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THE CACTUS AND SUCCULENT JOURNAL OF GREAT BRITAIN

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Notocactus tabularis (photo: G. A. Burton)

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OBITUARY

Percy Vere Collings, K.St.J.

It is with deep regret that we have to record the death of Percy V. Collings on December 5th, 1974. Percy as he was affectionately known to members, was 81 years of age and had led a very active life being interested in many subjects, not only succulent plants but also in other fields, not least that of pond and aquarium keeping. Percy was a founder member of our Society and before the actual formation of the Society he was in constant contact with Mr. Ernest Shurly in consultations respecting the formation of a society. On November 28th, 1931, he attended the preliminary meeting at St. Brides Foundation Institute when the decision was taken to start the Society. Percy was a member of the first committee and as far as I can recollect has been a member ever since, until his election as Vice-President in 1957. He held the office of librarian from 1933 to 1968.

Percy was always a familiar figure at the monthly meetings and also the committee ones and I cannot remember an occasion when he was not present right up until recently. He was usually present at meetings even after he had moved to Hailsham in Sussex. His large collection of mature cacti and other succulents was well known to many visitors to his home and he has been a successful exhibitor at many of the Society's shows. He was an active member of the North London Branch.

The Enterprise Aquarist Society will miss him very much as he was their President for many years and always a ready source of advice to the inexperienced new-

comers to the hobby. He will be sadly missed by our members and the deepest sympathy is extended to his widow and son. I am sure that he will never be forgotten by cactus growers as a real enthusiastic exponent of the hobby.

Arthur Boarder

S. L. Cooke

With the passing of Leslie Cooke, on 29th December, 1974, the cactus world has lost a crusader of some zeal, a man of integrity and a person of sound judgement. His name has come to be almost synonymous with that of the Succulent Plant Institute to which, as Chairman over a period of years, much of his energy and enthusiasm were directed. What has been achieved by this organisation in the way of establishing and protecting reference collections and in promoting specialist publications, is a fitting memorial to him. He was also a staunch supporter of the Mammillaria Society almost from its inception in 1960. He served on the Committee from 1961 to 1963 when he took over as Treasurer for a year and from 1967 to the time of his death. He had been an active member of the Godalming Branch of the National Cactus Society and the North Surrey Branch of this Society. All in all, he will be missed greatly.

W.F.M.

From the President

THIS being the first journal of the year I would sincerely wish the members a Happy Year. We all have problems and, as far as I can remember, we always have. One's hobby is a very effective counter to the less desirable effects of 'problems'. Cacti are pre-eminently an example of surviving under difficult conditions as many collectors can assure us. Their differences intrigue us and their flowers afford infinite satisfaction. A plant that was presented to me by the Society three years ago is coming into flower again. I have divided and repotted it and they are doing nicely. I hope each of you will find satisfaction and quiet pleasure in pursuing the hobby in the New Year. Good luck!

DORA SHURLY

Seasonal Cactus Care

by W. F. & B. Maddams

THERE ARE SEVERAL good reasons for raising as large a proportion as possible of a collection of cacti from seed. It is undoubtedly the most economical method and in the space of a few years one may obtain a fair-sized group of attractive flowering plants at a fraction of the cost of bought in specimens. Furthermore, it is often found that one or two seedlings in each batch outstrip their companions and if they are retained they will usually develop into fine specimens. Again, from the conservation angle, and all serious collectors should encourage this, propagation from collected seeds should considerably reduce the wholesale removal of plants from habitat areas.

The Society distributes a substantial amount of seed each year and we know from our contacts with members that some of them are very successful in raising good numbers of healthy plants. On the other hand we also know that many others do not achieve this degree of success, some failing to the point of becoming completely discouraged. We have been ardent and tolerably successful enthusiasts for this method of propagation for some fifteen years and those members who have attended the Society Shows in the R.H.S. Hall of recent years will have seen the results of our efforts. Among the Mammillarias, *Mammillaria centricirrha v. bockii,* raised in 1957 and *M. bocasana,* from seed sown in 1960, are now handsome specimens occupying eighteen inch half pots. Among the columnar cerei *Espostoa huanucensis,* which gained the award for the Best Cactus in the Show in October 1974, dates back to 1958. As details of the annual seed distribution are to be found elsewhere in this issue we feel it is appropriate to devote this set of notes to seed raising in the hope that some who have hitherto been unsuccessful and others who have not attempted it will succeed in obtaining healthy seedlings. To do so leads to a real sense of satisfaction and achievement, particularly when flowers are obtained for the first time.

The first requirement for successful seed raising is an adequate temperature. Alhough some recent interesting research work by B. Fearn has shown that the optimum germination temperature varies somewhat among different genera and species, 70°F. represents a good working compromise. This temperature is easily maintained by natural means during the summer months but if sowings are to be made earlier in the year, and this approach does have the advantage that it gives a long growing season, some form of artificial heat is essential. In this article we shall be concentrating on this method but much of what we say is very relevant to propagation by natural warmth later in the year.

Although one occasionally hears of very successful results being achieved by the use of an airing cupboard this is only a temporary expedient; when the seedlings appear it is imperative that they have some light and a temperature of at least 60°F. for some weeks. Hence, if seed raising is to be attempted on other than a very small scale the use of a propagator is almost mandatory and it will very probably mean the difference between success and failure. There are several excellent commercial propagators to be had but, unfortunately, they are expensive and, in our opinion, something of a luxury. We have built a series of inexpensive propagators over the years and have gradually evolved a design which has proved very satisfactory. It consists of three parts, the overall container, the tray to hold the seed pans and the source of heat. The first of these is easily, quickly and cheaply made from hardboard fastened to a framework of half or three quarter inch square wooden lengths. This gives a light but robust structure. The tray to hold the seed containers is made from eighteen gauge aluminium sheets. This is thick enough to have strength and rigidity but thin enough to cut and bend easily. It also has the advantage of holding any water which may seep through the seed containers.

The first of our propagators relied on a domestic

lighting bulb as the source of heat. This proved very satisfactory until the lamp reached the end of its comparatively short life which, by the law of perversity, usually occurred in the early hours of the morning. The temperature of the propagator then dropped to an unhealthily low level before the failure was discovered the following morning. This problem is easily overcome by the use of two electric light bulbs wired in series, which means that one terminal of the first is connected to one terminal of the second and the mains lead are wired one to each of the remaining terminals. The voltage across each is then one half of the main voltage, about 115 volts. Each bulb operates at a dull yellow heat and their lifetime is indefinite. When two bulbs are wired in series the overall wattage is one half of that of each bulb if they are equal. For example, two 150 watt bulbs will give an output of 75 watts. The heating capacity required to maintain 70°F. will, of course, depend on the size of the propagator and the temperature of the surroundings. A typical example is provided by our current propagator, the outside dimensions of which are approximately two feet three inches by one foot nine inches, with a depth of ten inches. This is situated in surroundings which normally do not drop below about 45°F. and 75 watts, provided by the above arrangement, is adequate to keep the temperature at a minimum of 70°F.

