain *Neohenricia sibbettii*; it has also very minute cream flowers which open in the evening and have a very delightful perfume.

*Stomatium geoffreyii* is a plant that should be in all collections. A few flowers will scent a whole room and it blooms very freely.

Your *Pleiospilos* should now be in full bloom, in fact, many may be over. As soon as the second pair of leaves start to form, that is the signal to withhold water. The new pair of leaves will feed off of the old and will need no more water until the original leaves are completely absorbed. This will probably take until next July. Seed pods can be taken from *Pleiospilos* when ripe, but germinate better if kept for a year.

A plant that is not met with much in collections is *Cerochlamys pachyphyllum*. It is one of the stemless *Mesembryanthemums* and blooms in late summer. The flowers are a rich rose colour on long stalks and open during the day. The leaves are thick and waxy.

Some novices may have wondered why our plants are given these long Latin names which, to a great many, must be quite meaningless. Of course, the primary reason is that Latin is a universal language and understood by botanists throughout the world and, therefore, our plants are known by the same names all over the world. Greek words are used less frequently. The names usually bear a description of the plant, with the exception of those named after certain people. I would suggest you purchase a dictionary of botanical names (A popular dictionary of botanical names and terms, by G. F. Zimmer, published by G. Routledge & Sons Ltd.—Ed.). This gives you the English translation of those weird and wonderful names and makes the hobby so much more interesting.

The way to be a successful grower of cacti and succulents is to get to know your plants thoroughly. Take each individual one and learn all you can about it from books which you can borrow from the Society's library. Make notes on all its requirements and treatment. You will find your plants repay you a thousand fold for that little extra care and attention.

If you are at any time going away for a few days, do not let your best friend loose in the greenhouse with a watering can, especially in the autumn and winter months. You will find more harm will be done than if they had been left dry. Apart from seedlings, a collection of cacti and succulents will be quite happy left unwatered for a week or ten days, provided plenty of air is given. By all means ask a friend to open and close windows daily, even during the winter if the weather is favourable, but never go away for a period and leave the greenhouse shut tight, plants are like human beings—they like to breath good pure air.

I re-potted my large *Agaves* and *Aloes* this year and was amazed to find that some of them were just a solid mass of roots, with hardly a particle of soil left. In this case, it is obvious that a lot of these roots are old and useless. I cut away all the old dead looking ones and left the plants just sufficient of the current year's roots to serve their purpose. That is often the cause of the leaf tips dying back. The plant has used up all the goodness in the soil and is, therefore, suffering from starvation.

One last word of warning—now is the time to check up on all heating apparatus as many of the first frosts come in October. Do not be caught out. All succulent plants that have been outdoors for the summer should now be safely inside.

Many of the *Gibbaeums* are autumn and winter growers and, therefore, need a little water during the winter months to prevent shrivelling. You will find *G. pubescens* comes into bud in January and blooms about March, also *Argeta petrensis*. You may find the latter will shrivel a lot, but it soon gets back to normal in the spring. *G. blackburnii* and *G. pilosulum* require the same treatment as for *Conophytums*.

The autumn months bring out some very beautiful colourings among the *Aeoniums* and *Sedums*. These make excellent plants to bring indoors for the winter months when flowers are scarce. *Sedum adolphi*, sometimes known as *Sedum nussbaumeri*, makes an excellent room plant. I had one on a fireside table all last winter and it was none the worse for its experience when put back in the greenhouse in the spring. A very attractive centre piece for a dining table could consist of many of the bright coloured *Sedums* and they would be ideal for flat dwellers who do not possess a greenhouse. Here are a few of those with the best colouring—*S. adolphi* (golden), *S. sieboldii* (pink in autumn), *S. guatemalense* (coppery red), *S. treleasei* (silvery blue) and *S. lineare variegatum*. These are all plants easy to obtain from reputable growers and are very suitable for beginners and juniors as they require very little water when brought indoors for the winter and then they retain their compact habit. I trust you have had as lovely an Autumn Flower Show as I am looking forward to at the rather early date of writing these notes.

One last thing I must mention, do not let your plants go into their winter rests without first making sure they are pest free. A good plan is to fumigate the whole house with Fumite. These little pellets are quite harmless to the plants. The operation must be carried out over night and the plants should be well watered first. If you are rather nervous of this method, a good idea is to spray with Sybol insecticide, used as directed.

Check up thoroughly on your greenhouse roof for drips. Last year I lost a whole pot of *Stapelia gigantea* through a drip which I had overlooked.

Have a look round your plants for seed pods. If ripe, they can be removed and packeted ready for next year's sowing. The *Stapelias* usually provide plenty of seed pods from the previous year's flowers. They suddenly appear like two long horns. When ripe they split and the seed is scattered, each one on a puff of silk, similar to that of a dandelion. *Ceropegias*, being of the same family, also seed in this way.

Ease up on the water this month, do not give a plant a real good soaking, but just sufficient to prevent shrivelling. *Echeverias* and *Haworthias* like a little water all through the winter, but always pick a nice bright day and water in the morning so that they are able to dry out before night. Never leave water laying in the heart of a plant, in fact, during the autumn and winter months it is far safer to always water from the bottom and then you will be sure that the neck of the plant will not remain wet.

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The secretary of the North Kent Branch reports that at their local Show they received, in open competition, five firsts, four seconds and a third, the cup for the best cacti exhibited and the cup for the best succulent exhibited, also a second for *Epiphyllum lepidocarpum* which had three blooms full out. Later, they staged a display of a hundred plants at a Works Show and obtained a Coronation Silver Plaque, while other members than Mr. Milton obtained two first and two seconds, also a certificate for best competitive exhibit.

OPHTHALMOPHYLLUM Dtr. et Schwant—*contd.*

By Dr. A. TISCHER

(Translated by Mrs. G. Peters)

13. *O. rufescens* (N.E.Br.) Tisch. (*Con. rufescens* N.E.Br. in *Gardeners' Chronicle* 1930, 11 p. 8 ; Jacobsen, *Succulent Plants* p. 156 ; *Kakteen und andere Sukkulenten* 1936 p. 157).  
Single body, 2.5 cm. high, 2 cm. in diameter, above somewhat depressed, cylindrical or somewhat obconical, notched, above shortly bilobate, lobes 4 mm. high, rounded above, fissured almost right through ; body sappy and soft tissue, smooth, hairless, tinted dark purple, not shining ; lobes windowed above, on the upper part of the sides a number of dark green spots. Flower not completely known, creamy white in colour, 15—30 mm. in diameter according to Jacobsen, white according to Dr. de Boer.  
Habitat : Kenhardt Division, at Poffadder.  
*O. rufescens* was described as *Conophytum rufescens* by Brown. I have received a plant of this species from Brown, unfortunately, I could not observe the flower. According to form, size, colour and the special structure of the body, it resembles species *O. friedrichae* so completely that the relationship with *Ophthalmophyllum* seems to me to be beyond doubt. The correctness of my view is supported by Mr. Bates of Hounslow. I have, therefore, already attributed this species to *Ophthalmophyllum* without any exact knowledge of the flower.
14. *O. schlechteri* Schwant. (Jacobsen, *Die Sukkulenten* p. 168, and *Succ. Plants* p. 228 ; *Succulenta* 1939 p. 113).  
Plants consisting of 1—2 bodies ; body prolonged oval, somewhat compressed, 4 cm long, 1.8 cm. in diameter, somewhat thinner at the base, bilobed above, lobes 7 mm. tall, somewhat conical, fissured not quite all the way through (?), smooth, not hairy, ground colour dark green to pale flesh tint or somewhat reddish, lobes above with a dull, not transparent window, whole body spotted with little transparent flecks ; flower white, 25 mm. in diameter.  
Habitat : Little Namaqualand, forty miles east of Port Nolloth (according to Jacobsen).
15. *O. schuldtii* Schwant. (Jacobsen, *Succ. Plants* p. 229).  
Single body, 2 cm. high, 2 cm. in diameter, hardly compressed at all ; compact obconical or practically spherical ; bilobate above, lobes 6 mm. high, slightly compressed, rounded above ; sappy fleshed ; smooth, hairless, light to dark purple, lobes above with transparent windows, the rest of the body with transparent flecks ; calyx tube 4 mm. long, fused for 1.5 mm. with the corolla tube, with six tips 3 mm. long ; corolla tube 5 mm. long, white ; 55—60 corolla segments in 4—5 rows, 1 cm. long, 1 mm. broad, narrowly spatulate, obtusely pointed or notched, white, inner ones shorter and narrower, transforming into numerous white staminodes ; numerous filaments projecting from the tube ; six stigmas, 2.5 mm. long, somewhat awl shaped on a style 1.5 mm. long ; ovary deepened above, 1 mm. into a bowl shape, dark olive green disc, well developed.  
Habitat : Great Namaqualand, at Vaaldoorn.
16. *O. triebneri* Schwant. (*Kakteenkunde* 1934 p. 60 ; Jacobsen, *Succ. Plants* p. 229).  
Single body, cylindrical above to obconical, slightly compressed, 2 cm. high, 2 cm. in diameter, lobes 6 mm. high, somewhat flat, sometimes keeled, roundish on the back, fissured throughout, smooth, hairless, sides lilac-brownish-reddish ; above sometimes deep ochre coloured, on the upper part of the sides thickly spotted in dark green which coalesce above on the lobes to form a window ; flower up to 2.5 cm. in diameter, with broad petals, shining, white, scented.  
Habitat : Great Namaqualand, sixty miles east of Eendoorn, at Kakamas (?).
17. *O. verrucosum* Lav. (L. Bolus, *Notes* 11 p. 473 ; Jacobsen, *Succulent Plants* p. 229).  
Plants consisting of one or two bodies, cylindrical to somewhat obconical, 2.5 cm. high, at the fissure 1.8 cm. in diameter, in the middle of the body 2 cm. in diameter, bilobate above, lobes 5 mm. high ; fissured throughout, soft tissue, satiny papillae, above on the lobes with clear transparent warty prominences, which, however, when completely turgid, become practically completely smooth and coalesce to form a window, also on the upper part of the sides a number of biggish transparent spots ; body tinted intensively reddish brown ; calyx tube 8 mm. long, fused for 5 mm. with the corolla tube, with six tips 3.5 mm. long ; corolla tube 10 mm. long ; 45—50 corolla segments in 3—4 rows, 12 mm. long, 2 mm. broad, spatulate, round above or notched, white below, at the tips suffused deep pink, inner transformed into numerous white staminodes ; filaments projecting from the tube ; six stigmas, filiform, 13 mm. long, on a style 2 mm. long, ovary deepened into bowl shape, in the centre heightened conically, disc on the rim of the ovary, narrow, reddish brown.  
Habitat : Van Rhynsdorp, at Nieuwerust.

