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THE CACTUS AND SUCCULENT JOURNAL OF GREAT BRITAIN

Vol. 33 February, 1971 No. 1

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Cacti—by A. Boarder

BY THE TIME these notes appear many members will be thinking about sowing seeds. This is the most exciting time of the year for those who enjoy raising their plants from seed. Fortunately there are several sources of new kinds and our Society always has a good selection. It is also possible to trace several dealers abroad who sell named seeds but I have not always been happy with such purchases. Usually I find a few kinds of seeds which I would like but not wishing to send a small order I make it up with other kinds which are not very important to me. However, invariably I get all the seeds I am not particular about but the very ones I need are not forthcoming. I may be told that these kinds are out of stock and that I should order again later, but these never turn up, although paid for.

Another difficulty is with new seeds that are fresh discoveries but have no names—only numbers. In my collection are many such kinds and I have never yet been able to pin a name on any of them. Some, however turn out to be quite good but others bear a close resemblance to plants I already have. Still the longer I grow Mammillarias the more I find that many of the species are only varieties and vary only in perhaps the length of the spines, or more wool or hair. This is not so surprising when one hears of the same species (with very different descriptions) being found on opposite sides of a mountain. Also in a large collection of Mammillarias it is possible to get crosses which can take the form of one or the other parent or be quite different from either.

I do not find that my present method of growing cactus seeds varies much from that I used nearly fifty years ago. The chief conditions I use are a half pot, clay or plastic, some J.I. seed compost, some of which is sifted for the top inch or so. Small seeds are never covered with compost but a slight covering with tiny stones is sometimes used. The pans are covered with glass and paper to keep in some of the moisture and to keep out the sun's rays. I use a germinating temperature of about 70°F. The pans are not allowed to dry out whilst germination is taking place. At the same time the pans are not over-watered. The pans stand on fine gravel in plastic trays in which a little water is occasionally placed.

I have just been making a start with repotting all my Mammillarias. The end of November seems late to most growers, but I find that it is the best time of the year for me as I can work in my greenhouse where the plants are at hand. When I used to repot in the spring it was usually too warm in the greenhouse and it meant

carrying all the plants to the garage and back. I fix up a small table where I can work with the plants at a good height to save back bending and with the blue flame lamp alight the atmosphere is quite pleasant. It is two years since these plants were repotted and I think that two years in the same pot is quite enough and if any cacti are left in the same soil for more than this time I am certain that they will not thrive; also they are more likely to get attacked by root bug when the soil gets stale.

So far I have found very little trace of root bug. It may be due to the fact that I always rub a little paradichlorbenzene around the inside of the pot. This substance is commonly sold under the name 'Moth Repellent'. I do not suggest that this will kill off all the bugs but it certainly does keep them down. I find that the plastic pots I use are still giving every satisfaction, although I think that the larger pots could with advantage be reinforced at the rims. These six inch half pots, complete with plant and soil, cannot be lifted by the rim, as could a clay one, but have to be handled very carefully with two hands—not always easy when the pots stand close together.

One of my favourite Mammillarias is *M. hahniana*. The white hairs make this plant so attractive especially when the ruby-like flowers encircle the plant and I never fail to admire the wonderful specimen of this plant exhibited at our June show. It is in my opinion the finest specimen of a cactus I have seen at any show. I say this with years of experience in trying to grow a plant as good as this one. I have several in my collection which I have raised from seed, varieties with more spines and less hairs than others bearing different varietal names, but not one has ever made a single off-set, to commence a group like the one mentioned. The largest plant is still not more than four inches across but it is 24 years old from seed. I feel sure that any experienced grower of cacti with many years growing behind him agrees with me that the one mentioned at the show is a real beauty.

I usually hang my epiphytes in an apple tree in the garden for the summer. This year it seems that very little rain reached my plant of *Schlumbergera barklyi*, known to many as the Christmas cactus. When brought into the greenhouse at the end of October, to be away from the frosts, it started to form flower buds as usual, however instead of a good crop of flowers showing up together the plant has opened up only a few flowers by the middle of November and other buds are only just forming. I feel sure that the plant did not get nearly enough water during the summer and is suffering from this shortage by not producing a full crop of flowers at one time. In most summers plants hanging in the tree get sufficient moisture but this year was rather an exception, and I had neglected to water it at all during the whole time it was in the tree.

I have been experimenting again with my greenhouse lamp. As I have written before I had fixed two long tubes of Polyglaze to my fume pipe to spread the heat along most of the greenhouse. However I found that these were not very satisfactory as they were inclined to buckle when knocked and it was almost impossible to remove them from the copper tubing in the spring when the lamp was dismantled. This year I have used plastic down pipe as used for rain water. These are of 2½ in diameter and fit into the copper fume pipe very nicely. I had removed the small caps at the ends of the fume pipe. This plastic piping can be bought by the foot, two six foot lengths costing me 23/-. I cut a small piece, about six inches in length from each pipe and cut this small piece through so that it opened up to make a securing sleeve. The tubing is black and so attracts the warmth of the sun, if any. I found that the lamp was drawing up to a dangerous level and discovered that the extra pipes were creating too much draught. This I soon remedied by boring a few inch-holes in the under sides of the pipes near the lamp and this has now stopped the extra draught and the lamp is functioning perfectly. I use two petrol cans as a reserve so that the lamp can be left for four days and nights without attention. The cans have to lie flat so that the top of each is not above the top of the lamp reservoir. I used to have a glass tube leading from one spare tank to the other but this necessitated lifting the tank and tipping it so that a start was made for the siphon system to work. I have now soldered a brass tube from the base of one can to the base of the other. The extra tubes on the fume pipe condense the moisture from the lamp and I catch over a pint of water every night, instead of it reaching the roof of the greenhouse.

This season seems to have been a splendid one for flowers and the formation of fruits. At the beginning of

Gina Sharman presents a bouquet to the President, Mrs. D. Shurly, at the CSSGB Annual Dinner, November 26, 1970 (photo: B. Maddams).

December there are hundreds of fruits in the greenhouse and these make a very attractive addition to the colour of the spines on the Mammillarias. Although most of these fruits will shrivel when ripe there are several species which carry the fruits plump and red for many months. The well known ones for this are the *M. prolifera* and *M. multiceps* types, which will have red fruits for over a year. I have another very nice Mammillaria, which so far as I know is unnamed but was found by Howard E. Gates in Lower California. It is a hooked spined type and rather white in appearance. The flowers are lily-shaped and white and are followed by red fruits which remain plump for a very long while.

I have never known such an open month as November, 1970. I usually predict a severe frost towards the end of October, but this year is the first I can remember when there was not enough frost to cut dahlias until well into November. The comparative mildness of the weather has meant that the plants have needed watering for much longer than in most years. I do not believe in withholding water completely from October to April, as is suggested by some growers, but of course a lot depends on the temperature of the greenhouse. Where this is in the fifties it is necessary to give a little water occasionally. I water according to the weather and never give too much at a time. No spraying should ever be done however after September, as although the weather could be all right at the time of spraying, it could change overnight and then the greenhouse could remain too cold and dull for the good of the plants.

Those members who have no greenhouse but grow their plants in the living room, should water with care but can usually give far more than would be necessary if the plants were in a greenhouse. The temperature of a living room could be at a growing level most of the time and unless some water is given now and again the plants could suffer. These plants should also be repotted every two years at least, as there is no doubt that if left too long they will deteriorate. To keep some of them very dry could mean that leaves of succulents could fall and pads of Opuntias shrivel and drop off. It is also essential that all plants in the house should be in the lightest possible position. Nothing will spoil the look and shape of a cactus more than if it is kept in a sunless place in a room. Plants which are normally round or pear shaped may grow a tall thin centre and become very unsightly. Shelves arranged at the sides of a window facing south provide an ideal place for plants. In such cases it is a good plan to use small plastic trays with a little gravel in them for the plants to stand on. This will prevent the drips from falling and also be a means of watering the plants. A little water in the trays occasionally will be taken up into the pot and no water can drip to a lower shelf.

When this journal reaches you it will be time to think about the general watering of the collection. This should not be given to all plants but only to those which show signs of fresh growth. Those plants which flower early should be the first to be watered. These plants are not necessarily of the same genus but different plants of the same genus can flower at differing times. Some Mammillarias flower in March whilst others do not do so until December. *M. longiflora* is one of the first and *M. plumosa* is one of the last, usually in December.

Cultural Notes

Other Succulents—by Mrs. M. Stillwell

WRITING THESE NOTES in December during the electricity crisis one is very grateful that the weather is comparatively mild. Here is an instance when one should never rely solely on electricity in the greenhouse, although I will agree that it is the ideal method for the least trouble. But what happens on a freezing cold day when the power is cut? Be safe and invest in a good oil heater as a standby. I have always played safe and combined the two, which I find works very well especially during the wintery weather. I have not yet had the electricity connected to the new greenhouse and the oil heater seems to be quite successful, and I am half inclined to forget the electricity, for the time being at any rate.

I have noticed this week *Pleiospilos nelii* is in bud; this is a lot earlier than usual and could be due to the extra light in the new house. The Fenestrarias are still flowering well at the time of writing. *Gibbaeum molle* is out, also *G. pilosulum,* while a number of others are in bud. I water them with care during the winter when they are growing. My *Cheiridopsis candidissima* flowered again this year, a large yellow flower with about a four inch stem.

A number of Crassulas bloom during the winter, among them *C. mesembrianthemopsis* a dwarf, clustering, windowed plant with small white flowers. I always give it plenty of sunshine, and keep it tight and compact. The common *C. lactea* is always in bloom for Christmas and looks quite fairylike as part of the seasonal decorations.

When you receive this Journal we shall be thinking of spring, but do not be fooled by the first few really

sunny days; we shall be getting cold nights, and the house should still be kept dry as possible. A lot of unnecessary watering too early in the year soon leads to trouble. Unless a temperature of at least 55 F. can be maintained, keep the Euphorbias on the dry side, and also any other succulents from tropical areas close to the Equator. As a rough guide, water Lithops and Argyrodermas about May when they should have almost lost their old bodies. I water my Conophytums once about the end of March and no more until early July at least. They only need repotting about every third year, or when they outgrow the pot.

If you have a floor in the greenhouse that gets very damp in the winter, always try to stand any pots on trays, or place a few bricks at intervals with planks across to form shelving, as it is surprising how much water a clay pot will absorb from a damp floor, and in winter this can cause plants under staging to develop a very unhealthy green colour. Try and renew old labels during the resting period when the plants do not require so much attention. Make them all uniform and give the collection a smart appearance. I prefer the T-sloped labels, as not only your visitors but you, yourself, can read the names at a glance without having to reach over and take out a label, with the chance of damaging the neighbouring plants with a coat sleeve. For my personal use I make a note on the back of the label saying where the plant was obtained and the date. Then if you loose a plant it may be possible to obtain another from the same source.

I seldom purchase plants during the winter months unless something too good to miss turns up, as they do not always take kindly to a change of environment in the cold weather. Plants coming by post risk being left out in icy conditions on a wayside station or on an airport.

Inspect plants regularly for pests and remove the dead leaves that collect at the base of Echeverias, Dudleyas and the like in order to prevent mealy bug or scale getting established. Kalanchoes and many Senecios tend to loose their lower leaves in the winter and become leggy. If there is plenty of new growth around the base, I cut out the old stems in the spring and use them for cuttings. They will often flower better from fresh new growth. Most of the leafy succulents benefit by being broken up from time to time, as too much old growth seems to result in a ball of matted roots that cannot function properly unless loosened up. Agaves and Aloes make a tremendous amount of roots which not infrequently wrap themselves round and round inside the pot, and after a number of years seem to replace the soil almost entirely. In such a case I take them out of the pot and carefully untwine all the cordlike roots, some of which may be a yard or more in length, and then remove all that appear non-essential, using a sharp pair of scissors. Haworthias too need a lot of the old roots taking away to make room for the new thin, white roots that appear annually. Usually the old roots die off and so can be removed easily. I like to keep small plants of the commoner Haworthias to compare one with another, but I can see no point in letting them grow to very large clumps so I break them up every few years. This, of course, does not apply to the slow growing, choice specimens which frequently take several years to reach show size. When space is limited, it is nice to keep what I term a "sample" of the commoner succulents in a three inch pot, and this allows the choicer plants to have the extra space that they deserve.

The end of February is the ideal time to sow seed. I still prefer the plastic bag method as it simplifies watering. There is no need to open the bags until the plants are ready to prick out. I have found this method especially good with Lithops. Even Stapelias grow prolifically under this method and I have never found them damping off. I have only used J.I. seed compost, and never tried any of the soilless composts which hold the moisture more readily. Let us see some fine seedlings at the Society Shows this year, for this is the true proof of a good grower!

Meeting Places of the Branches

Northern Counties:	Social Service Centre, Park Road, Whitley Bay, Third Monday in month at 7.30 p.m.
Berks & Bucks:	Windsor Public Library, one Tuesday in each month at 7.45 p.m.
West Kent:	Beckenham Old Town Hall, second Friday in month from October to May, 8 p.m.
Essex:	Cranbrook Methodist Church Hall, The Drive, Ilford, first Saturday in month, 7.30 p.m.
North London:	Capel Manor, Waltham Cross, third Friday in month, 7.30 p.m.
Herts:	Friends Meeting House, Upper Latimore Road, St. Albans, second Monday in month, 7.30 p.m.
North Surrey:	Adult School, Benhill Avenue, Sutton, first Tuesday in month, 7.45 p.m.
Hatfield & District:	Hatfield Congregational Church Hall, St. Albans Road, East, Hatfield. Fourth Monday in month, 7.30 p.m.

Notes on the 1971 Seed Distribution

by W. F. and B. Maddams

THESE NOTES have become an almost perennial feature of the February issue of the Journal. The fact that the Society continues to welcome new members to its ranks, and the availability of seed of less common genera and species, which may be unfamiliar to many members, amply justifies its continuation. Once again, the demand for cactus seed has resulted in a more extensive list than the one devoted to the other succulents but we have attempted to cater for a range of tastes in both instances.

The list offers a good range of genera and species coming within the sub-tribe Echinocactanae for those who are attracted to this group of plants. Particular mention should be made of the Gymnocalycium species because these are suitable for members with limited experience of raising from seed. As the name implies, *G. asterium* is a low growing species, the body width exceeding the height. It is one of the smaller growing of the Gymnocalyciums but the whitish flowers are produced freely. *G. comarapense,* from Comorapa in Bolivia, is a recent introduction. It is large, globular and has many ribs. The bell-shaped flowers are white with a pink throat. It is probably closely related to *G. zegarrae* which is becoming increasingly popular. *G. filadelfiense* and *G. pirarettaense* which are both best regarded as varieties of *G. mihanovichii* are still more recent, as they do not appear in Backeberg's Lexicon, and they are typical of the steady stream of new Echinocactanae coming from South America. *Gymnocalycium sp. Rausch No.* 159 hails from Quebr. del Toro but no further details are available; nevertheless, we hope that many members will be tempted to try it. *G. melocactiformis* is somewhat of a mystery, as the name is not to be found in the usual works of reference, but its recommendation is that the flowers stay open for almost a fortnight. Last but not least is the well-known *G. saglione* which, at maturity, can reach almost a foot in diameter. Nevertheless, it flowers when comparatively small.

The range of seed of Parodia species is now so extensive that we are endeavouring to offer a different selection each year over a period to enable the enthusiast for this genus to build up a representative collection. Fortunately, many of the newer species have black seeds of a reasonable size which are both easier to handle and produce seedlings with a respectable growth rate. This is not true of many of the older species, with fine brown seeds; these are for the experienced grower only. *P. pseudostuemeri,* from north Argentine, was described by Backeberg in 1963 and, as the name implies, it bears a likeness to *P. stuemeri.* Both are rather more densely spined than the average Parodia species. This characteristic is even more marked with *P. scopaoides.* The specific name means like scopa and this, in turn, means closely covered with thick hairs. The flowers are orange-yellow with a red throat. *P. tilcarensis* is a species of longer standing, although it is not mentioned in Borg's book. It is one of the largest members of the genus and, having black seeds, is easy to raise. The flowers are large and reddish.

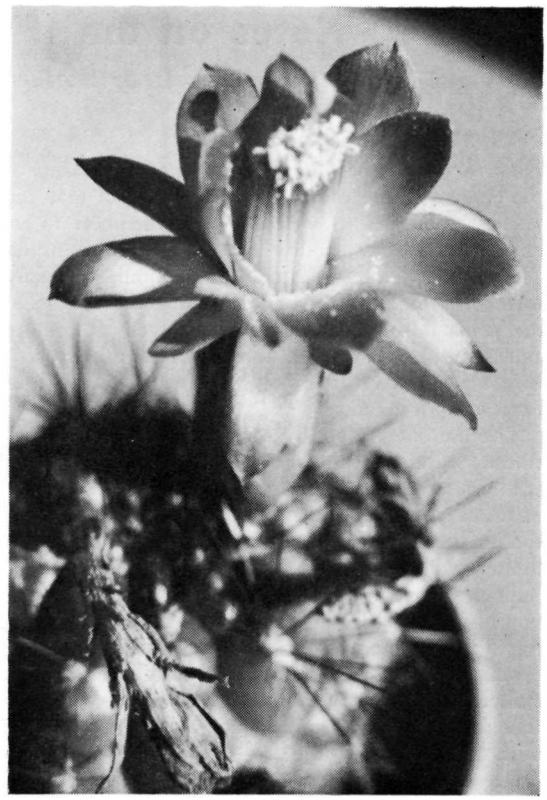
Parodia bunekeri, described by Buining in 1962, is one of a small group of species found in Southern Brazil of recent years and the subject of controversy because they have real affinities to the genus *Notocactus.* Indeed, some judges will not accept them as Parodias and other writers, in an attempt to effect a compromise, have suggested the new genus *Brasiliparodia.* It is to be hoped that this name does not gain general acceptance as it will merely add to the confusion. Setting aside taxonomic matters, the species in question can be thoroughly recommended. It grows readily and the flowers, which appear in April or May in appreciable numbers, are golden yellow. By contrast, turning to the genus *Notocactus* in its more conventional sense, *N. herteri* has reddish-purple flowers, which is quite unexpected, and it is a plant which should be in every collection. A fine coloured illustration is to be found in 'Cacti and Succulents' by W. Haage. *N. succineus* is typical of a number of recent introductions to the genus, as the result of more extensive collecting activities on the eastern side of South America, in that it has character. The body is a glossy green and the rather fine spines are an attractive yellow colour. The generic name Eriocactus may not be familiar to some members; it covers a few *Notocactus* species which Backeberg considered were atypical of the genus as a whole. The best known are *E. leninghausii* and *E. schumannianus,* and *E. grossei,* which we list, may only be a form of the latter. Be that as it may, it is worth a place in one's collection.

The remaining Echinocactanae from South America cover a range of genera and it is convenient to deal with them alphabetically. *Acanthocalycium violaceum* is an old friend for many of us but it still has much to offer by comparison with the range of novelties now available and there is sure to be a demand for the seed. Anyone who attempts to find it in Borg's book must turn to *Echinopsis violacea,* the genus in which it was placed prior to the activities of Backeberg. A further indication of the changes that have occurred during the past twenty-five years is to be found in the case of *Islaya islayensis* which Borg lists as *Parodia islayensis,* and earlier writers had named as *Echinocactus islayensis* and *Malacocarpus islayensis.* More recently, Donald and Rowley, in this Journal, have suggested that the genus

Islaya should be included in *Neoporteria* in the wide sense when it is also extended to cover *Horridocactus, Nichelia, Pyrrhocactus, Reicheocactus* and *Thelocephala.* To turn to more practical matters, *Islaya islayensis,* like the other species of the genus, is not easy to grow. These plants hail from the desert regions of southern Peru and are very susceptible to overwatering. This seed is best left to the experienced grower.

By contrast, *Neochilenia* (or *Nichelia*) *pygmaea* and *N. paucicostata* v. *viridis* can be recommended without reservation. The *Neochilenia* species are very easy to raise from seed and the pinkish flowers, appearing in mid-summer, are borne by plants a few years in age. This is also true of *Pyrrhocactus taltalensis,* a Ritter discovery which Backeberg regards as a *Neochilenia.* This group of plants usually fruits readily and although the colour is not so vivid as with the Mammillarias, for example, they are attractive none the less. A number of members have reported that the germination of seed of some of the South American Echinocactanae is poor and I am inclined to agree. This has been my experience with several genera including *Oroya, Soehrensia* and *Weingartia,* species of which are offered here. *Oroya suboculta,* with its reddish-yellow spines, makes a fine sight although one cannot emulate the closeness of the spination of imported plants when raising from seed. However, plants raised in cultivation have the advantage that the species are uniformly strong and coloured. *Soehrensia formosa,* with its yellowish white spines, is a beautiful species, as the name implies. Like the other *Soehrensia* species, the seedlings make steady growth, soon making robust plants which can reach a foot in diameter. They are among the largest of the barrel cacti from south of the Equator. *Weingartia multispina* shares with most of the other species of the genus the unfortunate reputation of being little known; only *W. neocumingii* is found at all frequently in collections. Like most of the species it produces handsome orange flowers around midsummer and it grows easily, although not particularly rapidly, from seed. The last member of this group, *Submatucana aurantiaca,* which is also frequently encountered under the name *Matucana aurantiaca,* is a plant which should be in every collection. It has a glassy yellowish green body, rather strong brownish spines and flowers when it is three or four years of age. The orange flowers are distinctly cerioid in character and species of this genus are often not accepted as Echinocactanae for show purposes; members should always check on this point to avoid acquiring the disappointing verdict 'not according to schedule'.

Species of the genus Mila may also come into this unfortunate category one of these days. In some ways they are the South American equivalent of the Echinocerei but they do not come within the sub-tribe Echinocereanae. They are regarded as belonging to the Echinocactanae but it would not be surprising if someone soon decided that this is not their correct affinity; indeed, Backeberg has already placed the genus in his sub-tribe Austrocereinae. *Mila pugionifera* is deserving of a place in the collection as are the other members of the the genus but this group of plants does not seem to have attracted the attention now being given to other and perhaps less deserving genera. One wonders what makes certain cacti fashionable.



Matucana auriantiaca (photo: B. Maddams).

Moving north of the Equator, but still remaining among the Echinocactanae, we again list several Ferocactus species, for reasons which I dwelt on a year ago. Two of these are forms of *Ferocactus covillei,* one collected in Arizona and the other some 300 miles to the south, on the north-western coast of Mexico, at Guaymas in the State of Sonora. This species differs from *F. wislizenii,* the other one common to this general area, in having only one central spine which is not usually hooked and relatively stout, inflexible radial spines. Although it may reach eight feet in height and a foot and a half in diameter in habitat its size will cause no problem in cultivation. *F. viridescens* is found in southern California and across the Mexican border in the northern part of Baja California. The name derives from the greenish flowers but the reddish spines are the

greater attraction with cultivated plants, at least for a good many years. *F. orcuttii,* named after the publisher C. R. Orcutt who collected extensively in Baja California, is one of the lesser known Ferocactus species. Unlike the major proportion of the Ferocacti from this region in the central spines are yellow, not blood red. Nevertheless, members particularly interested in the Echinocactanae should certainly have it.

We move a thousand or so miles to the east for the final member of this group of North American Echinocactanae, *Homalocephala texensis,* as this is native to Texas. This plant is known as the 'horse crippler' locally and one can understand this because, typically, its diameter is about three times its height and its spines are very strong. It grows readily from seed and will eventually reach flowering size, which seems to be five or six inches in diameter.

Of the Echinocereanae listed species of Echinocereus are again to the fore. *E. armatus* is something of a mystery plant; it is pectinate and has affinities to *E. pectinatus* but the type locality is not known. Nevertheless, it is amply worth growing. *E. coccineus,* a species which is currently the subject of a nomenclatural argument, is fairly widely distributed in southern Arizona and New Mexico. I was fortunate enough to see mounds of it in flower at an altitude of about 7,000 feet in the mountains west of Socorro, New Mexico, in May 1969 (see photograph in February 1970 issue of this Journal, p. 6). It is an intermediate species in that its many stems are short cylindrical, and so it comes between the few globular species and the many with elongated stems. The seed we offer was collected in New Mexico. I also saw *E. engelmanii* in 1969, at two localities in Northern Arizona and quickly recognised that it is very variable in spine length and colour. The variety *chrysacentrus* from Nevada, with yellowish spines, should be particularly attractive. *E. fendleri* is fairly typical of the members of the genus with elongated stems, although it does not normally develop large clumps of heads. The single rather short central spine may be yellow, brown or almost black and the flower is reddish purple. *E. triglochidiatus* is also sparing with its heads, although the stems are cylindrical and between six and twelve inches in length. It seldom has central spines but the radials are well in evidence and the form we offer, from the Manzana mountains, New Mexico, is very attractive.

The last of the Echinocereus species, *E. rigidissimus,* the rainbow cactus, will be well known to most members, and is much in demand. It is particularly impressive in habitat, as I can vouch from personal experience, and although it is not quite so vigorous in its growth as the other species listed it certainly cannot be called difficult. All five are quite reasonably cold resistant and will be quite happy with a minimum temperature of 40°F.

The remaining Echinocereanae come from South America, with Lobivia species predominating. As the name implies, *L. ferox* is fiercely spined and it may be synonymous with *L. longispina.* It has a white flower and Backeberg has classified it as a Pseudolobivia. The same naming problem arises with what we offer as *Pseudolobivia aurea,* which is often found listed as *Lobivia aurea.* Although the plant body is nothing out of the ordinary its lovely yellow flower, which has the long tube so typical of Echinopsis species, is outstanding and as it is easily raised from seed we thoroughly recommend it to those with limited experience. *L. muhriae* and *L. oyonica* are comparatively new. The former was described by Backeberg in 1963, from Jujuy in northern Argentine, and has an orange red flower. The latter was originally distributed under the Rausch field number 387 and it is a robust easily grown species. *L. schieliana* is an attractive semi-cylindrical species with rather fine interlacing white spines and a bright red flower. Because of its attractive spination it has more to offer than many Lobivias when not in flower. Only one Rebutia is listed but this is a particularly interesting one, *R. calliantha v. beryllioides.* It has yellowish brown spines and scarlet-red flowers; it was described as recently as 1963 and is still comparatively uncommon in collections.

The columnar Cerei offer a tremendous range of interesting plants and the problem is simply that of choosing from what is available for the comparatively limited listing each year. *Azureocereus hertlingianus* really does have bluish stems against which the spines contrast effectively. It reaches twenty feet in habitat, Peru, but it is manageable in cultivation. *Carnegeia gigantea,* the celebrated Saguaro from Arizona, particularly around Tucson, really needs no introduction. Every member ought to have the plant which figures in the Society badge. They need have no fear that it will thrust through the greenhouse roof. It reaches one foot in height in about 30 years and the flowering size of five to six feet in 70 years. *Cephalocereus royenii* is an uncommon and attractive species from Puerto Rico and this indicates its need for warmth during the winter. Members who have conditions suitable for Melocactus and Discocactus species will succeed with it and will have something very much out of the ordinary.

Cleistocactus villamontesii, from Angosto de Villamontes, has the usual long thin stems of Cleistocactus species and, less commonly, a greenish white flower with a purple throat. It is typical of a considerable number of new species which ought to be more widely grown. It is to be hoped that the tongue-twisting name *Espostoa laticornua v. atroviolacea* does not deter members from raising what is a throughly interesting plant with purplish brown radial and central spines although, like many of the Espostoas, the spines are not particularly apparent with young plants. It comes from northern Peru and southern Ecuador and probably does better with a minimum winter temperature of 45°F.

Haageocereus decumbens, unlike many members of the genus, was to be found in pre-war collections and

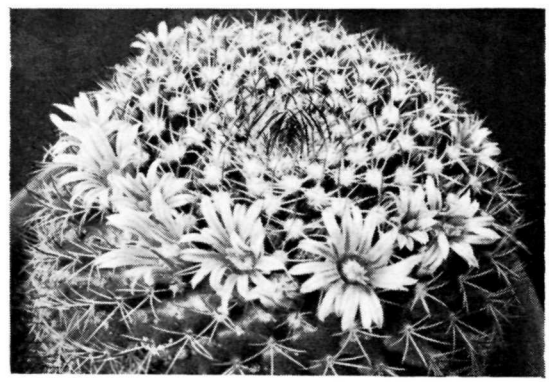
although its spination is somewhat variable it is usually brownish. *H. laredensis v. longispinus* is a good example of the new discoveries in the genus, as the result of extensive collecting activities in Peru during the last fifteen years. It has about forty golden yellow radial spines and one central, to 6 cm long on collected plants but, predictably, somewhat shorter on those raised from seed.

Backeberg lists 32 species of *Loxanthocereus* in his Lexicon but, none the less, this is a little known genus and one where placing in a systematic arrangement of the Cereanae is still open to doubt. All the species come from Peru and have it in common that the stems are somewhat thinner than those of the average member of the sub-tribe and, fortunately, they flower more readily. In the case of *L. granditesselatus* the stems may reach about six feet in length and they are about two inches in diameter; the flowers are red.

Oreocereus trollii, from northern Argentina, is an old favourite and despite new and interesting additions to the genus of late it can still command a place among a limited selection of the best of the Cereanae. This is also true of *Stetsonia coryne,* from the same part of South America. This is a somewhat variable species but the best forms, with strong, jet black spines, are outstanding. It grows easily from seed. The generic name *Pseudoespostoa* may be unfamiliar and could be with us for a limited time only with the trend towards re-uniting many of the Backeberg genera. Many will call the species we offer *Espostoa nana* and this is perfectly permissable. It is one of the best of Ritter's introductions and, as the name implies, it is the smallest growing member of the genus and, as is the case with all of them, there is a danger of basal rot if watering is continued late into the autumn and the temperature is allowed to fall too far.

The best known *Thrixanthocereus* species is *T. senilis* and the specimens on show in the R.H.S. Hall last October were much admired. *T. cullmannianus,* which has much to recommend it, and also has the many interlacing white radial spines, is not common in cultivation and we are glad to be able to offer seed. Most of us acquire one or two *Trichocereus,* such as *T. spachianus,* in our initial flush of enthusiasm for cacti, and then discard them in favour of more popular plants. Nevertheless, it should not be forgotten that the genus contains some decidedly attractive and impressive species for those who like columnar Cerei with stout spines. *T. terschehii* is one such. With age it forms clumps of columnar stems and the strong yellowish awl shaped spines may reach three inches in length. It is easily raised from seed and the growth rate is encouraging.

Our list would not be complete without a few Mammillaria species and the ones offered indicate clearly the diversity of form to be found in the genus. *M. collinsii,* from Oaxaca in south-west Mexico, makes a mound of heads after a few years. Its yellowish flowers normally appear in the autumn but a crop in spring is by no means uncommon. It comes from a semi-tropical area and prefers a minimum winter temperature of about 45°F. The diminutive *M. insularis* is one of the gems of the genus but, like the other hooked spine species from Baja California it is not particularly easy to grow. Nevertheless, with its jet black central spines and large magenta flowers, it certainly merits the attempt. *M. fasciculata,* from southern Arizona, is another member of this group which, technically, are known as the Series *Ancistrocanthae.* Although its flower is paler than that of *M. insularis* it is striped and large. *M. meiacantha* certainly presents no cultural difficulties. It grows steadily from seed and the hemispherical body will eventually reach about eight inches in diameter. The flowers are cream with a pinkish-brown mid-stripe are are often followed by attractive plump, red fruits.



Mammillaria meiacantha, collected (photo: B. Maddams).

The four remaining items on the cactus list are very different but all interesting. The genus *Echinomastus* is usually recognised as being among the Echinocactanae for show purposes but, during the last year or two, various American writers have just about decimated it, transferring some species to the genus *Neolloydia* and others to the genus *Thelocactus.* Both of these, of course, are in the sub-tribe *Coryphanthanae. E. intertextus v. dasyacanthus,* which Lyman Benson regards as a *Neolloydia,* makes short cylindrical heads, two to three inches in diameter and about twice that height. The purplish red spines tend to curl over the top of the plant and the flowers are much the same colour as these spines. It is a slow growing species and should only be attempted by the more experienced members.

Melocacti are not regarded with the awe that they commanded a few years ago, partly because they are not now rare in cultivation and also because it is now realised that an appreciable proportion of them do not require exorbitantly high winter temperatures. The two chosen here, from the northern and southern extremes of the distribution range, should tolerate a minimum of

50°F. *M. oaxacensis,* from the Mexican State of Oaxaca, is a somewhat elongated conical species and the cephalium does not elongate as markedly as in the West Indian species. The deep rose flowers are produced freely once the cephalium forms. Some impressive imported plants of *M. huallancaensis,* from Huallanca in Peru, have been in circulation recently. This species, also, elongated, conical, has about ten greyish, strong adpressed spines on each areole. Its cephalium is rather flat and the attractive pink flowers appear throughout the summer. *Tephrocactus nigrispinus,* from north Argentine, makes a mass of short cylindrical stems, up to six inches in length, and they are an attractive dark reddish green in colour. The central spines are purplish black on the newer growth and although they fade with age they are very colourful. It is probably advisable to soak the seed for some hours prior to sowing to aid germination.

It is regrettable that more members do not try the succulents other than cacti as some are most rewarding, not only because they grow more quickly than some of the cacti from seed, but also because they look attractive and interesting from the time they gain their true leaves. This year there are several of the family Agavaceae to try and these germinate well and soon make recognisable plants. *Beaucarnea recurvata,* or *Nolina recurvata* as Jacobsen prefers to term it, is native to south-eastern Mexico, but do not be alarmed if you recall pictures of this plant with its strong, narrow and long leaves shooting from a thick round woody base, the whole as high as a man; it will be many years before your plant attains this stature. In the meantime you can have the fascination of watching the base become gradually swollen and woodier and it will be a decorative plant for any collection. The three Agaves, *A. parviflora, A. schottii* and *A. stricta,* give a fair example of the variety of leaf-form available in this genus. *A. parviflora* is one of the dwarf species with white thread-like edges to its stout dark green leaves while *A. schottii* has thicker leaves with hairy edges and *A. stricta* is well-known to all, with its long, thin, spiky leaves forming an attractive globular plant.

Aloes, again, make attractive and distinctive seedlings and are easy to raise from seed. *Aloe ammophila* from the Transvaal forms dense groups at maturity. The slightly tapered bright green leaves have white markings. *Aloe bellatula* is amongst the newer dwarf species from Madagascar and is worth a place in any greenhouse, although it grows and flowers equally well indoors. The seeds should germinate well and the narrow spotted leaves soon make the plant distinctive; the deep pink to salmon bell-shaped flowers will open on the flower stem in the autumn and winter from quite an early age.

Fouquieria splendens is really a novelty plant to try to grow. Where there are Saguaros there are generally Fouquierias growing below them in the area of southern Arizona in the neighbourhood of Tucson and we

Cerochlamys pachyphylla (photo: B. Maddams).

were lucky enough to see them at their gayest with their red flowers when we were there in 1969. The stems are pale with brown mottlings and very thorny and it should be interesting to see how soon these characteristic features are noticeable in seedlings.

The remainder of the species listed are from the Mesembryanthemum family and there is no doubt that this is the most popular family amongst the 'other succulents' with the majority of members. It should be recalled, that unlike some of the seed listed above which can be pushed gently under the seed compost, most mesembryanthemum seed is best mixed with sand and scattered over the compost then pressed softly in. *Cerochlamys pachyphylla* is not grown so widely as it should be; it is easily raised from seed and the grey-green thick succulents leaves form a clumping plant quite quickly. The flower buds tend to form in late autumn and soon the purplish pink large flower opens on a short stem. The flowers tend to vary in colour and shape from plant to plant and sometimes they are almost double.

There is always a popular demand for Conophytum seed but it is very difficult to obtain in large quantities; however this year we have been lucky in getting five quite contrasting varieties. *Conophytum calculus* has roundish plant bodies of a clear pale green, and bright yellow flowers, and comes from the Van Rhynsdorp Division of Cape Province as does *C. wettsteinii.* The latter is considered synonymous with *C. pearsonii* according to Jacobsen but this does not detract from its attraction. The grey-green bodies clump quite quickly and produce a succession of bright pink flowers which remain open all the time. *C. impressum* is another 'cushion' type with grey-green heads with brownish dots; it has a scented white flower. The remaining two species, *C. lavisianum* and *C. polyandrum* both come from Little Namaqualand. The former is a typical bilobe with reddish edges to the lobes and yellow flowers but the latter is one of the taller growing more branching types with olive green lobes and a white flower edged with pink.

Diplosoma retroversum is another plant which is not often seen in collections but merits a place with its glossy, thick leaves marked with transparent dots and its purplish flowers. *Hereroa incurva* can be recommended, too; it is easily grown from seed and the leaves are glaucous with a reddish tinge to the green and small close dots. The golden yellow flower which opens in the evening can be produced when the plant is quite young. Other more unusual genera of which one or two species are listed include Mitrophyllums, Oophytum and Opophytum. These are all rather difficult to rear and to grow and are not recommended for newcomers to seed raising. Mitrophyllum, which means leaf like a bishop's mitre, is a genus which has a short growing period which starts around September with the new leaves breaking through the dried sheaf of the former year. The leaves are thick and succulent but the flowers rarely appear in cultivation. *Oophytum oviforme* is a case where the generic and specific name mean almost the same—egg-plant and oval, and describe the plant perfectly. It also grows in the autumn and has white and purplish pink flowers. *Opophytum aquosum* on the other hand is an annual shrubby species with flowers white to straw yellow; the name aquosum, watery, is given because of the thick fleshy leaves.

Lithops should be tried by everyone and we have a group of particularly interesting species this time. *L. comptonii* is amongst the gems of the genus with its attractive olive green marked body and yellow flowers. *Lithops dabneri* or more correctly *L. marginata v. dabneri* is fairly new and very worth growing for its purplish tan bodies with deep brown irregular lines and bright yellow flowers, while *L. turbiniformis v. elephina* is yet another variety of the *L. turbiniformis* group with their attractive brownish heads well marked in a deeper colour and yellow flowers.

Most of the remaining genera listed are also well-known. *Gibbaeum pubescens* is one of the winter growing members of the genus and has soft, grey-green, downy heads from which the red-purple flower gradually emerges in early spring. *Glottiphyllum barrydalense* takes its name from Barrydale Province, South Africa, where it is found. The leaves of each pair vary in length and shape, and the flowers, as in the other species listed, *G. regium,* are large and yellow. This latter species has longer, thick leaves. *Pleiospilos hilmari* is the smallest and most attractive member of this genus for many enthusiasts. The rounded leaves are a purplish green and not more than an inch to an inch and a half in length and the usual yellow flowers appear in autumn with regularity.

Finally there are three of the more shrubby types of Mesembryanthemum. *Lampranthus curvifolius* has grey-green leaves and rose pink flowers; this would grow well outside in sheltered places. The two Ruschia species are both dwarf shrubs; *R. carolii* has fleshy leaves and pink flowers with a purplish stripe and *R. pulchella* has grey-green leaves with transparent dots and a rose-red flower.

It only remains now to remind you that as well as the ten free packets of seeds you can purchase as many others as you fancy. Why not take this chance of trying a number of new species at a very low cost? Good sowing and growing!

Fortieth Anniversary Arrangements

WE ARE HAPPY to be able to enlarge upon the brief details given in the preliminary announcement in the November 1970 issue. At the same time it must be emphasised that there is still room for an expansion of the programme of activities envisaged at present and we repeat the invitation, made in the previous Journal, for suggestions to be sent to Mr. W. F. Maddams, Chairman of the sub-Committee dealing with the 40th Anniversary arrangements.

The Cactus Weekend, at Knuston Hall, Irchester, Northamptonshire, is well into the planning stage. Gordon Rowley and David Hunt have already accepted invitations to give talks and it is anticipated that other well-known speakers will also participate. A firm price for this event cannot yet be given but we anticipate that it will be approximately five pounds. Accommodation is available for a group of forty-three comprising six single rooms, 11 double and five treble. We must clearly use these facilities to best advantage and it is to be hoped that threesomes will be forthcoming. We are prepared to accept bookings forthwith and names should be sent to Mr. Maddams.

A thematic display will be mounted at the fortnightly Show in the R.H.S. Hall on 13th/14th July, 1971. This will cover various aspects of our hobby during the forty years which have elapsed since the formation of the Society. We have also accepted an invitation to stage a display of plants at the Aquarium Show in the R.H.S. Old Hall on 28th-31st October 1971 and this will precede the actual anniversary date by a matter of a few weeks only. There will be the usual two competitive shows, in June and October and we appeal to members to support them to the very best of their ability, so that they may be worthy of a special year. The Shows Sub-Committee will provide additional details of these two events in due course.

Notes from California

by Richard L. Russell, San Diego

As this is written, it is November in San Diego, but one would hardly realise it from the days which still are warm, although our night temperatures now drop into the 50's. I have stopped watering all my plants from Mammillarias to Epiphyllums, and from here on (since my plants are all outdoors) it is up to nature. We have occasional winters which produce only one or two major rainfalls, and if this is fated to be, my plants are going to shrink drastically. In fact, many of my plants are already shrinking, due to the "drought," and this is as it should be. For when the Cactus plant shrinks, it presents less surface, and therefore presents less area to the sun. Thus, the barrel types, for instance, behave like living accordions, shrinking in size and presenting less and less area to the elements.

I seem to go in cycles as far as my Cacti are concerned. Over the last year I have become particularly interested in Mammillarias, and my collection includes about 350 species, most of which I believe are true. Our American Cactus Journal is doing a wonderful job with its Abbey Gardens, listing for sale the largest collection of accurately labelled Mammillarias that I have seen. At this point I feel constrained to admonish European nurseries for what I consider an "overzealous" presentation of the Mammillaria clan. Many catalogues from Europe list obscure synonyms for Mammillarias, and list other plants which bear little relationship to the original. *M. sanluisensis* is a prime and current example; and the European *sanluisensis* seems to be a variety of *M. trichacantha*, in my opinion. Also, the endless varieties offered by European catalogues (often without even hinting the name of the actual species) I find annoying. Thus, I may order four different *Mammillarias* and find that they are all varieties of *M. compressa* with the name *compressa* never even appearing.

My only conclusion is that the desire among collectors for new Mammillarias is so strong that the nurseries are literally "pulling new names out of the nomenclature hat," and I wish somehow that this practice would cease. Of all the new and supposedly new Mammillarias, I would say that the outstanding one I have seen is *M. magnifica* (and its variety, *M. magnifica v. minor*). This fellow has long, rather wispy hair-like spines covering the plant body with some of the spines ending in tiny hooks. I would say it looks like a mixture of *M. hahniana* and *M. spinosissima*. The extraordinary thing about this Mammillaria is that the spines grow almost two inches long, giving it a really distinctive and outstanding appearance. I have two plants of *magnifica* and *v. minor*, and the *v. minor* seems to be lighter, almost yellowish green in body colour. I understand this plant grows quite large, although I have never seen a speciman larger than three inches tall.

California cacti—type locality of Mammillaria dioica (photo: R. L. Russell)

Speaking of Mammillarias (which I gather are the most popular group in Britain if not the world at this time), I thought that my readers might gain some insight and hints regarding culture if they could see a set of pictures of Mammillaria country. I have included three photos taken in the hills overlooking the sea about a mile from my house, and this is the home of the very variable *M. dioica*. Photo 1 shows the type locality, which is steep-hilly country populated by Opuntias, Ferocacti and thousands of Mammillarias of the dioica species. The other two pictures show typical Mammillaria groupings, both in full sun and undercover of brush. It is interesting to note that the Mammillarias which are out in the full sun are extremely heavy spines and dark-coloured, and present a very "hard-shelled, tough" appearance. Those which grow under brush present a greener, fatter, more lush look, and these I feel are more preferable for collectors. They are just prettier when growing in partial sun.