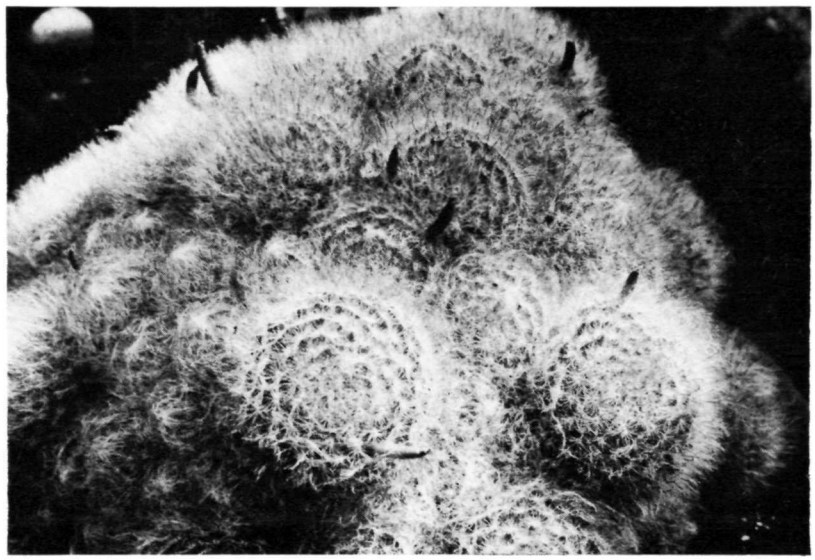
It is usually possible to determine by trial and error what combination of light bulbs is required to hold 70°F. in a particular set of circumstances. However, it should always be remembered that when two bulbs are used in series they should be of approximately equal wattage. If one is considerably bigger than the other the load will not be spread uniformly and one will burn much hotter than the other, giving it a limited life. The bulbs are mounted an inch or two above the base of the propagator, about one third and two thirds of the way along the central long axis, this spreads the heat as uniformly as possible. The metal tray holding the containers is supported on wooden struts screwed to the sides of the outer container at such a height that there is again a couple of inches clearance above the light bulbs. If the gap is too small some areas of the tray will become very hot and the containers at these points will dry out rapidly.

It is possible to make some comparatively cheap refinements to the heating system by using an aquarium thermostat to give an accurately controlled temperature and by using a cable heater rather than light bulbs, and this does give a better temperature distribution. Two final points in the overall design should be noted. There should be an adequate gap on the four sides between the aluminium tray and the hardboard walls, so that warm air may rise around the sides. Secondly, the overall depth should be such that the tops of the seed containers are a few inches below the sheets of glass which cover the top of the propagator. If the gap is too small upward growing plants, such as columnar Cerei, may reach the glass before it is convenient to remove them to other quarters. One final word of caution; anyone not familiar with the rudiments of electrical wiring should seek advice before attempting to construct the type of propagator we have described: better safe than sorry, to quote the old adage.

It would require several thousand words to describe adequately the many variants on the basic method of seed sowing. Hence, we shall concentrate on our system, which does not differ greatly from that used by Mr. Boarder and detailed on several past occasions in this Journal. The sowing medium can be John Innes seed compost or one of the no-soil composts, for which we have a preference. Because the great majority of cactus seeds are very small it is necessary to have a fine tilth at the surface. This is conveniently done by putting the compost through a domestic flour sieve. The coarse retained material is put at the bottom of the seed containers and followed by the main part of the compost, unsieved material. This is followed by the surface layer of the fines which pass through the sieve. The whole should be firmed down, without undue pressure particularly around the sides. If this is not done it may subsequently sink and shrink away from the walls.

There is probably no optimum size or type of container; it is very much a matter of personal preference. However, we do believe that they should be square or rectangular for convenience of packing in the propagator. We know that some enthusiasts sow one or two sorts of seed in two inch square plastic pots. We prefer larger containers and for some time now have used plastic boxes eight and a half inches long, six inches wide and two inches deep. These are filled almost to the top with compost. There are also many ways of dividing up these larger containers, with labels, strips of plastic and the like. We make a network of wires, soldered together, to divide each tray into four lengths and width ways, giving a total of 16 compartments, and one packet of seed goes into each.

There are, no doubt, also a number of ingenious methods for actually sowing the seed. We tip the contents of each packet into a teaspoon and endeavour to manouevre the seeds, one by one, with a sharp label or penknife, in some reasonable semblance of order into the appropriate compartment. This is tedious but it does avoid undue overcrowding at an early stage. If the seed is fairly small, say half to one millimetre as is typical for most *Mammillaria* species and a good many other cacti, it should be gently pressed into the surface of the compost with a small, flat object such as the square end of a pencil. Large seeds, Opuntias being the best example, should be pushed down until they are covered by a layer of compost about equal to their diameter. It is worth mentioning at this point that care should be exercised in opening packets of seed. Small seeds may be wrapped in tissue paper within the main packet and this inner wrapping should be unfolded carefully. If the



Mammillaria bocasana (photo: Maddams)

seeds are not wrapped, they may wedge into corners and crevices and may not be noticed. When multi-compartment containers are used a clear record should be kept of the seed sown in each compartment. It is possible to put a small label into each but we prefer to label the four corners only and then draw out a detailed plan in a book we keep specifically to record our seed sowing.

When the seed is sown, each container should be soaked in warm water until the surface is thoroughly moist. At this point one may also sprinkle a very thin layer of coarse, sharp sand, with a particle size of about 0.5 mm on the surface. This is not mandatory but it has two advantages. It seems to anchor down the very young seedlings and help them to root during the first few weeks, and it does lessen the incidence of algal growths at a later stage. When the boxes are thoroughly damp they are covered with individual pieces of glass, cut to size, and pieces of cardboard or brown paper to exclude daylight. Alternatively, and this method is strongly recommended by some successful seed raising enthusiasts, each container is put into a plastic bag to retain the moisture. The containers are then placed in the propagator with a sense of anticipation.

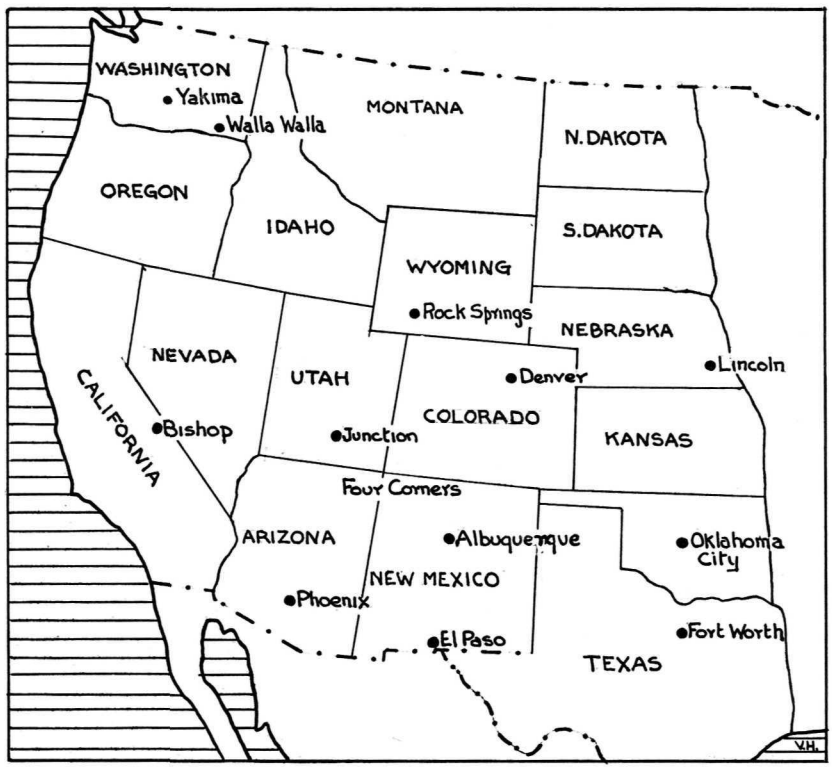
The time required to germinate cactus seeds varies considerably; it depends on the genus and the age of the seed. Some genera such as *Astrophytum,* seem to germinate consistently in about five days but ten days is typical of many genera. However, if little is to be seen after two or three weeks hope should not be abandoned as seedlings can and do appear after a month or two in some circumstances. *Opuntia* seeds are particularly fickle in this respect and quite some years ago we recall a sowing of them which failed to germinate. One year later they were dug up and replanted in another container and produced sturdy seedlings a few weeks later. The percentage germination will also vary considerably; there may appear to be a forest of seedlings in one compartment and only one or two in the next. An overall average of about 50% is reasonable.