The above descriptions contain everything hitherto published about the species of this genus. Our knowledge of the species still contains many gaps. Because of the great number of the characteristics which are possessed in common, it is very difficult to separate one species from another unequivocally. It is even more difficult in most cases to identify individual plants as a member of a particular species. Several of the species described are given by the authors as coming from the same locality. Judging by the minute differences given (a result of the frequent incomplete original descriptions) it is by no means impossible that several of the described forms may turn out to be identical with one another. Thus *O. herrei* Lav., *O. longum* (N. E. Br.) Tisch., and *O. lydiae* Jac. all occur in the immediate neighbourhood of Steinkopf. Exact observation from material on the spot should first determine whether or not, and just how far, these differences are specific or merely variations in form. Far reaching correspondences in the descriptions occur in the following species which have neighbouring localities; *O. friedrichiae* (Dtr.) Dtr. et Schwant., *dinteri* Schwant. and *O. triebneri* Schwant. In particular it must be proved whether the red flower of *O. dinteri* alone is sufficient grounds for founding a new species, if there are no further differences in the characteristics of the body and the flower.

The following come also from neighbouring localities: *O. maughanii* (N. E. Br.) Schwant., *O. schlechteri* Schwant., *O. jacobsonianum* Schwant., and *O. praesectum* (N.E.Br.) Schwant. The two latter have pinkish lilac flowers, the two former, white. The characteristics of the body of *O. praesectum* and *O. jacobsonianum* correspond closely. Furthermore, the description of *O. fullerii* Lav. follows closely that of these species though the locality lies further to the north east at Kakamas. Since a number of original specimens from the natural habitat are now in cultivation, it may be possible, in the foreseeable future, to solve this question. Until then we must wait until reliable material from the localities has been collected. For the rest we are not yet able to fit the range of forms of *Ophthalmophyllum* into the frame of existing scientifically investigated discoveries. Triebner and Schlechter in particular have made discoveries at the localities of known and unknown forms. Discoveries were made at Nieuwefontein, Gamoep, south and east of Springbok, at Namies (Bushmanland) and in the further neighbourhood of Kakamas, including Keimos to the east of Kakamas. Unfortunately these plants perished before they could be scientifically investigated. It may only be hoped that one day they will be rediscovered.

It is quite certain, however, that there are plants of *Ophthalmophyllum* in the collections which still await classification.

How often do we see in the descriptions given above that the differences between what were given hitherto independent species, are only very minute. (Unfortunately, I myself could not observe all the hitherto known species from plant material which was above suspicion). In the light of our present knowledge of this genus, it is very difficult to identify any individual plant with certainty. As far as I have been able to observe, the body form and colour varies considerably between individuals of the same species. Form and colour depend decisively upon the habitat of the plant (light conditions) and particular culture (watering). The *Ophthalmophylla* are decidedly "children of the sun," and can tolerate an extraordinary degree of desiccation. Plants kept in conditions of sunniness and airiness take on a compressed growth and are coloured more intensely than those kept in less clear conditions. In consecutive years, the same plant may exhibit often a more or less compressed or extended cylindrical, spindly, or obverse conical growth. With sparse watering, the body becomes smaller and more compressed and the window becomes duller, and less of a single piece, but becomes a group of many individual transparent darker spots. From all these points of view, it becomes extraordinarily difficult to find a *practical key* for the identification of an individual plant. We must also bear in mind that in our collections a number of hybrids have been raised. This makes it even more difficult to identify a plant without precise knowledge of its antecedents. In spite of this I believe it important to attempt a first effort at a key. It will certainly be capable of being improved. If the user, however, bears in mind the peculiarities and reservations mentioned above, the approximate identification of a plant will be made easier. What will be decisive, will be the achievement of the most typical plant forms through correct culture. As a rule, the *Ophthalmophylla* show their most typical body form and colour just before the commencement of the rest period (about April-May). They are then easier to identify.

#### IDENTIFICATION KEY

- I. Body compressed, usually not taller than broad, almost spherical or obtusely conical, above much narrower than at the base, above not very markedly bilobate. Colour: light to dark purplish red. ***O. schultzei* Schwant.**
- I' Body not so markedly compressed as in I, mostly taller than broad, cylindrical or obverse conical along the length, above only a little narrower, just as broad or a little broader than in the middle or below, usually with distinctly cup like or  $\pm$  flatly arched, sometimes rather oblique lobes, and fissured throughout, colour, purplish

- red, brownish red, light brownish to light flesh colour, ochreous yellowish or grey olive tint, light green or dark green. 2
2. Colour  $\pm$  purplish red, slightly compressed above, cylindrical, up to 1.5 times tall than broad, above rather the same breadth or a little narrower than below, up to 2.5 cm. tall, above distinctly bilobate, with single window, flower white.
- O. rufescens (N.E.Br.) Tisch**
- 2'. Body  $\pm$  brownish red, light brownish to light flesh colour, ochre colour, olive colour, light green or grey green. 3
3. Body  $\pm$  brownish red. 4
- 3'. Body pale reddish to pale flesh colour, light brownish to ochreous, olive, light green or dark green. 7
4. Window not single, but consisting of a number of big dark green spots, which are somewhat elevated, and give the upper sides of the lobes a slightly warty appearance, colour brownish red, body height about twice the breadth, flower white to pale pink.
- O. verrucosum Lav.**
- 4'. Lobes with a single window, which, in a number of cases overlaps on the sides, and breaks up into a number of big dark green spots ("micro-windows,") upper side of the lobes not appearing warty, smooth or somewhat dull. 5
5. Flower pinkish purple, colour of the body satiny,  $\pm$  dark brownish red.
- O. dinteri Schwant.**
- 5'. Flower white, colour of the body, satiny dark brownish red, or passing over into dark ochre above. 6
6. Body dark brown red, but lighter coloured than *O. dinteri*. Single window throughout.
- O. friedrichiae (Dtr) Dtr et Schwant.**
- 6'. Lower part of the body lilac to brownish red above part passing over into dark ochre, lobes somewhat flattened off, window transformed into coalescing spots or flecks.
- O. triebneri Schwant.**
7. Body light brownish red to light flesh tint, ochre yellow or olive tint. 8
- 7'. Body light green or grey green. 14
8. Body light reddish brown, to light flesh tint, flower white.
- O. schlechteri Schwant.**
- 8'. Body light brownish to ochre. 9
9. Body relatively dainty, not more than 1.5 cm. high, conical above, somewhat narrower than below, flower white.
- O. acutum (L. Bol.) Tisch.**
- 9'. Body in most cases taller than 1.5 cm. 10
10. Body light reddish brown, plant consisting of one body, lobes flat above, flower white.
- O. caroli (Lav.) Tisch.**
- 10'. Body light brownish to rather copper coloured, or pale clay coloured or yellowish to greenish olive. 11
11. Body light brownish to ochre, or light clay colour, flower lilac pink.
- O. praesectum (N.E.Br.) Schwant.**  
**O. jacobsonianum Schwant.**
- 11'. Body ochre to light loam colour or yellowish to greenish olive. 12
12. Body ochre to light loam colour, or yellowish olive. 13
- 12'. Body greenish olive, lobes rounded off flat or obliquely truncated, crown segments white below, above light pink.
- O. lydiae Jac.**
13. Body ochre to light clay, or yellowish olive, flower pinkish purple.
- O. fulleri Lav.**
- 13'. Body same colour as 13, flower white.
- O. maughanii (N.E.Br.) Schwant.**
14. Body grey green, very slenderly cylindrical, 3.5 cm. tall, lobes 1 cm. tall, flower white below, above light pink.
- O. pubescens Tisch.**
- 14'. Body light green to greenish olive. 15
15. Body light green, upper side of the lobes often obtusely keeled, flower segments white, pink at the tips.
- O. longum (N.E.Br.) Tisch.**
- 15'. Body light green, to greenish olive, crown segments white above, pink at the tips.
- O. herrei Lav.**

According to the description of the flower, one might come to the conclusion that *C. acutum* L. Bol. was a species of *Ophthalmophyllum*. The description of the flower is not, in fact, complete, but from the total habit of the plant, the comparatively long stigmas, the somewhat hollowed out upper side of the ovary, and the comparatively broad disc, one may regard its membership of the *Ophthalmophyllum* genus as beyond doubt. This species also comes from the more restricted distribution area of the *Ophthalmophylla*. I have, therefore, changed the name of this species.