The Mammillarias are tightly rooted in the soil and rocks and are very difficult to remove (unless one breaks off 80 per cent of the roots). The soil is hard, yet will easily crumble. It is very dry and will burst into "powder" in one's hand if squeezed. It is well to remember that this area is subject to a good deal of mist and heavy

California cacti—M. dioica in full sun (photo: R. L. Russell)

California Cacti—M. dioica in shade (photo: R. L. Russell).

morning dew, and except for the three or four rain-drenchings a year (usually in the winter), I would guess that the morning dew provides a large part of the water which keeps the Mammillarias going. Perhaps this could be best duplicated in England by a fine hose spraying in the morning hours during days when the sun is likely to appear.

Incidentally, except for Opuntias, I believe that Mammillarias are the easiest of the collected plants to establish in the garden. I usually set my collected plants in a mixture of one-third leaf mould, one-third pea-sized gravel and one-third vermiculite and place them in a spot where they get only partial sun. Within two to six months they root heavily, and this mixture (along with a liquid fertilizer) seems to suit them well. I am one of those who advocate a very loose, "low dirt or leaf-mould" content soil with plenty of gravel and more watering if necessary to keep the plants growing. This reduces the chances of rot and bug infestation to a minimum and builds healthy root systems. Roots are the key to growing good plants, and I seldom see a plant with strong roots which does not do well in broken sunlight. Most Cacti (except the real desert types) survive despite the fierce sun, and they will usually grow better (as witness the photos) if the sunlight is broken. Of course, where I grow an *Opuntia basalaris* or *O. ursina* they must have full sun or they will tend to rot with the first rain. With the full sun, however, they will take much, much more watering than they are used to in their desert homes—and of course, they will grow considerably faster.

Incidentally, I used to detest grafted plants because they looked so "freaky" but I am more and more approving of the grafting process. Grafting means that one can have a great variety of plants all growing under the same conditions, whereas on their own roots much more attention must be paid to the different needs of different species. When the graft becomes too large, one can slice off the top half and root it, while growing a series of "pups" on the bottom half of the graft which is left on the stock. Often the part-sliced off will shrink back to "normal" proportions and after growing roots, it will assume the smaller characteristis of the true, root-grown plant.

Personally, when I want to add a new species such as *M. dodsonii* or *M. derherdtiana*, I much prefer receiving a little plant growing on a Cereus stock than I would a small seedling which I have to "sweat over." Grafted plants come to me in better shape than rooted plants, and of course, the graft-stock roots much quicker than the scion on its own roots. Well, so much for the notes this quarter. Good luck to my Cactus-collecting friends everywhere during 1971.

Notes on Pest Control

by Keith M. Harris, Royal Horticultural Society, Wisley

Mealybugs

MOST growers of cacti and other succulents will need no introduction to mealybugs, but how many can claim to have controlled these pests effectively? They look like small white or pink woodlice that have been dipped in icing sugar, and they are insidious pests in the true sense of the word. Colonies of adult and young bugs live in crevices between leaves, on stems, or even on the root systems, and feed on the sap, so reducing the plant's vigour and fouling it with their sticky and waxy secretions. Damaging colonies are often first noticed when they have already reached plague proportions and are made conspicuous by the copious white wax, wool or meal that covers them.

These colonies contain mature female mealybugs, about 4 mm. long and capable of laying 100 or more eggs each, as well as the young bugs, which are miniature versions of the adults. They can crawl around using their legs but cannot cover any appreciable distance unaided and have therefore been mainly conveyed from one place to another on plants. This has proved no obstacle to their widespread distribution and the species that now infest our greenhouses, conservatories and living rooms are species that originally lived in the tropics and sub-tropics. They are a long way from home but conditions suit them and they thrive.

The fact that they are relatively immobile pests, when left to their own devices, means that it should be possible to practise some form of quarantine against them and, if your own collection of plants is free from these pests at present, you would do well to scrutinise any new acquisitions and possibly keep them in isolation for a time before incorporating them in the main collection.

Alas, this is generally a counsel of perfection and the pest is usually already well-established before it is recognised. If this is the case you either put up with the nuisance or take action against it and the latter course can lead to a running battle over the years in which neither side ever completely wins—or loses.

Measures recommended against mealybugs are numerous. At the most basic level, it may be possible to examine plants individually and remove any colonies with a brush, either dry or dipped in a solution of soap or insecticide. This usually leaves survivors in the more inaccessible places, which guarantees a resurgence of the pest at a later date.

At a more sophisticated level, insecticides may be used and the five most suitable ones that are sold to amateurs are nicotine, BHC, malathion, dimethoate and formothion. These can be applied as sprays to the aerial parts or as drenches to the roots and, in addition, both nicotine and BHC are formulated as fumigants and as dusts, which means that they can be used on plants which are being kept dry.

Neither dusts nor fumigants will be totally effective against mealybugs as there is generally inadequate direct contact with the pests. Spraying of nicotine, BHC or malathion should give better control and spray-strength solutions of these insecticides can be used to wash or drench root-systems that are infested by root mealybugs, but again, there may be insufficient direct contact with the pests as their waxy coverings are water repellent .The best prospect of complete control is offered by the systemic insecticides dimethoate and formothion which act both through direct contact with the pests and indirectly by being absorbed into the sap, so poisoning the mealybugs' food.

The best way to use these systemics is to apply them after new root growth has started in the spring as this is the stage of plant development when maximum uptake of the systemic can be expected. A spray strength solution applied as a fine spray to the aerial parts and as a root drench watered into the pots should eliminate all but the most stubborn colonies and these can always be given additional treatment during the summer. Formothion, which is available as Toprose Systemic Spray and as Topgard Systemic Liquid has given good results when used at a concentration of about ½ fl. oz. per 1½ gallons of water and dimethoate, which is sold as Boots Systemic Greenfly Killer for Roses and as Murphy Systemic Insecticide, should give equally good results at the same dilution.

All chemical treatments tend to have drawbacks as well as advantages and, so far as the insecticides mentioned here are concerned, the following hazards should be noted:

Nicotine concentrates are very poisonous and should be handled with great care; BHC, malathion and the systemics have unpleasant odours and malathion, and possibly some of the other chemicals, can have harmful effects on some plants. These phytotoxic effects are generally claimed to be most severe on crassulas, but much may depend on the conditions prevailing when the chemicals are used. If you avoid treating plants when they are dry or when they are likely to be exposed to bright light, such damage should be minimised and the evidence available to date certainly suggests that the systemic insecticides can be safely used on a wide range of cacti and succulents including the crassulas and mammillarias.

Biological control of mealybugs has been realised in California and Hawaii where predators and parasites are used to reduce mealbug infestations but, although the potential exists for similar methods to be used in

this country, it will be a long time before either commercial growers or amateurs are able to derive any benefit from this highly sophisticated approach to pest control.

Leaf cutter bees

These pests are nowhere near as well-known as mealybugs but they do cause concern at times by the way that they build nests in pots. They are small bees, rather like hive bees, and they are probably attracted to light composts which provide suitable sites for their nests. These consist of a series of small cells, each of which is fabricated from sets of circular and semi-circular pieces of leaf cut from roses, lilac, privet and various other plants. Each cell is thimble-shaped and is provisioned with pollen and honey which provides food for the single grub that develops inside. The nests, which consist of a row of these cells, are made in various situations in decaying wood, brickwork, soil, etc.

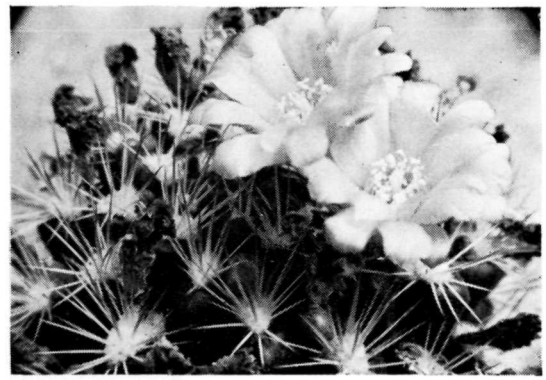
There is little point in using insecticides against these bees although a light dusting of BHC around infested areas may be sufficient to deter them. A better approach would be to catch and kill the bees when they are building and provisioning their nests, and the nests themselves should then be removed and destroyed. But before you do this, take one of the cells apart and see how neatly it is constructed!

Connoisseur's Corner

Weingartia hediniana

IT IS DIFFICULT to assess what combination of characteristics are necessary to make a particular succulent plant or a given genus popular, now that there is such a range of material from which to choose. Certainly, once there is the slightest hint that something is "with it" the demand leaps. This is by no means an ideal situation but it does have the advantage that it leaves much virgin territory relatively unexplored for those succulentophiles who prefer a touch of individuality.

There is no doubt that all of the species of the genus *Weingartia* are underrated and therefore not well known. The only one to be found with any frequency in collections is *W. cummingii* or *W. neocummingii* as it is more correctly called and this is typical in many ways of the genus as a whole. The generic name was established by Werdermann in 1939 and it then covered two plants known for the previous six years, at least by the splitters of the day, as Spegazzinia. This Backebergian name, as with many of his others, fell by the wayside, because the author failed to note that it had been put forward as a generic name in another connection as long ago as 1886. A few years ago P. C. Hutchison merged *Weingartia* with *Gymnocalycium* and the genus *Neowerdermannia* is also of this affinity. *Weingartia* has its areoles on the top side of the chin or bump, into which the ribs are serrated, *Gymnocalycium* in the middle and *Neowerdermannia* on the lower side.



Weingartia hediniana (photo: B. Maddams).

Backeberg lists 15 *Weingartia* species in his Lexicon and, almost certainly, Cardenas has subsequently described one or two more. The majority of these are virtually unknown in cultivation but it is doubtful if any of them have more to offer than *W. hediniana.* This is rather a robust species, with an attractive glossy dark green body, and it certainly grows to a size appreciably exceeding the body diameter of 6 cm quoted by Backeberg in his original description. The areoles are large, elliptical and covered with cream wool. From them emerge about a dozen and a half spines and it is quite impossible to say which of them are radials and which centrals. They are rather stout and yellowish in colour, the ones towards the centre of the areole being of somewhat deeper hue. The colourful orange-yellow flowers, which are so typical of the great majority of the species in the genus, appear in late spring and mid-summer. They are approximately 3 cm in diameter.

The plant shown in the illustration is in a five inch pot, and was raised from seed eight or nine years ago. It regularly produces about 20 blooms each year. They come in one or two bursts at the end of May and in June, with occasional extras later in the summer. It is by no means uncommon to find two flowers appearing at a particular areole. It is happy with the cultivation conditions which suit the Gymnocalycium species.

Trials at Wisley

The Royal Horticultural Society is to carry out at its Wisley Garden during 1971 and 1972 a trial of *Schlumbergera (Zygocactus) truncata.* Entries have been invited for three young plants of the Christmas Cactus, and one of these will be selected by Wisley for growing in a hanging basket. The trial will be judged in 1972.

Results of Show held on 13th and 14th October 1970

Judges

Cacti: Mr. E. W. Putnam. Succulents: Mrs. M. Stillwell.

Class 1 Three Cacti, any genera. 5 entries.
1st Mr. and Mrs. W. F. Maddams. Espostoa huanucensis, Echinocereus rigidissimus, Ferocactus acanthodes.
2nd Mr. D. A. R. Knight. Mammillaria geminispina, Ariocarpus furfuraceus, Astrophytum ornatum.
3rd Mr. E. G. Canham. Parodia maxima, Notocactus schumannianus, Echinofossulocactus ochoterrenaus.

Class 2 Three plants in Coryphanthanae. 5 entries.
1st Mr. and Mrs. W. F. Maddams. Coryphantha recurvata, Cochemiea setispina, Mammillaria candida v rosea.
2nd Mrs. H. Hodgson. Bartschella schumannii, Pelecyphora aselliformis, Mammillaria guelzowiana.
3rd Mr. R. H. I. Read. Coryphantha species, Neobesseya missouriensis, Ancistrocactus scherei.

Class 3 Two plants in Cereanae. 6 entries.
1st Mr. J. E. Taylor. Eulychnia saint-pieana, Winteria aureilanata.
2nd Mr. and Mrs. W. F. Maddams. Lasiocereus rupicolus, Weberbauereocereus longicomus.
3rd Mr. R. H. I. Read. Oreocereus trollii, Espostoa lanata.

Class 4 Three plants in Echinocactanae. 6 entries.
1st Mr. A. R Knight. Copiapoa cinerea, Ariocarpus furfuraceus, Astrophytum ornatum.
2nd Mr. and Mrs. W. F. Maddams. Neoporteria subgibbosa, Notocactus schumannianus, Ariocarpus retusus.
3rd Mr. R. H. I. Read. Leuchtenbergia principis, Ariocarpus fissuratus, Astrophytum ornatum.
VHC Mr. J. E. Taylor.
HC Mrs. H. Hodgson.

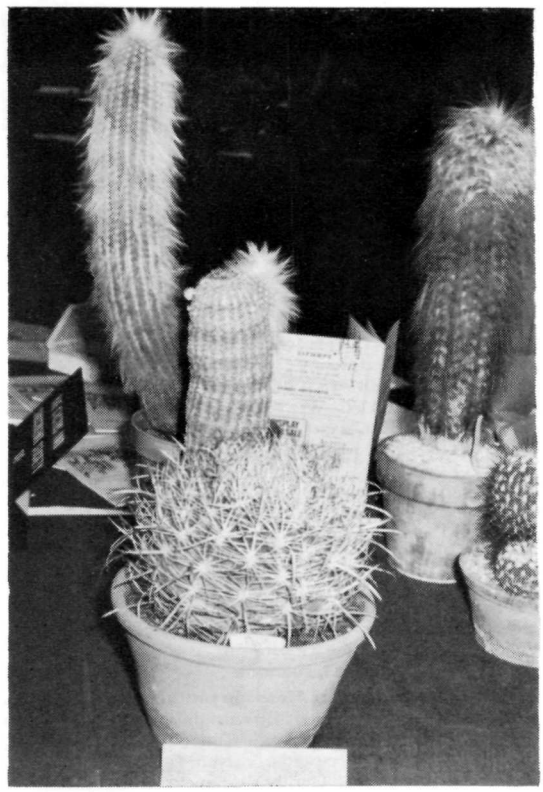
Class 5 Three plants in Echinocactanae in pots not exceeding 3 in. diameter. 8 entries.
1st Mrs. H. Hodgson. Toumeya lophophoroides, Turbinocarpus schwarzii, Aztekium ritterii.
2nd Mr. and Mrs. W. F. Maddams. Encephalocarpus strobiliformis, Turbinocarpus schmiedickianus, Frailea pulcherrima.
3rd Mr. D. V. Brewerton. Epithelantha micromeris, Lophophora williamsii, Turbinicarpus polaskii.

Class 6 Three Cacti, any genera, in pots not exceeding 5 in. dia. (For members who have not previously won a First Prize in any Cactus class). 4 entries
1st Dr. T. C. Smale. Copiapoa cinerea, Oroya neoperuviana, Submatucana myriacantha.
2nd Mrs. A. Whicher. Neoporteria rapifera, Astrophytum myriostigma, Mammillaria petterssonii.
3rd Mr. A. Sidaway. Cephalocereus senilis, Lemaireocereus dumortieri, Espostoa lanata.

Class 7 One Cleistocactus or Thrixanthocereus. 7 entries.
1st Mr. and Mrs. W. F. Maddams. Thrixanthocereus senilis.
2nd Mr. E. G. Canham. Cleistocactus straussii.
3rd Mr. H. Hodgson. Thrixanthocereus senilis.

Class 8 Three Cacti (for juniors under 18 years). 1 entry.
1st Mr. A. G. Rivett. Obregonia denegrii, Ariocarpus furfuraceus v intermedius, Matucana crinifera.

Class 9 One Cactus and one cristate of the same species. 3 entries.
1st Mr. and Mrs. W. F. Maddams. Mammillaria rhodantha rubra, Mammillaria rhodantha cristate.
2nd Mrs. P. Poulter. Mammillaria wildii and cristate.



Westminster Show, October, 1970. "Three Cacti"—1st Prize, Mr. & Mrs. W. F. Maddams. The Ferrocactus acanthoides *was also awarded "Best Cactus in Show" (photo: B. Maddams).*

Class 10 Four Euphorbias. 6 entries.
1st Mrs. H. Hodgson. Euphorbia obesa, E. suzannae, E. horrida, E. monteiroi.
2nd Mr. and Mrs. W. F. Maddams. E. fasciculata, E. valida, E. stelaespina, E. knuthii.
3rd Mrs. T. Watt. E. bupleurifolia, E. suzannae, E. deceptrix, E. stellata.
HC Mr. D. V. Brewerton.

Class 11 Three Crassulas in pots not exceeding 4¼ in. dia. 6 entries.
1st Mrs. H. Hodgson. C. dinterii, C.grisea, C. suzannae.
2nd Mr. and Mrs. W. F. Maddams. C. otzenii, C. barbata, C. mesembryanthemopsis.
3rd Mrs. P. Poulter. C. Morgan's Beauty, C. columella, C perfossa.
VHC Mr. R. H. I. Read.
HC Mrs. A. Whicher.

Class 12 Three plants in Ascelpiadaceae. 3 entries.

1st Mrs. H. Hodgson. Fockea crispa, Huernia pillansii, Diplocyatha ciliata.

2nd Mr. C. G. Brown. Raphionacme galpini, Fockea edulis, Pachycarpus scandiflorus.

3rd Mr. and Mrs. W. F. Maddams. Hoodia gordonii, Huerniopsis atrosanguinea, Huernia pillansii.

Class 13 Three plants in Liliacease. 5 entries.

1st Mrs. H. Hodgson. Aloe jucunda, A. haworthioides, Haworthia maughanii.

2nd Mr. D. V. Brewerton. Aloe rauhii, A. bellatula, Haworthia bolusii.

3rd Mr. and Mrs. W. F. Maddams. Haworthia parksiana, Gasteria liliputana, Aloe jucunda.

HC Mr. C. G. Brown.

Class 14 Three Conophytums and/or Opthalmophyllums. 7 entries.

1st Mrs. H. Hodgson. C. luckhoffii, C. ectypum v. tischleri, C. polyandrum.

2nd Mr. and Mrs. W. F. Maddams. C. pearsonii, C. truncatellum, C. frutescens.

3rd Mr. D. A. R. Knight. O. dinterii, C. praegratum, C. uvaeforme.

VHC Mr. R. H. I. Read.

HC Mrs. T. Watt.

Class 15 Two Cotyledons. 4 entries.

1st Mrs. H. Hodgson. C. species, C. reticulata.

2nd Mr. C. G. Brown. C. reticulata, C. luteosquamata.

3rd Mr. and Mrs. W. F. Maddams. C. pearsonii, C. C. paniculata.

Class 16 Three Lithops. 8 entries.

1st Mr. and Mrs. W. F. Maddams. L. aucampiae, L. schwantesii, L. bella.

2nd Mrs. H. Hodgson. L. erniana, L. helmutii, L. salicola.

3rd Mr. E. G. Canham. 3 species Lithops.

VHC Mrs. T. Watt.

HC Mr. D. A. R. Knight.

Class 17 One Gasteria. 5 entries.

1st Mr. and Mrs. W. F. Maddams. G. armstrongii.

2nd Mrs. H. Hodgson. G. batesiana.

3rd Mr. C. Parker. G. batesiana.

Class 18 Six stemless Mesembryanthemums. 5 entries.

1st Mrs. H. Hodgson. Dinteranthus vanzijlii, Lithops optica forma rubra, Conophytum piluliforme, Bjlia cana, Herreanthus meyeri, Lapidaria margaretae.

2nd Mrs. T. Watt. Herreanthus meyeri, Lapidaria margaretae, Lithops optica forma rubra, Cheiridopsis peculiaris, Dinteranthus wilmotianus, Conophytum wettsteinii.

3rd Mr. and Mrs. W. F. Maddams. Titanopsis schwantesii, Pleiospilos willowmorensis, Fenestraria aurantiaca, Cheiridopsis carinata, Aloinopsis schooneesii.

Class 19 Three Succulents not covered by Classes 10-18. 5 entries.

1st Mr. and Mrs. W. F. Maddams. Xerosicyos danguyi, Cissus hypoluca, Testudinaria paniculata.

2nd Mr. C. G. Brown. Cussonia paniculata, Othonna tuberosa, Seyrigia humbertii.

3rd Mrs. H. Hodgson. Agave filifera v. compacta, Sarcocaulon rigidum, Adromischus species

Class 20 Six South African Succulents in pots not exceeding 4¼ in. dia. 4 entries.

1st Mr. and Mrs. W. F. Maddams. Brachystelma barbariae, Haworthia bolusii, Anacampseros buderiana, Sarcocaulon burmannii, Ceraria pygmaea, Othonna herrei.

2nd Mr. C. G. Brown. Pachypodium saundersii, Haworthia truncata v. crassa, Duvalia compacta, Dactylopsis digitata, Anacampseros buderiana, Othonna intermedia.

3rd Mrs. H. Hodgson. Faucaria candida, Aloe humilis, Haworthia setata, Euphorbia horrida v. striata, Anacampseros meyeri, Cheiridopsis purpurea.

Class 21 Three Succulents, any genera, in pots not exceeding 5 in. dia. (For Members who have not previously won a First Prize in any Succulent Class). 4 entries

1st Dr. W. V. Harris. Cheiridopsis candidissima, Haworthia viscosa, Stapelia mutabilis.

2nd Mr. D. A. R. Knight. Aloe variegata, Cotyledon paniculata, Stapelia species.

2nd Mr. A. Sidaway. Faucaria hybrid, Haworthia ryderiana, Conophytum scitulum.

Class 22 Succulents raised from seed sown by the exhibitor on or after 1st January, 1969 in a container not exceeding 15 in. by 15 in. 2 entries.

1st Mr. C. G. Brown.

2nd Mr. and Mrs. W. F. Maddams.

Class 23 Three Succulents (For Juniors under 18 years) 1 entry.

1st Mr. A. G. Rivett. Euphorbia clandestina, Senecio anti-euphorbium, Euphorbia valida.

Class 24 One Cactus and one other Succulent, not less than 5 in. pot. 6 entries.

1st Mrs. H. Hodgson. Ariocarpus furfuraceus, Haworthia truncata.

2nd Mr. R. H. I. Read. Euphorbia horrida, Echinocactus grusonii.

3rd Mrs. T. Watt. Melocactus maxonii, Fockea crispa.

Class 25 Group of Cacti and/or other Succulents to cover space not exceeding 18 in. by 18 in. arranged for decorative effect. 4 entries.

1st Mrs. H. Hodgson.

2nd Mr. and Mrs. W. F. Maddams.

3rd Mr. C. G. Brown.

AWARDS

The Banksian Medal: Mrs. H. Hodgson.

The Sir William Lawrence Cup for Cacti: Mr. and Mrs. W. F. Maddams.

The Evelyn Theobald Cup for Succulents: Mrs. H. Hodgson.

Joan Farrow Memorial Cup for Groups: Mr. and Mrs. W. F. Maddams.

Challenge Shield for Juniors: Mr. A. G. Rivett.

William Denton Memorial Trophy for Branches: North Surrey.

P. V. Collings Cup for Four Euphorbias: Mrs. H. Hodgson.

Mrs. Pryke Howard Cup for Six South African Succulents: Mr. and Mrs. W. F. Maddams.

Mrs. Hedges Cup for Succulents from Seed: Mr. C. G. Brown.

The Denton Memorial Medal for Six Stemless Mesembryanthemums: Mrs. H. Hodgson.

Spoon for Best Cactus: Mr. and Mrs. W. F. Maddams (Ferocactus acanthodes).

Spoon for Best Succulent: Mrs. H. Hodgson (Euphorbia monteroi).

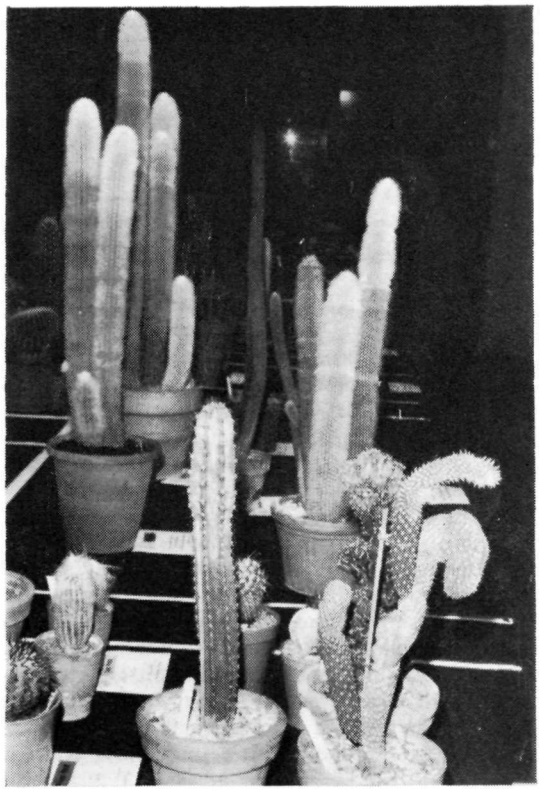
Forthcoming Meetings

At the R.H.S. Westminster:

Wednesday, February 24th. Photographing your plants. Mr. S. L. Cooke.

Wednesday, March 24th. Annual General Meeting at 6.30 *p.m.*

Wednesday, April 21st. The Holly Gate Collection. Mr. Clive Innes.



Westminster Show, October, 1970. Entries in classes "Novice Cacti" and "One Thrixanthocereus or Cleistocactus". (photo: B. Maddams).

Book Review

LYMAN BENSON **"Cactaceae"** in C. L. LUNDELL et alia **"Flora of Texas"** Vol. 2 Part II: 221-317, Texas, 1969. 8vo. 14 plates.

THIS IS THE third in a series of reviews of the cacti of North America state by state, prior to publication of a collective monograph of the Cactaceae of the United States. Unlike its predecessors, The Cacti of Arizona (1969) and The Native Cacti of California (1969), which were books, this forms part of a general flora of Texas. We are fortunate in being offered it as a separate paperback, but there is the disadvantage of no preliminary or cultural information, and no index which presumably will appear at the end of volume two.

It is hardly necessary to say that the work is as thorough, painstaking and well documented as the two mentioned above. The descriptions are clear and easy to follow, and the keys make it a very practical book for identification. There is at least one full page illustration of each genus, finely drawn by Mrs. L. Breazeale. Dr. Benson is conservative in the number of cacti that he recognises, and in spite of the reduction of many species to varieties or synonyms Texas retains its lead as the state richest in cacti in the U.S.A.—13 genera and 70 species. If it seems strange to have to revert to calling *Astrophytum asterias* "Echinocactus asterias", this merely points the welcome trend towards rescuing cactus taxonomy from its present abyss of oversplitting and bring it into line with the treatment accorded to other plant families.

Comparison of Benson's generic and specific concepts with those of the previous treatment of Texas cacti by Schulz and Runyon (based on Britton and Rose) 40 years ago is interesting:—

GENERA	SPECIES		
	Schulz & Runyon 1930		**Benson 1970**
Opuntia	33		18 + 2 hybrids
Wilcoxia	1	*Cereus*	3
Peniocereus	1		
Acanthocereus	1		
Echinocereus	21		10
Ariocarpus	1		1
Lophophora	1		1
Epithelantha	1		2
Ferocactus	3		3
Hamatocactus	1		
Echinocactus	1		3
Homalocephala	1		
Ancistrocactus	2		3
Thelocactus	1		1
Neolloydia	1		4
Echinomastus	2		
Coryphantha	8		14
Neobesseya	3		
Escobaria	4		
Neomammillaria	10	*Mammillaria*	7
Dolichothele	1		

One name citation calls for correction: the authorship of the name *Echinocereus reichenbachii* given as (Terscheck) Haage f. Ind. Kew. 2: 813, 1893 is fictitious; it should read (Terscheck) Br. & R. Cact. 3: 25, 1922.

Benson's Cactaceae of Texas is strongly recommended and can be obtained for $6.00 from Abbey Garden, Box 167, Reseda, California 91335.

G. D. ROWLEY

Lithops

Copies of D. L. Sprechman's "Lithops" have now arrived in this country. Published by the Fairleigh Dickinson University Press in the USA, the work includes contributions by Prof. C. B. Dugdale (anatomy), Prof. D. T. Cole (geographical distribution) and Prof. H. W. de Boer (analytical key). The price is not indicated but it is believed to be of the order of £18 or £20.

Succulent Snippets

by Sally Cornioides

A RATHER belated Happy New Fortieth Anniversary Year to you all and I hope many of you will be able to support the special events being planned, and make it an extra special year for the Society by bringing in as many new members as possible. Someone suggested we should celebrate a ruby anniversary by having rows of "ruby ball" cacti at the Shows—what a thought! Personally, I think that a showy display of Schlumbergeras, *Epiphyllum ackermannii*, *Mammillaria zeilmanniana* or *Parodia sanguiniflora* according to the season, would make a much more attractive impression. At any rate, I hope you are all giving the celebrations some consideration.

I know there are projects under way in the Northern Counties Branch, but the note from Mr. Jennison passed on to me by the Editor shows an extension of my comments a few Snippets ago which he included in their Branch Newsletter. He, in fact, had suggested that the names given in the "Flowers of the Desert" series of pot plants could be used as an intelligence test, and lists a number he has found, for a trial. He suggests the score should be recorded as follows: None right—quite sane, one right—kinky, two right—I don't want to know you, over five right—quick where's the nearest loony house? Later he suggests that perhaps succulents other than cacti may be included in their range which would widen the scope for titles and puts forward a few new ones of his own creation:

Smelly Nellie—*Stapelia variegata*
Karroo Rock (not named throughout)—*Pleiospilos nelii*
Incas Freakout—*Lophophora williamsii*
Horny Harry—*Caralluma europea*
Oklahoma glory—*Chamaecereus silvestrii*
Mexican Moonstones—*Lithops* species
El Prairie Diable—*Harrisia martinii*.

It certainly gives plenty of scope for those with that kind of thinking, but I am afraid reading this cutting also set me thinking on another tack. On that page alone there were five names spelt incorrectly, and I had already thought of mentioning this as there have appeared incorrect spellings of species and genera name in prize lists in this and other journals. I am afraid we often blame the printers but it is not really their fault all the time. It is certainly up to authors and editors to take special care in manuscript reading where botanical names are involved; they have the reference books to hand in order to check them, the printers have not. I feel sure that our new Editor with his previous dealings with entomological names will be well up to this challenge.

It is not only names in articles that are spelt wrongly, however, I am afraid it occurs on the show bench as well and here at shows where members of the general public are often seen busy taking notes, is a place where care should be taken. There is no excuse for any Society member having a mispelt name on a label, if he or she has not reference books of her own to check them from there is always the excellent Society library from which the information can be gleaned. We cannot really go about blaming nurserymen for names wrongly spelt when there are examples in our shows; it is a case of "physician heal thyself".

Talking of shows, some reference should be made to the excellent display at Westminster in October as I understand no-one, regrettably, felt inclined to present the Editor with a write-up. The Show Committee's experiment with a later autumn show seemed to be a successful one although many of the Mesembryanthemums flowered earlier than usual in 1970. Certainly, the Conophytums were at their best and it is not often there is a chance to show these beautiful little plants at the prime of their year. Many of the Lithops were in flower as well and both these genera were causing amazement and excitement among the general public; the stem succulents such as Sarcocaulon and Othonnas were well into their growing season, too, again showing the advantage of exhibiting a month later than usual. The only adverse comment that was reported to me about the display was that someone had said it was a case of "purses not perseverence" when it came to awards and prizes in several cases. He pointed out that newly imported plants and choice names had in many cases won against plants that had obviously been grown for some years in this country and probably from seed and were hence the result of real effort on the owner's part. I wonder what other members think about this? How much do you rank rarity against good cultivation and if the plant bears a name you have not met before would you give it higher points when judging? There are many thorny problems in the path of judging and I applaud Branches where members all have a chance to judge from time to time even if it is only a table show; it gives the "masses" some idea of the difficulties involved, as well as helping them towards better showing themselves.

Do you have £74 to spare? If so, you can set yourself up with a fine selection of 17 Peruvian Melocacti offered in a dealer's list I saw recently. If that really fires your enthusiasm you will not have to search too diligently to obtain sundry Brazilian species and a few

from the West Indies are to be had from time to time. I suggest that for an outlay of about £150 you can set yourself up as a Melocactus specialist, with a few Discocactus species thrown in for good measure. Then you have the cost of maintaining the collection because you will really need to hold a minimum winter temperature of 55 F, although 50 F will probably suffice for the Peruvian species.

Perhaps I should have made a New Year's resolution not to be too cynical because I do not really want to deter anyone from growing one or two of these fascinating plants, as was no doubt obvious from my mention of them in the November Journal. I have seen a few of the Peruvian species at one time or another and, quite frankly, I find very little difference between them. With the genus becoming steadily more popular, and with the flood of imported plants that inevitably follows such popularity, someone will soon start lumping the species. I am willing to stick my neck out by forecasting that such a move will be under way within the next five years. Fortunately, it will not mean altering too many labels so far as the majority of us are concerned.

* * * * *

There is no doubt that the Annual Dinner organised so ably by our Secretary, Mr. Read, was a success from start to finish. The start was the notice at the entrance to the Windsor which simply said, "2nd FLOOR CACTUS"—no need to dwell on that but I am told there was one cactus present, since one guest on his form had requested to sit next to a Notocactus!

Our visiting speaker, Gordon Rowley, I understand, made a smash hit at the start by gesticulating and knocking sherry glasses off a waitress' tray and a smash hit at the end with his delightful films, several of which had not been seen before by the majority of those present.

Correspondence

Dear Sir,

Richard Russell, in his *Notes from San Diego* (Nov. 1970) asks for comments on *Bergerocactus emoryi* in cultivation. Some years ago I raised this plant from seed and I now have a good-sized specimen in my greenhouse (that is to say, good-sized in comparison with the rest of my plants! It is in fact in a six-inch pot and its longest stem is about 60 cm).

I am very fond of this species and agree with Mr. Russell's description of it as beautiful. I have not found any great difficulty in growing it, though it was slow during its first two or three years. Of late it has begun to grow fast and throw up new shoots. So far no stems have died off, but the newer stems grow the fastest (I have noticed this habit in other *Cereanae* too). No flower-buds have appeared yet; no doubt my plant is still immature, though, judging by Backeberg's notes on the species, it is not a big grower (he gives the stem-length as one to two metres). I believe that *B. emoryi* flowers terminally, producing a large bud at the tip of the shoot; no doubt Mr. Russell could confirm this from his experience of wild and cultivated plants.

Unfortunately relatively few British collectors seem to have much interest in the *Cereanae* and *Bergerocactus emoryi* is but one of many delightful species which are rarely seen in collections here.

Yours sincerely,
E. W. Putnam.
72 Church Lane,
Avenue,
Hooley,
Coulsdon,
Surrey CR3 3RT.

Seed Raising Made Easier

by Robert D. Swan, Maryland

SEED raising has long been a joy to cactophiles. To grow a flowering plant or one near specimen size from a minute, lifeless appearing seed is a real accomplishment. Especially so since the seedling has to survive the hazards of beginning germination which might include dampoff, plus any number of other hazards over the years as it grows to maturity.

Until recently seed raising was confined to the warm months of the year when plenty of natural warmth and light were available. Now propagators can be bought or built to maintain steady, desirable temperatures by electricity. Articificial lights specially designed for maximum plant growth are available so that seeds may be grown indoors. These conveniences all make seed raising easier, more convenient and a part of our hobby that can be engaged in at any and all times of the year. Besides, in the Spring and Summer there are so many other things that need to be done in the greenhouse that little time is left for seed raising.

My own practice has been to plant seeds in the Fall and Winter when there is relatively little activity with the cacti in the greenhouse. In this way I have the pleasure of watching plants grow, while outside the house everything is nearly dormant. In the past seeds were planted in 2½ in. square plastic pots which were placed in polyethylene bags. The pots were then placed

on shelves inside the house which are lighted with fluorescent plant-growth lights.

In growing cacti from seed, maintaining the right amount of soil moisture has always been a difficult problem for me. Either I apply too much water or not enough. Constantly maintaining the right amount of moisture would obviously provide the best conditions for rapid plant growth. But even with polyethylene bags moisture was gradually lost to the much dryer atmosphere of the room. Now with the advent of a film called "Clysar," loss of moisture is no longer a problem.

"Clysar" is a new polypropylene film made by the Dupont Company. Its usefulness in seed raising is due to the fact that it permits an exchange of oxygen and carbon dioxide between the seed container and the outside air and yet does not let water evaporate as does polyethylene. If small glass jars are used, the top can be sealed with a small piece of "Clysar." "Clysar" is clearer than polyethylene and thus permits more light to pass through.

The method that I use with "Clysar" is based on an excellent article in the "Cactus and Succulent Journal" (U.S.A.) for July-August, 1970. The small glass baby-food jars which I use as seed containers cost nothing as long as you have a source of acquiring them. The jars are half-filled with a soil mix for seedlings. The jars, soil mix and the seeds should all be sterilized by some method just prior to planting. In this way when the jar is sealed the seeds are in a germ proof environment. An amount of water equal to about ¼ of the soil volume is added. Preferably it should be boiled to prevent unwanted organisms. Fertilizer should be added either to the soil mix or to the water. A slow-release type is preferable because of the length of time before fertilizing again.

A piece of "Clysar" is placed over the top of each jar and held in position by a piece of string. String is used because it lasts indefinitely. After the jar is sealed, it need not be reopened until the cacti outgrow their container or they need more fertilizer. For the jar to remain unopened for a year or longer is not beyond reasonable expectations. Although the soil is moist all the time, there is no chance for fungus or moss to interfere with seedling growth. Damping-off germs are excluded from this moist atmosphere. Once the seed planting is accomplished, there is no fuss, no bother—just the pleasure of watching the seedlings grow and grow and grow.

Propagation of Succulents

by P. Bent and C. Newton

THESE notes on our experiences over a number of years in the propagation of succulents from seeds and cuttings are prompted by the discussion at a recent meeting of the Society at Westminster. It seemed to us that there is a real need for information on this topic among members in general, and although we have been mainly concerned with the Mesembryanthemaceae we think our observations are applicable to succulents generally.

Seed sources

Total lack of success in raising succulents from seed is, not infrequently, due to the seed being old. On the other hand some varieties of seed germinate slowly and irregularly, while some which in Nature do so only after passing through an animal or bird may need a whole year in moist soil before the seed coat softens sufficiently to allow the young shoot to emerge. Seed pans should not be discarded hastily for failing to show germination, but the top layer should be turned over and the soil well soaked again, up to a year after sowing.

The most rewarding results, both as to germination and plants produced, come from sowing seed that has been collected *in habitat*, since this is usually well ripened and true to type. Open-pollinated material from botanic gardens should be avoided if true species are required, and in any case should be labelled clearly as 'open-pollinated' in order to avoid disappointment in future. When saving one's own seed it is essential to isolate a group of one particular species from any related plants which might flower at the same time.

Sowing

Much has been said about composts and soil mixtures for raising succulents. What is required is a medium which will retain sufficient moisture to ensure good germination and then supply adequate nutrients to maintain plant growth for so long as the seedlings remain in the pan. When seedlings are pricked out at a very early stage in their development the necessity for nutrients in the germinating medium is greatly reduced, but great care must be taken to avoid breaking the main root while moving them as this frequently leads to the death of the plant. However, potting on into fresh soil assists the growth of many plants. Prior to germination and at intervals until the plants are well established spraying with a weak solution of Chinosol is recommended. This reduces the risk of fungoid attack, particularly after transplanting, and appears to stimulate germination.

As regards the growing medium, we prefer John Innes compost mixed with sharp sand. The proportion of sand is determined by experience for each group of plants. A fine top layer is provided to receive the seeds.

Germination is speeded up at higher temperatures, but extra care is needed to ensure that the soil does not

dry out, unless the pans are enclosed in plastic bags. Additional light encourages the growth of seedlings and we have found that Gro-lux lamps placed six inches above the pans give good results when regulated to a 50/50 day and night ratio.

Vegetative propagation

Propagation by cuttings and offsets does not produce completely new plants but expands existing clones. An interesting feature of this method is the opportunity it provides for having clonotype specimens, that is a plant derived from the original type plant. Such plants add greatly to one's interest when one begins to specialise in a particular group, though they probably mean little to the average succulent enthusiast. We possess several Huernias that we believe to be clonotypes.

Speaking of clones, it is worth remembering that self-sterile flowers cannot be successfully fertilised by other flowers on plants belonging to the same clone. Pollen from plants outside the family circle, so to speak, is essential to do this.

Some imported plants are liable to root rots after planting, due to injuries received on the way failing to heal before disease organisms get in from the soil. We have found that plants survive better when planted together in groups and sprayed with weak Chinosol solution than they do planted singly. This works well with, for example *Muiria hortenseae, Didymaotus lapidiformis* and *Brachystelma* species.

Notes and News

Monthly Table Shows at Westminster

The 1970 project of bringing a plant from a specialised sub-tribe or "other succulent" family certainly increased the entries in the table shows and so this scheme will be continued for another year. The Society's "Guide to the classification of succulents" (5p) will assist those unsure of the groupings, and it is hoped that even more members will make the effort to bring up one plant to each meeting from April to November in 1971.

Christmas Cactus

In a recent paper (Kakteen **21** (10): 182-6) O. Hovel discusses the genus *Schlumbergera*. He suggests that the "Christmas Cactus" is most likely a hybrid—*Zygocactus truncatus* X *Schlumbergera russeliana*. It will be recalled that *Schlumbergera* X *buckleyi (bridgesii)* was suggested by Gordon Rowley in this Journal in 1967. (**29**:84). As they say in parliamentary reports "the debate continues".

Society Christmas Cards

It is regretted that owing to printing delays it was not possible to announce these cards in the November issue. However, they have proved popular with members at Westminster and it is hoped that full details of those for Christmas 1971 will appear in the August Journal in good time for all members to order at least a half dozen! A Society card on a mantelpiece makes good publicity!

South American Cacti

F. Buxbaum has contributed a chapter on the evolution of cacti (Entwicklungswege der Kakteen) in South America to the second volume of "Biogeography and Ecology in South America". This is published by Junk, The Hague (1969) as Monographiae Biologicae XLX, price 75 Dutch Guilders.

Mexican Cacti in Habitat

Charles Glass and Robert Foster, respectively Editor and Assistant Editor of the American Cactus Journal, will be the guest speakers at a specially convened meeting of the African Succulent Plant Society at the R.H.S. New Hall, Greycoat Street, London S.W.1 at 7 p.m. on 13th May, 1971. Messrs. Glass and Foster will be staging a two-projector slide show on Mexican Cacti in habitat and the same species in cultivation in California. Members of other Cactus Societies in the London area have been cordially invited to attend. There will be a silver collection to defray the expenses.

Permits to Grow Cacti

If you live in New Zealand and you wish to grow *Lophophora williamsii* or *L. lewinii* you must first obtain a licence under the Narcotic Regulations from your District Health Office. In a recent issue of the N.Z. Cactus & Succulent Journal the Society's President reminds members that the first licences were about to expire and that these would require renewing in order to avoid conflict with the Law.

ANNUAL GENERAL MEETING

The Annual General Meeting of the Cactus and Succulent Society of Great Britain will be held on 24th March, 1971 in the New Hall Lecture Room of the R.H.S., Greycoat Street, London, S.W.1. at 6.30 p.m.

READERS are asked to note that advertising space is available in this Journal at the following rates:

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For the August issue	1st July
For the November issue	1st October

In addition there is a SMALL ADS. column at 8p per line, minimum 23p for which copy should be received on the above dates also.

A Booklet on the Classification of Cacti and Succulents is now available from the Show Secretary. The price is 5p each plus postage. Branch Secretaries can obtain them at 12 for 50p plus postage. Postage is 1-8 copies 2p, 9-11 copies 3p. Postal Order or cheque, NOT stamps, please.