When a few seedlings have appeared in a particular container the covering to the glass should be removed. If this is not done the seedlings will become pale and drawn. There will be fairly heavy condensation on the glass covers and this should be removed occasionally. During the first few weeks, when the tiny seedlings have a fine tap root only, the surface of the compost should never be allowed to dry out completely. It should not be kept wet to the point of having standing water but it should always be moist. This can be ensured by regular spraying with warm water, using a spray which gives almost a mist, and by soaking from the base from time to time. The requisite degree of dampness is something best learned by experience but it is not too critical.

Small cactus seedlings need some light but they do not appreciate unbroken sunshine during their early months. The degree of shading required will vary with the circumstances but if the propagator is placed on a greenhouse staging some protection will be required by early March. This is conveniently obtained with tissue paper or muslin. If the shading is not adequate the seedlings will turn red and growth will stop. They usually recover if appropriate steps are taken but are checked considerably. The steps described thus far cover the sowing procedure and the first two or three months of life and we shall deal with the attention that is subsequently required in our next article.

Cacti and the Desert Climate

by Lee H. Bowker, Ph.D. *



Sketch map of western U.S.A.

MOST READERS of this Journal have probably had the experience of visiting a collection and hearing how cacti need only be watered once a month. The dehydrated plants thus treated show hardly any growth from year to year. Their owner assures you that this is how they exist in nature, for "it almost never rains in the desert." What is the truth in this matter?

The generalization that cacti grow in deserts where rain is an unusual occurrence is a poor one. A common method of defining the limits of a desert is the line of 10 inches annual precipitation. This is over simplified since it ignores such relevant factors as percentage of available sunlight, wind, humidity, evaporation, slope, and soil type. But as a rough operational definition of desert country, the 10 inch precipitation boundary isn't bad. Using this definition, it can be clearly stated that most cacti do not grow in desert conditions.

Among collectors of cacti, certain species come to be defined as "difficult". Some of these are symbolically so designated because of their appearance, history of cultivation, or supposed rareness. Ignoring these cases (which should be the subject of another paper), the only cactus species that come from true deserts are those known in the trade as "difficult". In contrast, most species of *Mammillaria, Gymnocalycium, Parodia,* etc. originate from areas that are semi-arid at worst.

The Western United States is somewhat more arid than the average cactus habitat in Mexico and South America, but since data for this area are at hand, I will use it as an illustration of my thesis. In the United States, annual precipitation along the Atlantic Coast varies from 44 to 64 inches. This decreases gradually as you move westward, but is still approximately 30 inches per year on a line from Fort Worth, Texas to Oklahoma City to Lincoln, Nebraska. Though this is three times the precipitation to be expected in a desert, Central Texas and Oklahoma support a varied group of *Coryphanthas, Echinocerei* and other genera.

*Whitman College, Walla Walla, Washington, U.S.A.

At this point, precipitation begins to decrease rapidly, reaching 14 inches at Denver and Colorado Springs, 15 inches at Las Vegas, New Mexico and 11 inches at Roswell. All of the Great Plains cacti such as *Coryphantha vivipara vivipara, Neobesseya missouriensis* and *Echinocereus viridiflorus* prosper in this semi-arid climate. The first true desert environments do not appear until the mountains have risen to break the high plains. In Wyoming, it is in the Red Desert near Rock Springs (9 inches) and further north at Deaver (5½ inches) and Powell (6 inches), all three in the shadow of major mountain ranges, that desert conditions prevail. In Colorado, similar dry basins occur west of the Rockies near Grand Junction (9 inches), Alamosa (6 inches), and Buena Vista (9½ inches), while in New Mexico, the first desert areas appear at Albuquerque (8 inches), Socorro (8 inches), and White Sands National Monument (8 inches).

Despite its abundant cacti, Oklahoma has no desert areas. The lowest reporting stations in Oklahoma proper receive 22 inches of precipitation per year, and the lowest station in the Panhandle (at its most western extension) records an average of 15½ inches. Texas has more species of cacti than Arizona, but only a handful of stations along its extreme southwest border experience *desert* levels of precipitation. These are in the El Paso (8 inches) and Presidio-Candelaria (8½ and 10 inches, respectively) strips. Species such as *Escobaria albicolumnaria, Echinomastus pallidus,* and *Mammillaria pottsii* are from the Presidio area and rot with the slightest excess of water. Species from further east are in a very different situation, probably receiving more moisture in their native environments than they do in most greenhouses.

In Arizona and Utah, elevation is the key to understanding the distribution of desert conditions. Its reputation notwithstanding, much of Arizona is not desert. There are two large desert areas in the state, one in the Four Corners area (Kayenta, 8 inches; Winslow, 7 inches) and the other covering the western part of Arizona (Phoenix, 7 inches; Parker, 4 inches; Yuma, 2½ inches). Most of the famous Arizona species (such as the *Mammillarias*) grow at high enough elevations so they do not exist in true desert. Some areas are so dry that even cacti do not grow. In between, the Saguaro and other species like those at Organ Pipe Cactus National Monument are at home.

Utah is a dry land with many deserts basins. The number of cactus species found within the state's borders is rather small, however. It is the land of the Sclerocacti, perhaps more sensitive to overwatering than any genus known. The Sclerocacti are generally found in areas that receive from 5 to 15 inches of precipitation per year. Some species seem to do well in areas that are exceptionally dry. *Sclerocactus pubispinus* near Wendover (just under 5 inches) and *Sclerocactus wrightiae,* which thrived at Hanksville (5 inches) until collectors wiped out the site, are examples of super-xeric species. These two species grow flat to the ground at Wendover and Hanksville, while *Sclerocactus whipplei,* growing in locations with more moisture, is a small barrel reaching one foot in height. Barrels are not as tough as near-geophytes, and I can remember *Sclerocactus whipplei* in a 1972 drought at Green River (6 inches) which had dehydrated so severely that they weighed almost nothing. The key to the survival of the Sclerocacti in more moist areas (15 inches) is that the low humidity, high evaporation, wind, and available sunlight create desert microclimates at the soil level (especially on sandy soil) which compensate for the excessive precipitation.

Dry as Arizona and Utah are, south-eastern California and all of Nevada are drier still. The California desert extends from Bishop (5½ inches) on the north to the Mexican border, and includes the depths of Death Valley (less than 2 inches). Nevada is the most arid state in the United States. Twenty-four of the 37 reporting stations in this sparsely populated state show annual precipitation normals for 1941-1970 of under 10 inches. Even high elevation is no guarantee of high precipitation, as is evidenced by Tonopah (5,400 feet, 4 inches) and McGill (6,300 feet, 8½ inches). Again, species like *Echinomastus johnsonii lutens* (Searchlight, 6½ inches) and *Sclerocactus polyancistrus* (able to retain a barrel shape at Tonopah despite the 4 inch annual precipitation) are particularly difficult to keep in cultivation. One might think that the aridity of south-eastern California and Nevada would produce huge numbers of cactus species, but excluding prickly pears and chollas, the number is not much over a dozen.

Perhaps the most common non-Opuntiad in Utah is *Pediocactus simpsonii,* which grows in mountain areas receiving 15 to 25 inches of precipitation a year or more, much of it coming as winter snow. Many collectors kill their Pediocacti by underwatering rather than overwatering them. In Oregon and Washington, *Pediocactus robustior* and its form *nigrispinus* have adapted to the lower precipitation of the Columbia Basin (Yakima, 8 inches; Madras, 9½ inches; Ephrata, 8 inches), but they grow in dense moisture-retaining soil on hills that receive somewhat more precipitation than the surrounding valleys.