There remained, hitherto, some doubt about the classification of some species with a similar habit to that characteristic of the *Ophthalmophylla*, in particular, as regards the presence of a window. To this group belong the following, among others, *Conophytum pellucidum* (N.E.Br.) Schwant., *C. pillansii* Lav., *C. fenestratum* Schwant., and *C. subfenestratum* Schwant. I had, however, the opportunity of observing the flowers of these species and concluded that all, without a doubt, belonged to *Conophytum*, in spite of great similarity (to the *Ophthalmophylla*) in habit, windows and flower structure. In their evolutionary history, however, they are of great interest, since they are undoubtedly a connecting link towards *Ophthalmophyllum*. It may be assumed that the latter is a later evolutionary stage, being derived from these or nearly related species.

I was not able personally to observe the flowers of another species of *Conophytum* of the sub-genus *Fenestrata*. Therefore, the solution of the problem of their generic relationship must remain open. I hope, however, that this complete picture of the state of our present knowledge of this so interesting genus, *Ophthalmophyllum*, will so serve its purpose that the gaps in our knowledge will soon be closed by the collection and evaluation of further material gathered in the field.

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## OUTCASTS

By H. HALL

During the latter part of March I was spending a few days plant-collecting in the Kimberley area. Compared with the richness of the succulent flora of Namaqualand and the Little Karoo, Kimberley is poorly endowed, and those I collected are not part of this story.

One hot afternoon, travelling rather slowly through a small village called Warrenton, my companion suddenly yelled "Stop! Pink Lilies." Dutifully, I halted the van, reversed a few yards but the "Lilies" were not the sort we might have expected. In a slight hollow by the roadside which, at some former time had been filled up with rocks of various sizes, and with a barbed-wire fence stretching across it as part of the road's boundary, we saw a large number of *Echinopsis multiplex* with crops of glorious bloom. Most of the specimens were many-headed, several forming cushions about two feet across. Amongst these were a few even larger specimens of what I feel sure were *Trichocereus lamprochlorus*, a species I grew in Manchester but which never flowered with me. I never could have imagined that the first flower I should see would be on a discarded specimen near the borders of the Transvaal. I took a couple of photographs for the record and a flower of the *Trichocereus* may be recognised. The bloom was some five inches long and partly closed.

These plants must have been discarded many years ago unless they are more vigorous in those parts. The climate there is eminently suited to the Cactaceae (or most of them I hasten to add), thundery rain in summer with considerable humidity and fairly high temperatures, and with cold dry winters. The odd thing was that there was practically no soil visible, the roots working their way deep down amongst the boulders. Anyhow, the plants were in magnificent health which goes to show what little such things ask for in the way of nourishment.

Of course we left them undisturbed, but I cannot understand why the local children hadn't removed the flowers for, to them, they must have been regarded with little more regard than roadside weeds, even though somewhat unusual ones in having such large and handsome blooms.

On our return from Kimberley a few days later, by the way, we passed a farm which had, for a fence around a sort of paddock, a marvellous hedge of *Trichocereus Spachianus*. It measured roughly three hundred yards in total length, the stems were about two feet tall on the average and, branching from the base, made the hedge about two feet thick. I leave the readers to compute the total number of stems, for they were all touching each other as is typical of the species when young and vigorous, and I passed on with a mental picture of the hedge when it is in bloom, for this species flowers very well in South African gardens.

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## EPIPHYTES

By G. G. GREEN

Those plants known as *Phyllocactus*, or *Epiphyllums* as they are correctly named, have been crossed so many times that very few of those to be seen today are natural hybrids. Indeed, plants bearing the same name are often quite different in the colour shading of the flowers owing to cross fertilisation.

This, however, does not detract from the amazing beauty of the flowers of these species, and one could specialise in these alone, collecting hundreds of varying shades of colour from pure white to deepest crimson, with yellows, orange and violets included. One thing this hybridisation has done is to increase the sizes of the flowers which on some species are anything from four to eight inches in diameter.

With a good collection of different sorts, the show of bloom is amazing and cannot be surpassed, in my opinion, by anything else that grows. Though the flowers are comparatively short lived individually (from two to six days), the number produced gives a long period in which the show lasts, roughly two months of the year.

Single rooted cuttings of one year will give one or two blooms, whilst mature plants of five years or over have often been known to have fifty and even more vividly coloured blossoms. Well worth growing, indeed ! After the blooming period, they may be planted out on a shady border, or the pots stood on ashes where they can be watered regularly and shaded from the strong sun on hot days.

This open air treatment is extremely beneficial for them as it ripens the new growth, which is then strong and healthy, so that more and better flowers are produced the following year. The plants remain healthy during the winter and are not so liable to fall victims to diseases during the wet months. A morning spray when the days are dry, and soil that never dries out will make handsome new growth.

I prefer to repot *Epiphyllums* every year in entirely fresh compost, shaking all the old soil off the roots and cutting away dead or damaged parts at the same time. A good compost is one that is light and porous containing equal quantities of leaf mould, coarse sand and good loam, with the addition of a quarter part crushed brick and charcoal. Where it is possible to obtain dry cow manure, by all means incorporate this, mixed with the leafmould. With this compost there is no need to put in a lot of drainage crocks, one piece over the hole sufficing, leaving more room for the roots. The best time of year to repot is the end of March, or immediately after the flowers have ceased.

Propagation is by means of cuttings, taken at the broadest part of the stem and placed after a day or so, in sand and peat kept moist. Seeds may also be sown, though it is some years before a satisfactory specimen is obtained. Seedlings generally develop a lot of branches which never grow sturdy until the third year, and it is much better to treat these as cuttings after the second year.

Very similar to *Epiphyllum* and long regarded as such is the *Nopalxochia*, a genus of very free flowering and easy-growing habits. The flowers are smaller than those of the *Epiphyllum*, but just as bright in colouring, and scented. The stems are very leaf like, broadening from thin cylindrical bases to flat, with a strong central nerve and crenate edges.

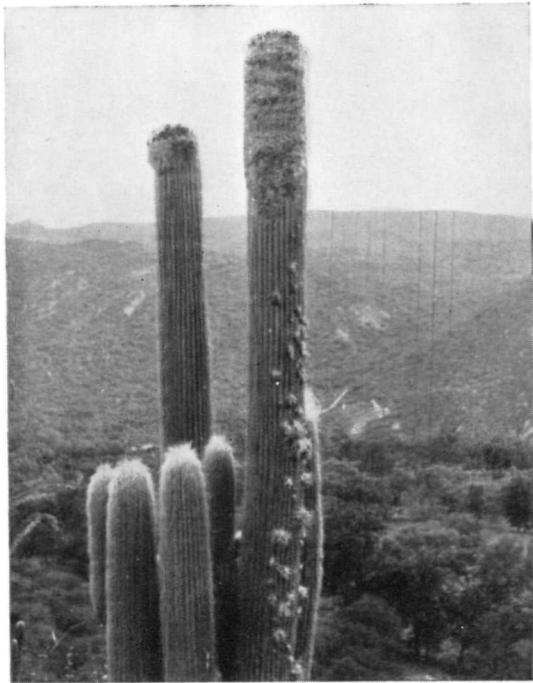
Though the genus *Rhipsalis* does not bear anything like the large and beautiful flowers of the above, they are nevertheless very attractive and interesting. The flowers are small and delicate, but are produced in large numbers along the stems, giving an extremely graceful appearance to the plants. The seed berries that follow have also a charm of their own, some being brightly coloured and others similar to those of the mistletoe, diaphanous and transparent.

There are various ways of cultivating these plants, but they all like shade and rather moist conditions. It should be remembered always, that their natural homes are in the dense tropical and sub-tropical forests where they live suspended from the boughs of trees, or live in clefts on the shady sides of ravines and cliffs, where accumulations of leafmould and other rotted vegetation have formed pockets of rich and porous soil.

They are not used to any prolonged drought, and do not need the rest that ordinary cacti have in our winter, but should have water either by spraying or immersion, at regular intervals, never allowing the roots to dry out but keeping the compost just moist.