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THE CACTUS AND SUCCULENT JOURNAL OF GREAT BRITAIN

Vol. 33 May, 1971 No. 2

CONTENTS

Editorial

It is not surprising that the naming of plants is a perennial topic since names are being used all the time in communicating ideas of one sort or another. Names given to plants are simply labels, and like labels on packets of tea they can be changed without altering the contents of the packet. On the other hand the same label can be used for different kinds of tea, and plants, either by accident or design and so causing confusion in kitchen or greenhouse.

To spread ones ideas on any aspect of succulent cultivation whatever names must be used that have a precise meaning to the hearer. When it comes to the purchase of plants, the situation was well expressed by C. D. Brickell in the RHS Journal last November.

"It is obvious that plants grown by nurseries for sale should be correctly named—nothing is more irritating to the keen gardener than to see a plant under one name, order it and obtain something entirely different under that name. This cannot be blamed (although it often is) on the nurseryman supplying the plant—but may be due to one or more of several factors which cannot be discussed adequately in this short note. Very frequently, however, the desired plant belongs to a horticulturally important genus of which the taxonomy and nomenclature is badly in need of revision".

With the arrival of Jacobsen's Dictionary of Succulents to join Bakeberg's Dictionary of Cacti the whole field of succulent plants in its widest sense has been provided with a firm nomenclatorial base. This will not stop all arguments over the 'correct' names, but it will provide an up-to-date starting point for the debate, cutting out a lot of dead wood in the way of synonyms. More important from the practical point of view, the ordinary succulent enthusiast can now lean on Bakeberg or Jacobsen, according to his speciality, for support when preparing his labels, or, let us say, writing a note for this Journal.

Mention of the 40th anniversary of the founding of this Society will be found below. The self-congratulations implicit in the modest celebrations already planned are fully justified by the flourishing condition in which the Society finds itself, and which were reported to the recent Annual General Meeting. It may be asked why the current volume of the Journal is no more than 33; was the Society slow to get off the mark in its early days? The answer, of course, is no. The first issue appeared in September, 1932 just one year after the formation of the Society, but the War necessitated a gap of nearly five years between parts 2 and 3 of volume 8.

Cactus Cultural Notes

by A. Boarder

LOOKING ROUND MY greenhouse this March I have been delighted to note the many fruit pods which have formed on the mamillarias. There seems to be no set time for these to appear, and different species have varied times of the year for putting forth their pods. Every week for some months now I have been removing pods as they dry up, but there always seems to be just as many the following week. Some species produce their pods soon after flowering, whereas others do not do so until the next year. I have a fine specimen of *M. moellendorffiana* which has recently set many fine fruits of an attractive purplish shade. This makes a nice change from the usual bright red colour of most mammillaria pods.

My plants of various types of *M. celsiana* are bearing many small, red fruits, mostly in complete rings. I have several large plants, all very much alike, under different labels including *M. potosina, M. neopotosina, M. neopotosina* var. *longispina*, and *M. nealeana*. All are very attractive but in my opinion such differences as there are would be sufficient only to call them varieties of *M. celsiana*.

Flowering has been early this year, due perhaps to the bright weather of the late winter. Rebutias were particularly early, accompanying the usual early flowering mammillarias such as *M. longiflora* and *M. picta*. The amount of new growth on many plants indicates a good start for the season. As I have often repeated, one cannot expect many flowers on mammillarias or cacti in general unless there is fresh growth at the top of the plants. Once an axil has produced a flower no more will come from that particular spot and new growth is essential to further flowering.

During the coming months growers will be very busy seed sowing, and soon plants will be coming along to add to the collection. There is no need to be in too much hurry to prick out the seedlings as long as all is going well. The best time for most cacti seedlings to be moved is when the cotyledons, or seed-leaves, have been absorbed. It is only then that an adequate root system has been made. Should they appear overcrowded, however, they should be pricked out right away. Prick out into good soil, about one inch apart.

Seed pans must be watched carefully for signs of that scourge the sciara fly. This pest is becoming too plentiful for the peace of mind of many growers and it would be appreciated if anyone who has found a cure for sciara fly would let the rest of us know all about it. The trouble is that there are four forms to be dealt with—the egg, the larva, the pupa and the fly itself—though it is only the larva which causes injury to plants. The fly can be dealt with by an ordinary 'fly killer'. The best one I have found so far is a proprietary powder containing sulphur, zineb, derris and malathion, which comes in a 'puffer pack'. It has a nasty smell because of the malathion, and one should move away as soon as possible after dusting. Powder falling on the surface of the soil will keep away flies for some time and prevent them from laying their eggs. The eggs are laid in any damp material, but moist peat appears to be particularly favoured. Application of powder is not likely to affect larvae already active in the soil, and these have to be tackled with a liquid insecticide watered on. I have used 'Pestex' with advantage, and a friend reports that after watering a seed pan with 'Kill' many larvae came to the surface to die. It must be remembered that fresh flies may hatch out at any season of the year in a greenhouse, even in winter, and there is no 'close season' for the sciara fly.

The question is often asked if cacti need any form of manure or fertiliser. I consider that a lot depends on the type of plant and the frequency of repotting. If a plant is repotted not oftener than every two years and is put in good compost, I do not think that any extra fertiliser is needed for the majority of cacti. However, there are exceptions, such as the epiphytes. These can always do with a little extra fertiliser when their buds are forming. I know that they can be flowered without this extra being given but I think that the number of flowers can be increased by the addition of one of the popular liquid fertilisers.

It should be remembered that a good potting compost contains, lime, hoof and horn grist, superphosphate and sulphate of potash. If a good loam has been used in the bulk matter this mixture should be sufficient for most plants for two years. However, fast growing young plants may require repotting every year, and I have known some to need a move half way through the growing season. It may also be necessary to move any plant which has grown to the side of its pot. When this happens it is not easy to water such a plant.

A watering with a systemic insecticide may be given during the spring or early summer and this does not mean that one has to wait until pests are seen before action is taken; the liquid is taken in by the plant and is presumed to poison any sucking pest which attacks the plant. I have used Pestex and find that it has no apparent harmful effects on any of the plants, however young.

I have been reading a book by Del Weniger, entitled "Cacti of the South-West", (Texas, New Mexico, Oklahoma, Arkansas and Louisiana). Only a few mammillarias are discussed, but I found the style of writing most pleasing as it gave all descriptions of

plants in English, not Latin, and all measurements are in inches instead of centimetres. Being too old in the tooth to learn new tricks I found it made it far more easy for me to compare sizes when given in inches. The strange thing about the book to my mind is that the writer recommends bringing together again most of the genera which were taken from *Mammillaria* by Britton and Rose, and now puts such genera as *Coryphantha*, *Escobaria*, etc., back in with *Mammillaria*. This seems peculiar to me but I am not quarrelling with the suggestion as for many years I knew as mammillarias all the plants which were taken out by Britton and Rose. Whether this idea will catch on with other specialists I do not know but, in any case, it will at least give rise to much controversy and speculation. The book in question has some fine colour photos of the cacti discussed and takes in *Echinocereus*, *Mammillaria*, *Echinocactus*; *Cereus*, etc., found in the regions named on the cover.

Any member who uses a paraffin oil heater in the greenhouse should examine it during the summer months. The wick may need replacing and it is no use waiting until the lamp is needed before ordering one. A thorough cleaning of all parts and a discarding of the old oil will help to keep the lamp working well during the following winter.

No doubt many greenhouse keepers will be painting or oiling their houses this spring. This job seems to be necessary with some types every two years. I have not yet heard of one but I forecast that soon it will be possible to get an all-plastic-framed house which will never need painting, will never rot or deteriorate. I have formed this idea owing to the fact that I have a plastic-framed aquarium which is perfect in that it will not rust and so never requires any attention whatever. The frame is half an inch angle and very thin. If a glazing bar about two inches wide, with an upright projection of about three quarters of an inch high, could be made this could then be joined to angle forms for the cross sections. This material can be had in colours and can be drilled for erection. Small plastic nuts and bolts can be obtained for securing. Providing this material could be obtained it would be quite easy for anyone to make a greenhouse of any shape or size required. Once up it would be an easy task to glaze it as small clips could be used to hold the glass on the putty or holes drilled in the upright piece of the bar to take a fixing peg. A garden frame would be quite easy to construct with such material. When I made my frame sixteen years ago I made concrete bars for the framework which, although appearing to be almost everlasting, are quite heavy and so one made with plastic would be considerably lighter. If I were younger I would certainly get in touch with a plastics manufacturer to see if such material could be supplied. This, I am sure, would be the end of all timber and metal greenhouses in the future. It would also be the end of decaying timber and rusting metal.

The 40th Anniversary Shows

IT IS HOPED that this year everyone who can will make a special effort to enter the two shows at Westminster. The Show Committee knows that there are complaints about the venue and that they are two day shows, which make it difficult for those coming from a distance, but surely arrangements can be made for some members to get together and one car and driver be used for the transport to the Show and arrangement of exhibits, and another to pack them and collect after the Show. Please make this a particular challenge this year; the schedule has been carefully revised in the hope that it will suit the majority of members.

Most of the classes in the June Show are self-explanatory but a few of the changes should be noted. Weingartias have been added to the Gymnocalycium class and it is hoped that some of these attractive plants will be seen with their orange to yellow flowers. Class 10 asks for two Echinocereus instead of last year's three which should help many smaller growers to enter. A class for two epiphytic cacti does not require hybrid Epiphyllums but rather the fascinating forms of Rhipsalis, Lepismium and Pfeiffera. A new class for six cacti in pots not exceeding 6 inches in diameter should meet the requirements of those who have not been collecting for very long, and here, as in the similar class for six other succulents, variety counts, so a good selection of genera will help you on your way to a prize. The only other changes are a class for a specimen succulent (other than cactus) which gives a fine opportunity for some mature and well-grown plants, and the change in Class 23 to one Jatropha, Cissus or Kedrostris, giving a range of choice between some of the most popular of the stem succulents.

Finally, it is hoped that more Juniors and Novices will make a point of entering the appropriate classes. It is as important to see these classes well-supported as any of the others.

A few further notes on the Autumn Show will appear in the August Journal when those Schedules will be included. In the meantime, look around YOUR collection and fill in YOUR entry form and send it to the Show Secretary with your entry money as soon as you can.

Cultural notes on succulents other than Cacti

by Mrs. Muriel Stillwell

WITH THE ARRIVAL of Spring there is always a satisfaction and feeling of relief that most of the plants have weathered the Winter. There are usually a few losses, which is almost inevitable, and one should not get too downhearted when this happens. I have relied solely on oil heating this winter in the new greehouse, and while this kept up the temperature I feel that a lot of the succulents did not take too kindly to it, owing to lack of ventilation. It is always advisable to leave one light open on the first hole if the house is otherwise fairly airtight. With my old house I had no trouble with the problem as where the roof joined the eaves there was quite a gap, which I found did always give plenty of winter ventilation without opening a window. Plants, like us, must breathe and will not flourish if there is a lack of oxygen.

Contrary to my usual practice, I have given the Lithops one or two waterings on a sunny morning to encourage the new growth. The old bodies will eventually die away but may take a little longer, and it could be May before they really look their best. I find the single and double headed ones thrive better if planted in pans together, where they get more root room. I think this encourages them to increase quicker, although some species will remain as one or two heads for many years. Varieties of *Lithops pseudotruncatellus* soon make fine clumps, as also do *L. salicola*, *L. olivacea*, *L. helmutii*, etc. Give them a good gritty compost and as much light as possible, and do not force them with rich composts and fertilizers.

It is safe to water Conophytums a couple of times up to April if the weather is favourable, to prevent them shrinking too much. You will probably be able to feel the new, young bodies inside the outer skin which will shrivel and die away during April, May and June. Cuttings taken last season may need a little water if not too well rooted. These like plenty of strong light, but placed too near the glass they may get scorched. Again, single heads are best rooted together in a pan, and then planted out into individual pots when firmly established. They do very well in plastic pots. If you have the time and the patience remove all the dead outer skins carefully with a small pair of tweezers before entering plants in a show. It is very easy to detach a head and so spoil a clump, so try and place your fingers gently but firmly on the surrounding heads to prevent it happening.

The Gibbaeums have been blooming, and today I see *G. velutinum* pale pink variety is just opening. *Jacobsenia kolbei* is flowering for the first time for me. I have had this plant for a number of years and always regarded it as a shy bloomer. I was not so lucky this year with *Pleiospilos nelii* both plants of which showed buds very early but all of these aborted.

With the good seed-list published by the Society this year we shall look forward to seeing some good seedlings in future shows. For beginners I still recommend the plastic bag method, even for the more difficult kinds. Just use a good JI seed compost in small plastic pots, sow the seed on top of the soil, stand in warm water until really soaked, and then place in a plastic bag and secure the top with a rubber band. Place in a propagator, if you have one, or in a half-size biscuit tin with a sheet of glass over the top. Do not be tempted to open the bags until the little plants are ready to prick out. What could be simpler? Fast growing succulents such as Stapelias will have to be pricked out much sooner than Lithops, for example. There are no watering difficulties while you are on holiday. After pricking out, seedlings should be shaded for a few weeks until hardened off.

Summer is a good time for taking cuttings and giving some of the old plants a new lease of life. Split up old clumps of Stapelias and pot on the new growth; they will flower much better. Caudex succulents should be treated with care. Many have long resting periods and must only be watered when they show signs of growth. Most of these plants appreciate a little extra heat during the winter and are therefore not suitable for window sills and greenhouses kept at low temperatures. They also respond better if sprayed with a fine spray rather than if the soil is kept soaking wet. Let us hope for another good summer with plenty of sunshine to bring out the flowers.

The Study of Cactus Seed-coats

One of the expensive toys of modern science is the "scanning electron microscope" which provides fascinating photographs of minute objects in unusual depth of focus and is particularly valuable in the study of surfaces. Being still something of a novelty such photographs are frequently to be found in magazines, as well as in scientific journals, providing as they do an amount of detail not obtainable with the conventional microscope.

In the journal 'Kakteen' for January, 1971, there is a series of four scanning electron microscope photographs of seed coats of *Gymnocalycium* spp. by H. W. Franke. They complement a discussion on the classification of *Gymnocalycium* by Buxbaum and Frank currently appearing as a series in that journal, in which much emphasis is placed on seed-coat characters in working out a family tree. Buxbaum and Frank provide line drawings to illustrate their conclusions.

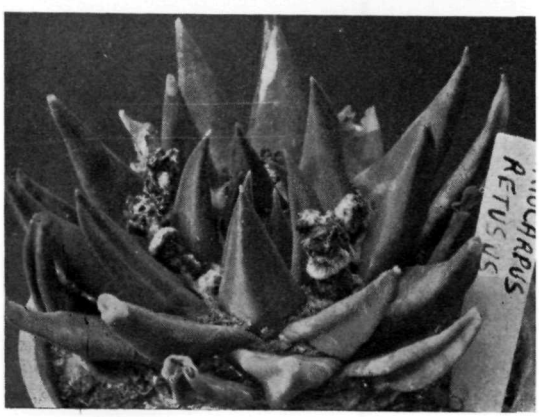
The Genus Ariocarpus

Report of a talk by Dr. C. J. Hardy in the R.H.S. Hall on 18th November, 1970.

THE speaker first dealt with the distribution of the various species in the genus *Ariocarpus*. They occur over an area which is approximately triangular in shape and covers much of north east Mexico. The apex is in the vicinity of Mexico City and two of the sides of the triangle are such as to embrace the eastern half of San Luis Potosi, the whole of Coahuila, much of Nuevo Leon and parts of Tamaulipas. The base of the triangle lies across the border into the U.S.A., in southern Texas, and runs approximately parallel to the border.

This region is called the Mesa Central and it is high plateau land with altitudes between about 4,000 and 6,000 feet. It is bounded on the west by the Sierra Madre Occidental, a rather formidable mountain range running north-south, and on the east by a lower range, the Sierra Madre Oriental. The climate is well defined and predictable. The winters are quite dry, and it is not until mid-summer, when the temperature has reached 90 to 100°F. that tropical storms, coming in from the east, bring from 10 to 25 inches of rain, mostly during the months of July and August. The rain often comes as torrential downpours and this causes marked erosion; this contributes to the rather barren appearance of much of the area.

The genus *Ariocarpus* was established in 1838, by Dr. M. J. Scheidweiler; the name means having fruit like that of Aria. The type species is the plant we now know as *Ariocarpus retusus*. However, for some time these plants were much better known under the name *Anhalonium*, which was introduced by C. Lemaire in 1839. The difficulty arose because it was not appreciated that *Ariocarpus* preceded *Anhalonium* and so is the correct name. During the period that the generic name *Anhalonium* was much used it was merged with *Mammillaria* until Coulter restored it. In 1925 Alwin Berger introduced the generic name *Roseocactus* to cover the species we now know as *Ariocarpus fissuratus, A. fissuratus v. lloydii* and *A. kotschoubeyanus*. Finally, in 1941, Castaneda described what is widely known as *Neogomesia agavoides*, a species which many botanists now regard as coming within the bounds of the genus *Ariocarpus*. The generic name honours Marte Gomez, one time governor of the Mexican state of Tamaulipas.

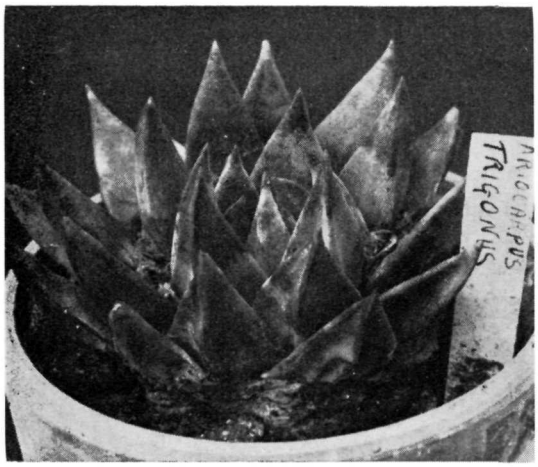


Ariocarpus retusus (photo: R. H. I. Read)

Ariocarpus agavoides (photo: B. Maddams)

Dr. Hardy then discussed the various *Ariocarpus* species in detail, using the classification put forward by Dr. Edward Anderson a few years ago. This well-known botanist and cactophile made extensive field studies prior to finalising his ideas. He does not accept the genus *Roseocactus* but adopts it as a sub-genus of *Ariocarpus*. Likewise, the genus *Neogomesia* is not recognised. *N. agavoides* and the remaining species are placed in *Ariocarpus sub-genus Ariocarpus*.

The two species in sub-genus *Roseocactus, fissuratus* and *kotschoubeyanus*, are distinctive because the tubercles are rather compressed and they have a well-defined



Ariocarpus trigonus (photo: R. H. I. Read)

woolly areolar groove. *A. fissuratus* was described by Dr. Engelmann in 1865; it is found in the Big Bend area of Texas and across the border in the Mexican states of Coahuila and Chihuahua. Particularly large specimens occur in the hills around Parras, in Coahuila. In this context an average plant is some four inches in diameter and large specimens reach six inches. The tap root is particularly pronounced and may reach a foot in length. The plants growing in Texas are rather flat whereas those from Coahuila have more globular bodies. There are sundry other differences; for example, the Texan plants have lateral gooves running perpendicular to the main groove. However, although Dr. Rose described the Coahuilan plant as *A. lloydii* in 1911, Dr. Anderson and various other writers believe that it only merits varietal status and therefore call it *A. fissuratus v. lloydii*. Both forms have magenta flowers which are about an inch and a half in diameter. There is also a rare spiral growing form of this species.

Ariocarpus kotschoubeyanus was described under the name *Anhalonium kotschoubeyanum* by Lemaire in 1842. Prince Salm Dyck subsequently referred to it as *Anhalonium sulcatum* and Monville as *Anhalonium fissipedum*. The currently accepted name was established by Dr. Karl Schumann in 1898. It is fairly widely distributed in the Mexican state of San Luis Potosi, Durango and Nuevo Leon and particular localities which have been mentioned in the literature include Cadereyta de Montes, El Huizache and Matehuala. Plants of about two inches in diameter are frequent in habitat but larger specimens are by no means uncommon in cultivation. The flowers, which appear rather earlier in autumn than the other *Ariocarpus* species, are about an inch and a half in diameter and have been described variously, as pale magenta and vivid heliotrope. There is also a rare variety of white flowers. In circulation also is the so-called *A. macdowellii* which, as Greenaway has pointed out, has only about half the number of tubercles of the more usual plants. Although Backeberg regards it as a good variety of *A. kotschoubeyanus* it is now fairly generally agreed that this so-called variety consists only of rather juvenile plants.

Dr. Hardy then considered the species of *Ariocarpus* sub-genus *Ariocarpus* in some detail. Although *A. retusus* has been known since 1838 there is no record of the type locality and Dr. Anderson has therefore named San Luis Potosi for the purpose. Apart from this area plants are also found near Paso de Cameros, in the state of Coahuila. It is easily recognisable on account of its rather long triangular tubercles, each bearing the areole near the tip. Five inches is about an average diameter for mature plants. The flowers, which usually appear in the second half of October, are cream tinged pink. There is a form of this species with much fatter tubercles which bear small points at their ends; this has often been called *A. furfuraceus* but, in the opinion of Anderson, it is not deserving of specific status. *A. trigonus* is similar to *A. retusus* in that no type locality had been recorded and Anderson again designated one, this time just north of Monterrey. It is found both in the states of Nuevo Leon and Tamaulipas. Particularly large plants are to be found near Juamave; there are occasional single-headed specimens 18 inches in diameter and plants with five to seven heads also occur. Elsewhere in Tamaulipas, near San Vicente, quite small plants are to be found. The flowers are about two inches in diameter and the petals are pale yellow; the many golden stamens add to the attraction of the blooms.

By contrast, *A. agavoides* is a diminutive species and many specimens in cultivation do not exceed two

Ariocarpus furfuraceus (photo: R. H. I. Read)

inches in diameter. As the name implies there is a resemblance, albeit rather superficial, to a small Agave. The long, thin tubercles, which are an unexciting grey-green colour, appear at the crown of a small bulbous stem, part of which is subterranean. The flowers are sited at the base of the areoles, which are set towards the tips of the tubercles. They often appear earlier in the autumn than those of the other Ariocarpus species and are a striking magenta colour. Although this species is found only in a very limited area, near to Tula in the state of Tamaulipas, there are numerous plants in European collections and cultivation does not seem to present particular difficulties.

Without doubt, *A. scaphorostrus* is the rarest of the *Ariocarpus* species and, according to one writer, the ugliest. The name alludes to the "boat-beaked" shaped tubercles and the areoles occur near to the bases of the tubercles. This species is comparatively recent, having been described by Boedeker in 1930. It is confined to a small area just south of Monterrey, in the state of Nuevo Leon. This is an area of barren stony ground and the plants are exposed to the fierce sun. It therefore tends to prove a little more exacting in its cultural requirements but it is worth growing, if it can be obtained, because the flowers are an attractive bright purple colour.

Notes from California

by Richard L. Russell, San Diego

(Written March 1, 1971)

All winter long I have been putting my attention on my mammillarias, which to me are the most interesting "winter cacti". I have about 400 different species and varieties, and there is not a day of the year when one or more of these "pincushions" is not in bloom. In fact, I would like to advance my "blooming-time theory" which may be an aid to classification for the harried amateur. Once you get a large collection of mammillarias, you are bound to start sinking in a confusion of names and synonymns. Different nurseries use different names for the same plants or varieties of the same plant. If you look up *M. elegans,* for instance, you will find countless varieties and sub-varieties, and it then becomes a question of how you want to label them. Personally, I just keep the original nursery name, unless it is flagrantly wrong. But if I note that the nursery name is simply a variety, I place the original and correct species name in parentheses on my label.

Now the time of blooming can be a very real help. If on January 5, for instance, I note three plants blooming in widely scattered parts of my collection, I compare the plants. Sometimes I will immediately note that they are the same species under different names and that even though the plants appear somewhat different, they are all forms of the same species. The flowering time of varieties and sub-varieties often coincides, and this comparison of various plants in bloom is a great help. Of course, in May or June this process is not too useful, since hundreds of plants are in bloom at the same time during those months.

Every February and March I stop, look and reverse myself. For that is the time when my epiphyllums starts stirring. Often, they will grow right through the winter, but by March buds are appearing everywhere and new shoots are starting to sprout in all directions. Then, knowing the amazing floral explosion which is in the making, I turn hypnotically to the epiphyllums. I have about 110 varieties of hybrids and about six true (always white) species. My hybrids are the real wonders, and for floral dramatics I don't believe there is anything in the plant world which compares to the hybrid epiphyllums. True, the plants themselves don't look like much. The branches are either flat or triangular, but when the buds appear, and grow larger and larger and larger, watch out. The wonders of the plant world are about to show their wares.

These range from the early blooming little Empress types (very prolific bloomers) to the later blooming medium sized and monster bloomers. When the giants such as Pegasus and Blazon send out their 10 and 12 inch shimmering flowers of irridescent colours, it's a sight to behold!

Now, if you like epiphyllums, there is a man in California worth seeing. He is the famed Dr. J. W. Troxell of San Diego. I had read about the Doc. but never met him, so last week I called him, and he said that although it was too early for blooming time, "Come on out". Dr. Troxell lives only ten miles from my house, so in half an hour on our California freeways I was there. It was a pretty little yellow stucco house, with not a sign of an epiphyllum outside. I was ushered around to the back-garden by Dr. Troxell's charming wife, and as I walked into the back I was truly staggered. My only comment was "Good Lord!" The back extends to a half acre, and it starts with a large

screened section. There, thousands of epiphyllums, arranged tier on tier, greet the eye. I had never seen anything like it, and I am not sure that there is anything like it. Most of the plants are in half-gallon tin cans, which are stacked neatly in ascending rows. The cacti are staked against very high trellises. It would take days to examine them all! Some were a few feet high, many were six to eight feet high, and some were 25 to 40 feet high, actually growing to the top of the patio and across the screening. The Doc., a retired navy physician, is a very friendly man, and he greeted me warmly. I was still reeling from the sight as he took me on a tour of his gardens, picking seven rooted cuttings out for me as we walked through his "nursery".

I asked him which of his plants provided the biggest blooms (I love truly giant flowers), and he said probably *Phyllanthoides grandiflora*. This surprised me, since I had not heard that this was the biggest hybrid flower, but perhaps the Doc's variety is special. At any rate, he said the flowers run over 10 and sometimes 12 inches across, and he gave me a cutting of this (which I will plant with great excitement).

I have a hybrid named "Tele" which the Cox Nursery of Encinitas, California, says is their biggest flower-variety, and my plant (which I purchased last year as a cutting) is now three-foot tall, consisting of five branches. It has produced around 25 buds, and I will know in about two months what "Tele" can do. (It is supposed to have 14 inch flowers). The branches of "Tele" are so stout and robust that I recently replanted it in a five-gallon plastic container, and those branches give promise of sending out something rather "wild". I will report on the flowers in the next journal.

To those readers who have an aversion or prejudice against hybrids, let me suggest two "parents" of the epiphyllum hybrids. These are *Heliocereus speciosus* and *H. elegantissimus*. The first, *speciosus,* was sent to me recently by a British reader, and it has not yet bloomed. However, I have seen this species bloom, and its gorgeous, red flowers with bluish highlights are a sight to behold. My *H. elegantissimus* bears magnificent orange-red flowers of large size, shimmering irridescent blooms the equal of anything in the plant world. Both species are easy to grow, like plenty of sun and a gritty soil, and are attractive, long-stemmed beauties even when not in bloom (they can be treated as "crawlers", they can be planted in hanging pots, or they can be staked up). For the sake of the flowers, I prefer the last.

By the way, I want to add one word about culture which I have learned the hard way. I have been using plastic pots, because all my plants are outside and during the hot summer our California sun bakes out clay pots in a day or so. But then there is the problem of the winter rains, which will leave a plastic pot wet for weeks on end. Finally, I have discovered that I must use a mixture of about half sponge rock and half leaf mould. This will dry out quickly during the winter and is very, very porous. Gravel seems to pack too tight, and simply does not work as well as sponge rock. In the summer I can water frequently if I wish, but the main thing is that the soil be open, very porous! I cannot stress enough that all cacti need air around the roots. Cut off the porousity of the soil, and the roots will rot in no time flat. I would rather grow plants in pure sand with nutrient solution than in too-heavy soil. Cacti will not survive unless that soil is OPEN, and this is the most valuable lesson I can provide the neophyte in my thirty years experience growing cacti. Also, I find that any cactus will grow in the same open-type soil. I don't care what mixture you use in the soil, if it is porous your plant will probably do well. It it is heavy, if it cuts off the air, no mixture is worth fooling with. That's what I have learned, and I want to pass it on.

I will close this article with an oddity. *Mammillaria elongata* is one of my favorite plants (I must have a dozen varieties of it, many with the lovely orange or reddish spines and others being miniatures). *Chamaecereus silvestrii* is another favourite. Imagine my surprise when I noted that Modlin's Nursery in California offered a *Chamaecereus-Mammillaria elongata* hybrid. I purchased it, and it is a very attractive rooted cutting, looking like a straw-colored *M. elongata,* but with a few very long central spines! I am waiting anxiously to see what kind of flowers this oddity puts out. Anybody got any ideas?

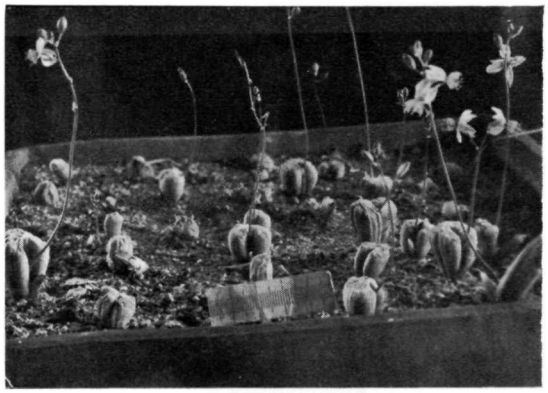
The Mushroom Fly or Sciara

The Mushroom Fly, *Sciara* spp., is one of a group of small, dark, delicate flies known collectively as Fungus Gnats. They are commonly found in dark, damp places among decaying vegetation, especially where there is fungoid growth. The name Fungus Gnat arises from the fact that the larvae or maggots of many species live in fungi, and *Sciara* spp., have become a serious pest of cultivated mushrooms, in fact one of the major troubles of the mushroom grower. Mushroom flies lay their eggs in damp compost and the small, transparent-skinned maggots are active in their movements through this, and in the absence of mushrooms will attack rootlets of any seedlings they may encounter. Hence the damage to cactus seedlings in pans of peaty compost.

Mushroom growers control maggot damage by killing the adult flies with residual sprays containing DDT applied to the internal framework of their growing sheds, and by the use of dilute insecticide solutions containing nicotine or one of the numerous organochlorines such as dimethoate on the beds of compost to kill the grubs. An ordinary household fly-spray of the aerosol type would be effective in a greenhouse against the flies, while the seed trays are watered with insecticide as suggested for root mealybug control.

Four South African Succulents

by H. Herre. (I.O.S.)



Bulbine mesembrianthemoides (photo H. Herre)

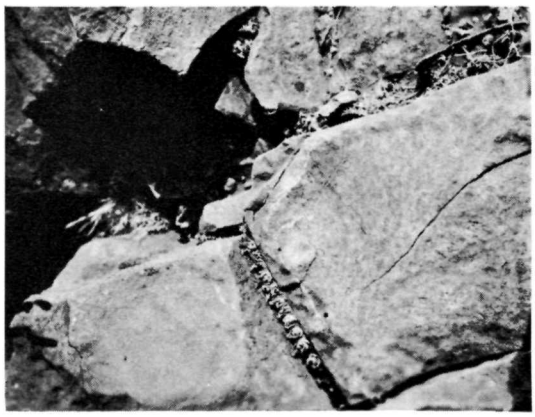
Bulbine mesembrianthemoides Haw.
Among the succulents growing among stones as also white quartz pebbles *Bulbine mesembrianthemoides* grows too. It belongs to the Liliaceae. During its resting time in summer it disappears into the soil, where the small tuberous rootstock is protected against heat and sun. Its leaves are full of water and therefore the plant is called "waterblasie" (=water-bubble) quite a suitable name. Its yellow flowers on fairly long stalks easily form seeds from which new plants may be grown again. Our photo of the single plant, taken out of the soil, shows the small rootstock and the centimetre scale along it, showing clearly how tiny the little plant really is.

Crassula suzannae (photo: H. Herre)

Crassula suzannae Rauh & Friedr
This most interesting little Crassula is named in honour of Mrs. Suzanne Lavranos who found it first after excellent rains, when taking out the sticks of the tent at "Great Karroo Heights" near Riethuis, about 60 miles west of the Missionary Station of Kommaggas. Only after very good rains it is to be found there. We collected several times there, but never found it before, except once. Our photo shows its dark green leaves with its cartilaginous margins, its peculiar manner of growth, as also its tiny white flowers with their flower-stalks. In cultivation it easily grows, when given a good resting time and afterwards enough water to start growth. Of course it wants a good amount of sunshine and warmth too.

Dolichos seineri (photo: H. Herre)

Dolichos seineri Dinter
This member of the Papilionaceae, one of the under-groups of the Leguminosae, grows in Hereroland, South West Africa and is famous for its large and heavy tuber which it develops with age. During its vegetation time in summer it develops long stalks, as other beans too, with lots of blueish flowers which readily form seeds. Our photo shows the plant in rest during winter (July). Near the tuber the soil was taken away to show the tuber. In cultivation it is easily grown, if kept dry in winter and wet during summer. The growing tendrils will show when watering will be necessary.



Haworthia tesselata (photo: H. Herre)

Haworthia tesselata (Salm.) Haw.
This photograph taken on one of the mountains of the Richtersveld shows the manner of growth there among the clefts. As these absorb the rainwater the tiny plants are able to stand also severe droughts and one wonders sometimes how this is possible. In good rain years flowers are formed and seeds produced, so that new colonies are possible.

Connoisseur's Corner

Cissus hypoleuca

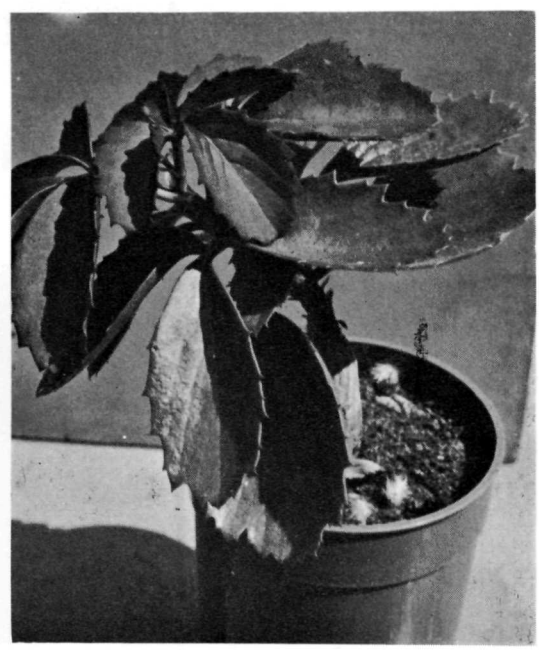
WHEN Professor Jacobsen wrote his well known three volume "Handbook of Succulent Plants" he remarked that the caudex-forming Cissus are extremely rare, valuable, treasures of our collections. Although the comment about rarity is now less apposite, the remainder of the statement is still valid and no collection should be without at least one member of the genus, which belongs to the Vitaceae, the vine family. They show a considerable range of stem forms and are less difficult in cultivation than might be supposed.

The two species most commonly encountered are *C. bainesii* and *C. juttae* which are amongst those transferred to *Cyphostemma* by Gordon Rowley (see this Journal 32, no. 2, May 1970, 30) but among the remainder (and one not actually mentioned by G. Rowley, however) *Cissus hypoleuca* must come high in the merit rating.

Like the others mentioned, it can be grown easily from seed but the plant growth becomes very different and in mature specimens gives for more recognition of being a member of the vine family than the others. It makes long, fleshy stems each year with leaves arranged alternately at joints and long tendrils arise from the axil of each leaf. The leaves themselves are thick, shiny and serrated and generally three-lobed; at first they are pale green and only about 1–2 inches in length but with age they darken and grow to 3–4 inches in length and 2–3 inches across each lobe.

The stem develops from the swollen base which tapers upwards for six inches or more. This caudex is very thick and woody and continues even more solidly to a type of thickened tap root underground, often wider and longer than the part above the surface.

In the author's experience this species does not go entirely dormant for three or more months during the winter as do the Cyphostemmas. Some leaves go yellow and drop in late autumn but generally new ones are appearing at the same time and fresh growth is really started in early spring. Watering should be eased when the leaves begin to drop but during summer a thorough soaking is required as soon as the soil dries out, and in hot weather this may happen several times a week. As this species comes from Natal a winter temperature around 50°F. should be sufficient. As has already been mentioned there is probably a thicker and longer swollen stem below soil level than above, therefore a long-tom pot is vital for good growth. Any good porous compost is suitable.



Cissus hypoleuca (photo: B. Maddams)

Aeoniums

by Margaret J. Martin

Aeonium simsii (photo: M. J. Martin)

AEONIUMS are members of the Crassulaceae found in the Canary Islands, Cape Verde Islands, Madeira and North Africa. Many are succulent shrubs or sub-shrubs, with rosettes of leaves carried on the ends of woody, branched stems. Some species are almost stemless, and rather reminiscent of the echeverias of the New World. However, aeoniums differ from echeverias in one important respect in that many species of aeonium are monocarpic, with the flower spike coming from the growing point and the rosette dying after flowering. Echeverias send their flower stems out from the sides of the main stem and the rosette continues to grow after flowering.

The flowers of aeoniums are carried in pyramidal racemes and are gaily-coloured—yellow, pink, white and red. These plants are fairly tough and can be planted out in rockeries during the summer. In favoured parts of the country such as Cornwall large specimens of aeoniums are to be found as permanent features in many gardens. Grown as pot plants they need a rich soil and plenty of water in the summer.

The genus *Aeonium* can be roughly divided into three classes—stemless species, small multi-headed shrubs about a foot high, and large shrubby species.

The best known of the stemless species is *A. tabulaeforme* from Teneriffe. This plant forms a rosette about a foot in diameter, made up of hundreds of leaves. The flowers are yellow. Another almost stemless species from Teneriffe is *A. cuneatum,* with large rosettes of long blue-green leaves and yellow flowers. *A. simsii* (=*caespitosum*) from Grand Canary forms cushions of bright green leaves. The leaves have many white hairs along the edges. This species also has yellow flowers.

Among the small shrubby aeoniums are *A. haworthii, A. lindleyi, A. sedifolium* and *A. smithii. A. haworthii* is a freely branching shrub with numerous rosettes about three inches across of blue-green leaves with red edges. The flowers are white. *A. lindleyi* forms small bushes about eight inches high, with numerous branches carrying small rosettes. The leaves are succulent and covered with hair; they are also sticky. The flowers are yellow. Also with yellow flowers is *A. sedifolium,* which forms cushions about six inches high. The succulent leaves are sticky.

The fourth member of this series is *A. smithii,* a high altitude plant which has been found up to 6,000 feet above sea level. It occurs in crevasses in the rocks where

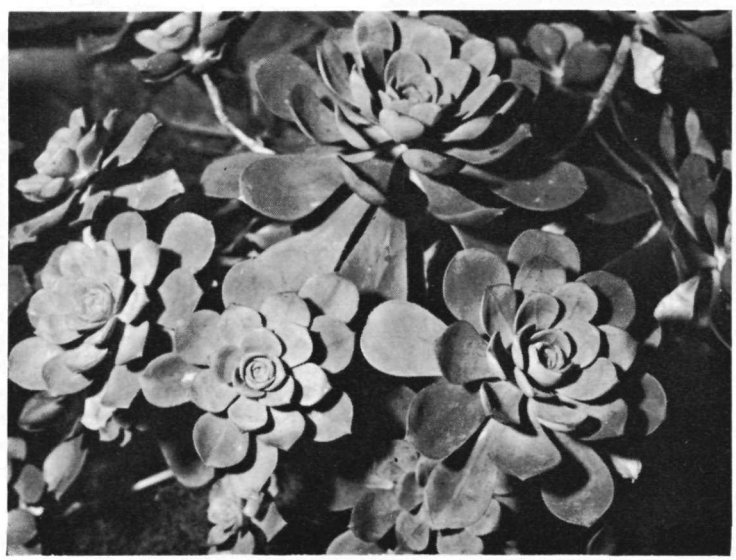
it may be covered in snow in winter. Like many succulent plants it can only survive the cold when it is completely dry. The stems of this plant are covered in white hairs, the pale green rosettes are about four inches across, the flowers are yellow.

The group of large-growing aeoniums includes *A. arboreum, A. ciliatum, A. hierrense* and *A. undulatum. A. arboreum* makes a shrub about three feet high and the rosettes are about eight inches across. The typical species has pale green leaves with white hairs along the edges, but there are also varieties with very dark leaves. The flowers are yellow. *A. ciliatum* has white flowers and large rosettes of bluish-green leaves. *A. hierrense* may reach a height of three or four feet. The stems are grey and the leaves blue-green with hairs along the edges. The pink flowers are produced on old plants.

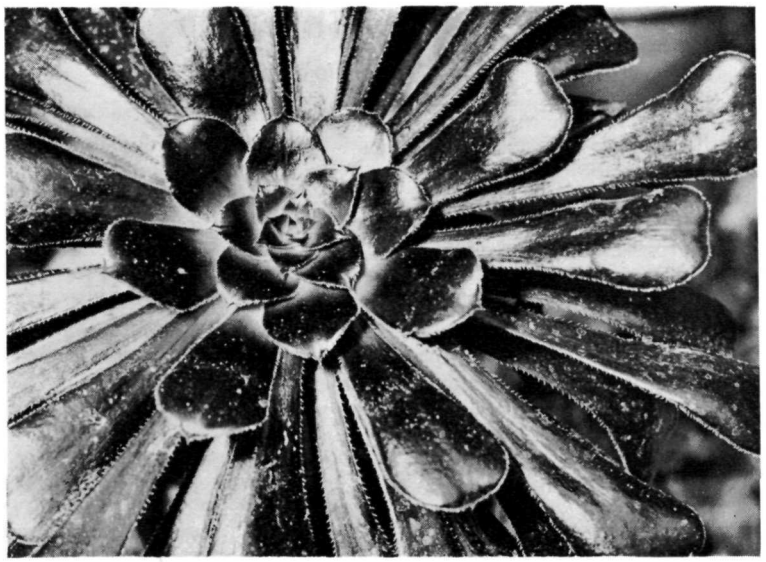
A. undulatum is found at an altitude of 4,000 feet. It makes a shrub about three feet high, with silvery stems and rosettes up to 18 inches across. The dark green leaves have wavy edges. The flowers are yellow.

Other large species which one may come across are *A. gomerense, A. urbicum, A. percarneum* and *A. valverdense.*

Aeonium cuneatum (photo: M. J. Martin)



Aeonium gomerense (photo: M. J. Martin)



Aeonium arboreum cv. *nigrum* (photo: M. J. Martin)

40th Anniversary Arrangements

MEMBERS are reminded of the Cactus Weekend, to be held at Knuston Hall, Irchester, Northamptonshire from 22nd–24th October next. As announced in the February Journal there will be a first rate team of speakers headed by Gordon Rowley and as the accommodation is limited booking should be made at an early date. Please contact Mr. W. F. Maddams, at 26, Glenfield Road, Banstead, Surrey.

In planning the thematic display covering various aspects of our hobby in the period 1931-71 in the R.H.S. Hall on 13th/14th July, the sub-committee has been very conscious of the necessity to avoid delegating the work to one or two people only. In particular, it is desirable that the plants on display should come from various sources, and once the details have been finalised a number of members will be approached. Apart from assistance in the form of plants, stewards will be required and the old adage, that one volunteer is worth two conscripts, is very apposite.