Though the areas of low precipitation are of great interest to the climatologist or geomorphologist, they are of limited appeal to the collector of cacti. The variety of species to be found is quite small compared to areas that are semi-arid. Vast desert areas contain no cacti at all, much like the Sahara which supports few succulents over most of its range. True desert cacti do not adapt well to greenhouse cultivation, and probably have an average life of less than three years in captivity. Unless you live in a desert area yourself, it would be kinder to ignore them. Alternatively, greenhouse-raised seedlings of true desert species are much more resistant to the ravages of over-watering.

The focus of the cactus world is more properly on the species from somewhat dry, but not desert environments, perhaps between 10 and 25 inches of annual precipitation. Since 90% of the species in most cactus collections are from non-desert climates in any case, we should cease talking all the nonsense about cacti being desert plants. Furthermore, it would be wise for collectors to segregate out those species originating in true deserts and to give them substantially different treatment from the larger body of non-desert cacti. This would include not only less water and more sun, but also better drained soils, or perhaps the substitution of clay for plastic pots.

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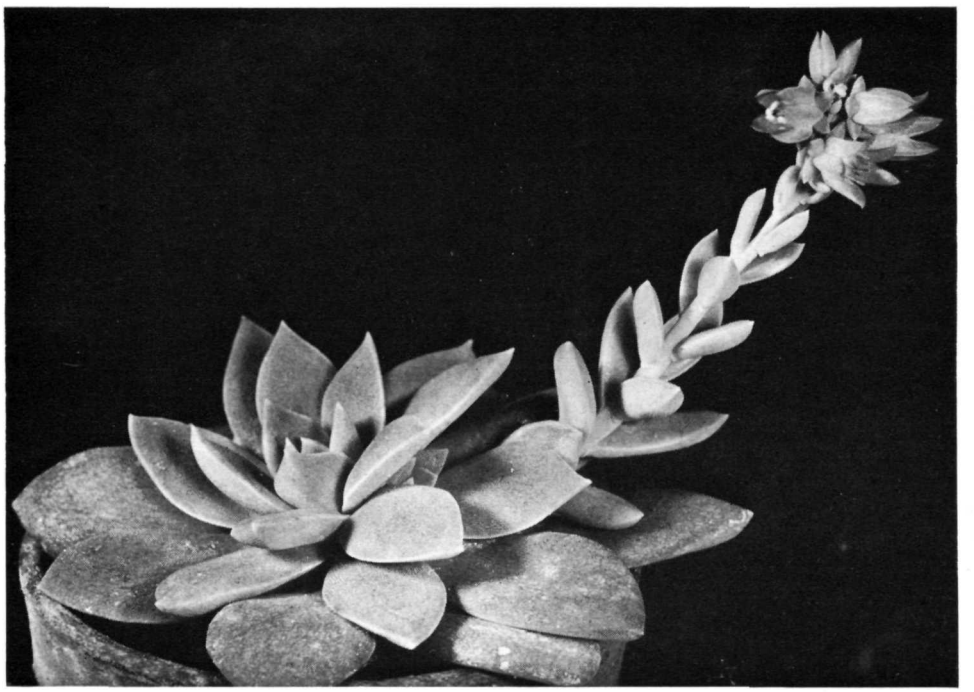
Cultivation of Succulents

by Mrs. M. Stillwell

SIGNS of early spring kindle one's enthusiasm, and February brings the new seed lists and catalogues. I would strongly advise collectors to consider obtaining some winter flowering plants as it is surprising how cheerful my greenhouse has been looking right up to Christmas and after. The showiest plant was a large *Cerochlamys pachyphylla* with at least ten large, mauve flowers out to perfection throughout the Festive Season, and lasting over a long period. Similar in colour are many Gibbaeums and some Argyrodermas. All my Faucarias flowered very freely after being out in the garden until well into October. Dwarf Aloes which take up very little room also flower very prettily during the winter. Watering these flowering plants during the winter must of course be done with great caution if the weather is very severe. Since they are built to conserve water over long periods I water them only when the plants start to look a little limp. Do keep one window slightly open at all times to allow a little fresh air to circulate, and so prevent the formation of mildew. Plants such as stapeliads are prone to mildew, and of course should be kept in the warmest part of the house.

When I had a lot of stapeliads I always grew them in full sun where they flowered profusely and became very strong and sturdy. It must be stated, however, that they have to be introduced gradually to really hot dry conditions, to avoid the risk of scorching young seedlings that have been grown on quickly. I used to keep mine standing in saucers and every few days a little water was put in each saucer, enough to keep the plant moist without any watering from the top. Stapeliads are also inclined to suffer from mealybugs, and a little Murphy systemic insecticide added to the water every six weeks should suffice to keep them clear. One cannot keep every kind of plant when space is limited, and I am afraid some of my stapeliads had to go.

February should see a number of the echeverias in bud, or even in flower. One of the more colourful and free-flowering is *E. derenbergii*. I am always pleased to see very early in the year the bright yellow flowers of *Sedum palmeri*, the dichotomous branching giving a feathery appearance. This is a native of Mexico not often seen in collections these days, but one which I can really recommend for its beauty during the dark days of winter. There are some extremely colourful plants in the genus *Sedum* which are often despised as being common. This, I think, is because they tend to be over-watered and allowed to become lush and uninteresting to look at. But what is more lovely than a well grown *Sedum pachyphyllum* that has been kept rather dry so that the tips of the leaves have turned an attractive ruby red? *Sedum nussbaumerianum* can become



Echeveria carnicolor (photo: M. J. Martin)

a rich amber colour and make a fine splash of colour in a group of plants on the show bench. I have always advocated growing a few of these colourful succulents especially for this purpose, to highlight a group of cacti and succulents particularly when the show does not coincide with the main cactus flowering period.

Speaking of shows, a judge looks for an overall group of plants and not a predominance of pots. Do bear this in mind when building up a group and always grade the plants so that each row hides the pots behind as much as possible, coming down to very small plants in the front. A few leafy succulents placed at the right intervals take away the hard look that can appear with a group solely of cacti. I hope that as many members as possible will support the one day show arranged this year as an experiment. Being on a Saturday, a number of new names should appear among the exhibitors who have been prevented from showing mid-week by business commitments. As soon as you receive the schedule, take it out to the greenhouse and try to select the plants you propose to take. This will allow plenty of time for repotting if this is required, for top dressing and for writing out a new label that can be read clearly by the visiting public. If you are well prepared in advance, then when the day comes it is just a matter of packing the plants. Do take care in selecting your plants and if three are called for do make sure that all three are in first class condition. All too often a judge finds two beautiful plants let down by a third that is of poor quality or obviously immature.

Go out of your way to help any new members who may be considering exhibiting at shows in selecting their plants. Tell them the different points that judges look for in making their awards. In my early days I was given tremendous help in this direction by enthusiastic members of long standing, to whom I was extremely grateful. I received seedlings and cuttings too, some of very rare plants. Several of our older members believed in the policy of distributing material of their rarer plants as a means of conservation, so that if they lost their plant they always knew where to get a piece back. This is a sound policy, as it happens that certain plants grow better for one person than another.

If the weather is fairly good I like to inspect the whole of my collection at the end of February. Each plant that is due for watering gets dipped right under in a bucket of water to make sure that the roots get really wet. Then it is allowed to drain before being cleaned up and examined for pests and then put back on the staging. It may take several weeks to complete this operation, but at the end one feels a sense of achievement in making a good clean start to a new season. The underwater treatment removes any dust that has accumulated on the leaves so blocking the breathing pores. This operation may not be so easy where no-soil composts are used, as these tend to float out of the pots, so in this case spraying may be the better method.