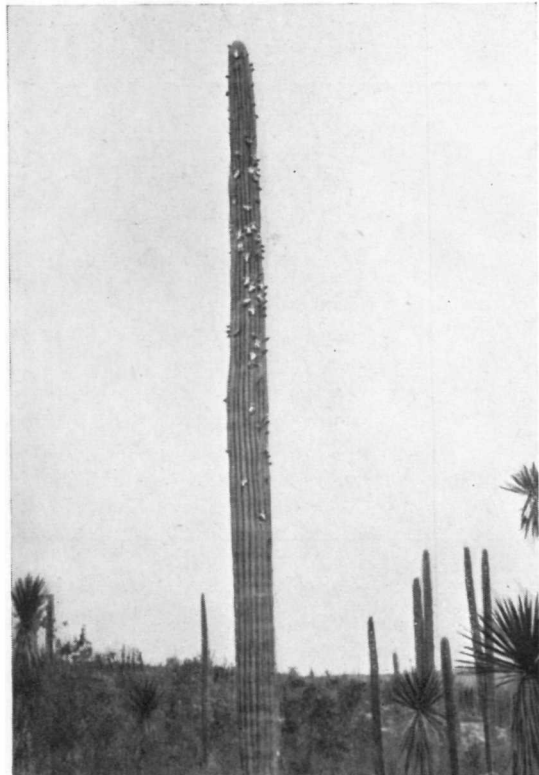
This is the main reason why so many species do better when grafted on *Selenicereus* or *Peireskia*, as the watering





*Cephalocereus senilis.*  
Venados, Hidalgo

Howard E. Gates



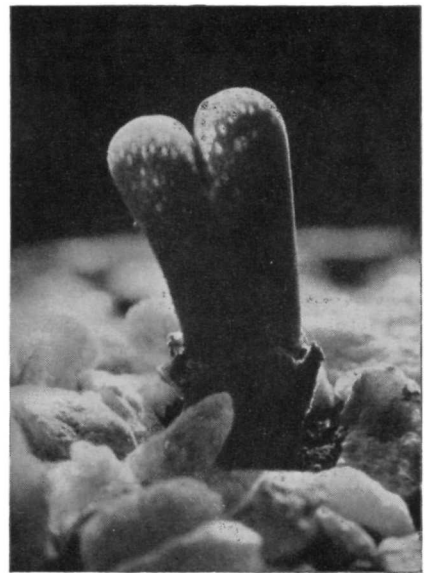
*Cephalocereus (Neobuxbaumia)*  
*mezcalaensis.* Puebla

Howard E. Gates



*Cephalocereus senilis.* Venados, Hidalgo.

Howard E. Gates

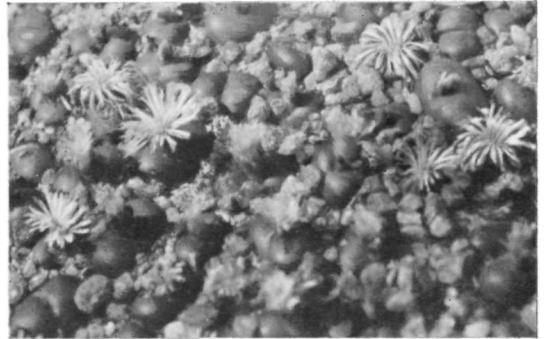


*Ophthalmophyllum longum*

Dr. A. Tischer

*Ophthalmophyllum jacobsonianum*

Dr. A. Tischer

*Ophthalmophyllum schultii*

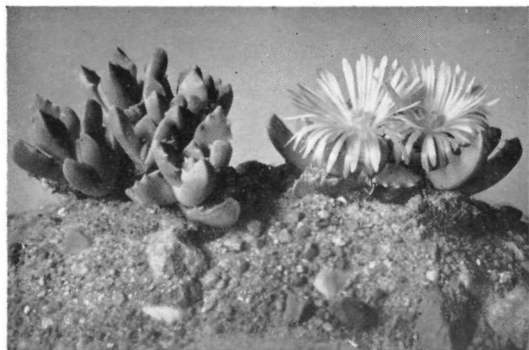
W. Triebner

*Echinopsis multiplex*  
discarded near Kimberley.

H. Hall

*Trichocereus lamprochlorus*  
discarded near Kimberley.

H. Hall



*Faucaria bosscheana*

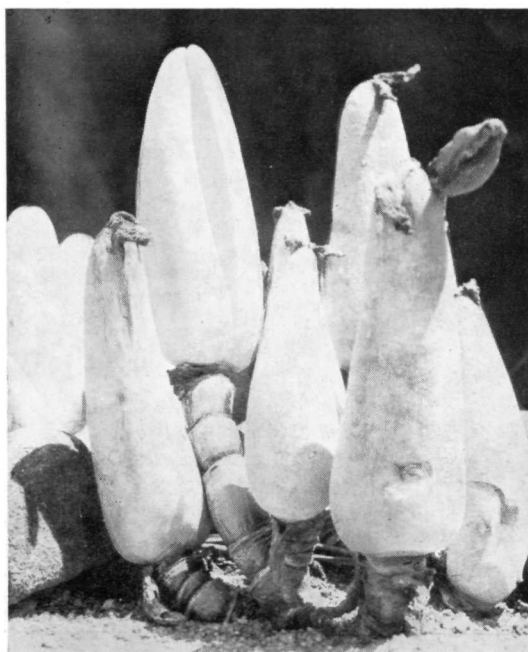


*Glottiphyllum praepingue*



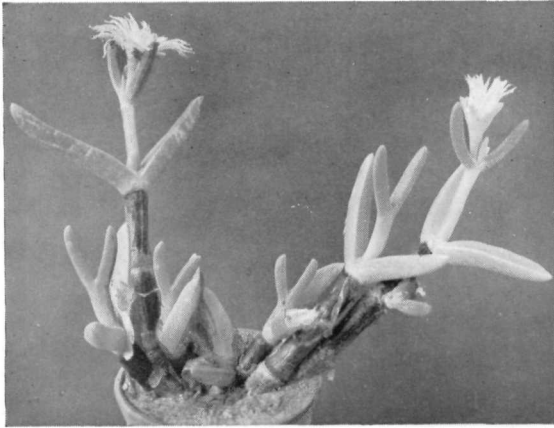
*Dorotheanus oculatus*

H. Jacobsen

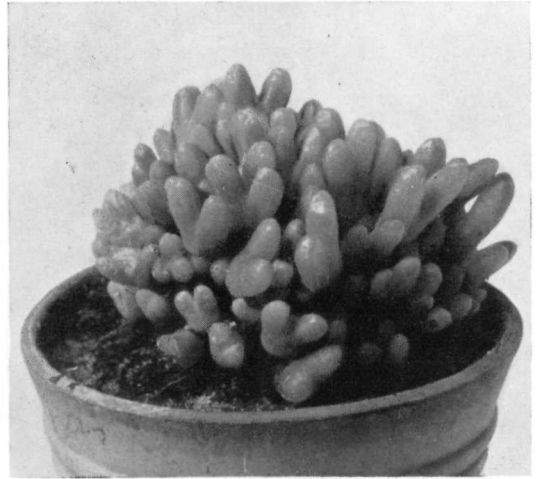


*Mitrophyllum mitratum*

Four photos from Professor Schwantes' "The Cultivation of the Mesembryanthemaceae."



*Conophyllum marlothianum*



*Meyerophytum meyeri*



*Monilaria schlechteri*



*Conocosia* sp.

H. Herre

Four photos from Professor Schwantes' "The Cultivation of the Mesembryanthemaceae."

problem is then related only to the needs of the stock itself, with a periodic spraying of the whole to keep alive the tendency to throw out aerial roots, a sure sign of health among epiphytes.

A good method of growing *Rhipsalis* in the ordinary greenhouse is to hang them from the roof in wire baskets. These can be lined with moss and filled with soil and the plant set in without its pot, or the pot itself may be packed round with moss, which can be kept constantly moist. Shade is very satisfactorily created by means of a square of calico or muslin suspended from the ridge bar on the sunny side of the basket.

In grafting, one's individual taste will decide which form the specimen will take eventually. A large stem for the stock will create a "standard" effect, or a very short stock of two inches will soon be entirely hidden by the branches of the *Rhipsalis*. The rate of growth on grafts, compared with that on their own roots is practically the same, but in the one, there is little need for worry regarding watering.

Compost for plants grown on their own roots should be very porous, yet rich in humus, and this is obtained through using two parts of old leafmould to one of loam and coarse sand. Charcoal may be added to keep the compost sweet, but limestone chippings or crushed mortar should not be used as generally the genus hates lime. Artificial stimulants are most harmful, but whenever possible, old cow manure may be added to the leafmould when mixing the compost. There are over sixty species in this family which would create enough interest in their collection for quite a time, but a few likely to give extreme pleasure are the following.