Ball point pens engraved "Cactus and Succulent Society of Great Britain 1931–1971" are now available at 5 new pence each. Branch Secretaries should apply for stocks for Branches (please add postage and packing 3p up to 5, 4p 5-25, over 25 post free) and individual members order from Mrs. B. Maddams, the Publicity Officer.

Meeting Places of the Branches

Northern Counties:	Social Service Centre, Park Road, Whitley Bay, Third Monday in month at 7.30 p.m.
Berks & Bucks:	Windsor Public Library, one Tuesday in each month at 7.45 p.m.
West Kent:	Beckenham Old Town Hall, second Friday in month from October to May, 8 p.m.
Essex:	Cranbrook Methodist Church Hall, The Drive, Ilford, first Saturday in month, 7.30 p.m.
North London:	Capel Manor, Waltham Cross, third Friday in month, 7.30 p.m.
Herts:	Friends Meeting House, Upper Latimore Road, St. Albans, second Monday in month, 7.30 p.m.
North Surrey:	Adult School, Benhill Avenue, Sutton, first Tuesday in month, 7.45 p.m.
Hatfield & District:	Hatfield Congregational Church Hall, St. Albans Road, East, Hatfield. Fourth Monday in Month, 7.30 p.m.

Succulent Snippets

by Sally Cornioides

BY THE TIME you read this the winter should be well and truly over and although it has not been a severe one in most parts of Britain it has been one of alarms and excursions as far as keeping our greenhouses warm is concerned. The electricity cuts in December did not inconvenience me unduly because I am well provided with paraffin heaters and the weather was obligingly mild at the time. However, on two subsequent occasions there was trouble with delivery of fuel supplies in the south east which almost led to a local dearth of paraffin. I was resigning myself to an increased electricity bill when fortunately supplies began again. I was doubly glad because just at this time one of my thermostats was having an extended fit of tantrums; it switches on and then becomes non co-operative. The temperature has gone up to 90°F on more than one occasion and although this has caused some of the "T.C.P."s to make an early start, and other plants obviously enjoy it my bank manager may not be quite so enthusiastic! I am afraid I do not find the maintenance on thermostats the easy job that some would have us believe and were it not for the fact that I am coy, and wish to remain incognito, I would invite these handymen to come and do battle with my recalcitrant box of tricks.

Mention on the radio a few weeks ago of a "mass of Croci in bloom" reminded me of another comment I was going to make as a result of my browsing in the bookshops again.

Actually, this was rather a rare occasion because I not only picked up the book and wallowed in it for some time but then purchased it for myself straight away—and if that is not a good enough reference for a book what is? The strange thing is that I cannot recall having seen it before, or a review of it anywhere, for I feel sure I would not have missed such a valuable addition to any gardener's reference library. The book in question is "A Manual of Plant Names" by C. Chicheley Plowden and the author explains he compiled it to satisfy his long felt needs of having a good deal of information easily available in one volume and he has certainly satisfied my needs as well, and I should imagine plenty of other people's too. Not only are the meanings of the generic and specific names and also the common or trivial names of many plants explained but the classification of the plant world right down into families is clearly set out and there are diagrams of leaf shapes and flower forms as well.

However, I must not digress too far from my original point, that of the 'Croci' because it was on a comment connected with this that I had the only occasion to disagree with the author. He states "Pluralising of generic names is not only quite wrong but an ignorant attempt to display non-knowledge of the classics" but he slightly redeems himself later on by saying "Fungi and Cacti are presumably acceptable through constant usage. . . . Nevertheless I feel that Funguses and Cactuses are to be preferred." Well, I do not know which you prefer, but I know which appeals to me more; the only advantage in Cactuses that I can see is that there is no doubt in the pronunciation, some people still insist it is 'Cactee' and technically speaking I suppose they are right.

I am filled with curiosity about what the 40th Anniversary sub-Committee have in store for us this year. Marches are becoming increasingly popular these days, so how about a planned walk from St. Bride's Institute, where the Society came into being, to the R.H.S. Hall, Westminster? We could arm ourselves with suitably spiny plants, because this is what the public expect to see, but *Lophophora williamsii* should be kept hidden away. I assume that the sub-committee are well advanced with their plans for the weekend meeting and as I have not received an invitation to entertain or amuse the participants I assume that the event is to be of a serious nature. Perhaps we should say mostly so; have just heard Gordon Rowley is to be there and he is always good for a laugh! At any rate I hear that the ones run by the N.C.S.S., although intended for the enthusiastic cactophile, have been much enjoyed and I am sure our event will also combine the best of both worlds—have you booked your place yet? If not you had better get on with it as accommodation is limited unless you fancy camping out at the end of October? A good venue has been chosen, I think, giving folks in all parts of the country a chance to get along.

Mention of *Lophophora williamsii* brings to mind the amusing comments of Charles Glass and Robert Foster in part 4 of their Mexico Logbook, appearing in the September/October issue of the American Cactus Journal. It seems that when they went on a trip to north east Mexico in October 1969 they had considerable difficulties in getting across the border. To quote their words "The Mexicans were sure we were hippies unless we would get haircuts and the American officials were equally sure we had marijuana stashed away somewhere." I hear tell that Bob Foster has now had his hair cut so they should make it when they face the immigration officials here in May.

Well, I must be off to my repotting and seed sowing and, as the mealy bug said to the red spider, "I hope to see you around in the summer"!

Book Reviews

CACTUS GROWING FOR BEGINNERS. By Vera Higgins. London: Blandford Press, new and revised edition, 1971. Pp. 68, 4 plates in colour, 10 figures. n.p.

This is the fourth edition of the late Mrs. Higgins' introduction to cactus growing, which first appeared in 1935. In addition it has been reprinted eight times, so comment on its popularity is superfluous. In a foreword by R. Ginns it is made clear that few changes in the text have been necessary to bring her instructions into line with current ideas, but plant names throughout have been brought up-to-date. This is altogether an attractive little book.

DAS SUKKULENTENLEXICON By Hermann Jacobsen. Jena: VEB Gustav Fischer Verlag, 1970. Pp. 589, 200 plates in black and white. DM 48.

Dr. Hermann Jacobsen of the Kiel University Botanic Garden is well known for his "Succulent Plants" (Benn, 1935) and the monumental three-volume treatise "A Handbook of Succulent Plants" (Blandford Press, 1959) Now he has produced a work complementary to the late Curt Backeberg's "Kakteenlexicon", and covering in a similar fashion the wide field of succulent plants other than the Cactaceae.

A dictionary of succulents is essentially for reference and not for reading. Remember the man of non-literary interests who received "The Concise Oxford Dictionary" as a present and later remarked that it was full of interesting detail but lacked a plot. Briefly there are details in Jacobsen's work of some 6,500 species belonging to 355 genera, supported by illustrations of 1,200 of the "generally less frequently encountered plants". By the systematic use of easily recognisable abbreviations all this is encompassed within 589 pages of text and 200 plates. Some five thousand synonyms are listed separately in an appendix.

The Mesembryanthemaceae are dealt with separately from the remainder of the fifty-one families which are included in this work. Since they occupy almost one half of the available space there is undoubted convenience in so dividing the whole heterogeneous group into two distinct parts, but may this not encourage the mesembryanthemum specialists to a kind of U.D.I. and lead to a restricted meaning for "other succulents" and more divisions within the craft.

Show committees and judges may have to revise their ideas if all the families listed (and some with only a single succulent genus) are accepted. At any rate Dr. Jacobsen cannot be accused of arbitrarily excluding from his dictionary any plants with claims to succulence, and his industry and scholarship are saluted.

Each genus is provided with a concise diagnosis. Where keys to the sections of a genus or to the individual species are already available they are repeated here. For example we find Schwantes' key to the sections of *Ruschia,* Bolus' key to the species of *Schwantesia,* Boer and Brown on the species of *Lithops,* and so on. Finally each species, sub-species and cultivar is dealt with individually, including synonomy, Here is an example taken from the genus *Crassula:*

> C. CV. 'MORGAN'S BEAUTY'.—Hybride (Dr. MEREDITH MORGAN, Richmond, Kalifornien): C. falcata x C.mesembryanthemopsis.—Kompakte, hugel-formige, vielverastelte Pfl., bis 20cm und mehr (durchmesser), 10cm hoch; A. mit B. 3.6cm breit, der Spitze zu verschmalert; B. in 4 leicht spiraligen Reihen in fast gegenstandigen Paaren, angedruckt, schief eiformiglanzettlich, ca. 3 (1-4)cm lang, 2 (1-3)cm breit, selten etwas spitz, obers. nahe der Spitze mit gestutzter Flache, ganzrandig, grun, mit weissen Papillen vollig bedeckt; B-. dunkel-karmin, duftend.

There are approximately 250 entries under *Crassula,* 45 of which are illustrated.

The illustrations are well reproduced and in most cases succeed in demonstrating satisfactorily the essential characters of a particular plant. Although they have been gathered from so many sources they go together surprisingly well.

DISEASES OF THE CULTIVATED PLANTS OF THE SOUTHWEST. By Rupert Burley Streets, Sr. Tucson: University of Arizona Press, 1969. Pp. 390, 177 figures. $9.50.

This account of the diseases of plants in the Southwestern U.S.A. includes a four-page section devoted to diseases affecting cacti, agaves and succulents. The Giant Sahuaro Cactus (*Carnegia gigantea*) is a highly prized and unique feature of the desert landscape frequently translated into gardens. Mature specimens are considered to be from 100 to 259 years old. The most important disease affecting this and similar columnar cacti, as well as opuntias, is a bacterial rot which gains entrance to the stem through mechanical injuries or the burrows of caterpillars of a tiny moth called Cactoblastus. Incidentally, it was the introduction of this Cactoblastus moth from America which saved much of Australia from being turned into a gigantic thicket of opuntia cactus some years ago.

Crown galls disfigure the older cacti, but rarely leading to death. *Lophocereus* and *Opuntia* spp. suffer from various root rots, and root-knot nematodes, though not so far recorded from plants in nature, are not uncommon on both cacti and succulents. Yuccas are afflicted with leaf spots which require the application of fungicides.

Perhaps the most interesting fact emerging from this very detailed and well illustrated account of plant diseases is the relative freedom of the native succulent plants from the afflictions which limit the cultivation of so many introduced trees and shrubs.

Succulent Plants

by W. Victor Harris

SUCCULENT, AS A botanical adjective, is defined in Chamber's Dictionary as meaning 'juicy and fleshy, or (loosely) merely fleshy', derived from the Latin *sucus*—juice or sap. Succulent plants are characterised by a high ratio of cell sap to surface area, usually expressed as the number of grams of contained water per square centimetre of surface. A large amount of stored water associated with a reduced area of surface through which water is lost by transpiration enables a succulent plant to withstand drought longer than ordinary, unspecialised plants. For example an *Echinocactus* sp. weighing 3kg was found to have only 1/300th of the surface area of a plant of Dutchman's pipe, *Aristolochia sipho* from the tropical rain forest, of equal weight.

Succulent plants commonly found in cultivation belong to two main types—leaf succulents and stem succulents—though there are indications of increased interest in root succulents. The main difference lies in the particular part of the plant that has become adapted for water storage. Such divisions are of necessity somewhat arbitrary since clear-out boundaries are rare in the plant world. The ultimate in leaf succulents is found in the Mesembryanthemaceae with such genera as Lithops and Conophytum, where the spheroidal bodies consist of two closely pressed leaves and little else. In Conophytum one finds species with the leaves fused completely together except for a small pore on top where the flower makes its way into the open air. Stem succulents are characteristically without leaves, or at most with them greatly reduced, and many develop thorns or hairy coats which also serve to reduce water loss. It would be an error to think of all stem succulents as being fleshy in the usual sense of the word, as for example Stapelia and related genera, forgetting the hard woody trunks of the larger American cacti and the African Euphorbias.

The possession of a high cell sap to surface area ratio enables a plant to survive in an area of uncertain water supply. This does not necessarily mean in a desert or where the annual rainfall is particularly small, but rather where the pattern of precipitation is erratic and unpredictable. In true deserts where vegetation is at a minimum survival depends to a large extent on the possession of seeds that remain viable in the soil for long periods awaiting a shower of rain, followed by a rapid growth to maturity rather than on succulence. Succulent plants are met with in all latitudes from Cape Horn to the northern temperate zone. Opuntias are to be found as weeds in the North American prairies, Sempervivums colonise rocky outcrops in the Pyrenees and the Caucasus, while epiphytic cacti live high up on trees in the rain forests of South America. The surface roots of desert cacti enable them to take advantage of light rains that do not penetrate the soil to any extent. The efficiency of their water storage mechanisms allows some mesembryanthemums to survive in the deserts of south-west Africa where rain may fall once only in three years.

Professor W. O. James described in Endeavour for April 1958 some of the results of investigations into the mechanisms of succulence. "No method is yet known by which any marked degree of succulence can be induced in a normally non-succulent species; but the degree of succulence in a susceptible species can be varied experimentally over quite a wide range. The most effective method is by the control of day-length. The crassulacean *Kalanchoe blossfeldiana* grown with days of about 12-hour illumination produces a lax habit with spoon-shaped, only slightly succulent leaves, with a succulence ratio of 0.81. On reduction of the day length to 9 hours the leaves become smaller and much thicker, with a succulence ratio of 1.80. Internally, the change consists of an enlargement, particularly in a transverse direction, of the leaf cells, without any considerable increase of cell number. It has been shown that if a single leaf of a young Kalanchoe plant is subjected to short-day treatment, the leaves that develop vertically above it become succulent: the leaves on the opposite side of the stem retain the normal long-day characters". Further experiments indicated that succulence, like the initiation of flowering, is determined by a hormone produced in young leaves and conducted upwards to the growing point.

The most obvious feature of a succulent habit of growth in a plant is the effect on water retention, but this is highly variable among the different families involved, and is bound up with the degree of surface protection—thickness of cuticle and the development of waxy layers—in a particular plant. Generally speaking however the individual cells of succulent tissues are able to lose much more of their water without damage to themselves than is usual in other plant cells. This appears to be due to an unusual degree of elasticity in the cell walls, especially in crassulas. In the mesembryanthemums the cell walls are less elastic but collapse into folds. Surface protection is well developed among the Cactaceae, associated with a reduction in the number of stomata, or breathing pores. This gives a very slow rate of water loss and it has been calculated that *Opuntia camanchia* loses water about 1,000 times more slowly than 'busy Lizzie', weight for weight. Experimentally, cactus stems and aloe leaves can lose 90 per cent of their moisture content and survive. It takes months of drought to produce this state of

(continued on page 19)

Annual General Meeting

The Annual General Meeting of the Society for 1971 was held at the Royal Agricultural Society's New Hall, Westminster on March 24th. In the unavoidable absence of the President, Mrs. D. Shurly, the chair was taken by Mr. Arthur Boarder, Chairman of Council.

Report of Council
The Honorary Secretary, Mr. R. H. I. Read, presented the report of Council for 1970, as circulated with the February Journal, and this was duly adopted.

Treasurer's Report and Accounts
The Honorary Treasurer, Mr. D. T. Best, expressed confidence in the general financial position of the Society when presenting the Accounts for 1970, details of which were also included with the February Journal. The Report and Accounts were adopted and a vote of thanks passed to the Honorary Auditors, Mrs. B. A. Baldry and Mr. P. J. Renshaw.

Election of Officers
All officers and the three retiring members of Council were re-elected, with the exception of the Honorary Editor—Miss Drage having resigned her post Dr. W. V. Harris was elected in her place. An additional Membership Secretary post has been created and Mr. N. Knight was elected.

40th Anniversary Year
Mr. W. B. Maddams reported on the activities of the committee appointed to organise special events commemorating the 40th anniversary of the Society in 1971. Details will be found elsewhere in this Journal.

Presentation of Cups and Awards
The meeting concluded with the presentation by Mrs. M. Stillwell, a Vice-President, of the cups and awards won at the Summer and Autumn Shows. Details of these have already been given in previous issues of this Journal. The impressive array of well polished silver trophies is a matter of no little pride for the Society, and not less for the fortunate and skillful recipients.

A NOTE FROM THE PUBLICITY OFFICER

JUST A REMINDER that my challenge still holds—have you brought a new member into the Society this year? Have you sold at least one booklet? If not, get moving now—some members have made wonderful efforts; if everyone did the same the Society really would have a fortieth anniversary flourish!

If you require further membership forms please apply to your Branch Secretary or to me direct (enclosing a stamp for return postage, please).

Secretary's Notes

Attention Existing Members
As a result of a resolution which was carried at the Annual General Meeting in order to assist the Journal Distributor and reduce the number of times that it is necessary for her to visit the Post Office it was agreed that in future the Journals will be desptached strictly quarterly which, in effect, means that anyone who has not renewed his/her subscription by the time the February Journal is despatched will receive the February issue with that of May. Similarly Members renewing after May will receive the February, May and August issues in one package.

Chelsea
Members are reminded that the Chelsea Flower Show will be held this year on Tuesday, 25th May, (admission restricted ot holders of R.H.S. Private View Tickets) and Wednesday, Thursday and Friday, 26th May to 28th. The Show is open from 8.30 a.m. to 8 p.m. on the first three days and from 8.30 a.m. to 5 p.m. on the final day.

The Society will again be staging an exhibit at Chelsea and any members who can possibly devote two or three hours of their time to stewarding are asked to contact Mr. A. F. Clare at 26, Albert Street, St. Albans, Herts., as soon as possible.

Free Subscription Competition
The Editor is always anxious to receive more copy and articles submitted need not always be of a serious nature. I will personally offer a FREE SUBSCRIPTION FOR ONE YEAR to any Member of the Society (but not an Officer) who will write an article of up to 500 words relating their most amusing experience associated with Cactus culture such as the day the lawn mower was left supposedly ticking over but vibrated into gear and ploughed through one side of the greenhouse and out of the other leaving a row of scalped plants in its path and of course finishing up by plunging into the deep end of the inevitable fish pond before grinding to a halt in the blanket weed.

Entries should be sent to the Secretary to reach him not later than Saturday 10th July. No correspondence can be entered into and the verdict of the Secretary will be final. The right is reserved to publish other entries besides the winning one without payment.

Forthcoming Meetings
Royal Horticultural Society, Greycoat Street, Westminster at 6 p.m. for 6.30 p.m.

June 22	Mr. S. W. I. Young "Euphorbias"
July 14	Bring and Buy Plant Auction
August 10	Mrs. S. G. Sharman "Focus on Succulents"

R.H.I.R.

Beginner's Dozen

IN EARLIER NUMBERS of the Journal we have offered suggestions to the uninitiated in a series under the title 'Beginner's Corner'. The fact that this appears to have been replaced by 'Connoisseur's Corner' should not be taken as an indication that the Society has moved up *en bloc* into the higher realms of succulent culture. The beginner is still much in our minds. Not infrequently one is asked for the names of plants which would grow on a window still, a conservatory or in a cool greenhouse by somebody who is wondering what lies behind our enthusiasm for succulents. (How many prominent growers have started off in just such a tentative fashion.) Here is a dozen plants all reasonably easy to maintain, with lasting decorative value as house plants and obtainable with little difficulty from nurserymen. The use of the Latin names is essential if the right kinds of plants are to be obtained, difficult though they may appear to the beginner. For example, every kind of aloe is not suitable for window sills, as some grow to six foot or more, and not every cephalocereus grows the mass of white hair that makes the 'old man cactus' so attractive.

Cacti:—

Cephalocereus senilis
Echinocactus grusonii
Echinopsis multiplex
Mammillaria bocasana
Notocactus lenninghausii
Rhipsalidopsis gaertneri

Other succulents:—

Aloe variegata
Ceropegia woodii
Crassula falcata
Echeveria metallica
Lithops spp.
Sedum sieboldii

Holidays, 1971

There are a number of members of our Society residing in Guernsey. If you are visiting this pleasant island during the coming summer and would like to meet them and see their collections, contact the Publicity Officer, Mrs. Maddams. She will be happy to make the necessary introductions.

The succulent collection at the Paignton Zoological and Botanic Gardens will interest members holidaying in South Devon. The tropical plant house there is arranged in large habitat groups representing rain forest, savannah and desert communities. A wide range of succulents, including cacti is on show in the last of these.

Correspondents Wanted

WE HAVE RECEIVED letters from two cactophiles in Czechoslovakia who are desirous of corresponding with members of our Society. Mr. Roszak is secretary of the local cactus society in a small town, Cesky Tesin, in the province of Ostrava. He has a collection of over 3,000 cacti representing some 400 species. He writes in German but would be happy to receive letters in English.

Mr. Sedivy, who writes in English, is 29 years old, lives near Prague and is particularly interested in the Mexican and North American cacti (*Ariocarpus, Gymnocactus, Turbinicarpus,* etc.). He wishes to exchange information on cactus culture and would send the Czech journal 'Kaktusy' in return for our own Journal.

As a temporary measure the North Surrey Branch has arranged for the current volume of CSJ to be sent to both gentlemen. Any member willing to make contact and carry on the good work should write to:

Herr Petr Roszak,
Cesky Tesin,
Uvoz 51, Czechoslovakia.

or

Herr Vladislav Sedivy,
Zbraslav II 287,
u Prahy, Czechoslovakia.

International Succulent Institute

The latest list of plants offered for sale by the International Succulent Institute, Orinda, California is now available from their U.K. representative Mr. N. E. Wilbraham, 7 Marlborough Drive, Tytherington, Macclesfield, Cheshire. The minimum order is 5 dollars, and individual plants vary in price between 1.50 and 10.50 dollars. Among the rarities on offer are plants of *Discocactus hartmannii* ex. Brazil, *Calibanus hookeri* (described as resembling a Testudinaria with bluish grass growing on it) and *Pachypodium geayi* from Madagascar.

Stapelias

The botany of the Stapelieae of South Tropical Africa continues to engage the attention of L. C. Leach. Part 6 of his work has appeared in the Journal of South African Botany, vol. 36, part 3 (1970) and deals with *Caralluma lutea* and related species. A key is provided to the 'lutea group' and the 'valida group' of the genus, and the numerous illustrations are of the customary high standard.

Overseas Subscribers

Please note that the correct address of Mr. A. H. Roberts is 16 Manor Place, Sutton, Surrey and not as given in the February issue of this Journal.

(continued from page 16)
affairs. On the other hand stapelias and related plants will lose a similar proportion of their water in a month, and die. Under cultivation, species of Glottiphyllum and even Lithops also show high rates of water loss in comparison with cacti, and just how they manage to survive under natural conditions is not known.

In spite of their considerable adaptation for survival under conditions of extreme dryness, many succulents are capable of penetrating areas of higher rainfall. Their continued spread is limited by competition with other plants rather than any incompatibility with a less exacting climate. However growth outside the normal habitat means the reduction of some, at least, of the environmental factors that control succulent characters. For instance, it has been recorded that the stems of stapelias found outside the dry areas are taller and the flowers larger, and that this is even more noticeable when they are cultivated in gardens or greenhouses. White and Sloane mention that the flowers of *Hoodia juttae* were twice the size when cultivated in South African gardens, while the stems of *Stapelia flavirostris* were narrower and more elongated when found in the moister coastal areas. They go on to remark "the point is important, because the length of stem of any species, as stated in the description, should be based on that of plants growing wild, whereas the collector may have a home-grown specimen with a much longer stem which he finds difficult to reconcile with the published description".

PRESERVE YOUR JOURNALS with a binding case, in which each issue is fixed with a wire. The case is finished in green cloth with gilt lettering on the spine. Price: 60p, post free to members.

IDENTIFY YOURSELF with the Society's lapel badge. Price 22½p, post free.
OR with the Society's blazer badge. Price 50p, post free. State whether black or navy background required.

IDENTIFY YOUR PLANTS with triangular white ivorine labels, which can be read without turning the head. Price: 20p per 100, post free.

All the above are available from the Hon. Treasurer—Mr. D. T. Best, 16 Ashleigh Gardens, Sutton, Surrey.

READERS are asked to note that advertising space is available in this Journal at the following rates:

Full Page	£5 per issue
Half page	£3 per issue
Quarter page	£1·75 per issue

Advertising copy should be sent in as soon as possible and the following are the final dates on which notices of alterations or other instructions can be accepted:

For the February issue	1st January
For the May issue	1st April
For the August issue	1st July
For the November issue	1st October

In addition there is a SMALL ADS. column at 8p per line, minimum 24p for which copy should be received on the above dates also.

A Booklet on the Classification of Cacti and Succulents is now available from the Show Secretary. The price is 5p each plus postage. Branch Secretaries can obtain them at 12 for 50p plus postage. Postage is 1-8 copies 3p, 9-11 copies 5p. Postal Order or cheque, NOT stamps, please.

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Associate Membership	25p
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Members resident abroad may, if they wish, subscribe to the Journal only at 75p for 4 issues, including postage by surface mail.

Subscriptions for 'Journal Only' should be sent to:
A. H. Roberts, 16 Manor Place, Sutton, Surrey.

Overseas subscribers wishing to receive the Journal by Air Mail should write to Mr. Roberts for further details.

THE CACTUS AND SUCCULENT JOURNAL OF GREAT BRITAIN

Vol. 33 August, 1971 No. 3

CONTENTS

Cactus Cultural Notes

by A. Boarder

THE many sunny days in the early spring this year ensured that flowers were produced in abundance during late April and May. I have never seen so many of my Mammillarias in flower at the same time. All the usual early flowering species made a fine display and the later ones look well and are likely to give just as good a show later on. Even many of my last season's seedlings have flowered and I was rather surprised at this as I had not taken very much trouble with them, being in a rather experimental stage with a fresh propagating frame. I am not at all happy with this new one as it is in an outside frame whilst my previous one was inside the greenhouse. The trouble with the new one is that one has to go out in all weathers to see to it, whereas my former one was inside the greenhouse and so was readily available.

I have the new frame heated by a small cable heater which is controlled by a small thermostat of the kind used to regulate the temperature of a tropical aquarium. This was quite a cheap one, costing no more than 12/6, old money. I do not suggest that this type is suitable for a greenhouse where it would have to cope with a heavy wattage, but anything up to a few hundred watts is easily dealt with. I did not find that the germination was very good this season, but must put a lot of the failures down to the seed when some seed pans give a very good germination and others with the same conditions do not. Also I usually divide the seed pans into sections and in such cases some of the seeds germinated splendidly whereas others in the same pan never showed up at all.

One is never sure how viable the seed is when it is purchased but if one's own seed is sown then a very good germination is usually obtained. I always test the seed which I buy by placing it on a white plate. The dust can then be cleared away by tilting the plate and rubbing off any dust or shell left behind. At the same time any seed which does not readily roll down the plate should be discarded as it will be found to be flat and worthless. Much of the seed I received last spring was very poor and in some packets only one or two seeds could be found in good plump condition and it seems a waste of my time to enter the names of the seed into my book and give a number when so few seeds are available.

I find that a very good plan for watering is to stand the seed pans on gravel in a saucer or shallow pan. The gravel is watered and not the top of the soil. The moisture can then be absorbed gradually into the seed pan and there is no likelihood of washing out any of the seeds which could be possible when watering from the top. I never mind if the seed pans almost dry out once the seed has germinated and I find that better results are obtained if the seed pans are not kept too wet once germination has taken place. One might think that when a number of different species are sown in one pan it is not possible to control the watering, but if one has the experience of knowing the types which can be sown in the one container, it is not likely to cause any trouble.

It is not too late to take cuttings or to behead a plant if it is necessary. Do not delay this procedure much longer as there might not be sufficient sunshine from now on to encourage the formation of fresh roots. The early summer is the best time for this propagation. I am pleased to say that the plant I beheaded some time ago is growing well and this year has flowered. This has been very gratifying as the plant in question is the one which started me growing cacti in 1905. I described in a previous article how the plant, *Echinopsis tubiflora,* had grown very tall and rather out of character and the base

part had become very brown and sere. It was taking a great risk to cut it down, but all went well and the top portion soon made fresh roots and with new growth has now flowered.

I have been particularly pleased with the amount of bloom on my plants of Dolichothele. I believe I have all the known species, and some of them have had seven or eight flowers out at the same time. As the flowers are quite large the display is astonishing. Some members have told me that they cannot flower them and others say that if you water them when they are in bud the flowers will not open. I do not find that this is so. I water all my plants when the soil gets dry and even some of them can get watered a little before this. It is not easy, when one has hundreds of plants packed close together, to be able to water each pot individually without, now and again, giving some to a plant not quite ready for it.

Although I have a water tank inside my greenhouse I rarely use it. Instead I water with a long hose which runs from my water tanks, rain water of course, and with a brass nozzle complete with tap, I can give any pot as much as I like without the chore of carrying a watering can. I can use a small spout or fit a rose for giving all an over-head watering. I do this now and again as I think that the plants benefit from this type of shower. In nature the plants would occasionally get a good downpour of rain, although perhaps not very often, and so I feel sure that it does them good. At least it removes any dust which may have fallen on them as well as assisting in the fertilisation of any seeds which are forming.

Whilst admiring the beautiful flower on my old Echinopsis, I thought that perhaps we older growers are inclined to scoff at this genus as being too ordinary. However there is no doubt that they are among the largest and handsomest of the flowers of cacti. Many of the popular genera have very much smaller flowers and I suppose that it is only because they are more often found in collections and usually more easily obtained that they are almost ignored by experienced growers. If they could not be so easily propagated from side shoots, or off-sets, it is probable that they would be thought of more highly. When one examines the flowers, with their long tubes and trumpet shape, one cannot but be impressed by their beauty, especially when the large bunch of stamens guides one's eye to the deep centre of the bloom. The method for growing and obtaining plenty of flowers differs I think from that of many other genera. These plants will benefit from a richer soil than many of the other types, and a little added fertiliser to the compost when repotting will help. The addition of some liquid fertiliser will help but this must not be over-done. Buds can appear and not open for many days, perhaps weeks, if the sun has not been powerful enough. However, once some warm weather approaches the buds develop with great speed and the actual opening of the flowers can be watched from about 8.30 in the evenings.

The many members of our Society who have no greenhouse might envy some of us who have one, but there is no need to go without flowering plants if one chooses carefully. Not all of the more often recommended cacti for beginners are of kinds which can flower easily. For instance I noticed that in a list of plants for beginners listed in the May number of this journal was *Notocactus leninghausii*. I am not denying that this makes a handsome plant, but I do not hold out much hope for the beginner who has no greenhouse and who expects to flower this plant. I would rather recommend *N. ottonis* as an easy plant to flower.

Other species of rather similar shapes, such as *N. muricatus, N. tabularis, N. concinus, N. mammulosus* and *N. submammulosus* can also be flowered far more easily than the plant recommended in the list.

I expect that some members have a difficult plant in their collection which, although perhaps never dies, certainly never appears to thrive. I have one or two like this and the one I have frequently threatened with extinction is *Wilcoxia poselgerii*. This plant looks more like a bunch of dead sticks than a living plant and yet it never fails to flower each year. The flower is quite attractive, being somewhat different from many cactus flowers. But there its attraction ends, and I sometimes wonder if the plant is worth keeping in the collection just to look alive for a few weeks in the year. Another plant I cannot get to look very healthy is *Mammillaria rosea-alba*. The lower part of this plant is always yellow and almost dead looking, but it never fails to send out a ring of quite large flowers every year. The flowers are rather similar to those of *M. zepheranthoides,* and although I have tried repotting this in varying composts I can never get the plant to look anything like a healthy plant should. I expect that some plants are made differently to others of the same species, since in conversation with other members I often hear that the plant which is my own problem plant, grows to perfection and with no trouble for someone else.

FROM THE PUBLICITY OFFICER

Christmas may seem a long way away but that is no excuse for not ordering Society cards in good time—the badge and greetings are on the outside and a decorated edging for insertion of your own picture or name and address within. This year the cards will sell separately at two new pence each or 22 pence a dozen—please add four pence if ordering by post. It would be of great assistance if Branch Secretaries can let me know their Branch requirements as soon as possible and any members wishing to put in an individual order over half a dozen as well, please.

Stocks of Membership Forms are in my hands and anyone requiring any of them should include stamps for return postage. Every Branch should have them available for Shows and displays and if you know of any local nurseries who will take a few all the better.

Cultural notes on Succulents other than Cacti

by Mrs. Muriel Stillwell

MANY members of the Mesembryanthemum family rest during the late spring and summer including *Conophytum,* which appear dead to the uninitiated when their outer skins turn brown and papery. The bilobed conophytums are usually the first to show signs of growth by starting to burst through the old skin about June, to reveal the new bodies inside, sometimes two or even three in number. If the old skins are really dry they can be peeled off from the base; this must be done very carefully as the new bodies break off very easily. Most of the bilobes have flowers in various shades of yellow, up to bright orange. While conophytums like plenty of strong light to flower well they do scorch very easily, so do not grow them too close to the glass and make sure there is plenty of ventilation in the greenhouse. Repot them when growth is just starting so that the plants can be cleaned up at the same time. Although the presence of old skins on plants is natural in habitat, a collection, especially for show purposes, looks much more attractive without them. Removing old skins can be a tedious job, especially with the smaller globular species in large clumps. Do not show conophytums during the resting period but wait until the autumn shows, when they really come into their own. Pot up in a very coarse gritty compost with all fine dusty soil removed. They grow well in plastic pots if watered carefully. Cuttings root easily from July onwards; cut back to green base, place on sandy soil and spray regularly.

Conophytums will go on flowering right through until December in many cases. They do not need high temperatures in winter, 45 F being ideal. It seems the varieties of conophytums are endless, including numerous hybrids, particularly among the bilobes. A collection of these plants would be ideal for someone who wishes to specialise but has only a small space. A large frame will do if no greenhouse is available, but window sills are not the place to expect an abundance of flowers. It is not necessary to repot if the plant looks well, and in fact they may be left undisturbed for five or even 10 years. Some of the small-bodied conophytums that make large mounds after a number of years often start to die back from the centre and so spoil the look of the plant. When this occurs it is necessary to break up the clump and pot the young growths that form round the edges. Not infrequently such die-back is caused by the plant becoming pot-bound and water does not penetrate to the heart of the root system. Visit a conophytum collection in the evening for some of the daintiest, scented flowers open at night and close during the day.

Species of *Anacampseros* belonging to the *avonia* section should have pride of place in a collection, although they are not quite so easy to obtain as the conophytums. They include the beautiful pure white succulents covered with papery scales. The gem of these is *A. alstonii,* a caudex-rooted plant with a flat crown from which grow numerous little silvery stems. During the growing season several of these elongate and terminate in a long thin pink bud, which finally opens to an exquisite flower, either white or pink, from which stands out a mass of yellow stamens. Grow this in a very coarse compost with the addition of limestone grit, water carefully and give all the sunshine available. *A. papyracea* is, of course, outstanding in its growth in pure white, cylindrical, scaly tails. The flower is frequently cleistogamous, but seed sets readily. To keep it pure white remove some of the old growth that looks inactive when the new growth appears about May or June. Use these for cuttings, which may take a little while to root.

A. rhodesica is a slow growing little gem, and I was fortunate to see it flower for the first time one afternoon in June about tea-time. The greenhouse was quite hot after an ideal summer day and the little white flowers really responded. Most *Anacampseros* species will only open their flowers for a short time on a fine summer afternoon, and during a bad summer one may not see a flower at all. *A. ustulata* and *A. buderiana* are also worth growing; they have white seed.

Like human beings our plants will not flourish unless they are happy in their environment. Never move a plant from one place to another if it is doing well, but a plant that proves difficult should be moved every few weeks until the right place has been found for it. Often a sun loving plant is placed in what appears to be the ideal position but the sun moves round and the plant receives several hours of shade caused by neighbouring houses, or even part of the greenhouse structure. Visit the greenhouse at different times in the day and note where the shadows come, and reserve these spots for the shade loving plants. I have recently had to move all my Gibbaeums in the new greenhouse for this very reason, as I found that they were getting a lot of shade around midday from an overhanging shelf, and they were not producing so many flowers as usual and beginning to look rather green. I shifted them all to the other side where they get unrestricted sunshine and they have now regained their nice, hard, white appearance, as they were in the old house. The Euphorbias have taken over their place and they seem to be much happier, so do not be afraid to experiment until you find the right position for your plants.

40th Anniversary Arrangements

BY THE TIME that these notes appear we shall be moving into the final and most active phase of the 40th Anniversary activities. Apart from the October Show and the Annual Dinner on November 25th, both of which are discussed elsewhere in this issue and assume an added importance this year, there are two special events in the Autumn, one of which has been mentioned previously and for which the final arrangements are now complete.

This is the Cactus Weekend, to be held at Knuston Hall, Irchester, Northants, from 22nd to 24th October. The event will get under way with the evening meal on the Friday and terminate with tea on the Sunday afternoon. The seven speakers comprise G. D. Rowley, D. R. Hunt, E. W. Greenwood, S. W. I. Young, Mrs. C. P. Read, K. H. Grantham and W. C. Keen—a first rate team. There will be a nursery visit on the Saturday afternoon, to provide a useful interlude.

Knuston Hall lies adjacent to B569, a mile and a half from its junction with A6, and within easy reach of the M1. It is also about a mile and a half from the terminating point of the United Counties fast coach service from London (Kings Cross) to Rushden. Transport will therefore present no problems.

The cost of the weekend will be £5 and a very limited number of places for non-residents are available at £3·75. Much of the accomodation is in the form of rooms for two and three and we hope that members of Branches will be able to make up such groups. Although this venture is the first of its kind so far as this Society is concerned, very successful cactus weekends of this type have been held and we can promise interested participants a thoroughly pleasant, entertaining and constructive time. The venue has been been chosen to make it easier for members north of London and the Home Counties to attend and we hope that they will avail themselves of the opportunity. Please contact your Branch Secretary, or Mr. W. F. Maddams, 26, Glenfield Road, Banstead, Surrey, without delay; early application is advisable as places will be allocated as requests are received.

The second event consists of a display of plants at the three-day Aquarist Show on 29th–31st October. Stewards are urgently needed for all three days; do not absolve your conscience by assuming that someone else will volunteer and, in particular, do not leave it wholly to the 40th Anniversary sub-Committee; they will have justified their existence by the work they do at the Knuston Hall weekend a few days previously.

Succulent Snippets

by Sally Cornioides

I SUPPOSE everyone has departed into their greenhouses for the summer judging by the fact that the Editor has not passed any letters—rude or otherwise—on to me lately. Certainly in May it was a delight to sun oneself but during most of June the rain and wind battering away has not made the situation so pleasant. The surprising fact is that the plants go on flowering away regardless; on one horribly wet and gloomy day I had no less than seven Echinopsis flowers open and an amazing range of colours of Lobivias. What is more on such a day we get a bonus because the flowers last longer, but what on earth makes them open in such weather is really worth some thought.

At least the weather was kind when two well-known names from sunny California were over here. The Editor tells me there was a wonderful gathering of cactophiles at Banstead to greet them on the Sunday; it must have been an unique occasion for the Editors of the two main British Societies were there to greet Charles Glass, Editor of the American Journal and his assistant Bob Foster, also Mr. Cooke of the S.P.I., Gordon Rowley and their host, Bill Maddams, Editor of the Mammillaria Journal. The Editor also reports that Mrs. Malcolmson, Treasurer of the New Zealand Society was there and the cameras were clicking on the people more than the plants; judging by the reports of the Americans' outfits, a colour film was vital! Incidentally, judging by the photograph in 'Garden News' the plant of the day was not a Mammillaria as expected but *Echinocereus purpureus*. I am also told that Charles Glass regretted that Sally could not be there but with ace reporter Gordon Rowley on the spot what more could be needed?

★ ★ ★ ★

Our display at Chelsea was again an eye-catching one and congratulations must go to the Hertfordshire Branch and another member, who could be well recognised by his plants, for the colourful arrangement. One lady was heard to remark, "I am not a cactofan but these really get me". Well, I suppose 'cactofan' is a good colloquillism for cactophile but it is not really my line. What I was sorry to see was few of the stewards were wearing Society badges—why not? That is one of the easiest ways of being recognised and a good advertisement.

I must say that at many of the shows I have visited during the last year or so I have been able to meet fellow members through spying their badges or as they have spied mine, so see that you wear yours as you go around, too.

Schumann and Buxbaum Reconciled

The Schumann system of *Mammillaria* classification brought provisionally up-to-date

by D. R. Hunt, Royal Botanic Gardens, Kew.

Introduction

Karl Schumann's system of *Mammillaria* classification has stood the test of time very well and no one has subsequently proposed a complete and fundamentally different system to compete with it. Although Britton and Rose and others have established numerous segregate genera, mostly founded on single characters, and Buxbaum has upgraded various of the subdivisions and given them new names, the basic series (*Reihen*) of the Schumann system are still recognizable. Neither Britton species into the Schumann system, and Backeberg's & Rose nor Craig attempted to fit the post-Schumann attempt in 'Die Cactaceae' was half-hearted. The form in which Schumann's system is by now most familiar is Berger's adaptation, later used by Borg.

The morphological studies of F. Buxbaum are amongst the most important recent work on the *Cactaceae*. Unfortunately, that author's predilection for speculation about the evolutionary implications of his work, together with a fecundity in the description of new taxa only exceeded by Backeberg, have made his system of classification both complex and unstable. For the *Mammillaria* group it is, moreover, still incomplete. (See Fig. 1).

Some reasonably simple system of classification is a pre-requisite if one is to gain an understanding of a complex group such as the genus *Mammillaria*. To produce such a classification, taking account of recent research and the welter of new species described this century, it is not necessary to modify Schumann's scheme to such an extent as might seem at first sight.

Subgenera

Schumann's first major division of the genus *Mammillaria* as he understood it was into four subgenera: *Coryphantha, Dolichothele, Cochemiea* and *Eumammillaria*. Of these *Coryphantha* must, I think, have generic status in a modern system; its tubercle structure, flowers and seeds all differ substantially from the rest. *Dolichothele* and *Cochemiea,* together with *Mamillopsis,* which Schumann included under *Cochemiea,* have also had generic status since Britton & Rose's time. The American monographers made little use of the category subgenus (or that of variety, for that matter) and most of their segregate genera would be the subgenera of other authors. *Dolichothele, Cochemiea* and *Mamillopsis* do not differ fundamentally in tubercles, flower or seed from *Mammillaria* sensu stricto and in the case of *Cochemiea* and *Mamillopsis* the flowers are no more aberrant from the general run than those of the *Krainzia* group for which generic status, though proposed, does not seem to be gaining acceptance. The overriding basis of my persuasion that it is best to retain *Dolichothele,* etc. as subgenera is this: *In the sum of their characters,* the species of these subgenera as closely resemble the other *Mammillaria* species with watery sap and black seeds as the latter group resemble those with milky sap and brown seeds, and there is no evidence to indicate that the floral characters, just because they are conspicuous, are more significant from a classificatory standpoint than the sap or seed characters which are less readily observed. To accept genera such as these, founded on only one character or even character-group, would mean, for the sake of evenness, accepting many others within *Mammillaria* and throughout the family, as Buxbaum and Backeberg have done. The claim that cactus taxonomy is out-of-step with that of other families has been rather overdone and is not altogether valid, but there are real advantages to the more conservative attitude taken by such writers as Schumann, Vaupel and more recently Benson and Kimnach. With fewer genera, classification is more readily comprehensible to someone without specialist knowledge, and the nomenclature of species is more stable, since it is not affected by minor changes of classification.