Water, water everywhere

*by Dr. Arnold Rainbow**

FEW SUBJECTS provoke more intense argument amongst cactophiles than that of watering; everybody seems to have their own ideas on when and how cacti should be watered, on what constitutes the idea compost and what is the ideal pot. All these points have their relevance to water relations in cacti as we shall see.

Despite the fact that cacti have, over the course of countless generations, adapted themselves to an arid existence, water is no less important to their survival than to any other form of life—be it animal or plant. Cacti are a good illustration of necessity being the mother of invention: in order to survive and reproduce they must make the most of what water is available—for water has numerous equally vital functions in the life of the cactus. These are summarised as follows:—

1.1 Raw material for manufacturing processes

Water is an essential ingredient of the synthetic process which is basic to plant life: photosynthesis (depicted in simplified form below), a process which, in the presence of the green pigment chlorophyll, locks up energy for subsequent use by the plant.

Photosynthesis

$$6\,CO_2 + 6H_2O \xrightarrow[\text{chlorophyll}]{\text{energy (sunlight)}} C_6H_{12}O_6 + 6O_2$$

carbon dioxide — water — carbohydrate — oxygen

Respiration

$$6\,CO_2 + 6H_2O \longleftarrow C_6H_{12}O_6 + 6O_2$$

$\downarrow$

energy for other processes (e.g. cell division)

The carbohydrate (for example, starch) produced by photosynthesis may be utilised in the synthesis of structural materials (for example, celluloses for cell walls) or it may be broken down in the course of respiration to produce energy. In the latter case, water is one of the by-products (see above diagram).

Plant chemistry is a complex subject so let it suffice to say that the addition or removal of water takes place at numerous stages in the manufacture of cell components and that all these components owe their existence in some way or other to the process of photosynthesis, a process in which water plays an integral part.

1.2 Transport medium

The vascular system in the plant is analagous to a complex canal network; products of photosynthesis and raw materials (for example, mineral nutrients) are transported about the plant through the 'canals' (tube-like cells) to wherever they are required, for example, sites of storage, manufacture or cell division. These 'tube-like cells' (the phloem and xylem) contain sap and it is this fluid (much of which is water) which carries materials from one part of the plant to another. The flow of water in the plant is mainly in an upwards direction. Such movement may depend partly upon the evaporation of water through the 'breathing pores' (stomata) at the surfaces of leaves and stem (mainly the latter in cacti)—a process known as transpiration. Transpiration may also produce a cooling effect at the stem surface just as many animals—including ourselves—may rid ourselves of excessive heat by sweating! Cacti are so adept at minimising transpiration (see for example CSSGB Journal, **36,** 41); however, that it would seem unlikely that its effect on stem temperature or water uptake would be very significant in such plants.

1.3 Solvent for nutrients

We have already seen in paragraph 1.2 that water is essential to the transport of materials within the plant. The dependence of plant nutrition on water can be seen to be even more basic, however, because the very uptake of mineral nutrients by the root system depends upon these nutrients being in solution. Dry nutrients are unavailable nutrients as far as the plant is concerned. Water may even play a part in introducing some nutrients into the soil: animal remains, plant litter and mineral matter are leached by rainfall which already contains some dissolved atmospheric gases such as oxides of nitrogen and carbon dioxide. As these materials are washed into the soil some may be taken up, almost immediately, by the plant root system, some may be utilised by microscopic soil organisms and some may be lost, at least temporarily, to the subsoil.

Certain soil-dwelling micro-organisms would benefit neighbouring cacti by converting such substances into materials more readily useful to the cacti; for example, certain bacteria would fix gaseous nitrogen oxides into compounds which could be exploited by cacti. The growth and multiplication of these micro-organisms, like all forms of life, also depends upon the presence of water. Where cacti are growing in containers, water is no less important as a solvent for nutrients in the compost. In addition, water may be used as a carrier for supplementary feed or a systemic pesticide. If rainwater is used, the usual atmospheric gases may be present in tiny amounts plus a number of industrial waste gases and other atmospheric debris: dust, spores and chemical residues. All these are usually present in inconsequential amounts in Britain, but in countries with less rigorous anti-pollution laws rainwater may be highly contaminated and quite acidic. Tap water contains purifying

* Levington Research Station, Levington, Ipswich, Suffolk.

agents such as chlorine plus some mineral matter. The nature and concentration of the latter varies with district but lime is often present and may be deposited as a crust around the pot (or the cactus!) unless removed by boiling, or with water softening devices, before watering is performed. I do not find hard tap water to be much of a problem, even with the 'lime-hating' Gymnocalyciums, but if *clean* rainwater were available I would use that in preference.

1.4 **Provision of rigidity**

Although many cacti possess a woody skeleton (notably the Cerei) most are soft bodied for at least the first years of life and their rigidity is maintained by the pressure of water within the cactus (remember how soft an *Opuntia* pad feels when rather dehydrated?). When the cactus is fully hydrated, so that the plant is somewhat swollen in appearance, it is said to be turgid. When the cactus is rather dehydrated and has a collapsed look about it the plant is said to be flaccid. Turgor is very important, not only for self-support but for growth. The pressure exerted by buds and off-sets as they squeeze through a tortuous mesh of spines must surely be great and how could these new growths survive so dramatic a birth unless they were rock-hard with turgor? If any readers would like a dramatic display of the importance of turgor to plant support, allow a young tomato plant to go dry—it will soon hang its leaves as they become flaccid.

1.5 **Filler**

As explained in paragraph 1.1, water may become intimately involved in the production of various cell parts and hence in the structure of the plant itself. In the cells of the plant a great many metabolic processes occur (including respiration and, in many cases, photosynthesis). These processes have evolved to function in liquid to semi-liquid surroundings (the cell cytoplasm and the matrix within the cell 'organelles') and the major constituent of these surroundings is water.

Plant cells usually possess a 'vacuole': a region of watery liquid separated from the cytoplasm by a membrane. Waste materials from the cytoplasm may be passed across the membrane and dumped in the vacuole without fear of the material seeping back or otherwise causing the plant ill-effects: a truly sophisticated cess pit! The nature of these waste materials varies but it may include coloured pigments or even chemicals of pharmacological interest.

1.6 **Dispersal and conditioning of seeds**

Rainfall, particularly rainfall of the violent type, must surely be an aid to the dispersal of cactus seeds, particularly those which have a corky base. In extreme cases, not only the seeds but the plants themselves may be dispersed by water but it is difficult to say whether being turned into flotsam and jetsam is often much benefit to the species concerned!

The existence of moist conditions is certainly necessary for germination of cactus seeds because the seed must be well soaked before emergence of the infant plant is likely to occur. In some desert plants (possibly including certain cacti) the seeds contain a germination inhibitor (coumarin) which must be completely washed out before the seeds can germinate. Such a system minimises the possibility that, having germinated in response to a light shower, the seedling dies before it has a chance to establish itself. Germination, in any case, is preceded by the softening of the seed coat so that it can split, and the swelling of the seed itself due to the absorption of water.

So much for the numerous roles of water in the life of a cactus; we will now turn our attention to the factors which are most likely to affect the plant's water requirements.

2.1 **Growth rate of the plant**

Growth rate varies not only from species to species but from season to season: the water required to maintain an *Islaya* in full growth during the summer may be scarcely enough to prevent even a small *Opuntia* from shrivelling during the winter. The only answer is to know the plant and keep a watchful eye on the calendar. Remember: vigorous cacti do not take up large quantities of water simply to bloat themselves out; many of the plants' requirements depend upon an adequate supply of water (see paragraphs 1.1-1.5).

Grafted plants can usually be watered according to the growth rate of the stock but care must be taken in many cases if the normally slow growing scion is not to become bloated as a result of its grafted condition.