- R. cassytha*, the mistletoe cactus, with thin twiggy stems, creamy white flowers and pinkish fruits.
- R. grandiflora*—thicker stems branching in whorls and marked with reddish lines. Flowers white, fruits red.
- R. houlettiana*. Leaf-like joints from thin, cylindrical stems and greenish white flowers along the edges followed by bright red fruits.
- R. platycarpa*. Broader, leaf-like joints with ribs, reddish green in colour. Flowers yellow and fruit pale green, turning white.
- R. paradoxa*. An interesting species with curiously flattened joints in alternate ways along the stems. Flowers white followed by golden yellow fruits.

*Erythrorhipsalis pilocarpa* is very similar to *R. cassytha* but has many close set, bristly areoles along the stems. It flowers around Christmas and brings a touch of seasonal cheer with the white flowers borne at the tips of the branches. The fruits that follow are dark red and bristly.

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Mrs. Stillwell, secretary of the Bucks and Berks Branch reports : We held our Annual Show in conjunction with the Royal Windsor Rose and Horticultural Society in the private grounds of Windsor Castle on July 11th and 12th, the only two days in the year that the public are admitted to these Gardens. Permission was first granted to the Society by Queen Victoria, who not only visited the Show herself, but also gave trophies. This year the Duchess of Kent presented the Cups and toured the Show afterwards. She showed great interest in our stand of cacti and succulents and asked me several questions about a *Stapelia grandiflora* which was in bloom. We had a stand 60 ft. long, with 11 competitive classes and several bold groups. There was a very fine display of photographs by Mr. Beeson of Slough. Mr. Boarder once more very kindly acted as Judge. Two new members resulted. Eight thousand people visited the Show in the two days.

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The winner of S. J. Pullen Cup for Miniature Garden was Mrs. M. Stillwell.

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The Sherman Hoyt Trophy, 1953, was won by Mrs. M. Stillwell, and Mrs. Pryke Howard was placed second and awarded the Banksian Medal. Both exhibitors showed mainly succulents and there were some very fine plants in both sets of plants.

MORE ABOUT MEXICO—*contd.*

By HOWARD E. GATES

This *Nyctocereus* is a rather sprawling plant, somewhat heavier than our familiar *serpentinus* and more heavily covered with golden spines which turn to a rich brown with age. *Pereskia konzattii* grows up to a forty foot tree which would not be recognized as a cactus by the casual traveller. It has a definite stout trunk with numerous lateral, spreading branches. Both the trunk and laterals bear plenty of needle-like sharp spines ranging to several inches in length. The weaver birds often build their pendant nests from the extreme tips of the upper branches. We were too early in the season to find the trees in leaf and flower.

I must not forget to tell of the bright green, large leaved *Euphorbia* growing in the region. Both the stems and leaves bore sharp prickles which stung like horse nettles on the slightest contact.

At the crossing of the river near Nejapa, we passed the type locality of Dr. Dawson's *Mammillaria nejapensis*. This globular, often clustering, white spined plant has very woolly axils in the greater part of the upper portions. The plants on this small hillside were very variable as to spine length. Some were extremely short while other plants had tortuous spines up to two and a half inches long. The variation in spination, led Dr. Dawson to describe three varieties of the species. The flower segments have brick red to scarlet centres with cream coloured margins.

On the low valley land between Tehuantepec and the port of Salina Cruz were numerous plants of *Pachycereus pecten-aboriginum*. This species seems to be all along the west coast from Guaymas in Sonora to the boundary of Guatemala. Even though it is probably the smallest of the *Pachycereus*, it is a noble plant. The usually erect branches arising from a six to ten foot trunk, often tower to a height of twenty-five feet. The very large fruits do not appear to have a true skin as the outer covering seems to be composed of areoles bearing everything from wool to long stiff, sharp spines matted together and disintegrate after a short time. The black seeds are the largest I know of with the exception of *Nyctocereus serpentinus*. The cut branches of *pecten-aboriginum* are often set closely together to form boundary fences.

At Tehuantepec, which in the past has been noted for poor accommodations, we found a large new hotel across the highway from a grove of tall coconut palms. In the dining room, Tehuana Indian girls dressed in their characteristic native costumes, served the tables. The prominent feature of this dress is a square yoke which comes from near the waist over the shoulders and is repeated down the back. The broad borders of this yoke are composed of bands of various colours embroidered or woven into intricate designs. The long black hair is put up in two braids which hang down the back. Ribbons are usually braided into the hair and either trail down beyond the braids or are tied together. Sandals are sometimes worn but more frequently the women are barefooted. Fiesta dress is much more elaborate.

On the flats en route to Salina Cruz, we found immense clusters of *Mammillaria collinsii*. These brown spined globes freely branch laterally. The rosy flowers arise from axillary tufts of wool in the upper parts of the plants. Also there were scattered *Cephalocereus collinsii*. These are more slender and do not branch as freely as some of the others of the *Pilocereus* group such as *chrysacanthus* or *palmeri*. The flattened fruits were half buried in the lateral woolly cephaliums. On the hills surrounding the port of Salina Cruz, we found a very few of the little known *Cactus oaxacensis* but none were old enough to produce the woolly Turk's cap white cephaliums. Most of the plants were hemispherical, quite shrunken from the long dry winter. The scarcity of this species may be attributed to the Tehuanan's fondness for cactus candy. In nearly every thicket were the sprawling plants of *Acanthocereus horridus*. Their few ribs were well supplied with stout spines.

At the port of Salina Cruz we found a small but modern harbour, well dredged out and protected by breakwaters. On a rugged point to the west of the harbour was the picturesque lighthouse. At the inner end of a breakwater, was a fine gently sloping beach which was a favourite retreat of the Tehuanans. It was always dotted with native bathers in all types of dress from Mother Nature's suits of the boys, through old clothes to the latest models of Bikinis. Changing of clothes was accomplished in the spaces between the great stones of the breakwater. Salina Cruz is one end of the trans-isthmian railroad. It never is without gasoline as it is also a terminus of the pipe line which carries petroleum products from great refineries on the east coast. No oil fields have yet been found on or near the Mexican west coast.

While warm it was not as warm at Tehuantepec as might be expected in such a tropical latitude. The most unpleasant feature was the strong and dusty north wind which continually swept across the isthmus from the Gulf of Mexico. It was hard to realize that Salina Cruz on the west coast was farther east than the port of Vera Cruz

on the Carribean. Several Americans on the isthmus were preparing to plant cotton. Wilbur Barker, dean of all the Gringoes in that territory, was operating the Chevrolet agency.

We went on beyond Juchitan to near Zanatepec, where Dr. Dawson had found a branching large *Cereus* which he had published and described as *Lemaireocereus setispinus*. From material we collected, we later found this species to be identical with the older *Cephalocereus scoparius* which occurs near Jalapa to the north east of Vera Cruz. More about this when we get over towards Jalapa.

Since the highway across the isthmus to the gulf coast was not completed, we were compelled to back track for more than two hundred miles over the same road we came on. However, this was well worth seeing twice. En route to Oaxaca, we turned off on the short side road to Mitla to observe the Pithaya de Mitla as *Lemaireocereus griseus* is called. Pithaya is the broad term covering many of the large *Cereus* fruits, which are sold in the markets for food. We found the plants to closely resemble the large much branching plants of *Lemaireocereus pruinosus*. It has a few more ribs than *pruinosus* and the fruits more elongated into an ovate form instead of spherical. The fruit colours of both vary but they are usually red with red pulp. Both are well covered with spines which are easily brushed off at maturity. Many of the back yard fences were made by planting cuttings of *Pachycereus marginatus* in rows. Even though they grew well and reached as much as twenty feet in height, we were told that they never fruited in Mitla.

In a village between Mitla and Oaxaca we found the famous Tule Tree, which is said to have the largest trunk diameter of any known tree. We photographed it across an open plaza from a point more than a block away, yet it was so large the entire tree could not be shown in the picture. The tree dwarfs the large church which is beside it. This tree is closely related to our cypress group. We saw many other magnificent specimens of this species growing near streams in the bottoms of narrow valleys and canyons.

In the edge of Oaxaca we found palatial accommodations in a large modern auto court whose cottages were scattered amongst the huge mango trees. In the morning we had the pleasure of making a kodachrome of the bare-footed Indian maid with her hair hanging in braids, as she carried the home-made twig brooms to clean up the apartments.

On the way north from Oaxaca, we saw many old *Myrtillocactus* plants probably belonging to the species *schreckii*. Their small white flowers resemble those of *Myrtis communis* and are followed by small globular red fruits ranging from a quarter to a half inch in diameter. Since *Myrtillocactus* are one of the few groups of cactus that produce more than one flower at an areole, they are probably the freest bloomers of all cacti. *Myrtillocactus* branches grow from a short trunk and keep on branching outward and upward until there are hundreds of branches on a twenty foot plant. They look like immense candelabra.

The casual traveller is apt to mistake *Escontria chiotilla* for just another *Myrtillocactus*. The size and branching habit is much the same and the campanulate flowers are not very large. The spines are longer and more porrect, but the strangest feature is the fruits. These are one to two inches in diameter, red in colour, bearing broad horny scales on the sides of the fruits and in a complete terminal ring which firmly clasps the dried up flowers. These also are sold in the markets for food.