Sections

Within the subgenus *Eumammillaria,* which under the International Code of Botanical Nomenclature must now be called subgenus *Mammillaria,* Schumann had 11 series grouped into two sections, *Hydrochylus* and *Galactochylus,* according to the nature of the sap. We now know that numerous species are intermediate in this respect, with milky sap confined to the body of the plant, present there seasonally or throughout the year, or only 'semi-milky' in consistency. It transpires that the 'intermediate' species occur in three series, two of which (*Heterochlorae* and *Polyacanthae*) Schumann placed in section *Hydrochylus,* one (*Elegantes*) in *Galactochylus.* These three series share other general similarities in habit, spine arrangement, flower type and seed structure, and neatly complement one another in their geographical distribution, to form a very natural grouping. In 1938, Backeberg separated series *Elegantes* and certain species of the *M. spinosissima* group as a section *Subhydrochylus,* and I am in favour of extending this section to cover the rest of the *M. spinosissima* group (series *Polyacanthae*) and series *Heterochlorae.*

The International Code also prescribes that section *Galactochylus* must be renamed sect. *Mammillaria,* as it contains the type species of the genus (*M. mammillaris*).

The names of the three sections recognised here are therefore: *Hydrochylus* K. Schum., *Subhydrochylus* Backeb. and *Mammillaria*.

Series (in subgenus *Mammillaria*)
Of Schumann's original 11 series, eight require no substantial change apart from the addition of more recently described species and some resorting of species. Each of the remaining three series requires division, but paradoxically the total of 11 is not increased.

VI. Reihe *Candidae* K. Schum.
The four species included by Schumann are not closely related. The type species, *M. candida*, has a seed structure unlike that of other Mammillarias apart from its close ally *M. ortiz-rubiona*, which, as Buxbaum argued, seems to imply a closer relationship with such genera as *Neolloydia* than with the rest of *Mammillaria*. In the rest of its characters, however, there is little to exclude it from the genus and I should not go so far as to place it in a separate genus. I follow Moran in treating *M. candida* as the type of a separate subgenus within *Mammillaria*.

M. micromeris lacks the characteristic 'divided areole' of *Mammillaria* and the case for a separate genus here is more clear-cut (*Epithelantha* Weber).

M. pottsii may belong in series *Leptocladodae;* it is very different from the last of Schumann's four species, *M. lasiacantha*, which was made the type species of a subgenus *Acentracantha* by Buxbaum, to include various species allied to series *Stylothelae* but lacking central spines. Following Buxbaum, I recognise this *M. lasiacantha* group, but at the level of Series where, in effect, it takes the place of series *Candidae*.

VIII. Reihe *Ancistracanthae* K. Schum.
Since Schumann's time the number of species referable to series *Ancistracanthae* has swelled considerably. Buxbaum at one time placed these species in no fewer than five genera and two subgenera. At the present state of our knowledge it is certainly helpful to restrict series *Ancistracanthae* to that fairly homogeneous group of species which is centred on Baja California, Sonora and the adjacent United States. The other species can be grouped in various ways. Provisionally I follow Backeberg in referring some to *Dolichothele*, and treat the rest as a Series corresponding to the genus *Krainzia* Backeb.

XIV. Reihe *Tetragonae* (Salm-Dyck) K. Schum.
The least useful of Schumann's series. Berger distributed the species amongst series *Macrothelae* and series *Polyedrae*, and I concur.

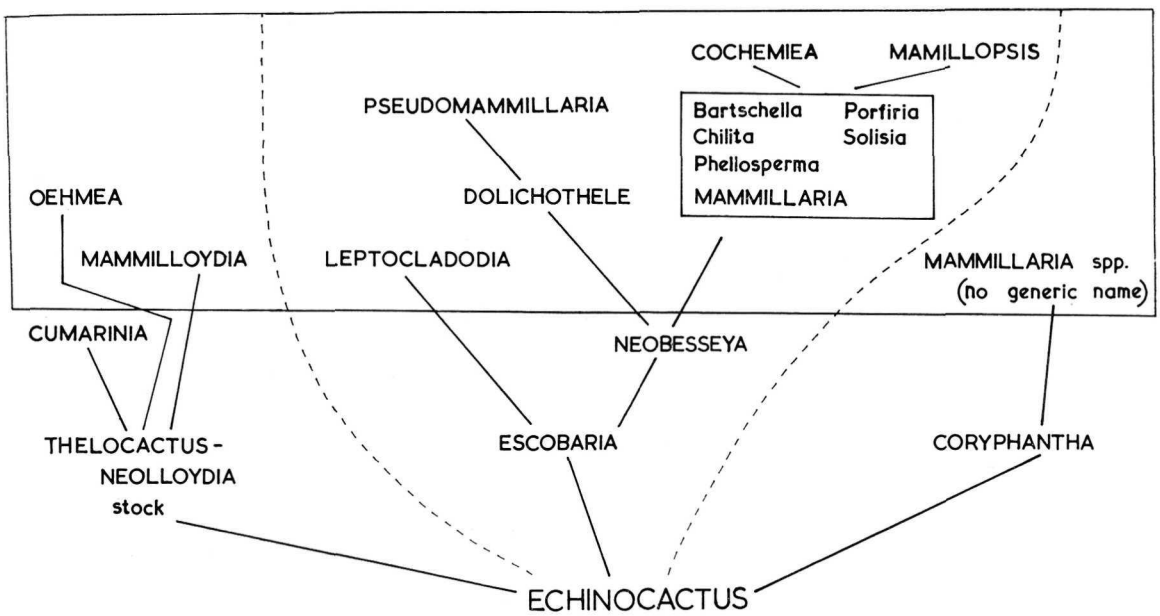

Fig. 1. According to Buxbaum, the "Mammillaria Stage", where plants have the spine-bearing and flower-bearing areoles (or parts of the areole) separate and not interconnected by a groove, has been reached from the ancestral stock of Echinocactus by evolution along three independent branches. In the above diagram these branches are shown separated by dotted lines, and some genera representing intermediate 'Stages' are included. The genera of the 'Mammillaria' stage recognised by Buxbaum (but included by me in a single genus) are those in the large oblong box.

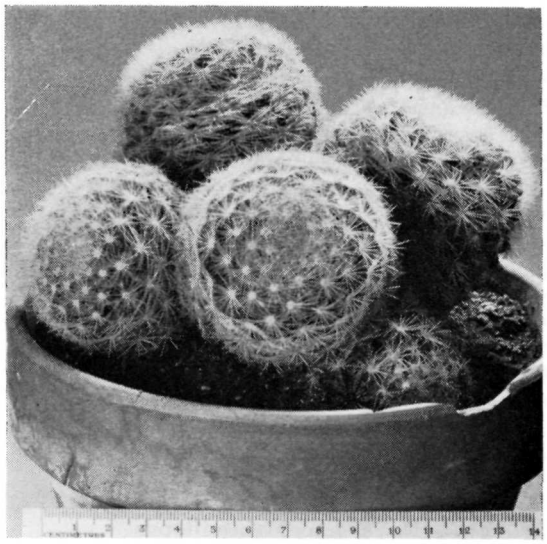

Fig. 2. M. candida. Collected specimen from San Luis Potosi: between Huizache and Ciudad del Maiz (Buchenau).

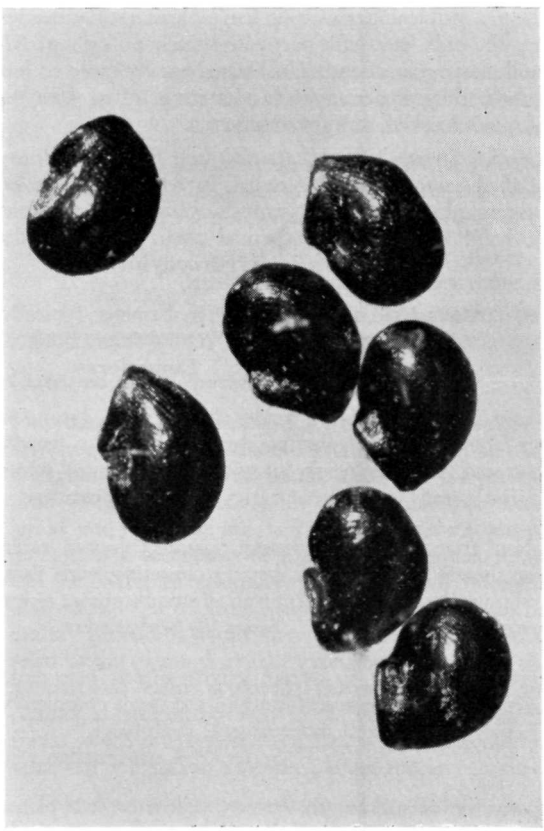

Fig. 3. Black, non-pitted seed of M. candida (x 20).

Nomenclature of the Series

Names used for subdivisions of a genus are subject to the International Code of Botanical Nomenclature like those of genera and species, and in particular to the principle of priority at a given rank. Most of the Series names adopted by Schumann were coined many years earlier by Pfeiffer, Lemaire and Salm-Dyck, each of whom had grouped the species at two undefined levels within the genus. At the upper level the group names were prefixed with a §, a sign often used in botanical writing to denote a Section or Series. At the lower level the group names were prefixed with letters or asterisks. Schumann selected the names he used from both levels indiscriminately taking, as it were, the best bits from each of the previous worker's attempts at classification.

If one were to treat the upper level of grouping as being of exactly equivalent rank in the work of Pfeiffer, Lemaire and Salm-Dyck, and similarly the lower level, and to apply the principle of priority, the names *Stylothelae, Heterochlorae* and *Macrothelae* would be amongst those that would almost certainly have to give precedence to unfamiliar alternatives. One would also be faced with the problem of deciding which of the two levels should be treated as corresponding to Series. Fortunately, there is a loophole which enables one to escape both issues. Schumann was the first to state explicitly the rank of the subdivisions he employed, and it is quite the proper course to treat the names he used as being first published by him at the stated rank.

Geographical Distribution

Within the genus as a whole, the subgenera, sections and series exhibit clearly defined patterns of geographical distribution. It is the purpose of the maps which accompany the classified list of species (below) to demonstrate these patterns, since they are of the utmost help in understanding the underlying patterns of morphological variation and speciation. The numbered symbols on the maps indicate the approximate sites of the type localities (often the only reliable distribution data available) of the species with the corresponding numbers in the list. Occasionally, where the type locality is unknown, a reliable subsequent report has been plotted.

Note on Conspectus (pp. 00)

Each of the major subdivisions of the genus, as here recognised, can only be circumscribed in terms of a combination of characters, since very few of the classificatory characters employed are exclusive to a particular group. Rather than list the diagnostic characters of each group separately I have attempted to set them out in the form of an indented key. I must emphasise that the key is intended to demonstrate how the *groups as a whole* are differentiated, and not as an identification key for individual specimens, though it should serve the latter purpose up to a point, should complete material with flowers and seeds be available.

Conspectus of Subgenera, Sections and Series

Seeds black, without intracellular pits, but minutely spotted in the interstices between the cells of the testa; stem depressed globose at first, eventually stoutly cylindric, clustering, individual heads 10 cm. or more in diameter, with watery sap; spines numerous in several series, about 30–60 at each areole, white, sometimes pinkish or brown tipped; axils with fine bristles; flowers pinkish, about 2–3·5 cm. long — Subgenus **Mammilloydia**

Seeds brown or black, if black then the testa with conspicuous intracellular pits; stem, sap, spines, axils and flowers various:

Tubercles large and fleshy, cylindric or terete, deep green, not glaucous; sap watery; flowers relatively large (more than 2 cm. long and broad), usually bright yellow or orange (in one species red?), rarely small, cream; spines usually few, in some species one hooked; seeds black or brown — Subgenus **Dolichothele**

Tubercles various, if relatively large and soft then the flowers not as above and the spines more numerous; sap watery or milky; flowers various, if large then not bright yellow or orange; spines various; seeds black or brown:

Flowers scarlet or orange with a conspicuous tube about 2–4 cm. long, longer than the diameter of the perianth limb; stamens exserted; one of the central spines hooked, except in one species; seeds black:

Perianth limb zygomorphic (bilabiate) — Subgenus **Cochemiea**

Perianth limb regular — Subgenus **Mammillopsis**

Flowers not scarlet or orange, mostly without a conspicuous tube, or the tube shorter than or about equal to the diameter of the perianth limb (Series *Longiflorae*); central spine hooked or not; seeds black or brown — Subgenus **Mammillaria**

● Seeds black, or if brown, then the testa pitted, the pits visible under a strong lens (at least x10); tubercles with watery or thinly milky sap (in one species, the only one with pectinate spines, milky sap: *M. pectinifera*); stem with watery, thinly milky or milky sap; mature individual stems usually more or less cylindric, i.e. appreciably taller than broad, if globose, then small and freely clustering, often with no central spines and very numerous radials; central spines hooked, straight or absent:

▲Seeds black, rarely brown (a few species in Series *Stylothelae* and *Leptocladodae*); flowers various; spines various; usually either in two well-marked series, central and radial, in which case one or more of the centrals hooked, or the series intergrading, with the centrals straight, or without centrals; sap watery (except *M. pectinifera*); habit various, the individual stems rarely stoutly cylindric — Section **Hydrochylus**

Flowers large, more or less salver-shaped, pink or purple, 25mm. or more in diameter, typically with a tube of about equal length; plants mostly small and caespitose, central spines hooked, straight or absent; seeds black — Series I. **Longiflorae**

Flowers mostly rather large, often 25 mm. in overall length, funnel shaped, pink, cream or white, the tube relatively short; plants often slenderly columnar or cylindric and densely clustering, with relatively stout, firm-textured tubercles; nearly all with hooked central spines (but some species with straight-spined forms); seeds black — Series II. **Ancistracanthae**

Flowers mostly rather small, less than about 20 mm. in overall length, various coloured, often creamy yellow; plants often globose or shortly cylindric and densely clustering with thin, soft-textured tubercles; one of the central spines hooked, or the centrals all straight, more or less intergrading with the radials; seeds brown or black — Series III. **Stylothelae**

Flowers mostly rather small, rarely exceeding 20 mm. in overall length, mostly pale pink, creamy yellow or white; plants often depressed globose and clustering, the stems completely hidden or almost so by the numerous radial spines, central spines absent; seeds black — Series IV. **Lasiacanthae**

Flowers small, not exceeding about 15 mm. in overall length, creamy yellow or red; plants mostly slender-stemmed, densely clustering; central spines straight or absent, never hooked; seeds brown or black — Series V. **Leptocladodae**

▲Seeds brown, irregularly pitted; flowers small to medium-sized, rarely reaching 25 mm. in overall length, usually purplish pink, less commonly creamy yellow; spines usually in two well-marked series, central and radial, or the radials reduced or absent; central spines straight or curved, rarely hooked (a few species of Series *Polyacanthae*); sap of tubercles watery, or at most thinly milky, but milky sap typically present, if only seasonally, in the stem or its lower part; habit typically stoutly cylindric or columnar, solitary or many-headed, more rarely the individual heads small or globose
Section **Subhydrochylus**

Flowers medium-sized *for the Section,* averaging about 12–15 mm. long, purplish pink or creamy yellow; central and radial spines usually sharply differentiated by colour, or the radials reduced to bristles or absent; radials not lending the whole plant a white appearance; sap usually watery throughout, milky sap sometimes present in the stem Series VI. **Heterochlorae**

Flowers mostly large *for the Section,* averaging about 15-20 mm. long, campanulate, purplish pink; spines usually numerous, the radials rarely lending the whole plant a white appearance, the centrals straight or one or more hooked; sap usually milky in the stem, if only seasonally, and in some species tending to be thinly milky in the tubercles Series VII. **Polyacanthae**

Flowers small, averaging 10–12 mm. long, purplish, pink or yellow; central and radial spines well-marked, the radials usually obscuring the tubercles and giving the whole plant a white (or more rarely yellowish) appearance; the centrals straight or curved, never hooked; sap milky in the stem and sometimes thinly milky in the tubercles Series VIII. **Elegantes**

● Seeds brown, without evident pits (but these obscured by the crumpled testa cell walls, visible under the microscope); tubercles with milky sap; mature individual stems often depressed or subglobose, i.e as broad or broader than high, often forming dense mounds or clusters, more rarely shortly columnar or cylindric; central spines straight or curved, hooked in one species (*M. uncinata*) only
Section **Mammillaria** (*Galactochylus*)

Plants mostly densely covered with white spines and/or bristles or hairs, rarely the spination yellowish or the radial spines and axillary bristles or hairs much reduced or absent; tubercles small, averaging 4-7 mm. long; flowers small for the genus, averaging 10 mm. long Series IX. **Leucocephalae**

Plants with relatively few spines, these often strong; axils mostly lacking bristles; tubercles usually large and gibbous, sometimes as much as 20 mm. long and broad at base; flowers medium-sized for genus, averaging 15 mm. long, often broadly campanulate Series X. **Macrothelae**

Plants with relatively few spines; axils typically conspicuously armed with bristles; tubercles medium-sized, conic, often more or less angled, often 8–10 mm. long; flowers medium sized, averaging 15 mm. long, campanulate Series XI. **Polyedrae**

Classified list of species

The following list accounts for all the species accepted by Craig (The Mammillaria Handbook, 1945) and by Backeberg (Das Kakteenlexikon, 1966). At the present time it is usually impracticable to say which species are 'good' and which are not, and in many cases my acceptance or non-acceptance of a species for the purpose of this list is rather arbitrarily based and not intended dogmatically. If to some I should seem, even so, to be unduly pessimistic about many described species which seem distinct enough on the greenhouse bench, let me say that I do readily accept that many of these plants are distinct as entities, but that to me they are introduced forms which often represent a very narrow selection of what can be found to comprise a single species in nature.

To make my list more useful to those who have access to a copy of Craig's book, I give Craig's numbering after the name of each species; thus '1. *M. candida* (219)' is species no. 219 (page 273) in Craig's book. (I have numbered Craig's 'Unclassified Species' in the same sequence beginning with no. 239 *M. alamensis* and ending with no. 261 *M. yaquensis*.) Where a species described since 1945 has been the subject of an article in the Journal of the Mammillaria Society in the series 'Descriptions of Species Novae since "The Mammillaria Handbook" ', the volume and page number are given, e.g. '12. *M. guiengolensis* (2 : 77)'.

Subgenus **Mammilloydia** (F. Buxb.) Moran in Gentes Herb. 8:324. 1953. (Map 1).

Type species: *M. candida* Scheidw.

One species (or possibly two, if *M. ortiz-rubiona* is distinct) from the region of San Luis Potosi, whose aberrant seed structure suggests long evolutionary history independent of the other subgenera. *M. estanzuelensis* may have been of this affinity, but is more plausibly referred to *M. denudata,* according to Glass & Foster.

1. *M. candida* (219) (figs. 2, 3)
incl. *M. ortiz-rubiona* (215)

Subgenus **Dolichothele** K. Schum., Gesamt. Kakt., 474. 1898. (Map 1).
Type species: *M. longimamma* DC.

The species included here are grouped together as much for simplicity, in view of the lack of any clear indications of relationships with component species of the other subgenera, as for the reasons of superficial similarity which presumably led Backeberg to include nearly all of them in *Dolichothele* (as a genus of two series). Of the north-eastern group, *M. carretii* perhaps belongs instead in series *Stylothelae,* but is hardly one of the *M. spinosissima* group (subgenus *Austroebnerella* F. Buxb.) as Buxbaum once suggested. The small-flowered *M. camptotricha* group is also anomalous, with tenuous affinities to several series of subgenus *Mammillaria* as well as to the true *Dolichothele* species. Of the southern species, the wide-ranging *M. zephyranthoides* and *M. beneckei* (with *M. guiengolensis)* are also morphologically isolated and perhaps more closely related to subgenus *Mammillaria* than to *M. longimamma,* etc. The recently described *M. kraehenbuehlii* (first placed in *Pseudommamillaria,* the *M. camptotricha* group, by Krainz) may be allied to *M. sphacelata,* according to a suggestion made to me by Mr. C. Glass.

M. LONGIMAMMA Group (spp. 2–7)

2. *M. longimamma* (fig. 4)

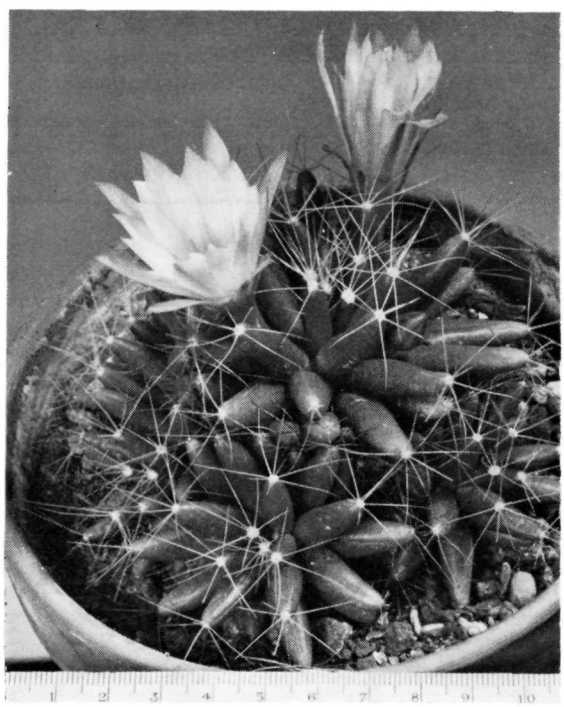

Fig. 4. *M. longimamma.*

3. *M. uberiformis*
4. *M. surculosa* (133)
5. *M. baumii* (233)
incl. *M. radiaissima* (234)
6. *M. melaleuca*
7. *M. sphaerica*

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8. *M. carretii* (132)
incl. *M. saffordii*

M. CAMPTOTRICHA Group (spp. 9–10) (genus *Pseudomammillaria* F. Buxb.; *Dolichothele* Series *Microfloridae* Backeb.)

9. *M. camptotricha* (94)
incl. 9a. *M. albescens* (95)
10. *M. decipiens* (183)

M. BENECKEI Group (spp. 11–12)

11. *M. beneckei* (131)
incl. 11a. *M. barkeri* Hort. non Shurly (4:8)
M. aylostera
M. balsasoides (116)
M. balsasensis
?*M. colonensis* (175)
M. nelsonni (type species of genus *Oehmea* F. Buxb).
12. *M. guiengolensis* (2:77)

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13. *M. zephyranthoides* (type species of *Chilita* subgenus *Archiebnerella* F. Buxb.) (134)
14. *M. kraehenbuehlii*

Subgenus **Cochemiea** K. Brandegee in Erythea 5:113. 1897. (Map 1).
Type species: *M. halei* Brandegee

Five very closely allied species found only in Baja California, probably with strong evolutionary connections with series *Ancistracanthae* and *Longiflorae. M. halei* is the only species of the group not to have a hooked central spine.

15. *M. maritima*★
16. *M. setispina*
17. *M. pondii*
18. *M. halei*
19. *M. poselgeri* (fig. 5)

Subgenus **Mamillopsis** Morren in Belg. Hort. 24:33. 1874. (Map 1).
Type species: *M. senilis* Lodd.

Two closely allied species native to the Sierra Madre Occidental of N. W. Mexico, probably with strong evolutionary connections with subg. *Mammillaria* series *Longiflorae.*

20. *M. senilis* (fig. 6)
21. *M. diguetii*

***Mammillaria maritima** (Lindsay) D. R. Hunt, **comb. nov.;** *Cochemiea maritima* Lindsay in Cact. Succ. J. Amer. 8:143. 1937: H. E. Gates ex Shurly in Cact. Succ. J. Gt. Brit. 4:12. 1935, *in obs., sine descr. lat.*

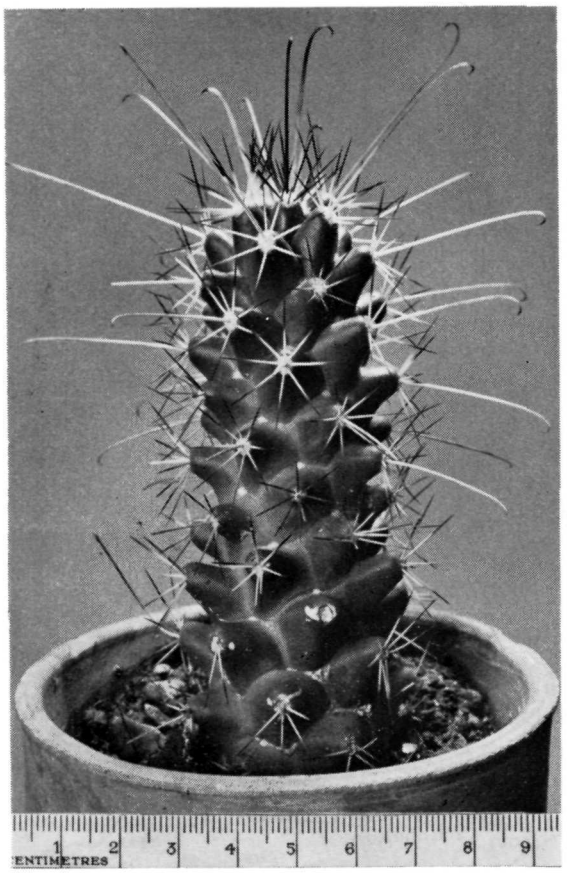

Fig. 5. M. poselgeri (young plant).

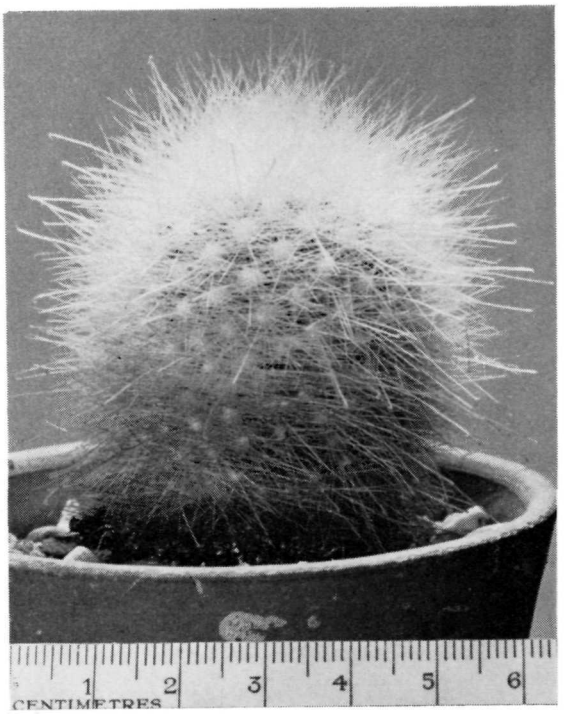

Fig. 6. M. senilis.

Subgenus **Mammillaria**
Section **Hydrochylus** K. Schum., Gesamt. Kakt. 514. 1898.
(Lectotype species: To be selected).
Series I. **Longiflorae** D. R. Hunt, **series nova;** *plantae humiles, caespitosae, tuberculis mediocribus, floribus pro genere permagnis, plerumque roseis vel purpureis, hypocrateriformibus vel infundibuliformibus, seminibus nigris.*
Species typica: M. longiflora (B. & R.) Berger.

A group of low-growing species with large flowers, showing distinct affinities to the next series, with which it intergrades, especially via *M. guelzowiana* and the *M. wrightii* Group. The disjunct distribution of the group, with *M. napina,* etc. far removed from the others, may be relictual, and hence an indication of its 'primitiveness' in evolutionary terms. Alternatively, the pattern can be taken to mean that the disjunct groups are not, in fact, closely related.

22. *M. tetrancistra* (type species of genus *Phellosperma* B. & R.; *M. phellosperma*) (151)

M. LONGIFLORA Group (spp. 23–26)

23. *M. goldii*
24. *M. saboae*
25. *M. theresae*
26. *M. longiflora* (type species of genus *Krainzia* Backeb.) (162)

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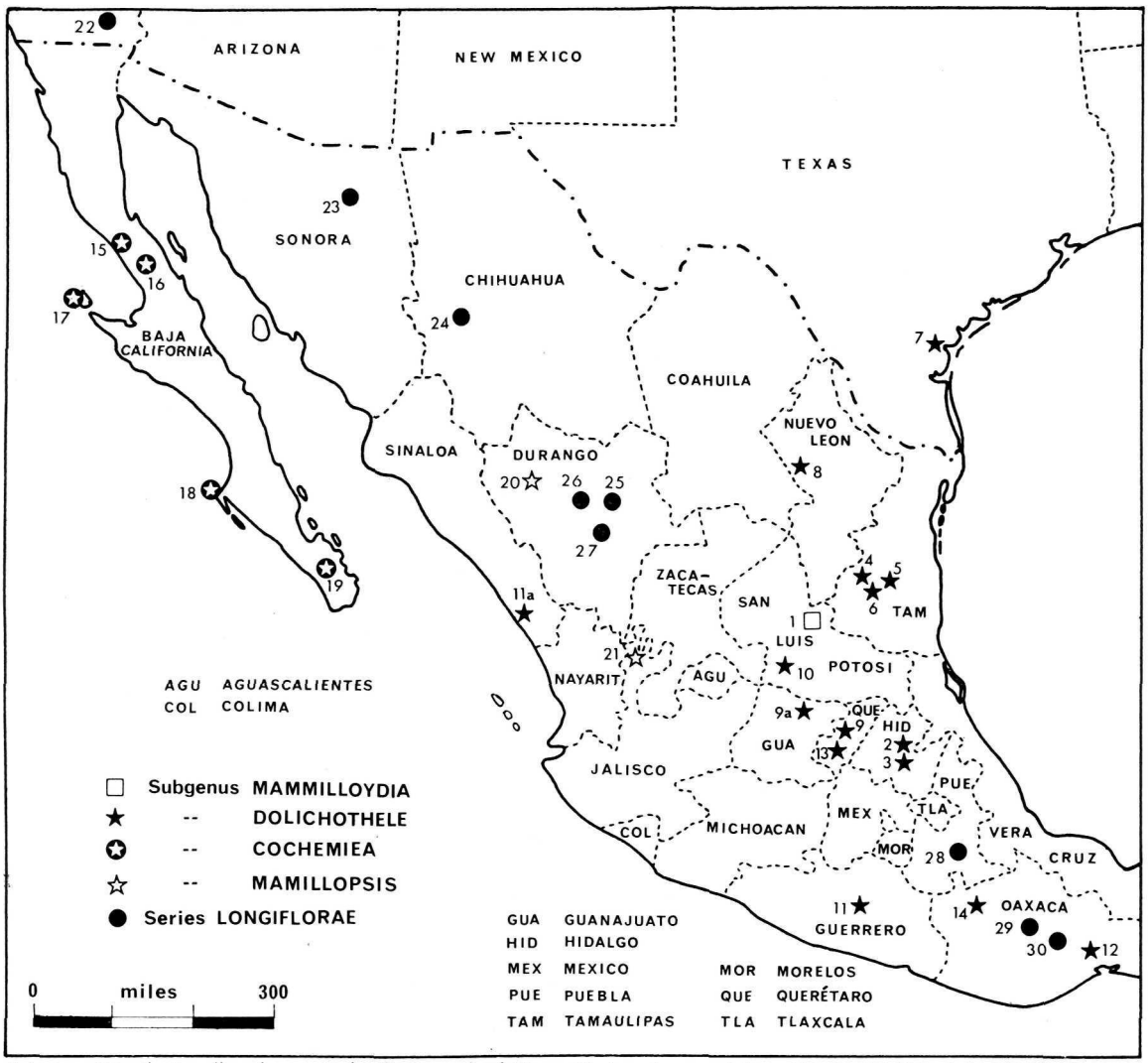
27. *M. guelzowiana* (173)

M. NAPINA Group (spp. 28–30)

28. *M. napina* (98)
29. *M. dodsonii*
30. *M. deherdtiana*

Series II. **Ancistracanthae** K. Schum., Gesamt. Kakt., 517. 1898. (Map 2).
(Lectotype species: To be selected.)

The predominantly hooked-spine group of N. W. Mexico and the adjacent United States, from which subgenus *Cochemiea* on the one hand, and series *Stylothelae* on the other are interpreted, according to Buxbaum's scheme, as more highly evolved developments, a hypothesis with which I agree. Straight-spined forms of various species occur, and there is a small group of species (nos. 63–66) in which this is the typical or only condition.



Map 1. Distribution (based on type localities, etc.) of Mammillaria subgenera Mammilloydia, Dolichothele, Cochemiea and Mamillopsis, and of subgenus Mammillaria Series I. Longiflorae. (List nos. 1–30).

M. WRIGHTII Group (spp. 31–34)
31. *M. wrightii* (141)
incl. 31a. *M. wilcoxii* (142)
31b. *M. viridiflora*
32. *M. santaclarensis*
33. *M. morricalii*
34. *M. garessii*

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35. *M. mainae* (129)
M. MICROCARPA Group (spp. 36–48)
36. *M. microcarpa* (164)
incl. *M. milleri*
37. *M. grahamii* (type species of genus *Chilita* Orcutt)
incl. 37a. *M. oliviae* (179)
37b. *M. marnierana* (3:66)
38. *M. orestera*
39. *M. chavezei* (4:33)
40. *M. thornberi* (*Neomammillaria fasciculata* B. & R., non *M. fasciculata* Engelm.; cf. Benson, Cacti of Arizona, ed. 3) (130) (fig. 7)
41. *M. yaquensis* (261)
42. *M. mazatlanensis* (193)
43. *M. occidentalis* (126)
incl. 43a. *M. patonii*
44. *M. sheldonii* (type species of *Chilita* subgenus *Procochemiea* F. Buxb.) (136)
45. *M. swinglei* (127)
incl. *M. inaiae* (191)
46. *M. alamensis* (239)

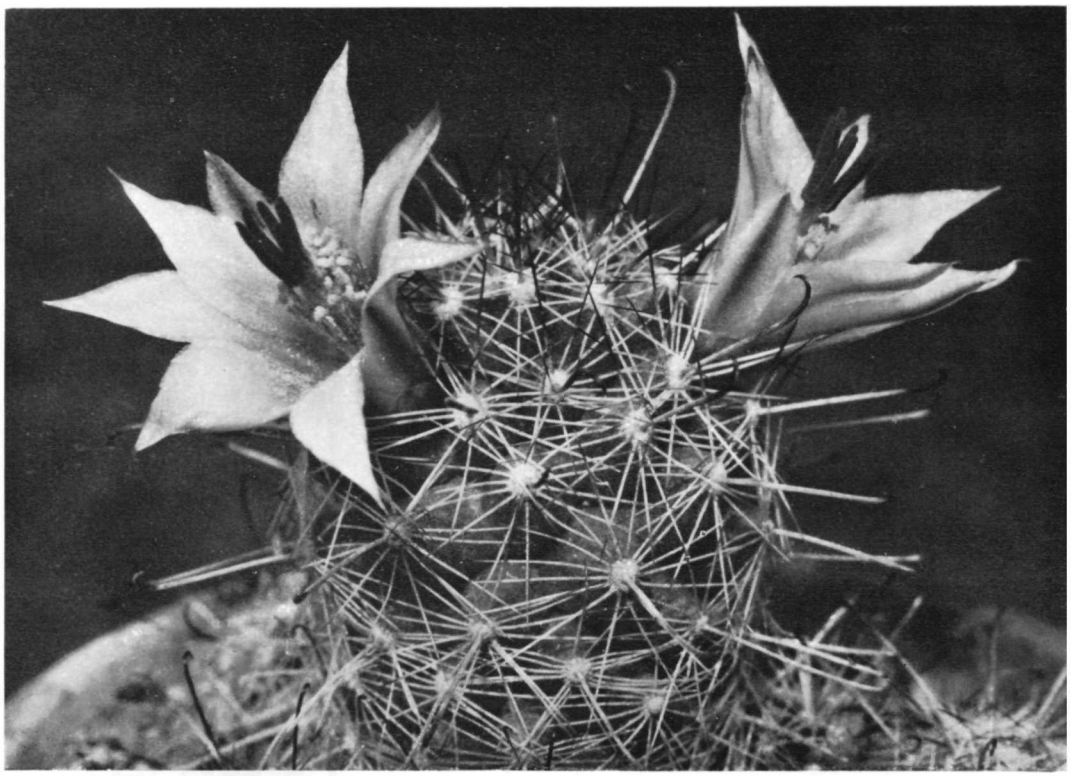

Fig. 7. M. thornberi (M. fasciculata).

47. *M. gueldemanniana*
    incl. *M. guirocobensis* (176)
    ?*M. pseudoalamensis*
    M. DIOICA Group (spp. 48–62)
48. *M. dioica* (119)
49. *M. louisae* (1 pt. 9:7)
50. *M. blossfeldiana* (139)
    incl. *M. shurliana* (1 pt. 9:8)
51. *M. goodridgii* (138)
52. *M. hutchisoniana* (135)
    incl. *M. bullardiana*
53. *M. insularis* (161)
54. *M. boolii* (157) (2:19)
55. *M. fraileana* (117)
56. *M. capensis* (114)
57. *M. armillata* (120)
58. *M. angelensis* (123)
59. *M. verhaertiana* (118)
60. *M. estebanensis*
61. *M. phitauiana* (177)
62. *M. schumannii* (type species of genus *Bartschella* B. & R.)

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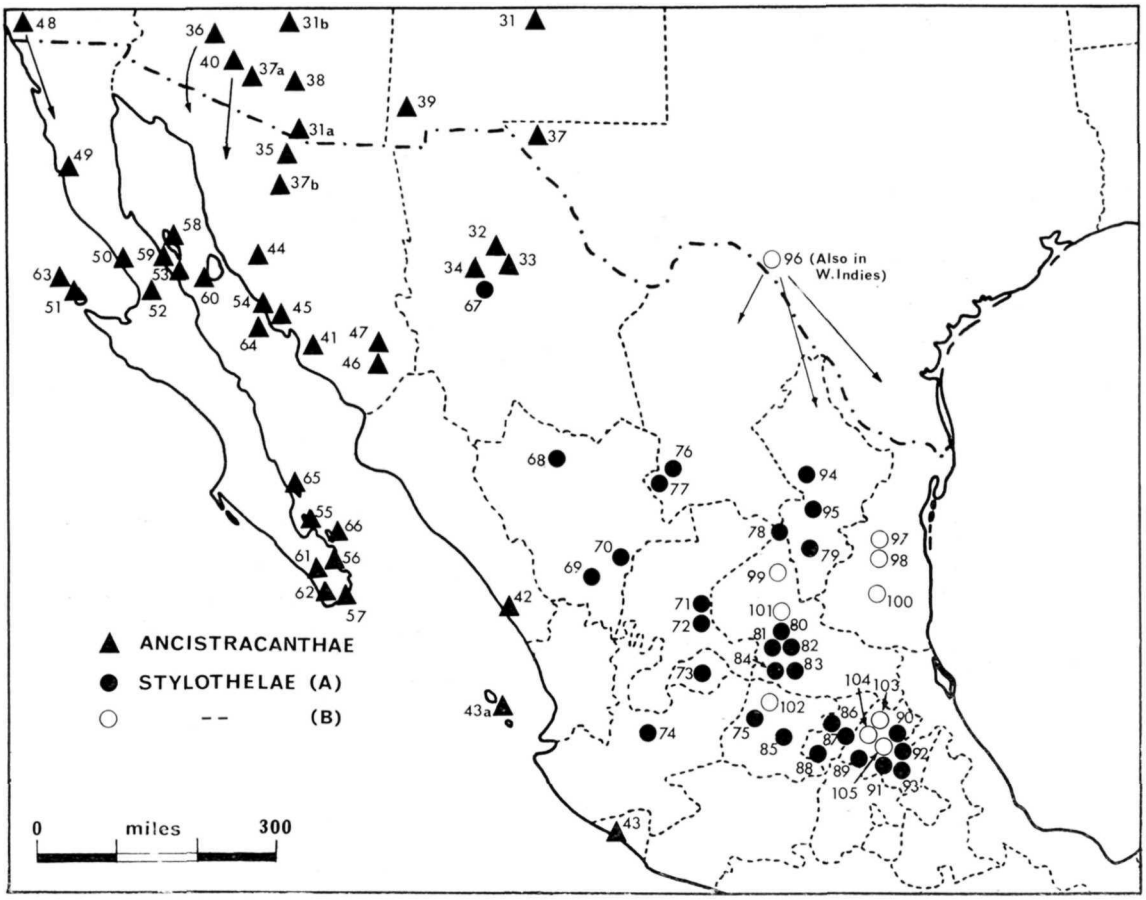
63. *M. neopalmeri* (216)
64. *M. multidigitata* (1 pt. 5:6)
65. *M. albicans* (210)
    incl. *M. slevinii*
66. *M. cerralboa*

Series III. **Stylothelae** (Pfeiff.) K. Schum., Gesamt. Kakt., 516. 1898. (Map 2).
(Lectotype species: To be selected).

This group appears to be the natural extension of the previous Series in a southerly and easterly direction, with progressively 'softer' tubercles and weaker spination. A few species have evolved a brown seed. Buxbaum placed the species in three groups, the first two with hooked centrals, the third straight. Whilst it is difficult to see how a dividing line can be drawn between his first two groups, the third is separable not only by the spine character but fairly clearly geographically.

Subseries A: At least one central spine hooked

67. *M. barbata* (172)
68. *M. moelleriana* (170)
    incl. *M. cowperae* (2:45)
    ?*M. multihamata* (152)
69. *M. mercadensis* (160)
70. *M. guillauminiana* (1 pt. 6:5)



Map 2. Distribution of Series II. Ancistracanthae and III. Stylothelae. (List nos. 31–105).

71. *M. sinistrohamata* (169)
incl. *M. seideliana* (158)
72. *M. zacatecasensis* (2:31)
73. *M. gilensis* (153)
incl. ?*M. flavihamata*
74. *M. jaliscana* (174)
incl. ?*M. fuscohamata* (4:32)
75. *M. posseltiana* (163)
76. *M. pennispinosa* (7:47)
77. *M. stella-de-tacubaya* (*M. tacubayensis*)
incl. *M. gasseriana* (171)
78. *M. bombycina* (type species of *Chilita* subgenus *Euancistracantha* F. Buxb.) (157)
79. *M. weingartiana* (165)
incl. ?*M. unihamata*
80. *M. bocasana* (166)
incl. ?*M. longicoma* (155)
81. *M. knebeliana*
incl. ?*M. haehneliana* (178)
M. leucantha (113)

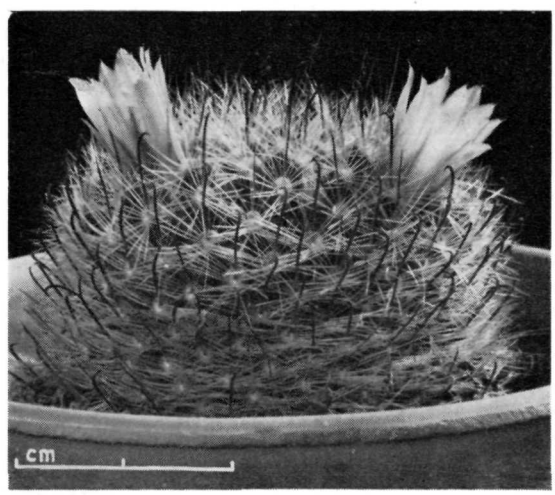


Fig. 8. A plant from the type collection of M. nana (now thought to be a re-description of M. eschanzieri).