2.2 **Plant growth form**

Squat or globular species suffer little more than a temporary contraction of the ribs/tubercules during dry spells, and most columnar cacti are woody enough to support themselves where 'normal' plants would flag. Many *Opuntia* and flat stemmed epiphytes, however, have little in their favour if they become very dehydrated and, because they rely so heavily on turgor for support (see paragraph 1.4) their water requirements are rather greater than most cacti.

2.3 **Plant size**

Imagine, if you will, a young *Copiapoa* seedling, almost spherical in shape and just 2 mm in diameter. Imagine also the juvenile *Copiapoa* in two or three years time, still almost spherical in shape but now ten times broader (2 cm in diameter). Now let us see how its transpiration problem will have changed:—

The volume of a sphere $= 4/3\ \pi\ r^3$ and the area of a sphere $= 4\ \pi\ r^2$

Hence the surface/volume ratio for the spherical cactus

$$= \frac{4\ \pi\ r^2}{4/3\ \pi\ r^3} = \frac{3}{r}$$

In the case of the small seedling, surface/volume $= \frac{3}{0.1}$

$= 30$ sq. cm of stem surface per cubic cm of stem tissue.

In the case of the juvenile plant, surface/volume $= \frac{3}{1.0}$

A range of Cacti growing in Gro-Bags at Levington Research Station (photo: A. Rainbow)

= 3 sq. cm of stem surface per cubic cm of stem tissue. In other words, a 10 fold decrease in the surface/volume ratio and a corresponding decrease in the problem of dehydration. (For those who value such information: the increase in bulk of the seedling is a thousand fold).

The moral of the calculation is: seedling cacti have a more difficult time resisting desiccation than juvenile cacti (let alone mature plants) so do not let them dry out unless absolutely necessary.

2.4 **Climate**

Water loss, either as plant transpiration or as direct evaporation from the pot of compost, is likely to be raised by high temperatures, winds/ventilation and low relative humidity (comparative dryness of the air). The amount of water required to maximise growth increases with temperature and light intensity. Temperature affects numerous aspects of plant function but, in simple terms, high temperatures usually accelerate growth, and faster growth demands more water. Increase in light intensity usually promotes photosynthesis and water requirements are raised once more (see paragraph 1.1). It is fairly obvious that the situation of a cactus (outdoors or under glass) its share of sunlight, its exposure to wind and other climatic factors can radically affect the way in which the plant should be watered. Those of us who heat our greenhouses with oil or gas (both of which produce water vapour on combustion) may find that our plants shrivel slightly less than those which are over-wintered in the less humid heat of an electric heater.

2.5 **Type of container**

At risk of preaching to the converted, plants in clay pots dry out sooner than those grown in plastic pots. Both types of pot can produce perfectly good results in the right hands, but I favour plastic pots for the great majority of cacti because I find that plastic pots encourage steady regular growth without me having to hover constantly around the greenhouse every few hours with a watering can. In other words, plastic pots save me a great deal of work and give me very satisfying results. The growth of Mesembryanthemums can be of a strongly seasonal or even 'stop-start' nature and it is possibly easier to exercise control over such plants where they are grown in clay pots (I find that small plastic pots are satisfactory, but having a small volume they dry out quite quickly). Plants grown in containers which lack drainage holes require less watering than a flower pot and can sometimes be used to good advantage, providing that common sense is exercised in the matter of how heavily and how frequently the plants are watered.

Many readers will be familiar with Gro-Bags; a Fisons product which offers a much improved technique for growing tomatoes and many other foods and flower crops; needless to say, we had to try a range of cacti! Growth has been extremely pleasing and we have found

it very simple to adjust the watering to suit the container (that is, the Gro-Bag) and the type of plants: epiphytes are kept quite moist, other cacti are allowed to become almost dry. Watering is performed much less frequently than with cacti grown in pots—even plastic pots. We have, however, not found it necessary to make drainage slits in the sides of the Gro-Bags (this could be done if the plants were ever accidentally overwatered).

2.6 **Type of compost**

The water holding capacity of a compost is a very important characteristic; if it is too low the compost will require frequent watering, if too high the root system may become unhealthy, resulting in poor growth or even death. The ideal for most plants is a compost which has a high water holding capacity, an open texture (including plenty of air spaces), good drainage and a balanced complement of plant nutrients. A number of soilless (peat based) composts such as Levington Compost fulfil, or almost fulfil, such an ideal. Peat-sand composts dry out more rapidly but can sometimes have advantages; particularly for Mesembryanthemums.

I gave up using loam composts years ago in utter disgust: nutrient content seemed to be very variable and the use of inferior loam by certain manufacturers led to severe compaction of the compost, poor root growth and general ill health. Whatever compost(s) one finally adopts, it will be found to have its own particular character and its own special requirements in relation to watering; my advice is, be patient and do not be afraid to try new ideas.

2.7 **State of the plant**

A shrunken cactus will have greater water requirements than an otherwise similar but plump cactus. Similarly, a cactus with a healthy and extensive root system can be watered more generously than one which is devoid of roots.

In winter months it may well be desirable to allow one's cacti to shrink somewhat, especially where economics dictate that heating must be frugal. In such a case one must remember that the cactus may not be capable of suddenly responding to renewed watering in the spring and the plant should not be watered too frequently immediately after its deep rest. If a little water can be provided on bright winter days the roots will not wither back so much and the plant will get off to a flying start in the spring.

Roots are often damaged during repotting. Teasing apart of the root ball is, in my opinion, often overdone but when the dead roots and stale compost need to be pulled away one should remember, when it comes to watering, that the roots are damaged and therefore susceptible to infection.

To judge from preceding paragraphs one would conclude that in order to grow cacti well one needs an awful lot of skill, or luck or both! In practice I am sure anyone can do very well indeed given a reliable compost and a modicum of common sense. As a further guide, however, the principal effects of miswatering are summarised below:

Underwatered

1. Cactus is shrunken or shrivelled (but less susceptible to frost).
2. Uptake of nutrients is limited and cactus must draw on stored water in order to grow.
3. Roots may shrivel—thus further impeding water uptake.

Overwatered

1. Cactus is bloated or even split (and more susceptible to frost).
2. Nutrients may be washed (leached) out of the compost but remaining nutrients may be freely taken up (if roots remain healthy). Ample water is available for growth.
3. Root ball becomes almost permanently saturated and roots become susceptible to infection (and hence decay).

The best compromise would appear to be thus: do not be afraid to let your cacti grow vigorously during the warmer part of the year, but reduce watering well before frosts are anticipated; then give just enough water to keep at least some of the roots alive (probably by applying the water as a spray). Cactophiles lucky enough to have ample daylight strength bulbs and heating units in operation during wintry weather can ignore such advice and continue watering as though the winter never existed—the rest of us can find solace in totting up the money we are saving for that new greenhouse!

(Detailed information on this topic will be found in 'Water, Soil and the Plant' by E. J. Winter, published by the Macmillan Press Ltd., price £1.95—*Ed.*)

New Cacti

The following new species of cacti are described in 'Kakteen und andere Sukkulenten', July to December, 1974:

Lobivia chorrillosensis Rausch, from Argentina; flowers rose-coloured with brownish outer petals. (July).

Lobivia versicolor Rausch, from Bolivia: flowers golden. (August).

Trichocereus vasquenzii Rausch, from Bolivia; flowers white. (September).

Discocactus patulifolius Bruining and Brederoo, from Brazil: flowers white. (September).

Discocactus mamillosus Buining and Brederoo, from Brazil: flowers white. (September).

Pyrrhocactus megliolii Rausch, from Argentina; flowers pink with golden outer petals. (October).

Discocactus magnimammus Buining and Brederoo, from Brazil; flowers white. (November).

Discocactus catingicola Buining and Brederoo, from Brazil; flowers pale olive-green. (December).

Pyrrhocactus villicumensis Rausch, from Argentina; flowers orange-brown. (December).