When we arrived at Huajuapán (pronounced Wah-wap-an) de León in the northern part of the State of Oaxaca, we decided we had enough of comfortable travelling, so started across country to Tehuacan via Chazumba and Zapotitlán de las Salinas. Along this route are a number of old towns dating back to colonial days, which have never been tied together with a good vehicular road. For miles we wound up the bottom of a narrow valley which turned into a canyon with the road getting rougher all the time. Finally when it could follow the canyon no farther, the road turned abruptly up and over the rocky ridge which forms the continental divide. In places rock ledges formed an irregular stairway. In others the road-bed was an aggregation of loose boulders. Several times on this cross country trip we had to dig out the rear bumper at short dips. We were thankful that we were not travelling in a sedan or station wagon. Even though it took us nearly two days of hard work to cover the eighty miles to Tehuacan, we were satisfied as we were apparently where botanists had never been before and were able to observe the transition of species from the western to the eastern slope. We greatly extended the known range of *Cephalocereus mezcalaensis* to the eastern slope where it had never been reported.

In one portion of this territory, were many native dwarf fan palms which were used for the making of hats. Everyone, men, women and children kept their fingers flying at the task of weaving. We even photographed two young men who were weaving as they drove their heavily laden pack burro over the rough road.

In the fair sized village of San Sebastián de la Frontera, we vainly sought accommodations for the night. No one had a place for us to stay during the passage of an approaching storm. So we travelled on for a few miles and

made a roadside camp in a rich stand of *Cephalocereus mezcalaensis*, *Ceph. tetetzo*, *Echinocactus grandis*, *Agaves* and *Yuccas*. Dr. Dawson stopped growing too soon and he had to look up to some of these *Echinocactus*. So did I in the case of few extra large ones. Just about the time our meal was prepared, the storm overtook us. So for four hours we took refuge in the cab of the truck. Amongst his other commissions, Dr. Dawson had the task of collecting certain types of moths. Often in camp he would spread a white sheet in front of the truck and turn on the head lights to attract the moths. As we sat in the cab on this evening with the rain coming down outside and a lantern burning inside, he had better success in catching moths than at any other camp site.

The next day was one of the most important of the whole trip in regard to the observation of plants. We went through forests of aborescent *Yuccas* and good stands of several *Agaves*. Possibly the most interesting plants were giant *Beaucarneas*. These had immensely swollen trunks which divided into slender branches, bearing terminal tufts of narrow, pendant leaves. The Mexicans on occasion have referred to me as "Gordo" or the fat one. However that appellation did not apply when I was photographed beside one of these with a trunk about twelve feet in diameter. In comparison I was really skinny.

*Cephalocereus tetetzo* here on the upper reaches of the eastern slope, were much larger than the same species found on lower elevations in the Tehuantepec drainage area. They were readily distinguishable from the single columned *mezcalaensis* with fruits all up and down the stems as *tetetzo* had a few lateral branches and the fruits were localized in an area near the top. Both species were massive and grew to a height of some thirty feet.

A little farther on, we came into an area with *Cephalocereus macrocephalus*. These were gigantic branching plants growing somewhat in the general appearance of *Pachycereus*. It was easy to spot them at a distance as they were preparing to bloom and the apical portions were covered with longer pinkish bristles instead of spines. Scattered around were the low clusters of *Ferocactus robustus* and *flavovirens*. The *robustus* was especially notable for great numbers of branches. Occasionally we found clusters eight feet across, several feet high and literally composed of hundreds of branches four to five inches in diameter. Both the flowers and fruits are yellow. *Flavovirens* had somewhat larger but not so many branches, more heavily spined.

Still farther we came into a colony of gigantic and freely branched *Cephalocereus hoppenstedtii*. These plants with numerous ribs bear rather weak gray spines. The cephaliums are formed on one side of the branches near the tops. These cephaliums become several feet long and are composed of dense mats of woolly fibres, two to three inches thick. Each year these cephaliums are extended upward a few inches by the new production of creamy or yellowish wool. The older wool below gradually turns black. The flowers and fruits are borne within the mass of new wool. This colony of *hoppenstedtii* must be an unusual one as Dr. Helia Bravo states in her book that this species never branches.

Every mile seemed to bring its new species of plants. *Cephalocereus chrysacanthus* appeared in a robust form branching from a short trunk. The purplish red fruits were almost hidden by the masses of wool surrounding them.

Higher we had passed an abundance of globular *Mammillaria mystax* with long twisted spines and carmine flowers. Here there were even more of the much smaller but freely clustering *Mammillaria sphaelata*. These were rather a dirty light gray colour, not as white and clean as when greenhouse grown. The small bright pink flowers were followed by short scarlet fruits.

We were in rather high, arid country instead of the tropical brush land of the west coast. Near Zapotitlan de las Salinas, we began to find the outlying farms and pastures fenced with rows of *Lemaireocereus hollianus*. Since this is the type of species for the Genus *Lemaireocereus*, I believe all of the many other Mexican species now known as *Lemaireocereus*, will eventually find their way into other classifications. There is nothing else like it that I know of in Mexico. It branches at the base, sending up a comparatively small number of branches, which arise erectly, closely set together, to a height of occasionally twenty-five feet. In spite of their height these branches are only four or five inches in diameter and bear many spines of which the longest point downward decidedly. Aside from *Pachycereus pecten-aboriginum*, the fruits are the largest of any cactus I know. Exclusive of the many, long, sharp spines which almost hide the dark purplish skins, the fruits range up to three and a half inches in diameter and four and a half in length. When fully ripe, the red pulp is practically a liquid filling the cavity enclosed by a fairly thick skin. These fruits are borne in groups of from two to six on the extreme tips of the branches.

Along with the *hollianus*, we found clusters of straw yellow spined *Mammillaria elongata*, *Myrtillocactus*, very colourful single headed small plants of *Ferocactus nobilis* and a dwarf *Pedilanthus* bearing slipper shaped scarlet flowers on the tips of its bare branches. Since all the *Ferocactus nobilis* we saw were small, we suppose the larger ones had been carried in for candy making or de-spined and fed to the cattle in a time of drought.



Between Zapotitlan and Tehuacan, we passed over a range of rugged limestone hills with several deposits of milky white onyx and some salt springs. The water from these springs was led into shelf-like basins built one below the other in steps upon the hillsides where solar evaporation precipitated the salt. On many of the slopes were open forests of *Cephalocereus hoppenstedtii*, but here they were all the typical single branched form. They were thickest in the middle, gradually tapering towards the tops and were slightly curved in one direction.

In the bottoms and sides of rugged canyons appeared colossal plants of *Pachycereus columna-trajani* which seems to be synonymous with *Pachycereus chrysomallus*. My companion, Dr. Dawson, accepts them as *Pachycereus* but I am dubious. In general appearance they are typical *Pachycereus* with a short, stout trunk and numerous massive upright branches. However, the flowers are borne in an apical crown of yellowish wool and brown bristles. The unopened flowers were coarse and heavy with short perianth segments that did not look as though they would open into the campanulate flowers of the other *Pachycereus*. We were too early in the season to find fruits and form a more definite opinion.

On the lower hills were good stands of the massive *Echinocactus grandis* which is quite similar to *E. ingens*. Some of the plants were two feet thick and six feet tall. At the bases the ribs and spines had weathered away showing great age. A notable feature of the larger plants were annular constrictions with the body above bulging as over a fat man's tight belt. The yellow flowers were borne in a circle within the terminal disk of wool which distinguishes *Echinocactus* from *Ferocactus*. The mature fruits had a thin papery skin with considerable wool adhering and were filled with brown seeds.

As we crossed the valley to enter Tehuacan, all the cactus disappeared. Around the city, except for the fruits in the markets, a traveller would not realize that he was in one of the world's richest cactus territories.

North of Tehuacan, we crossed over a high mountain range and entered the valley of the Rio Blanco which winds on down past Orizaba and Cordoba to the Gulf of Mexico. At moderate elevations on this eastern slope, there appeared to have been heavy rains and the lush, tropical vegetation was all green. In places the highway passed between plantations with coffee growing in the shade of larger trees. Bananas, oranges, mangoes, avocados, sugar cane and flowers were important crops. *Bromeliads*, orchids and epiphytic cactus were crowded together in great masses on some of the roadside trees.

We were surprised as we entered the lowlands to find the climate becoming dryer the closer we were to the coast. Personally I had always supposed that behind Vera Cruz would be wet and swampy with such crops as sugar cane and possibly rice. Actually much of it was grazing land with little farming and few cactus. Most of the cactus were in the *Opuntia*, *Acanthocereus* and *Hyllocereus* groups with a few *Epiphyllums*. *Bromeliads* both terrestrial and arboreal, were abundant and colourful.

From the point of arrival on the Gulf at Boca del Rio, the highway ran close to the shore past the Mocambo bathing beach with its immense resort hotel crowning a low hill. We found Vera Cruz to be built on low sand dunes with a ring of coconut covered, low, sandy islands, several miles at sea guarding the approaches. The modern harbour was well protected with seawalls though we expected to find more than the five or six large vessels at the docks.