82. *M. erythrosperma* (115)
incl. ?*M. multiformis* (148)
M. scheidweileriana (159)
83. *M. eschanzieri*
incl. *M. monancistracantha* (4:32)
M. nana (fig. 8)
?*M. trichacantha* (128)
84. *M. boedekeriana* (168)
incl. *M. aureoviridis*
M. aurihamata (112)
M. erectohamata (149)
85. *M. zeilmanniana* (143)
86. *M. kunzeana* (156)
87. *M. pygmaea* (122)
incl. *M. 'cadereytana'*
?*M. mollihamata*
88. *M. painteri* (167)
89. *M. rettigiana* (145)
90. *M. pubispina* (125)
91. *M. glochidiata* (121)
92. *M. schelhasei* (144)
93. *M. wildii* (type species of *Chilita* subgenus *Euebnerella* F. Buxb.) (111)
incl. ?*M. calleana* (3:30)
?*M. criniformis* (110)
?*M. crinita* (140)
94. *M. icamolensis* (124)
95. *M. glassii*

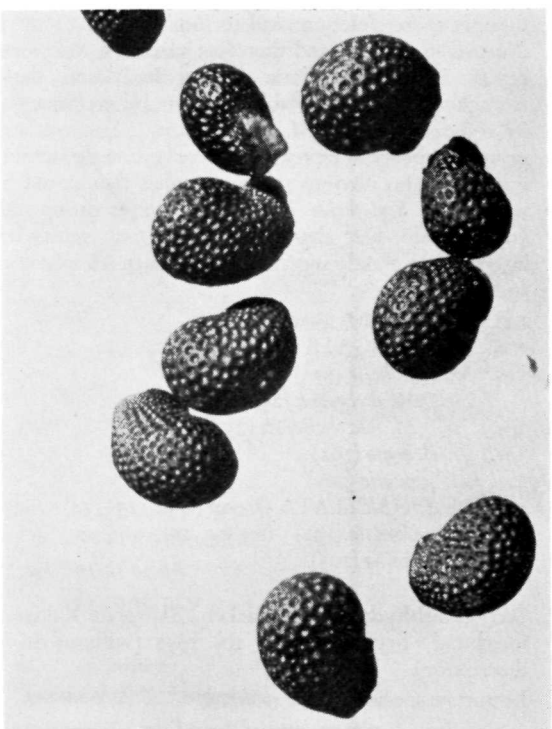


Fig. 9. Black, pitted seed of M. albicoma (x 18).

Subseries B: Central spines all straight (occasionally slightly hooked in no. 102)
M. PROLIFERA Group (spp. 96–101)
96. *M. prolifera* (221)
incl. *M. multiceps* (type species of *Chilita* subgenus *Rectochilita* F. Buxb.) (220)
97. *M. viereckii* (184)
98. *M. picta* (187)
incl. ?*M. aurisaeta* (6:40)
M. schieliana
99. *M. sanluisensis* (1 pt. 3:7)
100. *M. albicoma* (218) (fig. 9)
101. *M. subtilis* (? *M. pilispina*) (1 pt. 2:9)

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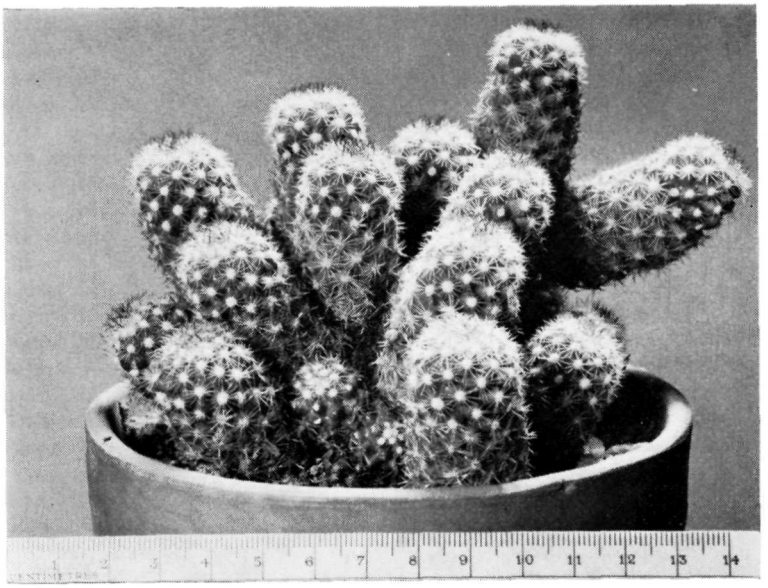
102. *M. schwarzii* (1 pt. 2:9)
M. GRACILIS Group (spp. 103–105)
103. *M. magneticola* (1 pt. 7)
104. *M. vetula* (231)
incl. *M. kuentziana* (7:12)
105. *M.gracilis* (*M. fragilis*) (100)

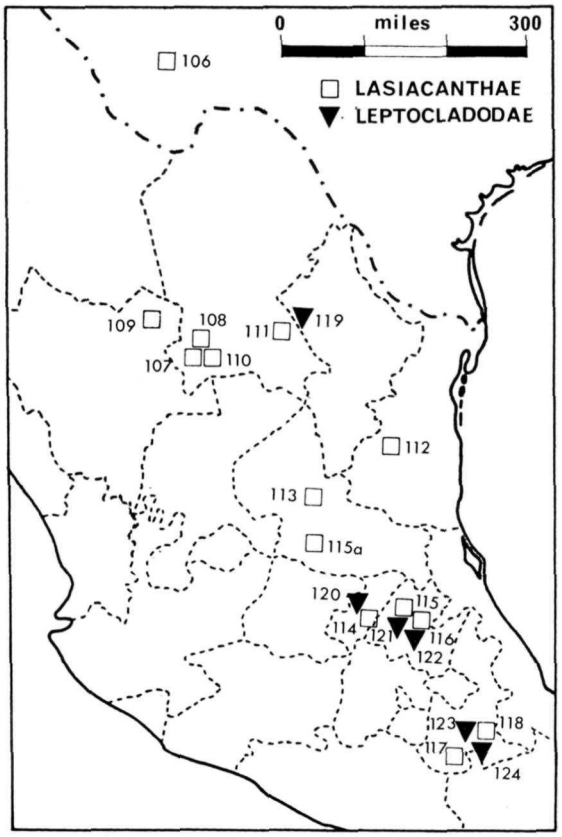
Series IV. **Lasiacanthae** D. R. Hunt, **series nova;** *plantae humiles, caespitosae, aculeis radialibus saepe permultis, aculeis centralibus deficientibus vel rarissime uno; seminibus nigris.* Syn. *Chilita* subgenus *Acentracantha* F. Buxb. in Sukkulentenkunde 5:23. 1954; *species typica M. lasiacantha* Engelm.

The species of this group are characterised by lack of central spines and abundance of radials. Geographically and morphologically they appear to be a development from the hooked-spine *Stylothelae* paralleling and intergrading with the straight-spined species of that group. None of the species has brown seeds, but *M. pectinifera* (and *M. aureilanata*, according to Boedeker) have evolved milky sap.

106. *M. lasiacantha* (109)
incl. *M. denudata*
?*M. estanzuelensis*
107. *M. magallanii* (180)
108. *M. roseocentra*
109. *M. lengdobleriana*
110. *M. lenta* (104)
111. *M. plumosa* (105)
112. *M. carmenae* (2:7)
113. *M. aureilanata* (106)
114. *M. herrerae* (107)
incl. *M. albiflora*
115. *M. schiedeana* (108)
incl. 115a. *M. dumetorum*, a species of uncertain status
116. *M. humboldtii* (102)
117. *M. solisioides* (2:67)
118. *M. pectinifera* (type species of genus *Solisia* B. & R.; sap milky).
Imperfectly known species of this Series:
M. egregia
M. neobertrandiana (1 pt. 6:5)

Fig. 10. Specimen of an intermediate between M. sphacelata and M. viperina. Collected between Tehuacan (Puebla) and Tomellin (Oaxaca) by Buchenau.





Map 3. Distribution of Series IV. Lasiacanthae and V. Leptocladodae. (List nos. 106–124).

Series V. **Leptocladodae** (Lem.) K. Schum., Gesamt. Kakt., 515. 1898. (Map 3).
Type species: *M. elongata* DC.

The species listed here fall into two groups which may be unrelated. The northern group, which Buxbaum thought more closely related to *Escobaria* than to other *Mammillaria* species and therefore placed in a separate genus, *Leptocladodia,* have brown seeds and show ambiguous affinities, notably to series *Heterochlorae* (cf. *M. densispina* and the *M. discolor* group). The southern group, probably to be regarded as only a single variable species, has no obvious relations, unless they could be with series *Stylothelae* via the *M. gracilis* group. *M. kraehenbuehlii* has characters which are somewhat intermediate, if only superficially, between *M. sphacelata* and *M. vetula.*

119. *M. pottsii* (*M. leona*) (238)
M. ELONGATA Group (spp. 120–122)
120. *M. microhelia* (235)
incl. *M. droegeana* (236)
M. microheliopsis (237)
121. *M. elongata* (101)
122. *M. echinaria* (203)
M. SPHACELATA Group (spp. 123–124)
123. *M. sphacelata* (192) (see fig. 10)
124. *M. viperina* (103)

Section **Subhydrochylus** Backeb., Blatter fur Kakteenforschung, 1938 pt. 6 (p. 10) 1938 (without Latin description).
Lectotype species: To be selected.

The three Series recognised here form a very natural interlocking group in central-Southern Mexico. At

their geographical boundaries their morphological distinctions are blurred. The group as a whole has morphological affinities with series *Ancistracanthae* and *Leptocladodae* on one hand and with the more highly evolved *Leucocephalae* and *Macrothelae* on the other.

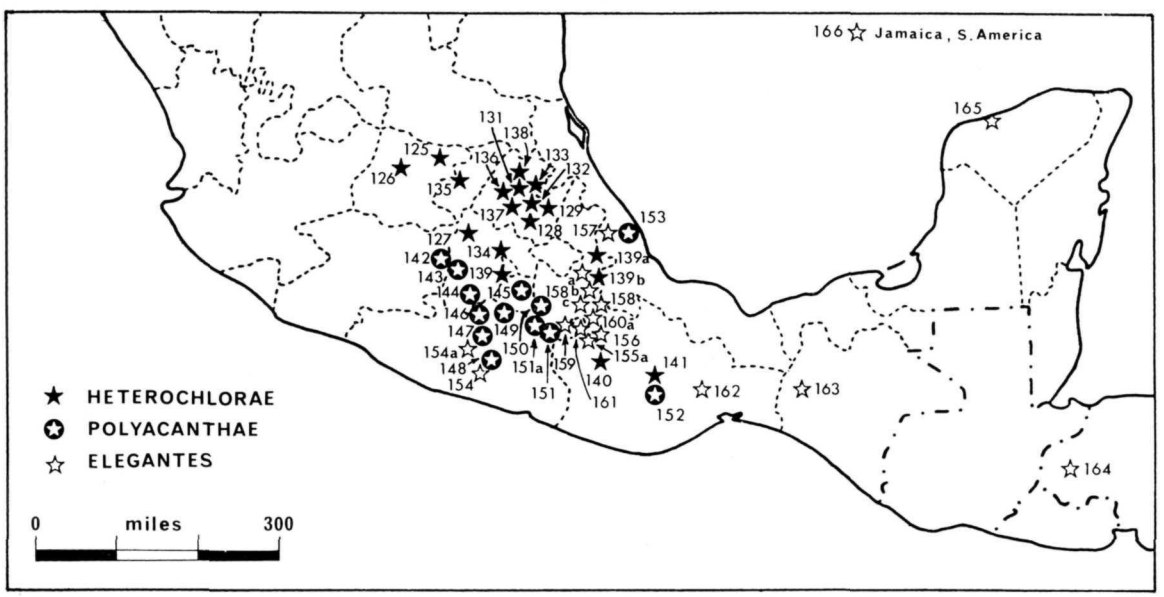
Following Buxbaum, I have left *M. eriacantha* as a member of the *Polyacanthae*. As such it will be seen from the map to be geographically anomalous, way over in *Elegantes* territory. It would be easy to transfer it to the latter series, and very probably correct, but undoubtedly the species has affinities to both series and its 'Atlantic' distribution may prove of significance when it is possible to reconstruct the evolutionary history of the genus, or at least this section, in more detail.

Series VI. **Heterochlorae** (Salm-Dyck) K. Schum., Gesamt. Kakt., 517. 1898.
Lectotype species: *M. discolor* Haw.

125. *M. densispina* (230)
    incl. ?*M. mieheana*
    M. RHODANTHA Group (spp. 126–134)
126. *M. neophaeacantha*
127. *M. pringlei* (208)
    incl. *M. parensis* (257)
128. *M. rhodantha* (189)
    incl. *M. aureiceps*
        M. 'bonavitii'
        ?*M. fera-rubra* (250)
        M. fuscata (225)
129. *M. amoena* (198)
130. *M. calacantha* (222)
131. *M. mollendorffiana* (1 pt. 4:6)
132. *M. rutila* (204a)
133. *M. wiesingeri* (194)
    incl. ?*M. mundtii* (199)
134. *M. erectacantha*
    Dubious species referable to this group:
    M. fuliginosa (206)
    M. phaeacantha (190)
    M. KEWENSIS Group (spp. 135–138)
135. *M. durispina* (97)
    incl. *M. kelleriana* (185)
        M. kewensis var. *craigiana*
        ?*M. subdurispina*
136. *M. kewensis* (96)
137. *M. obconella*
    incl. *M. dolichocentra*
        M. hoffmanniana (205)
        ?*M. polythele* (24)
        M. tetracantha Hort. non. Salm-Dyck (182)
138. *M. hidalgensis* (181)
    incl. *M. ingens* (1 pt. 7:7)
    M. DISCOLOR Group (spp. 139–141)
139. *M. discolor* (209)
    incl. 139a. *M. pachyrhiza*
        139b. *M. esperanzaensis* (211)
140. *M. ochoterenae* (207)
141. *M. schmollii* (232)

Series VII. **Polyacanthae** (Salm-Dyck) K. Schum., Gesamt. Kakt., 516. 1898.
Type species: *M. spinosissima* Lem.

142. *M. matudae* (1 pt. 8:8)
143. *M. meyranii* (1 pt. 8:9)
144. *M. backebergiana* (*M. fertilis* Hort. non Hildm.)
145. *M. spinosissima* (217)



Map 4. Distribution of Section Subhydrochylus (Series VI–VIII, list nos. 125–166).

146. *M. pitcayensis* (5:12)
147. *M. bella*
incl. *M. deliusiana*
?*M. joossensiana*
M. wuthenauiana (4:51)
148. *M. guerreronis* (91) (fig. 11)
incl. *M. zapilotensis* (93)
149. *M. nunezii* (214)
incl. *M. solisii* (type species of *Chilita* subgenus *Austroebnerella* F. Buxb.) (147)
150. *M. magnifica*
151. *M. duoformis* (1 pt. 5:6)
incl. 151a. *M. erythrocalix*
M. 'heeriana'
152. *M. rekoi* (92)
incl. *M. mitlensis*
M. pseudorekoi
M. pullihamata
M. rekoiana (90)
153. *M. eriacantha* (229)
Species of uncertain status, referable to this group:
M. hamata
M. neocoronaria
M. rossiana (4:83)
M. umbrina

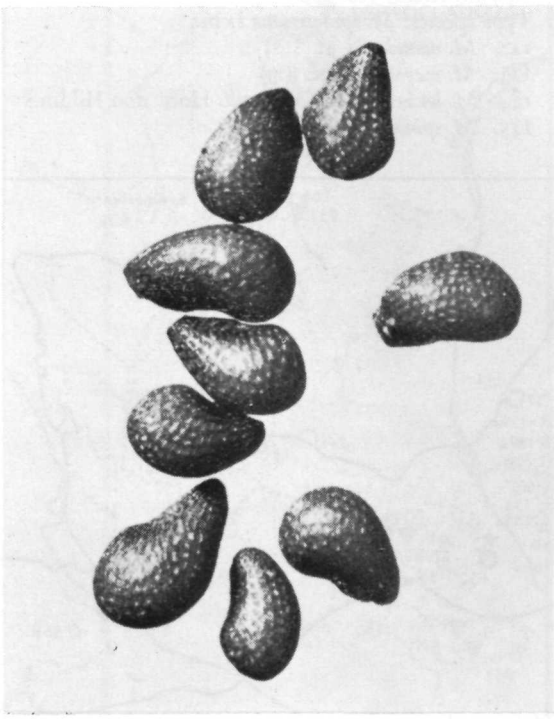


Fig. 11. *Brown, irregularly pitted seed of M. guerreronis.* (*x* 20).

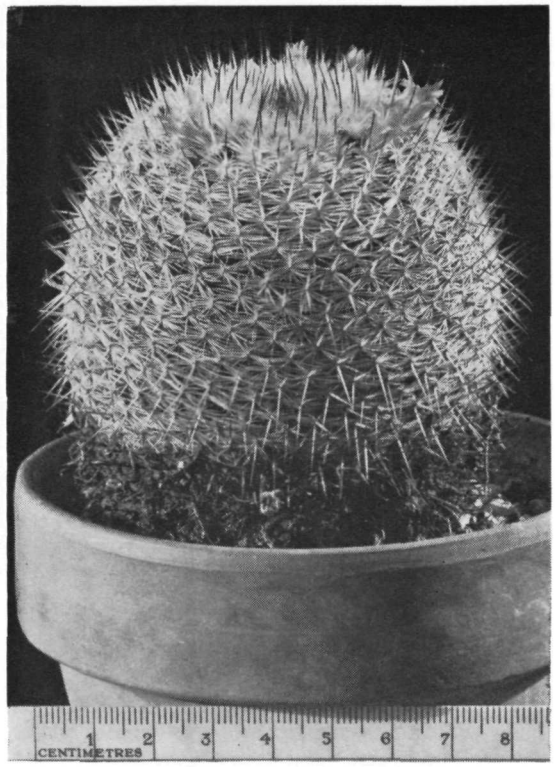


Fig. 12. *M. elegans. Collected specimen from Puebla: Tecamachalco (Hunt* 7385*).*

Series VIII. **Elegantes** K. Schum., Gesamt. Kakt., 561. 1898.
Type species: *M. elegans* DC.
154. *M. albilanata* (202)
incl. 154a. *M. fuauxiana* (1 pt. 4:6)
155. *M. lanata* (99)
incl. 155a. *M. martinezii* (3:4)
M. kunthii
?*M. pseudoperbella* (223)
M. supertexta
156. *M. vaupelii* (89)
157. *M. haageana* (197)
158. *M. elegans* (226) (fig. 12)
incl. 158a. *M. donatii* (201)
158b. *M. collina* (200)
158c. *M. conspicua* (213)
M. acanthophlegma
M. albidula (4:64)
M. dealbata
M. dyckiana
M. meissneri
159. *M. crucigera* (88)
incl. *M. buchenaui* (*M. falsicrucigera*)
160. *M. celsiana* (224)
incl. 160a. *M. flavicentra*

161. *M. dixanthocentron*
162. *M. halbingeri* (212)
163. *M. tegelbergiana*
164. *M. ruestii* (188)
165. *M. yucatanensis* (228)
166. *M. columbiana* (227)
incl. *M. bogotensis*
M. hennisii
M. soehlemannii
M. tamayonis
Species of uncertain status, referable to this series: *M. graessneriana* (204)

Section **Mammillaria** (syn. *Galactochylus* K. Schum.) (Map 5).
Series IX. **Leucocephalae** (Lem.) K. Schum., Gesamt. Kakt., 561. 1898.
Lectotype series: *M. parkinsonii* Ehrenb.

This Series, centred on the State of Querétaro and extending northwards, appears to be allied to the *Elegantes*, but generally the plants have a more depressed habit, and have milky sap in the tubercles coupled with a recognisably distinct seed. The similarities between the two groups have been a constant source of confusion and there remain several cases where the status and correct position of species well-known in collections by their names (though not by plants correctly identified) are uncertain, e.g. *M. muehlenpfordtii* (*M. neopotosina*) and *M. perbella*.

167. *M. chionocephala* (79)
incl. 167a. *M. ritteriana* (57)
M. caerulea (247)
168. *M. brauneana* (75)
incl. ?*M. saetigera* (54)
169. *M. formosa* (86)
170. *M. sempervivi* (34)
171. *M. klissingiana* (83)
172. *M. hahniana* (76)
incl. *M. bravoae* (77)
M. mendeliana (20)
M. woodsii (78)
173. *M. muehlenpfordtii* (*M. neopotosina*) (81)
174. *M. parkinsonii* (82)
incl. 174a. *M. morganiana* (87)
174b. *M. rosensis* (259)
174c. *M. cadereytensis* (246) (fig. 13)
174d. *M. infernillensis* (85)
M. 'aljibensis'
M. auriareolis (241)
M. avila-camachoi (4:8)
?*M. leucocentra*
M. pseudocrucigera
M. queretarica (258)
M. tiegeliana
?*M. vonwyssiana*
175. *M. microthele*
incl. ?*M. perbella* Hort., non Hildm. (195)
176. *M. geminispina* (52)

Series X. **Macrothelae** (Salm-Dyck) K. Schum., Gesamt. Kakt., 561. 1898.
Type species: *M. mammillaris* (L.) Karst.

This large Series covers virtually the entire geographical range of the genus. It is tempting to suggest that it is not only morphologically one of the most highly evolved series but also the most 'successful' in terms of dispersal and diversity and that these are a biological example of cause and effect. The ancestral roots of the group probably go very deep, but the superficial resemblance of some of its present day

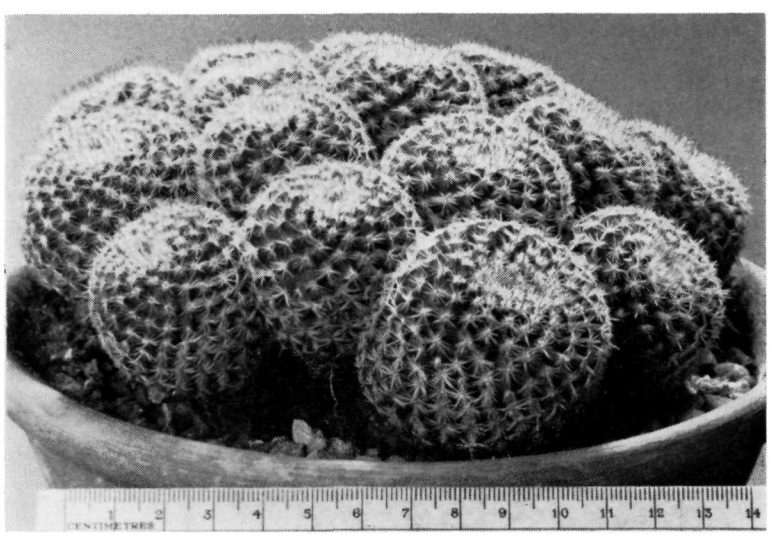


Fig. 13. M. cadereytensis (one of the M. parkinsonii alliance). A collected plant from the type locality (Querêtaro: Cadereyta; Buchenau).

members to species of the *Heterochlorae*, e.g. *M. kewensis*, may be more than pure coincidence or evolutionary convergence.

177. *M. mammillaris* (type species of the genus *Mammillaria* Haw.; *M. simplex*) (72)
incl. *M. pseudosimplex* (5:55)
178. *M. ekmanii* (possibly referable here: *M. glomerata*)
179. *M. nivosa* (40)
incl. *M. flavescens*
180. *M. gaumeri* (69)
M. HEYDERI Group (spp. 181–188)
181. *M. heyderi* (84)
incl. 181a. *M. applanata* (64)
181b. *M. hemisphaerica* (60)
181c. *M. macdougalii* (61)
181d. *M. meiacantha* (21)
182. *M. gummifera* (62)
183. *M. zahniana* (11)
incl. 183a. *M. winteriae* (10)
183b. *M. melispina* (22)
184. *M. melanocentra* (39)
incl. *M. euthele*
185. *M. grusonii*
incl. *M. mexicensis* (252)
M. pachycylindrica (2:56)
186. *M. zeyeriana* (73)
187. *M. albiarmata* (17)
188. *M. coahuilensis* (type species of genus *Porfiria* Boed.; *M. schwartzii*)

---

189. *M. wagneriana*
incl. ?*M. obscura* (35)
190. *M. xanthina* (70)
M. STANDLEYI Group (spp. 191–203)
191. *M. craigii* (38)
incl. 191a. ?*M. movensis* (254)
192. *M. tesopacensis* (71)
193. *M. bocensis* (33)
incl. 193a. *M. rubida*
M. neoschwarzeana (7:79)
194. *M. sonorensis* (59)
195. *M. bellisiana* (245)
196. *M. hertrichiana* (59)
197. *M. montensis* (253)
198. *M. canalensis* (248)
incl. ?*M. auricantha* (242)
M. auritricha (243)
M. bellacantha (244)
M. floresii
M. laneusumma (251)
M. mayensis (80)
199. *M. standleyi* (55)
200. *M. marksiana*
201. *M. lindsayi* (56)
202. *M. scrippsiana* (50)
incl. *M. 'autlanensis'*
M. pseudoscrippsiana (3:31)
203. *M. johnstonii* (65)
Also probably referable to this group:
M. ortegae (?*M. bergii*) (9)
M. ARIDA Group (spp. 204–208)
204. *M. glareosa*
incl. *M. dawsonii* (41)
205. *M. brandegeei* (44)
incl. *M. lewisiana* (1 pt. 7:6)
206. *M. arida* (66)
incl. 206a. *M. petrophila* (28)
206b. *M. gatesii* (42)
?*M. baxteriana* (43)
M. pacifica
207. *M. evermanniana* (53)
208. *M. peninsularis* (13)
M. GIGANTEA Group (spp. 209–210)
209. *M. gigantea* (68)
incl. *M. armatissima* (240)
?*M. hastifera*
210. *M. petterssonii*
incl. *M. hamiltonhoytea* (49)
M. ocotillensis (256)
M. pilensis (2:31, 3:66)
M. saint-pieana
M. MAGNIMAMMA Group (spp. 211–212)
211. *M. roseoalba* (15)
212. *M. magnimamma* (12) (figs. 14, 15)
incl. 212a. *M. vagaspina* (27)
212b. *M. bucareliensis* (incl. *M. bicornuta*) (36)
212c. *M. centricirrha*
?*M. flavovirens* (32)
?*M. macracantha*
?*M. pentacantha*
?*M. phymatothele* (48)
?*M. zuccariniana* (46)

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213. *M. uncinata* (19)
214. *M. lloydii* (16)

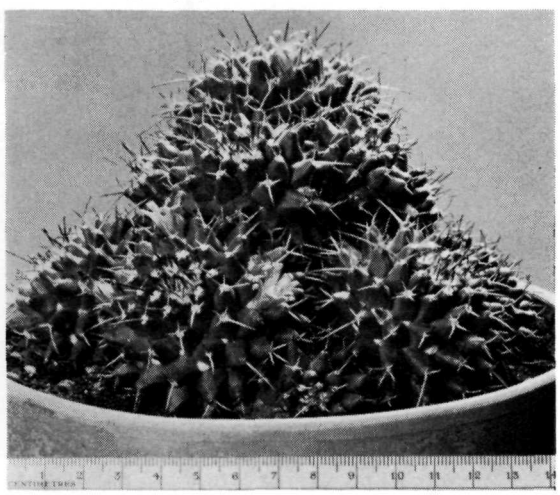
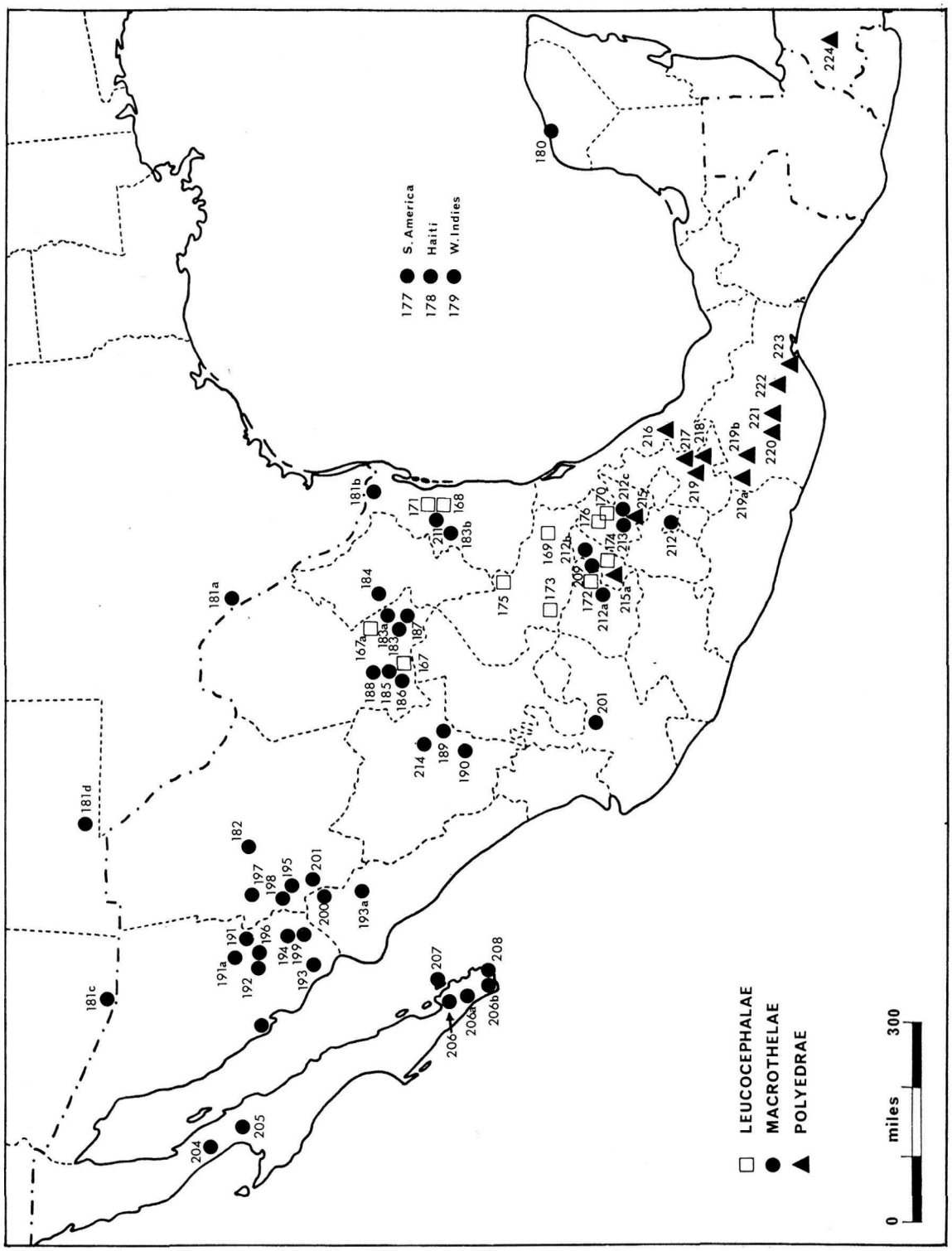


Fig. 14. M. magnimamma in one of its many varieties.



Map 5. Distribution of Section Galactochylus (Series IX–XI, list nos. 167–224).

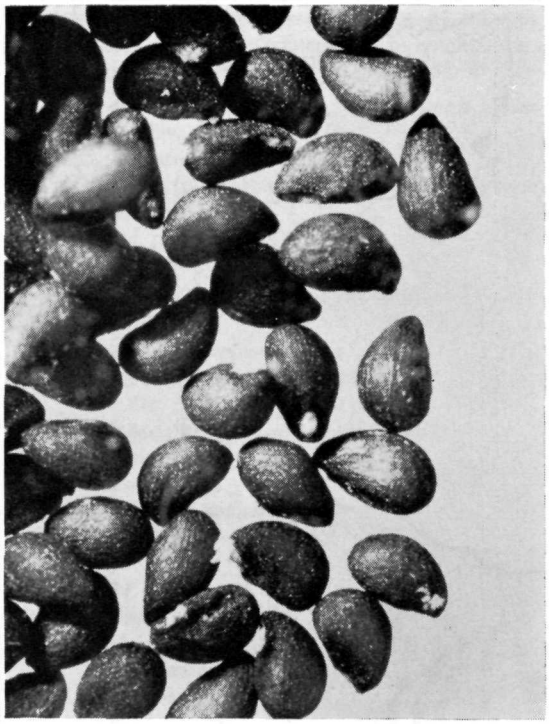


Fig. 15. Brown seed of M. magnimamma (x 18). The testa structure is not fundamentally different from that of M. guerreronis (fig. 11) but the testa is so thin and wrinkled that pits are not apparent.

Series XI. **Polyedrae** (Pfeiff.) K. Schum., Gesamt. Kakt. 563. 1898.
Type species: *M. polyedra* Mart.

A southern group, very closely allied to the *Macrothelae* where possibly some of its members, e.g. *M. compressa* would be better placed. *M. carnea,* though lacking the typical axillary bristles of the Series, seems to belong here.

215. *M. compressa* (2)
    incl. 215a. *M. tolimensis* (260)
        M. seitziana (3)
216. *M. sartorii* (45)
    incl. 216a. *M. tenampensis* (27)
217. *M. orcuttii* (23)
218. *M. carnea* (21)
    M. KARWINSKIANA Group (spp. 219–224)
219. *M. mystax* (31)
    incl. 219a. *M. huajuapensis* (4:63)
        219b. *M. casoi*
            ?*M. atroflorens* (6:40)
            M. crispiseta (249)
            M. mixtecensis (4:63)
            ?*M. varieaculeata*
220. *M. polyedra* (4)
    incl. *M. subpolyedra*

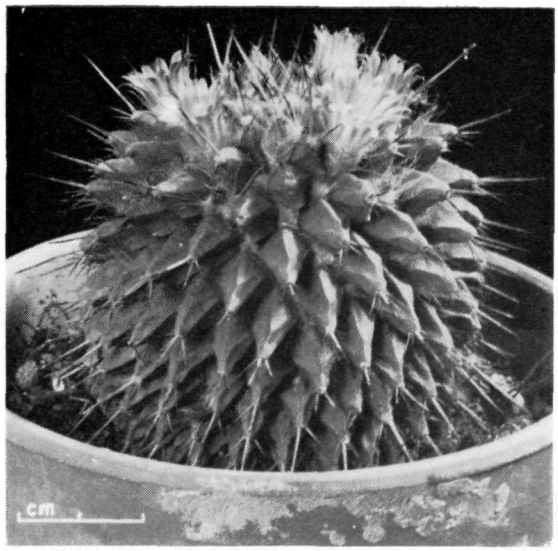


Fig. 16. M. polyedra. Note the many-faceted tubercles and axillary bristles.

221. *M. karwinskiana* (6)
    incl. *M. confusa* (5)
        M. conzattii
        M. ebenacantha
        ?*M. fischeri*
        ?*M. neomystax*
222. *M. nejapensis* (1 pt. 3:7)
223. *M. collinsii* (30)
    incl. *M. josef-bergeri*
        M. strobilina (18)
        ?*M. voburnensis* (25)
224. *M. eichlamii* (29)
    Dubious species referable to this group:
    M. esseriana (51)
    M. knippeliana (7)
    M. multiseta
    M. polygona (26)
    M. praelii (8)

Acknowledgments

This article has been compiled to commemorate the fortieth anniversary of the Cactus and Succulent Society of Great Britain, and it gives me an opportunity to say how much I attribute the continuing popularity of the genus *Mammillaria* amongst cactophiles to the influence of the Society's Founder, the late Mr. E. Shurly, for whom the genus was an absorbing interest for so many years. It is doubtful whether Craig's Handbook could have been produced without Shurly's collaboration, and I have continually consulted his enormous typescript 'A Detailed Bibliography of Mammillarias' (of which he presented a copy to the Royal Botanic Gardens, Kew) and his collection of seeds and maps (now the property

of the Mammillaria Society) during the course of my 10 years' spare-time study of the genus.

In recent years, I have enjoyed much fruitful discussion of the genus (not to say generous hospitality) with enthusiasts both at home and in Mexico and the U.S.A. Amongst these friends I must particularly mention Mr. & Mrs. W. F. Maddams and Messrs. Charles Glass and Robert Foster, since many of their ideas and observations are incorporated in what I have written.

I am also grateful to several colleagues at Kew who have assisted in the preparation of this article. The photographs are by Mr. T. Harwood (figs. 3, 9, 11, 15) and Mr. R. Zabeau (figs. 2, 4-6, 8, 10, 12-14, 16). Fig. 7 is reprinted by courtesy of the Mammillaria Society.

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Index to Mammillaria species names in the classified list. Accepted species and hybrids in Roman, others in italic; certain imperfectly known species not mentioned in the list are included and cited 'sp. dub.' (species dubia).

Show Reports

Chelsea Show 1971.

The exhibit in the name of our Society at this year's Chelsea Flower Show was more of a co-operative effort than the previous two operations. Members of the older Hertfordshire County Branch, together with those of the newly formed Hatfield and District Branch, combined to provide most of the average sized plants on show. Our Chairman, Mr. A. Boarder, and our old friends of the North London Branch—Rene Dyson and Percy Collings—together with Chris Coles, generously gave aid in the form of those larger plants so essential as a backbone and foil to the stand. Knowing the importance of colour, Harry Auger, with other commitments making it impossible for him to show in person this year, selected a varied dozen hybrid epiphyllums which would be in flower during the show. Not content with having done this, he also delivered the plants to our central point of collection and collected them from there after the event.

Our central collecting point was, by the good offices and grace of our President, Mrs. Dora Shurly, the thirty foot long greenhouse in her garden at St. Albans. Hearing of our need for more staff at and after the show, the Essex Branch launched themselves upon us with offers of help, as did some members of North Surrey. To all who aided us in the innumerable ways that only a show can bring forth, I would like to express my own personal appreciation and thanks together with the thanks of my Branch.

It would be discourteous of me if no mention were made of the extensive range of gymnocalyciums utilised on one corner of the stand. These were a few of the plants from the specialised collection of the late Miss Annie Dixon, one of the oldest members of the Society and the co-founder of the Hertfordshire Branch. It had always been her wish to take part in a Chelsea exhibit and, after her death in January of this year, her heir, Mr. John Dixon, collaborated with the writer to make this possible.

As usual, the large groups of mammillaria in flower provided by Mr. Boarder came in for much comment and did much to help fill a stand space of seventeen feet by ten. Notocactus and late-flowering rebutias formed a group in another corner, backed by a short range of astrophytums in variety.

The wide range of succulents which attracted so much attention came from a lady who has only lately decided to take a more active part in the hobby, namely Mrs. D. Davies of Hatfield. She also decided that, as her plants were going to be at Chelsea, she might as well join them. This was her first taste of stand duty and the general public in a questioning mood and like many other folk, she had difficulty in realising that her turn for relief had come around owing to her intense enjoyment of the situation and the consequent swift passage of time. A.C.

NORTH LONDON BRANCH, ANNUAL SHOW

The North London Branch held their 1971 show on the 25th, 26th April at Capel Manor Horticultural Centre. Exhibits were staged in a lecture room and a large greenhouse was used for plant sales. The organisation was capably handled by Mr. J. Worrall; the 28 open classes and four beginners classes were all well supported and attracted considerable interest from the general public and praise from our Judge, Mr. T. Hotton.

The rosette for the best cactus in show was awarded to Mr. N. Ivory for his superb multi-headed *Mammillaria bombycina*. The rosette for the best succulent went to Mrs. H. Guirl for her *Gibbaeum heathii*, a splendid plant with some 20 heads. Mrs. Guirl also won the "Ivory Cup" for three mesembryanthemumus with *G. heathii*, *Lithops aucampiae* and *Cheiridopsis crassa*. However the plant which attracted most public interest was Mr. R. Dale's *Mammillaria rhodantha cristate*, which must have measured over a foot across the fan-like cristation.

A.R.S.

Secretary's Notes

ANNUAL DINNER—THURSDAY NOVEMBER 25TH 1971

This year, being the Society's 40th Anniversary I want the Dinner to be a special success. It is hoped that we shall have some distinguished guests present including the Secretary of the Royal Horticultural Society.

Please make a diary note of the date NOW. The venue will be the same as last year, i.e. "The Windsor" —333 Vauxhall Bridge Road, London, S.W.1. Final details are still being worked out and will appear in the November issue.

An application form for seats is enclosed and should be sent to me duly completed as soon as possible. No tickets as such will be issued and presentation of your cheque may be taken as acknowledgement of receipt.

CHELSEA SHOW—1971

Another highly commendable exhibit was staged this year at Chelsea. This time the Hertfordshire Branch with Mrs. Massey at the helm brought home a Silver Banksian Medal to add to those of earlier Chelseas.

All the exhibits so far staged at this venue have been quite different and this year's was no exception. A pleasant balance was achieved between cacti and other succulents and some attractive epiphyllums in bloom provided height and beauty to the centre.

I would like to add my own thanks and those of the Council to both Mr. Clare and Mr. Hurley who once again sacrificed a week of their holiday so as to ensure that the show was stewarded at all times.

May I also add my personal thanks to all the members who came forward as stewards and also offer a special thank you to all the people involved both in the setting up and breaking down of the show. This is the sort of effort which makes the society what it is. R.H.I.R.

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For the November issue	1st October

In addition there is a SMALL ADS. column at 8p per line, minimum 24p for which copy should be received on the above dates also.

A Booklet on the Classification of Cacti and Succulents is now available from the Show Secretary. The price is 5p each plus postage. Branch Secretaries can obtain them at 12 for 50p plus postage. Postage is 1-8 copies 3p, 9-11 copies 5p. Postal Order or cheque, NOT stamps, please.

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THE CACTUS AND SUCCULENT JOURNAL OF GREAT BRITAIN

Vol. 33 November, 1971 No. 4

CONTENTS

Annual General Meeting

IN ACCORDANCE WITH Rule 6, I hereby give notice that an Annual General Meeting of the Cactus and Succulent Society of Great Britain will be held on Wednesday, 29th March, 1972 in the New Hall Lecture Room of the Royal Horticultural Society, Greycoat Street, London, S.W.1, commencing at 6.30 p.m.

The attention of members is drawn to Rule 5, sections (d) and (e) which define the procedure to be followed in the election of Officers and Council. The Rule requires that the President and the several Vice-Presidents be elected annually by a show of hands at the Annual General Meeting. The Chairman, Honorary Secretary, Honorary Treasurer and members of Council to fill the vacancies resulting from the retirement of members who have completed their three-year term of office will be elected by postal ballot in the event of the number of nominations exceeding the number of vacancies.

Nominations are therefore invited for the offices of Chairman, Honorary Secretary, Honorary Treasurer and three members of Council. These nominations must be in writing and must bear the signature of a proposer and seconder and be accompanied by the written and signed consent of the person nominated. Such nominations must be in the hands of the Honorary Secretary not less than nine weeks prior to the Annual General Meeting, that is, not later than Tuesday, January 25th, 1972.

The following are due to retire and are eligible for re-nomination:—

Chairman	Mr. A. Boarder
Honorary Secretary	Mr. R. H. I. Read
Honorary Treasurer	Mr. D. T. Best
Members of Council	Mesdames R. J. Dyson, B. Maddams
	Mr. H. A. Auger.

In the event of the number of nominations exceeding the number of vacancies a ballot paper will be circulated to paid-up members not less than 6 weeks prior to the Annual General Meeting.

R. H. I. READ
Honorary Secretary

Forty Years Ago — Looking Back

ANNIVERSARIES are suitable occasions for looking back. This month our Society celebrates its fortieth birthday in the happy position of being able to do just this through the eys of some of those who were there at the beginning. Mrs. Shurly, Mr. Boarder and Mr. Collings need no introduction to members and their contributions to this Anniversary Number of our Journal are most welcome.

from Mrs. D. SHURLY, President

Over forty years ago a certain gentleman was invited by his father-in-law to visit a horticultural exhibition at the People's Palace, Mile End Road, London. He agreed and while there saw one exhibit that fascinated him. It was an exhibit by a Mr. Emms, a friend of Mr. Endean a well known collector at that time, of a number of queer, exotic looking small plants in a miniature greenhouse. That gentleman was my dear late husband, Mr. E. W. Shurly. His interest grew, and he cast around for others who might share his interest and pleasure. He began to contribute articles on his experience with these plants to "Amateur Gardening" and thought of putting a query in the correspondence column of that very reputable paper to find out the strength of that interest and the possibility of forming a society. The response was sufficient to encourage the idea and an inaugural meeting was held at St. Bride's Institute, London at 3.00 p.m. on November 28th, 1931 where I was at the door checking on those who arrived. Eighty or more people attended.