Notes on the 1975 Seed Distribution

by Terry Smale

ONCE AGAIN I shall begin by apologising for the small number of "other succulents" on the list, and indeed, if anyone can help me to obtain supplies of these, I would be pleased to hear from them. However, I hope that there are sufficient interesting species to satisfy the "cactophiles", and since Bill Maddams is describing seed raising techniques elsewhere in this issue, I shall commence straight away to describe some of these species.

Starting with the South American Echinocactanae, there are half a dozen sorts of the popular genus *Gymnocalycium*. The most uncommon of these is probably *G. chubutense* which has the distinction of growing in the Rio Chubut area of Argentina at latitude 43°S, surely one of the most southerly growing of cacti. It is a single headed, flattened, grey-green plant, with 15 low ribs carrying about 6 longish grey spines. The plant grows to 150 mm. diameter and produces long tubed, pure white flowers. *G. eytianum* is native to Eyti in Bolivia and belongs to the *G. pflanzii* complex. It is a large growing plant, to 300 mm. diameter, flattened and with rather weak spination. It produces the short tubed campanulate flowers typical of this complex. but in this case they are pure white. *G. claucum,* which was described by Ritter in 1963, is a very distinct, tap-rooted plant, with a body that is grey, almost like some *Copiapoas*. The ribs are very broad and low, and the few thick spines lie flat to the body. Flowers are white with a purple centre. *G. mostii* is a better known species, which is worth growing for its magnificent flowers. These are very large, pink, shading to darker pink in the middle. *G. moserianum* is a plant related to *G. vatteri,* and is therefore in the seed group Trichomosemineae, and not to be confused with the variety of *G. mihanovichii* that is also named after Gunter Moser. *G. nidulans* is a blue-green globular plant which grows to about 100 mm. diameter, and bears pale pink flowers with a darker centre. Each areole carries 6 spines and these are turned upwards and interlaced, giving a birds-nest effect.

Among the Notocacti on the seed list are a few which are just names to me, and for which I have not been able to trace descriptions. *Notocactus veenianus* was described by the supplier as a novelty discovered in 1973. *N. orthacanthus* has a slightly better pedigree, in that it was found in Uruguay byWalter Rausch in 1968 and given his number R372. The next plant in the sequence, R373 was described as *N. rauschii* in the 1969 Succulenta, and appears from the description to be a very fine plant. It is globular, to 160 mm. diameter, blue-green, with a woolly crown. The plants are covered with pale pink spines which are black when young, and produce typical lemon yellow *Notocactus* flowers, which are short and 50 mm. across. *N. werdermannianus* was first discovered quite a long time ago, but has only recently become generally available. It grows to 100 mm. diameter, with a yellowish-green body that is divided into about 40 ribs. The areoles are close together and carry many pale yellow spines, the 4 centrals being up to 15 mm. long. The sulphur yellow flowers are large, over 70 mm. diameter. *N. horstii* is another of the distinctive plants found by Leopold Horst. It can grow quite large, and has flexible orange-brown spines, which stand out from the woolly areoles. The orange flowers are produced in the autumn. *N. haselbergii v. vacariensis* came from the first Horst expedition as HU39. A *Frailea* on our list, *F. itapuensis,* which has tiny yellow spines, was also discovered on this expedition as HU88.

Parodia penicillata is one of those few Parodias which readily form good show specimens. Plants that I have seen, have tended to be globular, up to 150 mm. across, sometimes offsetting, but the Kakteenlexicon states that it elongates to 700 mm. tall. The plant carries many longish, thin, straight spines, which are white in the common form, but can be cream or yellow. The bright red flowers are freely produced. *P. malyana* is a small densely spined species, with flowers that vary in colour from yellow to orange-red. I do not have a description to hand for *P. minima,* but it is a small seeded type, and surely must be small growing.

Pride of place among the Neoporterianae on the list, goes to *Pyrrhocactus umadeave,* which has been seen recently in this country as large plants collected from their habitat in N. Argentina. They are covered by a mass of long stiff whitish spines, which all tend to curve upwards and roof over the crown of the plant. As with most Pyrrhocacti (in the Backeberg sense), the flowes are yellowish and rather insignificant. There are two dwarf species of *Neochilenia* which are both fairly free flowering, and differ very much from each other in body form. *N. aerocarpa v. fulva* has a brown, somewhat cylindrical body with woolly areoles that are close together and carry short pectinate whitish spines. The flowers are reddish. *N. pygmaea* has a very dark, almost black, body which is divided into fairly large tubercles. The few spines are dark coloured and the flower is white.

Representatives of the Borzicactanae include two columnar and two globular species. The columnar ones are the hairy *Oreocereus celsianus,* which needs no introduction, and the more unusual *Seticereus roezlii*. The latter plant has the same habit of growth as *S. icosagonus* in that it clumps from the base and produces stems of 70 mm. diameter, growing eventually to about 1 m. tall. There are 9 notched ribs, with each areole carrying a dozen 10 mm. long grey spines. There are more

bristles on the flowering areoles, and the red tubular flowers are said to be very freely produced. *Denmoza erythrocephala* is a slow growing plant, eventually attaining 300 mm. diameter, which is surrounded by numerous thick reddish spines. The red tubular flowers which only have very small petals, are produced from the top of old plants. *Submatucana paucicostata* on the other hand, will flower at three years from seed, freely producing 60 mm. long, cinnabar red, zygomorphic flowers. The grey-green bodies are clump forming, up to 70 mm. diameter. They have large flattened tubercles armed with a few flexible grey spines.

Staying with South American cacti, I shall now try to describe some of the *Rebutia, Echinopsis* and related genera. *Rebutia senilis v. erecta* is a short cylindrical form of the well known species, that was collected by Fric in the thirties. *Aylostera nitida* is a rather more recent discovery that was collected by Ritter as FR769. *Mediolobivia brachyantha* is a clustering sort with 20 mm. diameter, short cylindrical bodies, with 12 ribs and 5 mm. long transparent radial spines. The short flowers are scarlet in colour. My favourite *Echinopsis* is *E. subdenudata* which is almost spineless. It is a solitary, flattened, grey-green plant, growing to 120 mm. across, and with 10-12 very acute ribs. The long white flowers are freely produced throughout the summer. The genera *Echinopsis* and *Pseudolobivia* are scarcely distinguishable and the flowers on *P. ancistrophora* are almost identical to those on the previous species. *P. ancistrophora* is one of the smaller plants in the genus, and the form offered by the Society was originally collected in Salta, Argentina by Rausch as R237. Among the true *Lobivias* on the list is *L. boliviensis* which can be a very variable species. It is clustering, with red flowers, and in its best forms can be very strongly spined. *L. schreiteri* is another clustering species, but the heads are small, only up to 35 mm. in diameter. The white spines are 15 mm. long, curved around the body, and the flowers are purple-red with a dark throat. *L. cintiensis* eventually becomes a cylindrical plant 500 mm. tall and 100 mm. in diameter. It has about 20 low ribs with many short whitish spines and produces red flowers. The genus *Acanthocalycium* tends to be intermediate between *Echinopsis* and *Lobivia*. The flowers on *A. glaucum,* which was first described by Ritter in 1964, are 60 mm. across, golden yellow, and strongly resemble those of certain *Lobivias*. The buds characteristically appear initially as pointed tufts of dark hair. The body of this Northern Argentinian plant is a nice light grey-green colour, 70 mm. diameter, with about 12 ribs that are divided into tubercles. The 6-8 strong, dark-tipped spines stand our from the body of the plant.

Turning now to the North American cacti, there is *Echinocereus barthelowanus* from Lower California. This species, which is closely related to *E. brandegeei,* is a clustering cylindrical type that is very attractive by virtue of its long dagger-like central spines. *E. subinermis* in its body form somewhat resembles an *Echinopsis* with its globular to short-cylindrical, blue-green body. The spines are very small, but the fine yellow flowers, with green stigmas, appear readily, even on small plants.