Our route from Vera Cruz led north-westward to the state capital at Jalapa. In this direction, the coastal plain was narrower and the vegetation increased more rapidly. There were large citrus and pineapple plantations. In the hills toward Jalapa, we noted large cactus that at a distance resembled large *Lemaireocereus*. However, we readily identified them as *Cephalocereus scoparius*. This plant has fluted, many ribbed branches that arise in an irregular manner from a short trunk. This is another of the so-called *Cephalocereus* that does not have a cephalium. The flowers appeared just below the branch tips in a ringed area that bore longer and more bristly spines than the short stouter ones on the lower portions. See Fig. 28, Page 172, C. & S. Jour. XXIV. The reddish spineless fruits are small, usually described as being the size of a hazel nut. Growing in the same region, usually in groves of trees, were plants of *Cephalocereus sartorianus*. These were typical plants of the *Pilocereus* group with white wool on the upper portions of the ribs but not long enough to hide the furrows. The fruits were quite similar to the flattened apple shaped ones with red flesh and black seeds that we had found on other species. Scattered under trees in one grove we found *Mammillaria echinaria* growing curiously. They were on the flat tops of coarse grained rocks, not growing in soil or in cracks, but with the roots spread over the rough surface in the manner of lichens. None were found growing in soil, but this may have been due to the tramping out by cattle. The general appearance of these plants was that of *Mammillaria elongata*, well covered with stiff, straight, golden brown spines.

(To be continued)

## SHOW RESULTS 23/24 JUNE, 1953

- Class 1. Three *Echinocactanae*.  
1, H. J. Aylott ; 2, R. H. West ; 3, A. J. Edwards.
- Class 2. Three *Coryphanthanae*.  
1, R. H. West ; 2, R. Barrett ; 3, P. V. Collings.
- Class 3. Three *Cereeeanae*.  
1, Mrs. E. B. Pryke Howard ; 2, R. H. West ; 3, H. J. Aylott.
- Class 4. Three *Echinocereeeanae*.  
1, R. H. West ; 2, H. J. Aylott.
- Class 5. Three Cacti.  
1, R. H. West ; 2, Mrs. E. B. Pryke Howard ; 3, Mrs. D. F. Shurly.
- Class 6. One Specimen Cactus.  
1, Mrs. D. F. Shurly ; 2, R. H. West.
- Class 7. One *Mammillaria rhodantha*.  
2, P. V. Collings ; 3, H. J. Aylott.
- Class 8. Cactus from seed sown on or after 1/1/50.  
1, Mrs. J. A. Luty Wells ; 2, R. H. West ; 3, Mrs. D. M. Mallett.
- Class 9. Cacti raised from seed more than three years old.  
1, R. H. West.
- Class 10. Three Cacti up to 3" pots.  
1, C. G. Devin ; 2, R. H. West ; 3, Mrs. M. Stillwell ; V.H.C., Mrs. E. B. Pryke Howard.
- Class 11. Miniature Gardens.  
1, Mrs. M. Stillwell ; 2, Mrs. J. A. Luty Wells ; 3, Miss A. W. Pilcher.
- Class 12. Three *Mesembryanthemums*.  
1, Mrs. M. Stillwell ; 2, P. V. Collings ; 3, Mrs. D. F. Shurly.
- Class 13. Three *Haworthias*.  
1, S. J. Pullen ; 2, Mrs. M. Stillwell ; 3, Mrs. E. B. Pryke Howard.
- Class 14. Three *Gasterias* or *Aloes*.  
1, Mrs. M. Stillwell ; 2, Mrs. E. B. Pryke Howard.
- Class 15. Six *Euphorbias*.  
1, S. J. Pullen ; 2, Mrs. M. Stillwell ; 3, Mrs. D. F. Shurly.
- Class 16. Group of Cacti/Succulents.  
1, Mrs. J. A. Luty Wells ; 2, Mrs. E. B. Pryke Howard ; 3, T. P. Matthews.
- Class 17. Three Succulents other than Cacti.  
1, Mrs. E. B. Pryke Howard ; 2, Mrs. M. Stillwell ; 3, H. J. Aylott.
- Class 18. Six Succulents/Cacti.  
1, Mrs. E. B. Pryke Howard ; 2, Mrs. M. Stillwell.
- Class 19. Six South African Succulents.  
1, Captain H. J. Dunne Cooke ; 2, A. J. Edwards ; 3, Mrs. M. Stillwell.
- Class 20. Group of new and unusual plants.  
1, Mrs. M. Stillwell ; 2, Mrs. D. F. Shurly.
- “Amateur Gardening ” Silver Bronze Medal for Outstanding Exhibit :  
Mrs. M. Stillwell.
- “Amateur Gardening ” Diploma :  
Mrs. J. A. Luty Wells.
- Judges : Mr. A. Boarder and Mr. Stenning.

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We all envy the weather in South Africa, the land of sunshine, but this is what Harry Hall says of a recent trip of his. “We ran into very bad weather the whole time and the entire range of the Swartberg was under snow. We had icy showers and occasional sleet, the veld soaked all the time and worst of all a really icy wind which on one or two occasions made even the task of holding my trusty pick a real effort, so numbed my fingers became.”

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## REPORTS OF MEETINGS

### July 28th, 1953 : Mr. A. Boarder—Pests and Diseases.

Mr. Boarder opened the discussion on this subject, but so many who were present suffered from pests that diseases had to be put off to another time. After Mr. Boarder's opening remarks the meeting became very lively with discussion and I think the best way to report the meeting will be to list the pests mentioned by Mr. Boarder and those who put the questions with cures and other comments.

*Leaf Cutter Bees* : These insects cut discs from leaves in the garden, search and find a suitable pot with a cactus or succulent plant, bore a hole in the soil and deposit the leaf in which they lay their eggs. This habit disturbs and maybe damages the roots and also dries them by exposure. They do not otherwise damage the host plant. If you see the bee in your greenhouse the only thing to do is to watch it and note the pot to which it goes. Find the hole and put in a drop of paradichlorbezoïn. Of course, you can turn out the pot, find the leaf and egg or larvae and destroy it but the first method is a cure if you do not want to unduly disturb the plant.

*Wireworm* (pupae of *Click Beetle*), *Leatherjackets* : put a carrot on a stick and insert them in the ground. Take out periodically and destroy pests trapped by it.

*Woodlice*, *Millipedes*, *Slugs* : paris green and bran mixed together put round in little piles will destroy them. If bran is unobtainable, use breadcrumbs, tea leaves or a little cornflakes. Meta crushed up with a half a pint of bran is also deadly when slightly dampened. Woodlice are very destructive with seedlings. Given a couple of nights and a whole pan of seedlings can disappear.

*Earwigs* : Fill an inverted pot with dry grass. This will trap them and they can be periodically found and destroyed.

*Caterpillars* : Spray with Sybol or Gummexine once in three weeks. These insects poison themselves when eating the skins if the plants are sprayed. Butterflies do not harm our plants as they use nettles as their hosts and caterpillars found on cacti and succulents are invariably moth caterpillars.

*Flea Beetle*, *Cuckoo Spit*, *Thrips*, *Froghoppers* : dust with D.D.T. powder.

*Mealy Bug*, *Scale*, *Red Spider* : Spray plants with nicotine and methylated spirits, one part of nicotine to forty parts of methylated.

*Ants* : Put D.D.T. or anti-ant powders down their holes. Of course, the old remedy of a kettle of boiling water down their holes will destroy them, but if there are any survivors, they simply shift to another place. Ants carry away mealy bug and milk them. Ants have been seen to carry away seeds.

It was surprising to learn of the host of pests that various members suffered from. Other points were :—

Many of the pests like the darker places, particularly those that do not move fast, such as mealy bugs, and, especially where there is a large collection, it is advisable to now and again turn the plants round and so expose the darker places to see if the pests are there.

Quick moving insects, such as centipedes, are invariably friends of the cactus collector ; it is the slow insects that are the pests,

When spraying insecticides, chemical or otherwise, wash off with a free spray of water after a while as most mixtures leave a sediment which chokes the pores of the skin of the plant. Detergents have been found to be very effective insecticides when mixed with water, but if used in winter you may lose plants.

When using sprays be careful of any punctures in the skin of the plants as some of the preparations, while harmless externally, can injure the plant internally. Spray in the evenings to prevent scorching.

It is always preferable to hand pick pests, but this is a very messy job and there is the danger of some being overlooked. In many cases hand picking is absolutely essential. On flat skins it is easy to scrape off, but it is very difficult when dealing with such as cristates. Whether you spray or hand pick, it is essential to do the process again a fortnight afterwards. Neither the spray nor hand picking eliminates eggs, and a fortnight is the incubation period of most of our pests and this repeated process enables you to be sure of making a perfect clearance.

Misting with lukewarm water will wash off most of the insecticides, such as old nicotine. Volck is a greasy mixture of petroleum content and is inclined to block the pores and should be washed off after a while. Some find Clensel effective for scale, but syringe off with tepid water afterwards.