The Society was formed and Sir William Lawrence Bt., V.M.H. was voted to the Chair. Mr. P. V. Collings, Mr. R. S. Fardon, Mr. H. G. Harrison, Mrs. V. Higgins, Mr. O'Donoghue and Mr. E. W. Shurly were elected as the provisional Committee with Mr. E. W. Shurly as Honorary Secretary. The membership grew to around 300 and a Journal was published under the very efficient editorship of the late Mrs. V. Higgins. Many contributors have become world famous.

The objects of the Society were to collect information of all kinds in respect of cacti and succulents, organise exhibitions, issue publicity, and take steps to create and further the interest of collectors of these plants. These objects at that stage were very painstakingly undertaken by some of the officials. The Society continued happily until the outbreak of the Second World War in 1939, when conditions eventually rendered it necessary to suspend its activities for the time being.

After the war it was very difficult to get in touch with each other and when one did there was a woeful tale of loss or destruction of members' collections or personal tragedy. However, Mr. Shurly did a very good job in picking up the threads and making them into a corporate Society again under the presidency of the Earl of Mansfield. A decision was made to re-start the Journal and Mr. Shurly offered to be Editor "temporarily"; however this lasted for many years until failing health made it impossible for him to carry on.

The Society acted as hosts to the I.O.S. Third Congress in September 1955 at the Normandie Hotel, Knightsbridge. A very excellent exhibition of plants was staged at the Royal Horticultural Society's Hall in Vincent Square, and the venue became the Mecca of the cactus world.

The Society had some very good officers and its reputation grew. The objects it set out to do have been and are in course of performance.

In the early days it had been noted by some members that there were quite a number who had defective hearing, Mr. Shurly among them. The pleasure and quiet content that their plants afforded was a source of satisfaction to them.

from P. V. COLLINGS, Vice-President

In 1917, while on leave from the Forces, I met a friend, also on leave, who invited me to his home and while walking round his garden, I noticed in his greenhouse two very peculiar plants the like of which I had not seen before. My friend told me they were 'cacti'. I have since learned that one was *Mammillaria gracilis,* the other *Gasteria maculata.* That encounter started my interest in this branch of horticulture. I obtained the address of the nursery where these plants had been purchased and promptly visited it to find they only stocked these two varieties, and bought one of each for myself.

Having acquired over the years a collection of about 200 cacti and other succulents, in 1929 I started writing articles on their cultivation in Popular Gardening. Also appearing at that time were articles on the same subject by a Mr. E. Shurly. As his opinion and mine differed considerably I eventually asked the Editor of the paper for Mr. Shurly's address. To my surprise I found he lived only four miles away from me. I contacted him and we met on several occasions to discuss our different ideas on cultivation of cacti. During one of these talks Mr. Shurly put forward the idea of forming a society for those interested in cacti. I agreed that this was an

excellent idea and we circulated all whom we knew who grew them. An inaugural meeting was arranged at St. Bride's Institute for November, 28th 1931. Over 80 collectors attended. It was decided to form a Society and for the sum of 5/-, each of those present became members; and so was born The Cactus and Succulent Society of Great Britain.

In his capacity as Secretary, Mr. Shurly obtained the services of Sir William Lawrence, Bt., as President and Mr. R. S. Fardon as Chairman of the Council. Mrs. Vera Higgins, M.A., was appointed Editor and Meetings Secretary. Later Mrs. Higgins became librarian and held this post until I took over in 1933—a position which I held for 35 years until I retired to Hailsham in Sussex. Today the only surviving member of the original Council is myself.

In 1933 the first Dinner of the Society was held at the R.H.S. Hall. This was a splendid and very formal occasion; many professional growers were present as was also Col. Durham, Secretary of the R.H.S.

At the peak of my collection I had about 3,000 plants including the much-prized *Machaerocereus eruca*—the Creeping Devil—and many descendants of my original collection of 1917 to 1931 housed in a greenhouse 25 foot by 14 and two other houses 16 foot by 8.

from ARTHUR BOARDER, Chairman

It seems a long time ago when the Society was formed and it is rather difficult to remember all the various characters who joined during the first year or so. There was little or no advertising of the Society in those days and it was only by personal recommendations that new members were found. I do not know how many of the original members are still with us, and besides myself I can only name Mrs. Shurly and Percy Collings. There may be others and if so I trust that they will let the Editor know so that they can be acknowledged.

I suppose that the outstanding figure of those early days was Mrs. Vera Higgins. She was our first Editor and always took a leading part at all our meetings. Her husband was also a member but always appeared to remain somewhat in the background. I remember at the meeting when the name of the Society was being discussed that Mrs. Higgins wanted it to be called the Succulent Society of Great Britain, but this title was overruled for the present title. Mrs. Higgins argued that the plants were all succulents and the proposed name would cover all the plants. The argument against this was that few people would be as interested in the title succulent as they would be with cactus. Mrs. Higgins was of course right in her opinion as one might just as well name a Sparrow Society as the Sparrow and Bird Society.

Another member who was always present at the meetings was Mr. R. S. Farden. He was an ardent collector and had a good collection including many Haworthias, a subject on which he wrote in the Journal. He used to travel to Belgium for plants from the nursery of Fr. de Laet at Contich, and was sometimes accompanied by my old friend Mr. Green of Bury House, Ruislip. Another member who is easily remembered is Dr. H. T. Marrable and he often spoke or submitted articles for the journal. A member who gave a talk on occasions was Mr. O'Donoghue, and I remember that he was rather scathing with his remarks when he saw some young cactus seedlings I had brought up to a meeting, saying that they would not live through the winter. As some were several years old this was proved to be not true.

One man stood out in my recollections. I am not sure if he was a member or not, but he gave a talk and used to exhibit at the fortnightly shows at the R.H.S. Hall, he was Mr. T. M. Endean. He was a great character and he always recommended growing our plants in burnt clay. This brought up plenty of arguments at meetings, but the specimens of Lithops and Conophytums which he exhibited at the shows was proof that he could grow these plants excellently whatever medium he used. I shall never forget seeing some of his plants of these genera, large pans a foot or more across with splendid specimens of both Lithops and Conophytums and I do not think I have seen such fine specimens since then.

Dr. N. E. Brown was also one of the earliest speakers I remember at our meetings, which were always attended by a goodly number of members. Our first President was Sir William Lawrence, but unfortunately he died on January 4th, 1934. Some of our earlier members were: the Rev. F. C. Champion, Miss M. E. Durham, Messrs. F. J. Chittenden, C. J. Lambert, G. Lamb and H. J. de Vries.

Our first journal was published in September, 1933, and since then has continued to be available to members apart from the war years. The first exhibition was held on June 20th, in the old hall and was a great success. One of the outstanding features of this show was the splendid display by Messrs. W. T. and H. E. Neale. This took up nearly 100 feet of staging and was so arranged that the various new genera introduced by Britton and Rose were kept in their respective groups and this was very interesting and instructive for members. I remember some of the exhibitors at this show and Percy Collings was among them, also Mr. W. Denton, Capt. Noakes, Mr. R. S. Farden, Mr. W. G. Theobald, Mr. S. J. Pullen, Mr. W. F. Higgins and Mr. J. Haddon. There were sixteen classes at this first show.

At the second exhibition of the Society on July 24th, 1934, the Neales again put up a splendid show of plants, which took up the whole of one side of the hall. In this show there were 18 classes and I was fortunate enough to win a first for cacti raised from seed. At that time only one show was held each year but it was found that at each show fresh members were obtained.

Anniversary Display at Westminster

Forty Years of Succulent Plant Growing

PROMINENT among the events arranged to celebrate the Fortieth Anniversary of the Society this year was the display of plants at the Fortnightly Show of the Royal Horticultural Society on July 13,14. Arranged by the Anniversary Sub-Committee under the chairmanship of Mr. W. F. Maddams, the display traced the progress and trends in growing succulent plants over the period since 1931 when the Society was founded. The plants on show were arranged in four sections, each covering a decade.

1931-40—In this section we were able to show some plants that were in the collection of Mr. Percy Collings, a founder member of the Society, prior to 1931, among them *Echinocactus ingens* and *Asterophytum myriostigma.*

The founder of the Society, the late E. Shurly, was known internationally for his research work on the genus Mammillaria. It was therefore appropriate to display the ten Mammillaria species described in 1931. They show well the diversity of form to be found in this, usually considered the most popular genus of the Cactaceae. *Mammillaria* species in this group are: *blossfeldiana, hamilton-hoytae, herrerae, mendeliana, microheliopsis, ochoterenae, ortiz-rubiona, phitauiana, surculosa, zeilmanniana.*

A wide range of cacti and other succulents were in cultivation during the years immediately preceding the Second World War and several themes are possible. The choice of a group of Stapeliads was made because this was a period of intense activity in this group of genera, culminating in the publication of one of the classic texts on the subject "The Stapeliae" by White and Sloane (1937). Stapelias, Carallumas and Huernias are amongst the genera depicted in this group.

1941-51—Not surprisingly most of the fine collections in Great Britain were lost during the period 1940-45 and activity in the field was virtually non-existent.

Fortunately, progress was being made in the United States at this time and three valuable books were published. They are "Cactaceae" by Marshall and Bock, "The Mammillaria Handbook" by Dr. Craig and "The Succulent Euphorbieae" by White, Dyer and Sloane. The display showed a few of the many plants of interest to be found in the Family Euphorbiaceae.

The period 1945-50 saw the renaissance of succulent plant collections in this country. Circumstances were difficult and imported plants were not available. Consequently, plants were grown from the limited range of seeds then obtainable and various Mammillaria species figured prominently among these. The group of specimen Mammillaria, grown from seed in this era, was from the collection of Mr. Arthur Boarder, a founder member and now Chairman of the Society.

1951-61—Although some excellent collections of cacti were being assembled during the years 1950-55 there was a strong interest in the Mesembryanthemaceae. This family includes a wide range of highly succulent genera of which Lithops and Conophytum are probably

the best known. Others in the section here include Fenestraria, Faucaria and Stomatium.

By the latter part of the decade a wide range of plants was available and it is quite impossible to give a representative coverage in a small group. The plants shown were, therefore, selected from the more popular genera of the period.

1961-71—This decade witnessed an upsurge of collecting in many parts of the world which has enriched succulent plant collections. There is little doubt that the obvious feature of the early sixties was the influx of new cacti from the western side of South America, very varied in form and all attractive. For the most part they belong to the sub-tribes Cereanae and Echinocactanae. Included in this group are Copiapoas, Horridocactus, Espostoas, Eulychnias and Matucanas.

There has been another swing of the pendulum in recent years and the plants most recently in fashion are various of the other succulents, particularly those with swollen stems, the so-called caudiciform plants. These are often weird in appearance, particularly during their resting seasons. They come from a wide range of plant families, including the Apocynaceae (*Adenium globosum*), Cucurbitaceae (*Momordica rostratus*), Fouquieraceae (*Idria columnaris*), Geraniaceae (*Sarcocaulon burmannii*), Pedalinaceae (*Sesamothamnus lugardii*), Portulacaceae (*Ceraria pygmaea*), Vitaceae (*Cissus hypoleuca*).

Four Decades—Anniversary Display at Westminster, July, 1971 (photos: B. Maddams)

The Sub-Committee wishes to thank the following members for assistance in the preparation of this display: Mrs. Marshall (Berks. & Bucks. Branch) for the loan of an interesting painted backcloth, Mrs. Whicher (North Surrey Branch) for labelling the exhibits and Messrs. P. V. Collings, A. Boarder, D. V. Brewerton, C. G. Brown and A. Woodward for the loan of plants.

Mammillaria weingartiana and Friends

by Ed. and Betty Gay

To most cactophiles living in the western United States, one of the most pleasurable features of our hobby is the opportunity to visit, photograph and collect cacti in habitat. When this experience is combined with a visit to a foreign country, nearby but different from our own in language and customs, it is doubly fascinating. When it is further enhanced by the company of like-minded friends, it is triply enjoyable.

After the May, 1971 convention of the Cactus and Succulent Society of America, we had the privilege of leading one of the post-convention field trips. Our group set forth for a two-week journey through several of the States of northern Mexico, leaving from and returning to the convention city of El Paso, Texas. Altogether there were twenty-five of us in eleven field vehicles, from all parts of the U.S. and even from England. We were fortunate in having Pat Read from Surrey as our passenger and companion.

The trip began none too comfortably, in the hot and drought-stricken lower Chihuahuan Desert of southern Texas and northern Coahuila. On the fourth day, though, the road led upward through Saltillo to the six thousand foot elevation of the central highlands. Afternoon thunderstorms washed and fattened the plants and refreshed the travellers, so that we were in a mood of happy anticipation as we swung eastward from the main highway at Matehuala toward the small town of Ascension, Nuevo Leon.

This side trip, recommended by Charles Glass and Bob Foster, proved to be thoroughly delightful; so much so that it was two and a half days later and we were a full day behind schedule by the time we had covered the distance of 185 miles to Linares and another arterial highway. The days were kaleidoscopes of shifting scenes as the road wound up to eight thousand feet and back below three thousand, over mountains, through alpine valleys, and between cliffs.

It can be deduced that with so much difference in altitude and terrain there was a rich variety of vegetation. Leaving Matehuala, we were in high desert country, dominated by immense yuccas, softened by bushes of larrea and calliandra, with a wealth of cacti. These varied from huge specimens of *Echinocactus viznaga* and *Ferocactus pilosus* through a wide range of *Coryphantha* and *Thelocactus* species down to tiny gems of *Turbinicarpus macrochele*. The most abundant *Mammillarias* were green clusters of *M. ritteriana v. quadricentralis* and fine plump snowballs of *M. candida*. A lucky few in our group found specimens of *M. albicoma*. In several areas the hillsides were covered by vigorous stands of *Dasylirion longissima*, great globes of long needle-like leaves shimmering in the breeze above

clumps of *Opuntia stenopetala* pads edged by flame-coloured, short petalled flowers.

There was only a moderate density of human population—several small villages, cultivated fields in some of the valleys, the tropically attractive riverside town of Aramberri where we stopped for refreshments and a bit of shopping. The scene became more montane as we climbed toward Ascension (most aptly named). Near here we spent two nights, our camp sites illuminated by moonlight and sociable campfires. In this area there were pines, and the steep pitch of the roofs indicated that there might be snow in winter. Most were covered with a material that seemed unfamiliar until closer observation revealed that it was nothing more than large, flat agave leaves overlapping each other like shingles.

We were searching for three particularly desirable plants that Charles and Bob told us we would find in the grassy valleys—*Echinocereus knippelianus, Neobesseya asperispina,* and *Mammillaria weingartiana.* Grassy valleys! The rainy season had begun, and grassy valley followed grassy valley; small and large, steep and broad, high and low, one after another, each more inviting than the last, each with its own treasures. There were *Mammillaria ritteriana, Coryphantha unicornis,* and *Thelocactus bueckii.* At the edge of the pines were *Echinofossulocactus bustamentei* and *Neolloydia beguinii.* One grassy valley yielded tuberous rooted specimens of *Aristolochia,* with its strangely shaped flowers that have earned the common name in English of "Dutchman's Pipe" and in Spanish of "Orejita de Conejo" ("Little Rabbit's Ear").

It was late afternoon of the second day when in a broad grassy meadow we found a single plump specimen of the *Neobesseya.* Encouraged, we fanned out across the valley. Nestled flat in the grass among the limestone rocks we soon began finding specimens of *Mammillaria weingartiana.* The location was right, at type habitat, and the plants roughly matched the description in "Craig". The white radial spines were not as numerous. Only a few plants had over 20, and none as many as 25. Most of them had only one hooked central, usually dark brown, but sometimes red or even horn coloured. Only the largest clusters matched the 4 to 5 cm. size of the description. One to two cm. was the usual size, and only the very tops of the plants appeared above soil level. However, the recently-washed spines fairly glistened in the sunshine, so that we soon began to see that there was an abundant quantity of good specimens for all. The only disappointment was that there was only one specimen of the *Neobesseya,* and not a single *Echinocereus.* We must check still more valleys.

The sun was low and we were more than half ready to abandon the search when we pulled off the road on a long slope leading to a pine forest that seemed a likely camp site. Almost at once, though, our newly-accustomed eyes began to spot more *M. weingartianas.* Better than that, peeping out between them were pinkish-white flower buds, and occasional tips of long tubercles. *Neobesseyas!* They had apparently pulled completely down into the loam during the dry season. Now that the rains had begun, they were beginning to plump up and push their way out of the soil, to bloom, fruit, grow, make chlorophyll again, and prepare for the next season of hardship. The local people tilling the fields across the road surely must have chuckled at the sight of all the "gringos" groping about on hands and knees, excitedly uncovering, photographing, and removing the deep-seated small plants. We agreed that these were more difficult than any previous find, submerged as they were.

Submerged? If the *Echinocereus* grew under the same conditions, in the same area, might it not have the same habit? We began eagerly examining mere cracks in the soil. Just outside the truck door, where we had almost stepped on it, we found the first one. It was buried a half-inch deep, pallid from its long incarceration, but fat, healthy, and forming buds.

By now it was almost dark. There was not much time left for searching, and no decent light for pictures, so there was no question about moving on. We camped at the edge of the nearby pines, so that when daylight came we were within a quick scamper of the *E. knippelianus* bed. The morning light brought out a profusion of pink flowers, peeping up like a field of crocuses. Once more, there were plenty of plants for all. Our collecting was further spurred by the nearby fields and the thought that if we were able to return to this spot in another year we would be lucky not to find it already under cultivation.

Before mid-morning we were on our way to Linares and then went to new adventures in Coahuila, Durango, and Chihuahua—but none that we would remember with more pleasure than the search for *Mammillaria weingartiana* and its friends.

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(Mr. Gay is a leading member of the American Cactus and Succulent Society, and was President for a term until last year. During a recent visit to England, Mr. and Mrs. Gay were persuaded to write this for us, and we look forward to further contributions—Editor.)

Greetings

Officers and members of the Society have been pleased to receive the congratulations of the Trinidad and Tobago Horticultural Society and The Natal Cactus and Succulent Club on the 40th Anniversary.

The June Show, 1971

Report by W. L. Tjaden

JUNE is a month of pleasant anticipation for intending visitors to the Royal Horticultural Society's Fortnightly Shows at Westminster. The Chelsea Show has already whetted our appetites, and for cactus enthusiasts there is our Society's annual competition held in conjunction with one of the R.H.S. Shows to look forward to. Both as a shop-window to convert the non-enthusiast, and a display of well-grown plants, our show this June was, I think, of even higher quality than in the past, even if the number of exhibits had not increased.

Some plants which have impressed us at previous shows were again seen in even more striking form. Thus in the top class for six cacti Mr. L. Jeffries showed a superb *Seticereus icosagonus* in a 10 inch (or was it a 12 inch) pot. He had this plant in his winning entries in 1969 and 1970, when it was good enough to be judged the best cactus in the show. Its photograph is on page 55 of last year's Journal. This year the four 2 inch thick golden-spined stems, now a foot in height, were each crowned with up to twelve arching tubular flowers reminiscent of those of *Cleistocactus strausii,* but of a much more vivid red. Although an old discovery the species is far less common than it should be. It was a pleasure to see how much the plant had progressed. Nevertheless it was neither the best plant in the show nor, I believe, the runner-up, both of which plants I mention below. The other plants in Mr. Jeffries' exhibit included *Wigginsia erinacea* in a 7 inch pot, its dark green body bearing short white spines contrasting with its woolly dome, the flowers still in bud; a 12 inch pan of *Mammillaria plumosa* in fine condition; and an *Echinocereus subinermis* in a 5 inch pot with eleven well-advanced buds on its eight ribs, contrasting with the grey body. If only one could persuade all show plants to come into flower on show day then there would be no more cries from ignorant visitors that they do not like cacti.

Mr. and Mrs. Maddams were second in Class 1, as they were in 1969 and 1970, but the margin must have been minute. Inevitably the onlooker tries to follow the judge's thoughts. Against *Mammillaria plumosa* in the winning entry could be set a fine 12 inch pan of *M. bombycina.* Clearly there was nothing to choose between the two. A 9 inch pan of *Echinocereus blanckii* var *berlandieri* had recently flowered well, and a very woolly *Espostoa huanucensis* with two stems, one a foot high and three inches in diameter, deserved the epithet 'lanata' far more than the better known species. *Lasiocerius rupicolus* in a 6 inch pot was a good straight cereus with large golden areoles bearing one inch central white spines surrounded by small golden spines. Finally there was a *Ferocactus acanthoides* in a large pan, a fine imported specimen, and a *Winteria aureispina* in a 6 inch pot. This striking plant had a number of stems eighteen inches long and one inch thick densely covered in golden spines, and the species is surely essential in every good collection.

It is only fair to report that good though the other three entries were, and each was commended, they were closer to each other in merit than to the first two entries. In Mr. R. H. Read's third prize exhibit I liked his *Mammillaria gigantea,* although unluckily its flowering was over. I have found this a quick-growing and easily managed species, although a really large specimen needs some years. I liked too the green spiny dome of *Homalocephala texensis* and the large green, globose *Pseudolobivia kermesina* in a 6 inch pan and bearing five flower buds. Both Mr. D. A. Knight and Mr. J. E. Taylor had *Mammillaria melanocentra* in their exhibits, fine large single-bodied domes which for easy, if inaccurate, reference I liken to *M. gigantea.* Both plants had flowered but showed much difference in appearance, one having a grey-green body with longer black-tipped spines most noticeable at the growing point and hence, no doubt, the epithet 'melanocentra'. Mr. Knight also had a fine ten inch high *Astrophytum ornatum* in an 8 inch pot, and Mr. Taylor had *Coryphantha elephantidens,* an aptly named species akin to *Mammillaria* with large shiny dark green and clustering stems bearing white woolly centres, exuberantly flowering over the edges of the 8 inch pan. A *Winteria aureispina* in Mr. Taylor's exhibit, although good, did not equal that in the second prize entry and may have placed him at a slight tactical disadvantage.

Class 2, being restricted to exhibitors who had not won a first prize, I thought should have come lower down the schedule. The four entries in this Class were somewhat ill-at-ease flanked by the big shots of Classes 1 and 2. However, Mr. D. T. Best's winning entry contained a good *Mammillaria celsiana* in flower and a choice *Lobivia carnea* in a 4 inch pot. Miss N. Sullivan, who was second, showed a 5 inch pan of *M. erythrosperma,* a species which experts sometimes lose in cultivation.

In Class 3 for three Rebutias or Lobivias the first two prize winners in the first class changed places. A 10 inch pan nearly filled by a magnificent *Rebutia pseudodeminuta* with 45 blooms out in addition to many just over, obviously played a key role in placing Mr. and Mrs. Maddams first. They also showed a 7 inch plastic pan of *R. marsoneri* which had flowered recently, and a nine inch tall, single stemmed *Lobivia jajoiana* carrying several buds. This Lobivia has an unusual reddish-brown open flower. The second prize entry, also of excellent

plants, had *R. spinosissima* with many open light-scarlet flowers, an 8 inch pan of *R. senilis* var. *kesselringiana,* its yellow flowers just over, and an intriguing species *R. pygmaea,* a clustering plant of small stems bearing thin pectinate spines. In Mr. Taylor's third prize entry was *R. wessneriana,* overflowing a 6 inch pan with large midgreen, white spined offsets, but it was in the next Class that he came into his own.

I suppose that there may be, somewhere, other plants of *Mammillaria hahniana* as magnificent as Mr. Taylor's 14 inch pan of this woolly beauty, but it is hard to believe it. It was a worthy 'best in show', and a pleasure to recollect from earlier shows how it has been improved still further. Mr. Taylor's supporting plants, also in 14 inch pans, were *M. praelii* and *M. bombycina.* In Mr. and Mrs. Maddams' second prize entry was a pan of *M. magnimamma* var. *beckii* with large dark green heads mounding up to some ten inches high, the one inch long white spines being in satisfying contrast. Here, I thought, was a better alternative than *M. compressa* for a quick-growing large mammillaria. Also in this exhibit was the beautiful *M. candida* var. *rosea,* perhaps ten inches high and bearing one offset, and also *M. picta.*

In Class 5 for six Mammillarias in small pots there were six entries. Mr. and Mrs. Maddams were well ahead with choice varieties up to the size limits. Mrs. H. Hodgson was second, also with such rarer kinds as *M. oliviae, M. herrerae* and *M. lloydii* but in 2½ inch pots well below the permitted size. Third was Mr. Read, likewise with choicer kinds. Although not rare, a plant of *M. lanata* took my fancy in Mr. Taylor's entry, but in general the lesson is clear—success in this Class now demands good rare plants, not common ones.

Class 6 for three Opuntiae was graced by small plants only, and room could be found in almost all collections for the species on show. These included *Opuntia imbricata, O. diademata, O. fragilis, O. stanleyi* and *O. russellii, Pterocactus kuntzei (tuberosus), Coryno-puntia invicta, Grusonia bradtiana, Tephrocactus sphaericus* and a choice *Micropuntia pygmaea.*

In the next class, for three Echinocactinae, *Echino-fossulocactus vaupelianus* in Mr. Taylor's winning entry was especially good, its wavy ribs adorned with black spines and crowned with a white fleecy cap. A large *Parodia catamarcensis* which had already flowered and *Leuchtenbergia principis* completed his entry. In Mr. and Mrs. Maddams' second prize entry was another fine wavy-ribbed species, *Echinofossulicactus (Stenocactus) ochoterenaus,* and a six inch high *Notocactus schumannianus* with a good woolly cap. A large *Astrophytum ornatum* accompanied by an Ariocarpus and a Copiapoa formed Mr. Knight's third prize entry.

Class 8 for under 18s was disappointing with only one entry. This Class also should be towards the end of the Schedule. In Class 9 for three Gymnocalyciums, Mr. and Mrs. Maddams took first prize with a large plant of *G. curvispinum,* in a 7 inch pot carrying three pale pink flowers two inches wide, *G. gibbosum* and *Weingartia hediniana,* with five orange-red blooms. In Mr. Jeffries' second prize entry all three plants were in bud, but no flowers. I liked especially his *G. valnice-kianum* in a 6 inch pot. It has long incurving grey spines and large tubercles. Mr. Taylor, third, also had no plant in flower but his *G. bruchii* was an impressive mound filling its 7 inch half-pot.

Class 10 for two Echinocereus again had Mr. and Mrs. Maddams as winners. They showed a ten inch tall, single stemmed *E. rigidissimus* in bud, a species which has dense red spines lying flat on ribs only half an inch apart, the green of the plant body barely showing through in contrast. Other species shown which either had flowered well or were about to bloom included *E. engelmannii, E. knippelianus, E. fitchii* and *E. subinermis.* The last named species in Mr. D. V. Brewerton's entry had three fine flowers three inches across and helped him to a well deserved 'V.H.C.'. Class 11 for one *Mammillaria elegans* was instructive in showing the variation in spine colour, spine density, etc., possible in one species. One is obviously not automatically on the road to success just through acquiring a plant entitled botanically to a particular name. It must either be a good seedling or part of a good clone. Mr. Jeffries' plant in a 12 inch pan certainly met this standard with a seven inch long mother stem and many two inch offfspring.

Class 12 is a free-for-all, one cactus only required, and here was the runner-up to the best plant in the show, Mr. Jeffries' magnificent *Notocactus lenninghausii* in a 10 inch pot. While we have seen the plant before, we have never seen it in such good form. The fourteen inch high mother plant, perhaps four and a half inches wide, was surrounded symmetrically by five sturdy seven inch high offspring, all six heads bearing from three to over twenty buds on their crowns. What a picture this will be when in flower! A very fine *Echinocactus grusonii* in a large, possibly 12 inch pot shown by Mr. Read could only gain second place, and likewise a 14 inch pan of *Mammillaria bocasana* only a third for Mr. and Mrs. Maddams. I liked Mr. Taylor's *Lophophora williamsii* with its multitude of button-like stems. It was disappointing to find only one entry, albeit a good one, in the epiphyte class. Mr. and Mrs. Maddams showed a good, well-branched plant of *Zygocactus* (now, alas, it should be *Schlumbergera) opuntioides,* which would have deceived almost anyone if exhibited as an Opuntia, and also *Marniera chrysocardium,* with a pinnatisect stem reminiscent of *Epiphyllum anguliger.* Class 14 for six cacti in pots of 6 inches diameter or less put a premium on choice varieties, shown at once in the outstanding quality of Mr. and Mrs. Maddams' winning entry. This included *Mammillaria pennispinosa* in crimson fruit, a long lasting pleasure compared with the short life of the flowers, and *Sulcorebutia steinbachii* with many two inch high, dark green heads masked by small

recumbent red spines rising from narrow white areoles. Mr. E. G. Canham's second prize entry had *Parodia suprema, Notocactus schumannianus* and *N. graessneri,* the latter with very fine, golden spines. However, almost all the species shown in this Class were deserving of mention, and I can but refer readers to the list of prizewinners given elsewhere in this issue.

Class 15 for seedlings sown in 1969 or later was easily won by Mr. and Mrs. Maddams, with a fine display in a 15 inch square box of a good variety of choice Mammillarias up to three inches across. Here undoubtedly were some prizewinners of future years! Mr. Canham's plants sown in 1970 were necessarily smaller, but like Mrs. Poulter's third prize entry there was a good assortment. The main key to success with seedlings is warmth and possibly extra light in the first winter after sowing. Bottom heat may be an advantage as distinct from general warmth. On seedlings of a good new species much of one's success in the years ahead will obviously depend.

Succulents other than cacti must receive but brief mention now, as their main chance is in September. A fine *Euphorbia horrida* in a 9 inch pot gained first prize for a specimen succulent for Mr. Read, but some winning entries were smaller, as for instance Mrs. Hodgson's euphorbias in Class 17. The largest plant in this entry was *Monadenium stapelioides* in a 6½ inch pot. I liked very much the small plants of *Aloe jucunda* in Class 18, with serrated leaves of glossy, spotted dark green, and of the slightly larger *Aloe somaliensis,* with red edges and larger white spots. Mr. C. G. Brown's three caudiciform plants in 4 to 6 inch pots were first in Class 19, but the showiest plant was a *Stapelia schinzii* in a 7 inch half-pot and one of the third prize entry. Unluckily this latter was in bud, not in flower. In Class 20 *Echeveria pulidonis,* with broad grey-green, red-edged three inch leaves and bright flowers, *E. shaviana* with glaucus, spatulate, fringed leaves, and *E. subrigida* all took the eye as show-worthy species. *Dudleya rubra* with broad green leaves, shown by Mr. Brewerton, I thought preferable to *D. attenuata,* but this was in flower. Classes 21 and 23 attracted only three entries each, and Class 24 two. In the limited entry for Class 25, Mr. D. T. Best showed three fine plants—*Euphorbia valida, Pachypodium succulentum* and *Haworthia truncata.* In Class 26 for one cactus and one other succulent Mrs. Hodgson won with a 9 inch pan of *Mammillaria plumosa* and a 6 inch pot of *Haworthia truncata,* but I particularly liked the closely-knitted dark green leaves of *Gasteria armstrongii* in the second prize exhibit.

Both of the bowl gardens in Class 27 had a good variety of plants with effective use of rock and gravel, but the inclusion of quick-growing plants like *Aeonium arboreum* implies that the garden is one for frequent re-planting. Finally, with only Mr. and Mrs. Maddams and Mr. Brewerton as entrants in Class 28, the former's splendid group once more gained the day. Many of their plants were in flower, including among many others *Echinocereus blanckii, Aztekium ritteri, Lobivia aurea, Parodia mutabilis* and a striking *Mammillaria spinosissima.* We all owe a great deal to the show organisers and to the present-day exhibitors. Despite the problems of exhibiting, why not repay them at the next show even if only with one entry?

Results of the June Show, 1971

Judges
Cacti: Mr. A. Boarder. Succulents: Mr. S. W. I. Young.

Class 1 Six Cacti. 5 entries.

1st Mr. L. Jeffries. Mediolobivia aureiflora, Mammillaria plumosa, Seticereus icosagonus, Wigginsia erinaceus, Hamatocactus hamatocanthus, Echinocereus subermini.

2nd Mr. and Mrs. W. F. Maddams. Espostoa huanucencis, Ferocactus acanthodes, Mammillaria bombycina, Echinocereus berlandieri, Lasiocereus rupicolus, Winteria aureispina.

3rd Mr. R. H. I. Read. Pseudolobivia kermesina, Ariocarpus fissuratus, Homalocephala texensis, Leuchtenbergia principis, Mammillaria gigantea, Oreocereus trollii.

V.H.C. Mr. D. A. Knight. HC Mr. J. E. Taylor.

Class 2 Three Cacti in pots not exceeding 5 in. dia. (For Members who have not previously won a First Prize in any cactus class.) 4 entries.

1st Mr. D. T. Best. Lobivia carnea, Oreocereus celsianus, Mammillaria celsiana.

2nd Miss N. Sullivan. Mammillaria erythrosperma, Trichocereus werdermannianus, Astrophytum ornatum.

3rd Mr. J. C. Hughes. Opuntia cylindrica cristata, Astrophytum myriostigma, Gymnocalycium delaetii.

V.H.C. Mr. A. Sidaway.

Class 3 Three Rebutias and/or Lobivias. 6 entries.

1st Mr. and Mrs. W. F. Maddams. L. jajoiana, R. pseudodeminuta, R. marsoneri.

2nd Mr. L. Jeffries. R. senilis v kesselringiana, R. pygmaea R. spinosissima.

3rd Mr. J. E. Taylor. R. wessneriana, Aylostera schumanniana, R. senilis iseliniana.

V.H.C. Mr. D. V. Brewerton.

Class 4 Three Mammillarias. 4 entries.

1st Mr. J. E. Taylor. M. praelii, M. bombycina, M. hahniana.

2nd Mr. and Mrs. W. F. Maddams. M. magnimamma v bockii, M. candida v rosea, M. picta.

3rd Mr. D. A. Knight. M. geminispina, M. bombycina, M. dumetorum.

Class 5 Six Mammillarias in pots not exceeding 4½ in. dia. 6 entries.

1st Mr. and Mrs. W. F. Maddams. M. eriacantha, M. mercadensis, M. magallanii, M. cowperae, M. carretii, M. solisioides.

2nd Mrs. H. Hodgson. M. longiflora, M. sempervivi, M. herrerae, M. oliviae, M. aureilanata, M. microcarpa.

3rd Mr. R. H. I. Read. M. shurliana, M. herrerae, M.

boolii, M. insularis, M. humboldtii, M. pottsii.
V.H.C. Mr. J. E. Taylor. H.C. Mrs. P. Poulter.

Class 6 Three Opuntiaea. 4 entries.
1st Mr. J. E. Taylor. Opuntia imbricata, Opuntia species, Pterocactus kuntzei.
2nd Mr. E. G. Canham. Opuntia diademata, Grusonia bradtiana, Opuntia stanlyi.
3rd Mr. D. V. Brewerton. Coryopuntia invicta, Opuntia diademata, Tephrocactus sphaericus.

Class 7 Three plants in Echinocactanae. 6 entries.
1st Mr. J. E. Taylor. Echinofossulocactus vaupelianus, Leuchtenbergia principis, Parodia catamarcensis.
2nd Mr. and Mrs. W. F. Maddams. Notocactus schumannianus, Stenocactus ochoterenous, Neoporteria subgibbosa.
3rd Mr. D. A. Knight. Ariocarpus furfuraceus, Copiapoa cinerea, Astrophytum ornatum.
H.C. Mr. E. G. Canham.

Class 8 Three Cacti (for Juniors under 18). 1 entry.
1st Mr. J. T. Meldrum. Epiphyllum hybrid, Ariocarpus kotschoubeyanus, Notocactus ottonis.

Class 9 Three Gymnocalyciums and/or Weingartias. 6 entries.
1st Mr. and Mrs. W. F. Maddams. G. curvispinum, W. hediniana, G. gibbosum.
2nd Mr. L. Jeffries. G. kurtzianum, G. valnicekianum, G. multiflorum.
3rd Mr. J. E. Taylor. G. species, G. saglionis, G. bruchii.
V.H.C. Mr. E. G. Canham.

Class 10 Two Echinocereus. 5 entries.
1st Mr. and Mrs. W. F. Maddams. E. rigidissimus, E. engelmannii.
2nd Mr. J. E. Taylor. E. knippelianus, E. fitchii.
3rd Mr. E. G. Canham. E. fitchii, E. hempelii.
V.H.C. Mr. D. V. Brewerton.

Class 11 One Mammillaria elegans (any variety). 5 entries.
1st Mr. L. Jeffries.
2nd Mr. and Mrs. W. F. Maddams.
3rd Mr. J. E. Taylor.
V.C.H. Mr. R. H. I. Read.

Class 12 One Cactus. 5 entries
1st Mr. L. Jeffries. Notocactus leninghausii.
2nd Mr. R. H. I. Read. Echinocactus grusonii.
3rd Mr. and Mrs. W. F. Maddams. Mammillaria bocasana.
V.H.C. Mr. J. E. Taylor.

Class 13 Two Epiphytic cacti. 1 entry.
1st Mr. and Mrs. W. F. Maddams. Zygocactus opuntioides, Marniera chrysocardium.

Class 14 Six Cacti in pots not exceeding 6 in. dia. 6 entries.
1st Mr. and Mrs. W. F. Maddams. Horridocactus setosiflorus, Sulcorebutia steinbachii v gracilis, Mammillaria pennispinosa, Epithelantha micromeris, Echinocereus subinermis, Cochemieo setispina.
2nd Mr. E. G. Canham. Espostoa lanata, Parodia suprema, Echinofossulocactus crispatus, E. ochoterenaus, Notocactus graessneri, N. schumannianus.
3rd Mrs. H. Hodgson. Strombocactus disciformis, Mammillaria guelzowiana, Ariocarpus retusus, Notocactus scopa, Copiapoa humilis, Bartschella schumannii.
V.H.C. Mr. E. J. Taylor. H.C. Mr. R. H. I. Read.

Class 15 Cacti raised by the exhibitor from seed sown on or after 1st January, 1969. 3 entries.
1st Mr. and Mrs. W. F. Maddams.
2nd Mr. E. G. Canham.
3rd Mrs. P. Poulter.

Class 16 One specimen Succulent. 3 entries
1st Mr. R. H. I. Read. Euphorbia horrida.
2nd Mr. C. G. Brown. Momordica rostrata.
3rd Mr. and Mrs. W. F. Maddams. Pachycormus discolor.

Class 17 Three plants in Euphorbiaceae. 5 entries.
1st Mrs. H. Hodgson. Euphorbia suzannae, Monadenium stapelioides, E. bupleurifolia.
2nd Mr. D. V. Brewerton. Euphorbis stellata, E. arida, E. squarosa.
3rd Mr. and Mrs. W. F. Maddams. Euphorbia knuthii, Jatropha cathcartica, Monadenium schubei.

Class 18 Three plants in Liliaceae. 5 entries.
1st Mrs. H. Hodgson. Haworthia sp., H. setata, Aloe jucunda.
2nd Mr. and Mrs. W. F. Maddams. Aloe jucunda, Haworthia parksiana, H. bolusii.
3rd Mr. D. V. Brewerton. Aloe rauhii, A. haemanthifolia, Gasteria armstrongii.

Class 19 Three plants in Asclepiadaceae. 3 entries.
1st Mr. C. G. Brown. Pachycarpus grandiflorus, Raphionacme hirsuta, R. galpinii.
2nd Mrs. H. Hodgson. Brachystelma barberiae, Diplocyatha ciliata, Fockea crispa.
3rd Mr. and Mrs. W. F. Maddams. Brachystelma barberiae, Hoodia gordonii, Stapelia schinzii.

Class 20 Two plants in Crassulaceae. 5 entries.
1st Mr. and Mrs. W. F. Maddams. Dudleya attenuata, Echeveria pulidonis.
2nd Mrs. H. Hodgson. Echeveria shaviana, Adromischus sp.
3rd Mr. R. H. I. Read. Crassula susannae, C. tecta.

Class 21 Three plants not in Classes 17-20. 3 entries.
1st Mr. C. G. Brown. Cissus hypoleuca, Sesamothamnus lugardii, Alluaudia procera.
2nd Mr. and Mrs. W. F. Maddams. Idria columnaris, Xerosicyos danguyi, Cissus bainsii.
3rd Mrs. H. Hodgson. Glottiphyllum oligocarpum, Titanopsis hugo schlecteri, Anacampseros meyeri.

Class 22 Three Succulents (for Juniors under 18). 1 entry.
1st Mr. J. T. Meldrum. Echeveria longifolia, Pachyphytum hookerii, Scilla violacea.

Class 23 One Jatropha, Cissus, or Kedrostris. 3 entries.
1st Mr. and Mrs. W. F. Maddams. Cissus hypoleuca.
2nd Mr. C. G. Brown. Jatropha cathcartica.
3rd Mr. D. V. Brewerton. Cissus hypoleuca.

Class 24 Six Succulents in pots not exceeding 6 in. dia. 2 entries.
1st Mr. and Mrs. W. F. Maddams. Fockea crispa, Aloe haemanthifolia, Lithops terricolor, Euphorbia valida, Cotyledon pearsonii, Ceraria pygmaea.
2nd Mr. C. G. Brown. Seyrigia humbertii, Sarcocaulon pattersonii, Poelnitzia rubriflora, Alluaudia humbertii, Aloe jucunda, Pachypodium brevicaule.

Class 25 Three Succulents in pots not exceeding 5 in. dia. (for Members who have not previously won a First Prize in any succulent class). 4 entries.
1st Mr. D. T. Best. Euphorbia valida, Haworthia truncata, Pachypodium succulentum.
2nd Miss N. Sullivan. Crassula montisdraconis, Hereroa puttkameriana, Hoya bella.
3rd Mr. A. Sidaway. Pleiospilos optatus, Adromischus cooperi, Cheiridopsis sp.

Class 26 One Cactus and one other Succulent. 4 entries.
1st Mrs. H. Hodgson. Mammillaria plumosa, Haworthis truncata.
2nd Mr. and Mrs. W. F. Maddams. Coryphantha recurvata, Gasteria armstrongii.
3rd Mr. J. C. Hughes. Gymnocalycium valnicekianum, Euphorbia pugniformis.

Class 27 Miniature garden of cacti and/or other succulents arranged for decorative effect to cover space not exceeding 12 in. by 12 in. Natural stone or rock may be used, but not ornaments (figures, animals, etc.). 2 entries.
1st Mrs. R. H. I. Read.
2nd Mr. J. C. Hughes.

(Continued on page 89)

The Succulent Display at the Paignton Zoological and Botanical Gardens

by A. P. G. Michelmore, The Herbert Whitley Trust

HERBERT WHITLEY founded and owned what were originally known as the Primley Zoological and Botanical Gardens, the only such combined gardens in Britain. He designed them both as an education to the public and a life interest to himself. Amongst his many achievements was his Tropical House, which is still unique. It is reputed that he designed it on the back of an envelope, and he certainly built it with his own labour back in the 1930s. It has just been re-roofed, and it is hoped that it will stand for many long years more.

The visitor enters it down a flight of steps, at the foot of which he finds himself gazing at the luxuriance of the tropics around a steaming, tepid pool swarming with little tropical fish. Turning from this, he sees a wide, plant-flanked corridor stretching away into the distance. On either side are the main compartments of the house, viewed through wide windows. On the right are no less than twenty-one small compartments, now arranged as displays of some of the more striking single families of plants. On the left are six large compartments, arranged as displays of ecological and human significance, such as rain forest undergrowth and medicinal and poisonous plants, This is not the place to describe all this variety, but to concentrate on the last of the big compartments, which houses the Succulent Display.