Red Spider is so minute that they usually do their damage before they are detected. They make a web and cause scarring. Damp is their greatest enemy, so if troubled with this pest you can stand the pots in wet sand, kept moist.

**June 23rd, 1953 : G. D. Rowley—Water, Soil, Light and Air.**

Mr. Rowley discussed aspects of past and present research work at the John Innes Horticultural Institution, Bayfordbury, which had a bearing on the cultivation of succulents under glass. Controlled tests carried out over a number of years with seedlings of tomato, lettuce, *Primula*, *Streptocarpus* and other pot plants had made it possible to say which cultural practices have the greatest influence on growth and development, and which have least. Many time-honoured gardening traditions and oft-repeated tips fall into the latter class. Thus it has been shown that the use of cool water well below the temperature of the house has no ill effect at all judged by size and weight of the resultant crops. The favourite warning to use water with the chill taken off it has therefore no experimental backing. Similarly cold soil for potting does not perceptibly check growth, and to space out crowded pots on a staging if anything diminishes growth by encouraging evaporation from the roots and destroying mutual shading in hot weather.

Watering in after planting, and firming the soil round the roots, have only slight effects ; plants in loose soil and very slightly firmed do almost as well, if not equally so. However, growth and vigour are profoundly affected in at least four ways, all of them directly associated with nutrition. They are the choice of compost, the transplanting programme (pricking out, potting off, etc.), the pot size, and the use of supplementary feeding. There is no reason to doubt that these apply equally well to succulents as to quick-growing mesophytes, even though the response may be slower. Mr. Rowley has, in fact, shown how important a good soil is in this Journal for April, 1953, pp. 40-2.

On the matter of watering pot plants, a new watering and spraying lance developed by Mr. A. C. Bunt would undoubtedly prove a boon to the cactophile. Modelled rather on the lines of the feed from a petrol pump, it is fitted to an ordinary hose pipe, and has a trigger by means of which the flow of water through the nozzle can be accurately regulated. The John Innes Watering Lance is being manufactured by Messrs. E. A. Gardner & Sons, of Maidstone, Kent.

The importance of overhead spraying is twofold. It cuts down evaporation, and thus saves the need for more frequent watering in summer. And it reduces excessive heat in small glasshouses : in a trial in the speaker's own glasshouse the temperature dropped from 94° to 91° in a matter of minutes after spraying the air with a fine syringe. Books still continue to tell us that succulents should not be watered overhead. Two out of three received this year repeat the same startling allegation that Nature has been wrong for thousands—for millions of years! The ingenious "droplet theory" offered as proof is a good example of how complicated an apparently simple thing could be : it was shown that the idea of water globules acting as burning glasses was not optically sound, and in any case the presence of the water itself could not possibly allow burning to take place. Some other explanation must hence be sought for the scarring of plants often associated with overhead watering.

While realising the importance of soil and water, growers rather tend to take light and air for granted. Both the intensity of light and the day length are very critical for success in succulents, especially in relation to flowering, where the best possible cultivation will be unavailing against light starvation or air pollution.

Much can be done to improve flowering by increasing the amount of sunlight reaching the green tissues. Worthing averages 1½ hours more sunshine daily than inland towns in the north of England : sufficient reason alone to explain the phenomenal colour, spine production and flowering of succulents on the south coast. Again, the average glasshouse cuts down the incident light by 40-50%, a loss which can be reduced to 30% by the use of larger panes of glass, small crossbars, correct slope of sides and roof, and correct positioning. For succulents the best siting for a glasshouse is with the longer axis running 15° N. of E.—not N.-S. as is so often the practice. In this way the light during the critical winter period is greatly boosted at the expense of only a very little light in summer, when it can be more readily spared. Dirt on the glass can further reduce the incident light by 10-48%. Mr. Rowley recommended regular washing of the glass inside and out with water containing detergent and a special tool having a long bamboo handle and a strip of sponge rubber the width of the panes backed by a crosspiece of wood.

Inside a glasshouse every little aid to lighting helps in winter. Thus a white-washed staging reflects 15½ times as much light as a dark one covered with peat. Artificial illumination will undoubtedly prove a great aid and more than justify installation costs, as it has done for tomato growers. It is, however, an involved subject which might well be given a lecture to itself.

Air is the source of organic carbon to the plant, and hence deserves credit as a most essential food. Yet it is invariably taken for granted, even by glasshouse designers who rarely provide adequate ventilation. Only 2-3 parts in every 10,000 of air by volume are carbon dioxide and useful to green plants. This represents a mere 4" potful in a glasshouse 20 feet long and 9 feet wide. Add to this the fact that air must circulate in and out of the

tiny air pores of the plant skin, and that this circulation is cut to the very minimum for reasons of water economy in succulents, and it is clear how much a stuffy atmosphere can retard development.

The commonest forms of air pollution as far as plants are concerned are sulphur dioxide in industrial cities and carbon monoxide from incomplete combustion in faulty burners. It may well be that many of the mysterious scabs, spots and discolorations of succulents often brought to Society meetings are in reality the results of these unseen poisons, and not of insect pests or diseases at all.

Mr. Rowley concluded with a table summarising the interactions of humidity and light intensity as they affect succulents in winter, and exhibited the following books and pamphlets giving fuller details of the subjects discussed :

1. LAWRENCE, W. J. C. "Science and the Glasshouse." Oliver & Boyd. Edn. 2 1950. 176 pp. 15/-.
2. "The John Innes Glasshouses." J.I. Leaflet No. 10. Oliver & Boyd. 1950. 12 pp. 1/-.
3. "Artificial Illumination of Seedlings." J.I. Leaflet No. 11. Oliver & Boyd. 1952. 7 pp. 9d.
4. "Answers to Growers." J.I. Bulletin No. 1. Kynoch Press, Birmingham (1945). 60 pp. Out of print.

! ! !

Leicester Mercury : The rare "living stone" cactus from California did not look like a living thing at all.

Torbay Herald, Torquay : Cacti flowers are stalkless and therefore must not be turned in a different direction to the light otherwise the flower will strangle itself. (Help ! Ed.).

Western Evening Herald, Plymouth : There were several *rarities* (italics, Ed.) to be examined, among them a *Euphorbia Splendens*, the Palestinian (it comes from Madagascar—Ed.) succulent which made the Crown of Thorns.

Daily Dispatch, Manchester : A small, round plant that looks less sinister than the others—*Opuntia microdasys*—harbours a drug which is highly valued as a stimulant by natives in the remoter parts of Mexico. They boil and eat the leaves before their annual three day feasts.

Evening Chronicle, Manchester : The plants themselves must never be splashed with water.

Ipswich Evening Star : Exotic perfume, bizarre forms and dazzling colours held the large gathering of members and friends spellbound until a late hour.

Lynn News : *Chamaecereus Silvestry Variety Lutea Cristata*.

Dundee Evening Telegraph : Cacti like small pots. In fact, they thrive when pot-bound. . . . Despite their parched appearance they've stored up all the water they require during the summer.

Grimsby Evening Telegraph : That plant was quite easy to tend, its chief soil requirement being lime rubble, though, *unlike other cacti* (italics Ed.), it needed watering.

South Wales Evening Post : What other plants can be (a) left for months without water or attention ; (b) chopped into small pieces—each of which will take root and grow.

Times Pictorial, Dublin : Unlike any other plant, you never cover the root with earth. You just leave it lying on top of the soil.

South Wales Evening Post, Swansea : for the plants tend to grow sturdier and with stronger spines when root bound.

Northern Echo, Darlington : Illustration of a cristate plant, described as a prickly bloom.

We cannot get to America because of the currency regulations, but we look forward to the day when this will be possible, if only to attend the Convention of the American Cactus Society. They go in for things in a big way, besides serious matters they have a socially jolly time. Their Convention continues for seven days, including nine group meals, with breakfast on one occasion ! They visit seven cactus gardens, have numerous outings and finally, jolliest of all, they maintain in the happiest way their Ancient Order of Cactus Nuts, crowning their King and Queen ! Illustrated addresses, visit to Ghost Town, hat contest, loud shirt contest (now then, Mr. Harle !) and other events.

The South African press reports that the jointed cactus has become a complete pest, like the *Opuntia* in Australia. It has completely occupied over two million acres of the best agricultural land. The Union has spent hundreds of thousands of pounds on its eradication, but cannot keep pace with its increase. It is stated that it originated from a collector's specimen in his rockery.

Bill Sowerbutts, of the "Evening Chronicle" Manchester, has issued a leaflet entitled "Cacti for Beginners." It is a rather compressed account, but, while containing errors on cultivation, it is worth while having and readers are invited to write to him for copies.

The New York "Herald Tribune" reports that thorny cactus has been turned into a bouncy, shock absorbent cushion. Cactus fibres are sprayed with a specially compounded natural rubber latex, called Lotol. The cushioning is used in lawn furniture, mattresses and upholstery.

#### LISTS RECEIVED

T. N. Blackburn, Woodplumpton, nr. Preston: an eight-sided printed list with a large number of cacti and succulents.

Worfield Gardens, Bridgnorth, Shropshire; a twelve-paged printed booklet listing a considerable number of cacti and succulents.

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