This Succulent Compartment is some fifty feet long by twelve wide. It is viewed through four wide windows from the central public passage. Looking through these windows the visitor gets four different views of a limestone rockery sloping upwards and backwards from eye level. At the back of the rockery, and hidden by it, is a staging on which tall plants in pots are kept to peep over the back of the rockery. Behind the stage is a wide service passage. Behind this again is a wall of rough limestone blocks full of crevices for planting small rock plants. The wall backs on to the back wall of the building itself, leaving at the top a space some two feet wide, which contains soil, and leaves a height of four to five feet between it and the roof. This space is admirable for plants needing much sun and very well drained soil. The back is used for erect plants to hide the plain masonry wall, while the front has trailing plants to hang down over the top of the rough limestone structure. The effect is that of a broken cliff top. The roof slopes down from back to front, allowing plants of considerable size to be grown in the hinder part of the compartment.

Starting at the left-hand window the observer looks into a thicket of Aloes and their relatives of the lily family. The tree Aloes include the strange, branched shrub, *A. plicatilis,* the Fan Aloe, with its strap-shaped leaves all in one plane, and the single-stemmed, thorny *A. marlothii* and *A. ferox*. The dwarf species include *A. longistyla* and *A. vera*. The latter is an outlier of this mainly southern and tropical African genus, for it is native of the Atlantic islands and probably of North Africa. On the far left is *A. ciliaris,* which in nature scrambles up amongst other shrubs and in a house may be trained against a wall. In front of the Aloes are groups of their smaller cousins, the Gasterias and Haworthias, both native to South Africa. These interesting plants have less showy flowers than the Aloes and are mostly grown for their curious forms and often mottled leaves. At one time Whitley was believed to have the finest collection of Haworthias in the world, many of his forms being still unidentified.

Echinocactus grusonii and Opuntia robusta surrounded by 'other succulents' at Paignton (photo: T. J. Collis)

Moving to the second window, one sees near the back a few more plants of another mainly African group, the Sansevieras, formerly classed with their neighbours the Aloes in the lily family but now as Agavaceae. However in this window the eyes are soon drawn to the contorted yellow and green tentacles of a large variegated Century Plant, *Agave americana,* of the same family. Other smaller species nearby are the handsomely sculptured *A. victoriae-reginae,* the very spiny *A. xylonacantha,* the rather erect *A. caribaea,* and *A. stricta* with its abundant and very narrow foliage. The Agaves themselves are all American. To the right there is a mixed group of Crassulaceae, the family to which our own native Stonecrops, Houseleek and Wall Pennywort belong. The erect branches of *Aeonium arboreum,* capped with rosettes of leaves, are found widely in the Mediterranean region. However, most of the species exhibited are South African, such as the undershrubs *Crassula portulacea, C. falcata* and *C. tetragona,* together with the curious *C. lycopodioides* looking almost like a *Cassiope* heather, as well as the dwarf *Adromischus bolusi, A. clavifolius* and *A. trigynus.* One or two are Central American, like the attractive *Sedum morganianum,* whose leaves fall off at a touch and give rise to new plants. In front of the Crassulaceae are one or two succulent members of the groundsel and daisy family, which we have in the past called Kleinias. They include what are now classified as *Senecio stapeliformis* and var. *globosus* of *S. articulatus,* the well known Candle Plant.

Moving to the third window one sees on the left a clump of the humble *Scilla pauciflora.* Behind it there is a small selection of that outstanding family of South African origin, the Mesembryanthemums (Aizoaceae). A single member of the Purslane family (Portulacaceae) *Portulacaria afra,* is worth noting, for in its native South Africa it is eaten by livestock and forms thickets up to 20 feet high. The central pillar of the compartment supports a fine plant of that primitive cactus, the West Indian Gooseberry, *Pereskia pereskia* (*P. aculeata*), which occasionally in late summer produces its panicles of white flowers looking rather like miniature wild roses. The form exhibited may be var. *rubescens,* for the young leaves are bright red underneath and are particularly attractive with the sun shining through them. (Your Editor, and subsequently by inheritance the writer, grew another species in their garden in Uganda years ago.) Most of the middle view from this window is occupied by cacti, of which some seventy species are planted out. Cacti, of course, are of New World origin, apart from a few species of *Rhipsalis.* The most striking specimen visible at present is a football of *Echinocactus grusonii* some twenty years old. Formerly there were two fine old trees of a prickly pear, *Opuntia leucotricha,* which had to be constantly and painfully cut back to be prevented from pushing the roof out. Unfortunately for the viewers, but to the relief of the gardeners, they had to be removed and replaced by small specimens when the house was re-roofed. Only a few of the other species can be mentioned here. There are a well branched specimen of the Mexican *O. robusta,* a monstrous form of *O. tuna,* which is native to Jamaica, and both red- and white-areoled varieties of *O. microdasys* of Northern Mexico, which looks so attractive with its neat growth and lack of spines. Closely related is *Nopalea coccinellifera,* one of the chief hosts of the cochineal insect. At the back is a young plant of *Cereus jamacaru,* which grows so big in Brazil that its wood is used in house building. Another useful species is *Myrtillocactus geomentrizans,* which in Mexico is planted as a live fence, and whose little fruit is much eaten, both fresh and dried, in that country. It grows eventually into a low tree of candelabra form. The *Notocactus* include *N. leninghausii* of southern Brazil. Amongst the smaller species suitable for pot culture, there are planted out the carmine and green flowered *Mammillaria durispina* of central Mexico, and the common little red-flowered Peanut Cactus, *Chamaecereus silvestrii,* from western Argentina. On the right of this window are two plants of the South African *Cissus juttae,* given by Kew some

Cissus juttae (left) and Euphorbia milii (centre) at Paignton (photo: T. J. Collis)

fifteen years ago. Looking like inverted parsnips, these plants produce just two or three leaves and a panicle of flowers each year. Though hardly beautiful, except to the perverted eye of a confirmed succulentist, they are a fine example of how a family of normally climbing vines can adapt itself to living in a desert.

From the fourth window the view is mostly taken up by Euphorbias, succulent cousins of the milky-juiced and leafy Spurges of our own gardens, fields and woods. Here also the older tree specimens have had to be replaced by replants. The tallest species at present is *E. ramipressa.* This species comes from Madagascar and has flattened twigs. More impressive is the fiercely thorny *E. grandicornis,* a tree of spreading candelabra form from a wide belt of eastern Africa from Natal to Kenya. The well branched *E. lactea* of Ceylon will also grow into a candelabra type tree in time. From the Canaries come the switch plant *E. aphylla* and a young single column of *E. canariensis,* which should ultimately produce a dense thicket of stout, erect stems. The densely branched *E. echinus* and *E. resinifera* are natives of Morocco. The latter species is cultivated there for the drug, euphorbium. Two smaller grotesque species from South Africa are *E. globosa* and *E. horrida.* Trained up a pillar is *E. milii,* widely known as Christ's Thorn or *E. splendens,* and notable for its scarlet bracts. Just in front of it there are the thin, glaucous, cylindrical, jointed columns of the red-flowered *Pedilanthus macrocarpus* from Mexico. Behind the Euphorbias is the related succulent-stemmed tree, *Synadenium grantii.*

So far we have been looking only at the foreground. Let us throw our eyes back to the rock cliff behind, working back from right to left. In the extreme corner is a *Puya,* probably *P. chilensis* (family Bromeliaceae), with its vicious saw-toothed leaves hanging down out of reach of those working in the service area below, but its flower stem soaring up to the roof. Near it is that handsomest of all the Kalanchoes, *K. beharensis.* One or two other species of the genus, including the subgenus *Bryophyllum,* spring up here and there in the compartment. On beyond the *K. beharensis* is a grey *Agave americana* and a beautiful clump of an unidentified Agave. The well known fibre crop of East Africa, *A. sisalana,* follows. Further on there are some *Nopalea coccinellifera* Prickly Pears, another grey *Agave americana,* some more *Euphorbia milii,* some *Lampranthus* sp. of the Mesembryanthemum family and some more kinds of *Sansevieria,* unkindly called Mother-in-Law's Tongues.

Planted on the floor and climbing (with its adherent roots) up the rockwork is a nice plant of the clinging cactus, *Hylocereus undatus.* Two great Organpipe Cacti *Lemairocereus* spp., are also planted at the foot of the cliff wall, in order to give them the full height of the building. In spite of this position they often have to be beheaded to save the glass roof from being pushed out. They produce their huge creamy white, semi-nocturnal flowers regularly in early summer.

We have described this house as an attractive exhibit to the general public and an interesting collection to the succulent specialist. It remains to note its special value for education, which is the reason for the existence of the Zoological and Botanical Gardens. The collection shows strikingly the way in which many plants conserve water in conditions of drought. It demonstrates the abundance of succulents in southern Africa and central America, and their scarcity in the dry regions of the Sahara, tropical Asia and Australia. The explanation of this fact is not obvious. The plants show well the principle of convergent evolution, in which plants growing in similar conditions come to resemble one another superficially, even though quite unrelated. Having demonstrated this principle here with Organpipe Cacti from the New World and Candelabra Euphorbias from the Old World, one can go on in the Zoo to compare in the same way Sugarbirds from the New and Sunbirds from the Old World, equally similar but unrelated, or again the big wading birds of the unrelated Heron, Stork and Crane families. In the Succulent House one sometimes hears the uninitiated exclaim, "Oh, the desert!" It is necessary to explain that many desert plants are not succulent. Nor do all succulent plants grow in deserts. Many Aloes grow in grassland with a good total rainfall but with a marked dry season. Other succulents grow in fairly damp climates but in dry sites, such as on rocks or up on trees. Some people forget that succulents grow wild even in such damp, cool climates as our own, like the familiar Stonecrops on our walls and cliffs.

I am indebted to Mr. R. J. Gross, Head Gardener, and one of his assistants, Mr. P. Goodson, for help in compiling this account. Mr. T. J. Collis has kindly taken the photographs.

Forthcoming Meetings

At the R.H.S., Greycoat Street, Westminster at 6.30 p.m.

November 17: The Cactus Family. Mr. E. W. Putnam

December 8: Members' Slides

(Continued from page 86)

Class 28 Group of cacti and/or other succulents to cover space not exceeding 18 in. by 18 in. arranged for decorative effect. 2 entries.

1st Mr. and Mrs. W. F. Maddams.
2nd Mr. D. V. Brewerton.

Awards

Mrs. Luty Wells Cup for Three Mammillarias: Mr. J. E. Taylor.
The Ibbotson Cup for Six Cacti: Mr. L. Jeffries.
Sarah Cutler Memorial Cup for Specimen Mammillaria: Mr. L. Jeffries, Mammillaria elegans.
S. J. Pullen Cup for Miniature Garden: Mrs. R. H. I. Read.
Spoon for the Best Cactus in the Show: Mr. J. E. Taylor, Mammillaria hahniana.
Spoon for the Best Succulent in the Show: Mr. R. H. I. Read, Euphorbia horrida.

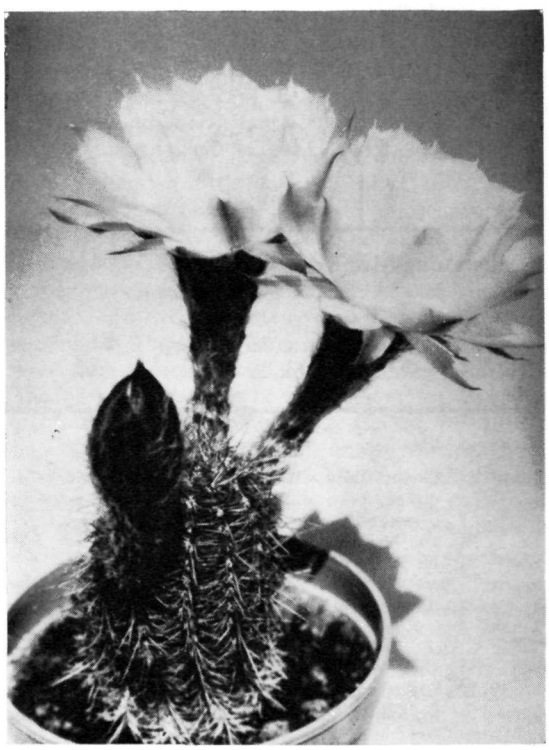
Lobivia famatinensis (Speg.) Br. & R.

by Terry Smale

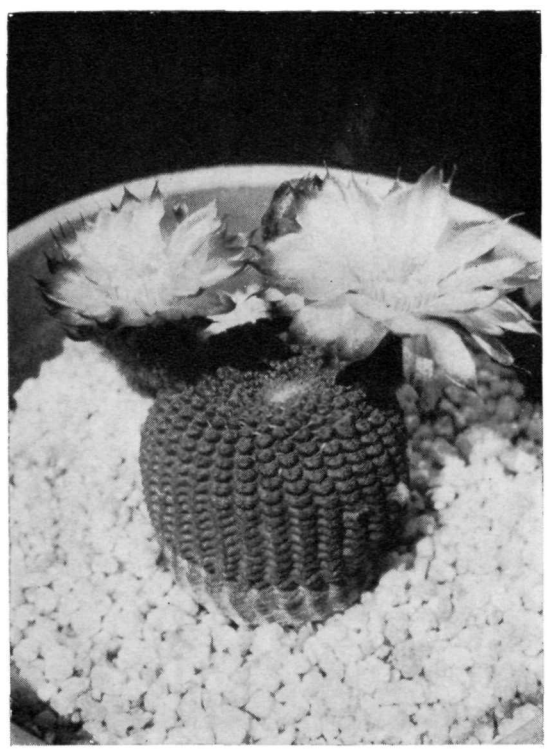
THE TRUE identity of this plant was for many years a subject for controversy between Curt Backeberg and most other authorities on South American cacti. The generally accepted conclusions on this debate were summarized by A. F. H. Buining in this Journal, 1964, **26,** 56.

Many cactus enthusiasts will not have seen the true *Lobivia famatimensis,* especially in bloom, and therefore I am taking this opportunity of illustrating a plant that is in the collection of Mr. Len Jeffries. This particular specimen was originally grafted and has flowered for several years. The appearance of the flowers agrees well with the original description by Spegazzini: they are yellow with brownish tips to the petals. If one wishes to obtain this plant, it is most likely to be found under the name *"Reicheocactus pseudoreichianus"* which is the name given to it by Backeberg, who thought that it was related to the Chilean *Neoporteria* complex. However, this plant from the Argentine is a *Lobivia* in its floral and seed structure, and in the illustration one can see that the flowers appear from the side of the plant in typical *Lobivia* fashion.

Echinocactus famatimensis was discovered by Spegazzini in 1915 in the Sierra de Famatima and the description was published in 1921, but the plant was lost to cultivation for a number of years. In 1934 Harry Blossfeld began collecting in Northern Argentina. He had been commissioned by a number of clients to obtain plants of *Lobivia famatimensis,* but in the published habitat area he found only three specimens which may have been this plant, but which were not positively identified and never reached Europe. A few months later, Blossfeld found many specimens of a *Lobivia* in the Quebrada de Humahuaca, which he thought were similar to *Lobivia famatimensis* and sent them to his clients as such. They have now become widely distributed and can be found in most collections masquerading as *Lobivia famatimensis.* In fact these plants are only forms of the very variable *Lobivia densispina* (Werd.) Buin., which occurs with flower colour from cream to deep red and with varying spine formations. My illustration of *Lobivia densispina* is of a yellow flowered form which has rather longer spines than normal.



Lobivia densispina (photo: T. Smale)



Lobivia famatimensis (photo: T. Smale)

Cultural notes on Succulents other than Cacti

by Mrs. Muriel Stillwell

During the autumn I like to do a lot of repotting, rather than wait until the spring. This means that I can go all through the collection, plant by plant, examining each one for pests, etc. One must also be careful of overwatering during the later months of the year when plants take longer to dry out. This applies mainly to plastic pots. Water all possible plants with either malathion or a systemic before the winter comes, when plants are often left for several weeks without much attention. Have a look under each pot if they are standing on sand or similar material, for mealy bugs delight to hide here. I have a number of plants standing on cornish grit and, on the lifting the pots, find many have sent a cluster of roots from out of the bottom of the pots into the sand. This shows they need repotting before it gets too difficult to remove plant from pot without damaging the roots.

Conophytums that cease to grow should definitely be broken up, and the older bodies removed. Do not try to re-root cuttings too late in the year. If it is necessary to break up large branching succulents, leave until spring when growth will be more active. The autumn repotting must be more of a potting-on operation without too much root disturbance. This is also the time to look around the collection and to make sure that each plant is happy in its particular environment. Never move a plant that is doing well, but do experiment until you find the right place in your greenhouse for your plants. I have found that some plants will flower well in one position but just sulk if moved to another spot. This is mainly governed by the amount of light available, while some plants must have full sun others respond better in light shade.

During the winter, read all you can about your plants, particularly their native habitats and conditions under which they grow; it may help you to decide the best treatment for your plants. While I do not believe in giving plants a lot of liquid feeding, some do appreciate small doses when coming into bud. It helps to ensure that the flowers reach maturity without dropping. The Pleiospilos have flowered well this year. Last year most of them were broken up and rerooted, as they had become old and woody. Several took a long time to root-up again, but are now making nice plants. Two of the best are, I think, *P. simulans,* with its wide leaves, and *P. grandiflorus,* with its double flowers. There are numerous hybrids in this genus and one seldom sees a really true *P. bolusii.*

Also during the winter it is a good idea to try and make warm corners for those plants needing extra heat, such as caudiciform succulents and certain of the Stapeliads. Even a thick polythene tent erected in the centre of the house would be a help, especially if it is near to a heater. Many valuable plants are lost every year through letting the temperature fall too low. This may prove costly to try and keep a large house over 50°F, but a small compartment could possibly be heated at very little cost, and worth the extra bit of trouble. It is important during the winter, especially if using oil heaters, to make sure some ventilation is available in the greenhouse. Leave one of the lights slightly open to enable the plants to breathe a little free oxygen, for a close atmosphere often is the cause of succulents turning yellow and unhealthy looking with leaves going brown at the tips.

Cactus Cultural Notes

by A. Boarder

Exhibiting

It would be good to see more of the members exhibiting at our shows. I expect that some are afraid that their plants cannot compete with those of perhaps older members, but one never knows until one tries, what may be the result. Some of the plants I saw at the June show, although very good could have been beaten, and I was very disappointed to see that some of the exhibitors were careless in their presentation. I know that this is not everything, but to see badly exhibited specimens is not only disappointing to the judge but it does not give a very good impression to visitors. One of the points which never fails to surprise me is that some of the pots appear to have had no attention at all. They are dirty and the top of the soil has not received any attention at all. One sees weeds or moss and scruffy looking top soil on some of the pots yet it would not take long to clean the pots, scrape off the top half inch of potting soil and refill with fresh. The addition of some chippings always freshens up a pot but whether one need keep this on after the show is up to the individual. Personally I cannot see how the member can tell if a plant needs watering when the actual soil is hidden by a layer of chippings.

I do not suggest that the pots should be covered with red ochre or similar matter as the judge would not like

to get his hands smothered with red whilst handling a plant. Another bad aspect of exhibiting which was in evidence at the last show was the use of labels. In some classes calling for three plants, I noticed three different labels. Surely it is not outside the possibility to supply fresh labels for three plants, or at least to see that there are not such varied types, as a metal one, a "T" shaped one and an upright one. This carelessness might lose the exhibitor a prize or at least put an exhibit down a place. For instance if there are two exhibits almost identical as to pointings and one is well presented this one could get precedence over the poorer displayed entry.

While on the subject of showing, I feel that I must try to clear up one point that some exhibitors appear to lose sight of. It is such classes of three or more cacti where it is thought that the greater the variety the better will the chance of winning occur. Now although this may be right to a certain extent it can be over-done. Just because a group of three contains three different genera, it does not mean that it must automatically win over a group with three plants of the same genus. If this were to be the case one would only have to put in three very poor specimens but of different genera to win against a group of three species of a single genus that were excellent specimens. Of course if the group has three splendid specimens of different genera it would be another matter, but variety alone should not be sufficient, quality is also required.

I have heard some members ask why I do not appear to like grafted plants at shows. I must explain my theories on this subject to clear up any misunderstanding. I am not against grafted plants as such, but let us consider the rules of showing cacti. There are 25 points allotted and five of these are for a plant being true to nature. A grafted plant can never be said to be true to nature as these never appear in the wild. Another five points are given for being difficult to grow. How can this be assessed when the plant is not growing on its own roots but as a parasite on another plant. It can be seen from this that a grafted plant can lose ten points for these two requirements alone. If a class could be provided for grafted plants alone then this would be in order, but until such a class is provided I would never be able to award maximum points for a grafted plant in a class of normal ones.

Flowering young cacti

I frequently hear from members who cannot understand how it is that I can flower cacti in the late spring and summer of the year following raising the plants from seed. I do not suggest that I am able to do this with many species, but among the Mammillarias there are many which can be flowered without any special treatment. Several of the types similar to *M. bocasana* never fail to flower for me in the time stated, also some of the hooked types such as *M. longiflora*. It may be that the method I adopt subsequent to germination and early growth will interest those who have not been successful in obtaining early flowering.

The first phase is pricking out when the cotyledon has been used up, for it is then that a proper root system has been formed and it is safe to move the young plants. I prick out into concrete boxes measuring 14 by 7 by 3 inches, using a compost which is easiest described as the bulk mass as for J.I. seed compost with the addition of fertilisers used in J.I. No. 2. The seedlings are placed about one inch apart. The boxes are kept in a frame with shaded glass, as exposure to sunlight would cause the plants to turn red and cease growing. A winter temperature of about 50°F is maintained, and watering is done very occasionally, and only if the weather is mild.

After about a year it is time for a change and the plants are replanted into concrete boxes 14 by 8 by 4 inches, so giving them a little more depth of root space. Do not pot on these plants into any pot less than 2½ inches in diameter. It will be found that small cacti will continue to grow much better whilst still in a box than if put into tiny pots which dry out quickly. I do not give these seedlings any extra fertiliser and they obtain all the nourishment they need from the original compost. The old idea that cacti only flower when pot-bound is refuted by the fact that many will flower in the pricking-out box without ever being in a pot.

Are Fasciated Growths in Cacti caused by Microbial Infections?

by L. Jeffries and T. Smale

FASCIATION, a process in which the growing point of a plant divides prolifically, producing irregular and grotesque growths, may be seen in several plant families. It is perhaps most striking in the Cactaceae and two forms are seen. The irregular form develops from many buds, producing the rock-like masses of, for example, the monstrose form of *Cereus peruvianus*. The well known crests, such as occur in *Opuntia vestita*, develop along one diameter only.

Borg (Cacti, Blandford Press Ltd., 2nd Edition, 1951) suggests, but presents no evidence for, fungus infection as a cause of cristation in *Opuntia microdasys* and also of "Witches Brooms" of forest trees, structures which he apparently regards as analogous with the fasciations of cacti. In the same work, reference is also made to the artificial induction of fasciation by injury to the terminal buds of the growing stems of cacti. It should be borne in mind that such injuries may well be accompanied by

microbial infection, and this may have some bearing on the process as a cause of fasciation.

Viruses and bacteria are well known causes of disease in plants, animals and man. However, in 1967 it was suggested by workers in Japan that organisms revealed by microscopy of the phloem of plants infected with four different yellows diseases may belong to a third group of organisms, the *Mycoplasmataceae,* or mycoplasmas. These microorganisms, lacking the rigid cell-walls possessed by bacteria and showing unique characteristics, are distinct from the bacteria and the viruses, and would appear to fall between both groups. Mycoplasmas are widely distributed in nature, some species occurring as saprophytes in sewage and soil, and others being specific parasites of animals or man. A lung disease in cattle is one of the most important infections attributed to organisms in this group.

Species of *Mycoplasma* found in man and animals are sensitive to, and infections are usually treated by, antibiotics of the tetracycline group. The symptoms of diseases in plants containing structures resembling mycoplasmas are suppressed by the application of tetracyclines to the roots or leaves; this is regarded as presumptive evidence of the identity of the structures with *Mycoplasma.* In certain of the yellows diseases of plants, it has been shown that the *Mycoplasma*-like bodies are transmitted by insect vectors. As far as is known, these plant pathogens are not transmissible to animals or man.

It was with considerable interest that we noted the recent publication of a paper entitled "Mycoplasma-like Bodies in Cacti with Witches Broom Symptoms" (D. Lesemann and R. Casper, *Phytopathologische Zeitschrift,* 1970, **67,** 175-9). This draws attention to the possible association between the monstrose form of *Opuntia tuna* (L)Mill and structures microscopically resembling mycoplasmas. It is unfortunate that the authors apply the term "Witches Broom Disease" to monstrosities in cacti, since the expression is generally restricted to the description of compacted masses of branches and foliage that appear on trees, especially conifers. By the vegetative propagation of such structures removed from conifers, many of the well-known dwarf conifers of considerable garden merit have been derived.

Lesemann and Casper obtained a clear indication that certain monstrose forms of cacti were caused by an infective agent when they grafted pieces of the monstrose form of *O. tuna* on to healthy cacti, which subsequently became monstrose, with depressed growth rate and the production of large numbers of stunted shoots from the areoles. They showed by electron microscopy that the phloem from the tips of the stems of monstrose *O. tuna* contained bodies resembling *Mycoplasma* in morphology and since these structures were not seen in normal healthy cacti, they were regarded as a likely cause of the monstrosity. It would be of great interest to determine the range of species of cacti that may be infected by grafts from monstrose *O. tuna.*

The examination of tissues from other monstrose cacti for evidence of infection with mycoplasma-like organisms would be most worthwhile, since it is possible that mycoplasmas may be only one of several causes of fasciation. Thus, it is worth noting that although we have seen many grafted crests in which the stock has produced normal shoots, we have not seen a stock that has produced a fasciated shoot.

Succulent Snippets

by Sally Cornioides

I AM glad the Editor is allowing me a little space in this special number so that I can hope that you will all be celebrating the final flourishes of the fortieth anniversary year in some way—even if only by adding a ball point pen to the Christmas stockings of all the young fry or offsets in your family. The Dinner is another occasion when more members should be gathering; it is not a starchy affair by any manner or means and someone generally manages to do something amusing.

It is very pleasant to hear tell that cupid has once more been amongst the cacti in this special year. Congratulations Ivy and David of the Essex Branch and may your joint collection go from strength to strength as others we can recall.

Maybe it is a pity that there was not a Sally Cornioides in the earlier days of the Society to put to paper the background and personal achievements of those times. Many older members reminisce verbally but very few go further and write these memories down and a history of the Society would be useful and interesting. However, there have been many ordinary members who have played small parts in the overall record of achievement. Perhaps these sentiments of mine explain why although poetry as a whole does not turn me on, to use the modern phrase, I have always had a soft spot for Gray's 'Elegy'. The slightly sad thing is that many of these anonymous members have been knowledgeable in various ways but have not had the urge to commit the information to paper or maybe even the realisation that it should be done.

While I am on the topic of the 40th Anniversary, it was altogether appropriate that Mr. Hunt should be able to produce his very valuable article for inclusion in the August issue. He dedicated it to our late President,

who would have been thoroughly gratified to see what is, I surmise, a considerable step forward in the classification of the genus Mammillaria. I hope that I shall not be accused of cynicism when I say that the first thing I look for in an article of this type is name changes, whether they be new combinations, new creations or consignments to the taxonomic dustbin. Needless to say, I was not disappointed; or should I say disillusioned. We must have a modicum of order in all things but the way in which the botanists continue to enmesh themselves in the nomenclatural and procedural webs of their own weaving never cease to amaze me. My enlightenment on the genus Mammillaria had reached the stage where I appreciated that species could be divided into two groups, those with watery and milky sap, bearing the rather uncouth names Hydrochylii and Galactochylii. Now I learn that the latter is nomenclaturally unacceptable and must be replaced by Mammillaria! I believe my fellow columnist Gordon Rowley remarked not so long ago that there is only one Mammillaria species; it would save us a lot of trouble if we could really believe this.

* * *

I mentioned Echinopsis last time but another mention of these sometimes rather despised plants I feel sure is not out of hand. There are two interesting concepts that I am developing and I hope other members may be able to assist as well. I remarked before that I had several plants of this genus in flower on the same day and these included different varieties. Almost four weeks to the day there were flowers out on these plants again and in yet another four weeks or so another plant of the genus joined them for the third attractive display. I suppose I really was not surprised when chatting to a few other members just after this third occasion to find their Echinopsis had flowered around the same times as well. Is this just a chance or did other members find these beautiful flowers opening around the end of the month in June, July and August? I must remember to continue my investigations next year on this interesting point and hope others will assist in the project, too.

* * *

It may seem rather early to give Christmas and New Year wishes, but I suppose that as Christmas cards have been in the shops at least two months I may be considered tardy by some with my greetings. However, may your Zygocacti all flower at Christmas and your seedlings germinate in the New Year.

Book Reviews

CACTI AND THEIR CULTIVATION by Margaret J. Martin, P. R. Chapman & H. A. Auger; Faber and Faber, 1971. £4.50.

PRESUMABLY most authors of instructional books set out to write them with one or more well-defined objectives in view, although they may not be so bold as to state them explicitly. In the present instance the three authors, who will be well-known to many members of the Society, suffer from no inhibitions; they state that the purpose of their book is not so much to stimulate an interest in cacti as to develop an existing one. They have certainly succeeded and their efforts will doubtless be read with profit and pleasure. The style is easy and refreshingly forthright in places and, overall, it is somewhat reminiscent of two earlier books with a strong measure of originality, Buxbaum's 'Cactus Culture based on Biology' and 'Collectors' Cacti' by Bloom.

Given that one is aiming for the convinced but inexperienced catophile rather than for the beginner, there are several alternative approaches when dealing with the multitude of genera and species. One might opt for a simplified version of the strictly taxonomic approach of Professor Borg or, moving to the other extreme, the genera might simply be dealt with in alphabetical order as was done by Buxbaum. The present authors have chosen an intermediate approach, one that was doubtless dictated by their comment that they are not particularly interested in taxonomy. They consider the whole of the Cactaceae, and the coverage is surprisingly complete for a book of this size and type, under seven headings; primitive cacti, giant cacti, large cacti, cacti of North America, cacti of South America, rare cacti and epiphytes and other large-flowered cacti. This leads to some lack of coherence that may cause confusion among less experienced cactophiles who are vaguely familiar with the systematic treatment based upon the usual tribes and sub-tribes. For example, the reader wishing to track down the Echinocactanae will find them spread among the chapters on giant cacti, large cacti, cacti of North America, cacti of South America and rare cacti. Likewise, the Coryphanthanae are dispersed between two chapters. This could well prove a disadvantage for those aspiring to show their plants for the first time.

However, having opted for this particular approach the authors pursue it to good effect. As is to be expected, the genera which are of a special interest to them receive particularly good treatment; apart from epiphytic plants these comprise the Echinocactanae indigenous to South America. Some are discussed thoroughly and it is particularly pleasing to see Frailea species accorded a generous ration of space. Likewise, devotees of Gymnocalycium, Notocactus, Parodia and Rebutia should

have no quibbles. On the other hand, the genus Copiapoa receives a rather cursory treatment and, in particular, the smaller growing species gain but scant mention. Surely these cannot be known personally to the authors otherwise they would not comment that Copiapoas seem to be difficult to flower in this country. It is hard to imagine a more floriferous plant than *C. hypogaea.* The choice of Weingartia species is also surprising; most of those mentioned are almost unknown in cultivation whereas the deserving *W. hediniana* is overlooked.

Perhaps it is unfair for a reviewer to pay too much attention to his particular interests as he may tend to see the book out of perspective. In the present instance there is little danger of this happening because the authors have made a sound choice in selecting some forty Mammillaria species for particular mention. Only in the case of the little-known and rather difficult *M. morricalii* can one quibble. The rather serious misprint in this section of the book, on page 109, will provide Mammillaria enthusiasts with a chance to do some detective work. They will probably conclude that the unnamed plant is *M. guiengolensis,* which is no more than a local form of *M. beneckei.* The *Oehmea nelsonii* discussed a few pages later is also none other than *M. beneckei.*

It would be a mistake to dwell on the treatment of individual genera and species for too long because it might suggest that this topic is dealt with at excessive length, to the exclusion of cultural matters. This is far from being the case as there are chapters devoted to general cultivation and propagation. These can be read with profit by everyone as they contain a good many home truths; for example, the statements that they do not like the idea of starving their plants so they feed them, and the makers of paraffin heaters are invariably over-optimistic about the performance of their wares. There is no doubt that these chapters reflect a wealth of practical experience.

Last, but certainly not least, there are the illustrations, 13 in colour and 93 in monochrome. These live up to all we have learned to expect from two of the authors and they set a standard for others to follow. The only criticism here is that the plant portrayed as *Echinocereus pentalophus* is manifestly nothing of the sort; it is clearly one of the pectinate species of the genus. The inclusion of such a wealth of fine illustrations undoubtedly poses a problem as it must be the prime factor in pushing up the price to a level which may well place it beyond the reach of many of the readers for whom it is intended. It is to be hoped that this will not prove to be the case because the book has much to commend it and merits a wide audience. W.F.M.

Apologies

The Editor regrets that the pages of the May number of this journal were numbered 1 to 24 instead of 25 to 48. Will those who bind their copies please make the necessary alterations to the pagination.

SEDUMS. Edited by J. A. Hart and T. C. Wrigley. Morden: The Succulent Plant Trust, 1971. Pp. 56, 16 plates. 50p.

THIS booklet is based on observations of a "Round Robin" study group organised by Mr. R. Ginns, 1966-67. I am all in favour of these small groups getting together to study one particular genus of plants, especially when they have the growing experience which always helps when writing such a report as this. The species dealt with are mainly tender ones, of interest to the advanced collector.

Mr. Wrigley states that there are now four to five hundred species. Personally I feel that there is far too much "splitting" that is not really necessary, and this only leads to confusion.

The sixteen full page illustrations in black and white are, in most cases, clear and recognisable. If one wishes to pursue one's studies further, there is a helpful three-page bibliography. There is a wealth of information condensed into this small booklet of some fifty pages, and it is well worth the 50p asked.

M. Stillwell

Correspondents

ZYGOCACTUS TRUNCATUS—CHRISTMAS OR EASTER CACTUS

My *Zygocactus truncatus,* which is over two feet in diameter, flowered in mid December with just under 100 blooms. Due to lack of space in the greenhouse after Christmas the plant was left to rest on top of a hall cupboard where it received only dappled sunlight through the top porch windows. It was watered as it became dry, but no special feeding was given.

In early April I was surprised to see a small bud on one of the tips of growth. By May 1st. the first of 15 well formed buds had opened. The flowers proved to be quite normal in size, shape and colour with no loss in intensity such as may be seen in epiphyllums flowering later in the season.

I am unable to say if these buds are on growth which did not produce flowers at Christmas as I always remove dead flowers of cacti, when seed is not required, in order to avoid fungal growth on the old petals. I can only suggest that the lack of light and the reasonably mild winter weather has reproduced autumn conditions and induced a second flowering. I would be interested to hear from other members who have had similar experiences, or who have views on the reasons for such abnormal flowering.

J. C. Hughes,
87 Elmstead Gardens,
Worcester Park, Surrey.

As Others See Us

BEING a member of the Management Committee of the Trinidad and Tobago Horticultural Society, I naturally was very interested in seeing as much as possible of the "Flower World" of England while I was on vacation in London recently. Unfortunately, I missed the Chelsea Show by some four days, but nevertheless attended some of the fortnightly shows put on by the Royal Horticultural Society of Great Britain.

At one of these Shows which was held towards the latter part of June, the accent was on "Cacti & Succulents", and I was really amazed to see the great variety of cacti which are grown in England and the very high standard of plants which were on display there. I had previously seen cacti growing in Miami and had thought then that they were fabulous, but those that I saw at the Society's Show at Vincent Square were really fantastic. I was very impressed too by the staging of the plants in general which I am sure made the task of judging the Show much simpler for the Judges.

On my previous visits to England, the last being about nine years ago, foliage plants and especially cacti were not very popular at the flower shops, and if I remember correctly, I had never seen a cactus for sale anywhere in England before my last visit. It could well be that as I had no eyes for cacti then I never really saw them, but I was pleasantly surprised to see so many growers of these beautiful and unusual plants scattered all over England now.

My husband and I are both very interested in Mammillarias in particular, and there were some very lovely specimens seen at the Show. I had the pleasure of visiting the home of Mr. & Mrs. W. F. Maddams where I took some very fine coloured slides and these have given us a greater incentive to expand our collection.

It is a great pity that no exporters of cacti were found in London, as I was really very impressed with the quality of the plants, most of which were apparently grown from seeds and were generally superior to the collected plants available from the United States.

I wish to congratulate the organisers and participants and look forward to returning to England in the not too distant future to visit the Cactus Show once more.

Mrs. Rita Barrow,
10 Mayfield Road,
Valsayn Park,
Trinidad, W.I.

Succulents in the Antipodes

HERE IN New Zealand spring is with us again—that magical season in the calendar of the cactus and succulent grower. Every season brings its surprises and rewards but for me thought of the beauty of the spring flowering season are something that lighten the more drab days of winter.

My home is near the centre of North Island where we plan for up to 14 degrees of frost (e.g. temperature of 18°F) but temperatures are usually above freezing point by 9 a.m. and do not fall below again until late evening. For several years I grew about a thousand cactus plants in a greenhouse made with a wooden frame and covered with polythene. A two inch permanent ventilation gap was left under the eaves. The plants did very well under polythene but, as it needed renewing every twelve months it was finally replaced with glass.

Many plants from warmer climates seem to be quite happy under frosty winter conditions provided they are kept dry. No succulent rarities will be found in my collection but such plants as *Melocactus intortus, Melocactus jansenianus* and *Euphorbia hadramautica* have survived several winters. The latter has a plastic bag over the pot as extra protection. Numerous members of the Stapeliad family are happy under cool winter conditions. *Piaranthus nelsonii* hangs its many small jointed, purplish branches from a top shelf; possibly they would all root in a wide container. *Diplocyatha ciliata* is plump and in bud although it has had no water for six weeks.

Our local rainfall is about 54 inches annually but this still leaves many sunny hours and even in mid-winter temperatures in the glasshouse are frequently above 60°F for several hours a day.

Many of my plants have been grown from seed; importation of plants is limited and as we are so far from overseas sources of supply, air mail postage is costly. Lists from overseas societies and seed firms are eagerly anticipated. Growing from seed is interesting but the annual problem is where to put all the trays when the seedlings are planted out. Last spring in an endeavour to save space several community plantings of two-year-old seedlings were made in large square containers. I expected these to be set for two years, however the plants so enjoyed the company and the extra root room that they need repotting again this season.

The faithful winter flowering plants, *Parodia chrysacanthion, Mammallaria plumosa* and *M. decipiens* are just finishing. The first spring flowers this year will be on *M. pottsii, Parodia mairaina* v. *atra* and *Weingartia multispina;* this last plant always flowers much earlier than the other species of Weingartia in my collection. *Crassula* 'Morgan's Pink' will greet the spring with a scented display of dainty pink flowers.

May I, in closing, congratulate your Society and its members on its fortieth Birthday Anniversary. May the coming years be as enjoyable, profitable and interesting for you all as the past ones.

Mrs. E. Graydon,
16 Tirau Street,
Putaruru,
New Zealand.

SUCCULENT PLANT TRUST

The Succulent Plant Institute was founded in 1962 with the principal aim of setting up a National Succulent Centre, incorporating a National Collection, library and laboratories. It was envisaged that such an establishment would provide collectors and researchers with unrivalled reference and study facilities. Valued historic collections would be preserved and efforts would be made to protect and propagate rare and threatened species.

Although the SPI has achieved considerable success and world-wide recognition for its work in other fields, progress towards the achievement of the principal aim has been slow. The major problem is, of course, finance. Even a modest project must absorb a vast amount of cash. In order to assist in raising the capital needed, the SPI has set up a new registered charity, the Succulent Plant Trust, with Messrs. Gordon Rowley, Bill Putnam and Leslie Cooke as the first Trustees. As a charity, the Trust will enjoy exemption from income tax and capital gains tax and will thus be in a position to make the most of donations received. It must be emphasised that the Trust is an independent, non-profit making organisation and will not operate in competition with the societies.

All persons interested in cacti and succulents are invited to consider offering their support. Donations, however small, would be gratefully received. Legacies, either of cash, plants or books or documents of special interest, would be much appreciated. If you have the privilege of paying U.K. income tax and are willing to pay a fixed donation each year. for a minimum period of seven years, please consider making out a Deed of Covenant. Your donations are then regarded as taxed income in the hands of the Trust and the tax can be reclaimed. This makes a considerable difference, as £1 given under covenant becomes £1·63 with the tax refund. Even a donation of 61p p.a. will give a tax refund of 39p to yield a total of £1. A simple form must be completed by those adopting this form of donation and these may be obtained either from Mr. Cooke, 63 The Drive, Morden, Surrey, or from me. Please do not send any money until the form has been completed.

All moneys received will be accumulated on the trusts given in the Trust Deed, a few copies of which are available on loan. The Trustees are ultimately responsible to the Charity Commissioners for the proper administration of the Trust and donors may be assured that neither the Trustees nor myself will be able to abscond to South America with the funds.

This is an ambitious venture. It will take time but it is not impossible. With the Trust we have a framework on which we can build. The ultimate success of the project must depend upon *you*.

J. G. Stearn, ACA,
Hon. Treasurer, SPT,
24 de Freville Road,
Great Shelford, Cambridge.

Secretary's Notes

Annual Dinner

Thursday, November 25th, 1971—6.30 for 7 p.m.
Venue- "The Windsor"—333, Vauxhall Bridge Road, S.W.1.
Guest of Honour L. MAURICE MASON, Esq.

Final arrangements are now in hand for the above, please note the time of the function which was regrettably omitted from my last notes. The cost is £2·50 per head. If you have forgotten to send in your seat reservation form up to now do not be afraid to write or phone me up to 48 hours before the event. I want everybody that I can muster for this 40th anniversary occasion—My phone number is 01-642 5734. As will be seen from the above there is a change in our Guest of Honour from the previous announcement. We are very fortunate and shall be greatly honoured by the presence of Mr. Maurice Mason on this occasion. It is hoped that the after-dinner entertainment will take the form of films on South Africa.

Free Subscription Competition

The response to the competition for a free subscription which appeared in the May 1971 issue of the Journal was not quite as good as I had hoped. However I am glad to announce that the winner of this competition was MRS. M. SEYMOUR of Maidstone whose amusing story follows and to whom I offer my congratulations.

Mrs. Seymour does not title her story but what follows is the Tale of the Magnetic Spiny Beast:—

It's no good—it's got to go! Very sad, but once they start to bite there's nothing else for it. It is only a youngster too. I haven't the nerve to ask some unsuspecting soul to give it a home, as it can't be trusted indoors, and I defy anyone to try and train it.

No—it isn't a dog—just an *Opuntia tunicata*! It is time to repot it, but I just haven't the nerve. The last time I did it was an awful experience. I got it out of the pot without injury either to myself or the plant, but while filling in and firming the new compost I got stuck on one of the spines, and in trying to free my finger, got impaled on the other hand. Impaled is a very apt description. I couldn't get away. I swear the spines touched bone! I called to my husband who was in the kitchen, but having the radio on rather loudly, he didn't hear. I called louder, but he still didn't hear.

I am convinced that human flesh acts as a magnet on this particular species. The more one struggles, the deeper the spines seem to go.

In the end, I just gritted my teeth, closed my eyes, and pulled my hands apart. I've never needed that much nerve to have a tooth filled!

Anyone want an *Opuntia tunicata*?

READERS are asked to note that advertising space is available in this Journal at the following rates:

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Quarter page	£1·75 per issue

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For the February issue	1st January
For the May issue	1st April
For the August issue	1st July
For the November issue	1st October

In addition there is a SMALL ADS. column at 8p per line, minimum 24p for which copy should be received on the above dates also.

A Booklet on the Classification of Cacti and Succulents is now available from the Show Secretary. The price is 5p each plus postage. Branch Secretaries can obtain them at 12 for 50p plus postage. Postage is 1-8 copies 3p, 9-11 copies 5p. Postal Order or cheque, NOT stamps please.

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