We are offering two species of *Escobaria,* which belong to the Coryphanthanae. This is a genus that tends to be neglected by growers, which is a pity, because it offers a number of small growing, attractively spined plants, which mostly flower freely, although the flowers are not very large. *E. chihuahuensis* is a globular to short cylindrical plant, up to 60 mm. diameter and sometimes clustering. It is hidden by numerous brownish spines, and the flowers are purple. *E. gigantea* is an unpublished species which is probably a variety of *E. varicolor*. Its name is misleading because it is a fairly small, single headed, short cylindrical plant, that is only "gigantic" by *Escobaria* standards.

The range of *Mammillaria* on the list this year includes a number of dwarf forms. *M. nana* is a small solitary plant that is covered with hairy spines. The numerous thin radials are glassy-white and there are two brown centrals, one of them hooked. The flowers are small and creamy-white. *M. monancistracantha v. chrysacantha* is a very similar plant, but it has golden yellow radial spines. *M. boolii* is another dwarf globular cactus, which forms small clumps with age. It has white radial spines and a single hooked yellow central. However, its crowning glory is the very large, deep pink flowers, which can be as big as the plant itself. *M. longiflora* is another small growing plant with large flowers, which in this case are pale pink. This species will usually flower at two years of age and I have noticed that my plant is in bud at the moment, ready to open its flowers with the first warmth of early spring. *M, carretii* is somewhat larger growing than the few preceding species and has a brownish-green body with pleasantly contrasting yellowish radial spines. There is a single long thin hooked central spine, and the flowers are medium sized, white with a pink mid stripe.

Moving on to the larger *Mammillarias,* there is *M. meyranii* which is 50 mm. diameter and grows to 500 mm. tall. It has a network of yellowish-white radial spines and two 10 mm. long centrals. The spines are orange on the new growth, and the small flowers are purple in colour. *M. johnstonii v. guaymensis* is a globular plant, up to 200 mm. across, with large four sided tubercles. The radial spines and upwards-curved centrals are brown in colour, and the pink flowers are followed by large red fruits.

I hope that I have been able to provide information of interest on at least some of the species on the seed list. I would like to conclude by thanking my friends in the North Surrey Branch for packeting the seed, and by offering thanks to Miss Brown on behalf of all Society members for the hectic work that she has done each year in sending the seeds out to their final destinations.

Results of the Westminster Show, October 1974

Judges:
Cacti: Dr. A. W. Mace Succulents: Mrs. E. M. Stillwell

Class 1 Three Cacti. 3 entries
1st Mr. and Mrs. W. F. Maddams. Stenocactus ochoterenaus, Mammillaria kuentzii, Machaereocereus eruca.
2nd R. H. I. Read. Echinocactus grusonii, Oreocereus trollii, Ferocactus acanthodes.
3rd J. E. Taylor. Malocarpus erinaceus, Mammillaria plumosa, M. spinosissima.

Class 2 Three plants in Coryphanthanae. 4 entries
1st Mr. and Mrs. W. F. Maddams. Cochemiea setispina, Mammillaria klissingiana, Mamillopsis senilis.
2nd J. E. Taylor. Coryphantha eliphantidens, Mamillopsis senilis, Thelocactus lophothele.
3rd Mrs. B. A. Baldry. Coryphantha andreae, Cochemiea poselgeri, Mammillaria sp.

Class 3 One plant in Ceraneae. 3 entries
1st Mr. and Mrs. W. F. Maddams. Espostoa huanucensis.
2nd R. H. I. Read. Espostoa melanostele.
3rd Mrs. M. Dennard. Cleistocactus wendlandiorum.

Class 4 Three plants in Echinocactanae. 3 entries
1st Mr. and Mrs. W. F. Maddams. Sulcorebuta steinbachii v. gracilis, Ferocactus acanthodes, Soehrensia schaeferi.
2nd J. E. Taylor. Stenocactus vaupelianus, Gymnocalycium sp., Leuchtenbergia principis.
3rd Mrs. M. Leach. Notocactus graessneri, N. magnificus, Echinocactus grusonii.

Class 5 Three plants in Echinocactanae, in pots not exceeding 3½ in. dia. 7 entries
1st Mr. and Mrs. W. F. Maddams. Pilacanthus paradinei, Turbinocarpus pseudomachrochele, Aztekium ritteri.
2nd Mrs. M. Dennard. Ariocarpus kotschoubeyanus, Aztekium ritteri, Pediocactus paradinei.
3rd R. H. I. Read. Blossfeldia minima, Turbinocarpus pseudomachrochele, Neoporteria nidus.

Class 6 One Grafted Cactus. 1 entry
1st Mr. and Mrs. W. F. Maddams. Mammillaria guelzowiana splendens.

Class 7 Six Cacti, in pots not exceeding 6 in. diam. 7 entries
1st Mr. and Mrs. W. F. Maddams. Epithelantha micromeris, Mila caespitosa grandiflora, Cochemiea poselgeri, Copiapoa humilis, Mammillaria guelzowiana, Neolloydia horripila.
2nd D. T. Best. Parodia suprema, P. mutabilis, Echinocactus grusonii, Cephalocereus senilis, Mammillaria neocelsiana, Oreocereus celsianus.
3rd J. E. Taylor. Astrophytum myriostigma, Echinocereus knippelianus, Homalocephala texensis, Ferocactus acanthodes, Rhipsalis cereuscula.
VHC R. H. I. Read.
HC Dr. and Mrs. C. G. W. Randall.

Class 8 Three Cacti, in pots not exceeding 5 in. dia. (for juniors and members who have not won a first prize in any cactus class) 4 entries
1st N. Randall (junior). Cochemiea poselgeri, Gymnocalycium monvillei, Cephalocleistocactus ritteri.
2nd A. Sidaway. Aylostera albiflora, Mammillaria hahniana, Astrophytum ornatum.
3rd Mrs. M. Dennard. Mammillaria bravoae, Thelocactus bicolor v. tricolor, Copiapoa fiedleriana.

Class 9 Three Euphorbias. 4 entries
1st Mr. and Mrs. W. F. Maddams. E. valida, E. obesa, E. stellata.
2nd Mrs. M. Leach. E. monteroi, E. obesa, E. oncoclada.
3rd Mrs. B. A. Baldry. E. echinus, E. millii, E. valida.

Class 10 Three Crassulas. 3 entries
1st Mrs. A. Whicher. C. suzannae, C. tecta, C. mesembryanthiopsis.
2nd Mr. and Mrs. W. F. Maddams. C. ausiensis, C. cultriformis, C. namaquensis.

Class 11 Three plants in Asclepiadaceae. 2 entries
1st Mr. and Mrs. W. F. Maddams. Brachystelma barberiae, Fockea crispa, Hoodia gordonii.
2nd J. C. Hughes. Caralluma europea, Huernia keniensis, H. primulina

Class 12 Three plants in Liliaceae. 4 entries
1st Mr. and Mrs. W. F. Maddams. Aloe bakeri, A. jucunda, Gasteria armstrongii.
2nd R. H. I. Read. Aloe haworthioides, Haworthia maughanii, H. viscosa.
3rd Mrs. A. Whicher, Aloe juvenna, Haworthia bolusii, H. truncata.
VHC Mrs. P. Poulter.

Class 13 Three Conophytums and/or Ophthalmophyllums. 3 entries
1st Mr. and Mrs. W. F. Maddams. C. cupreatum, C. pearsonii, O. sp.
2nd Mrs. P. Poulter. C. corculum, C. scitulum, C. pallidum.
3rd Mrs. A. Whicher. C. mundum, C. scitulum, C. wettsteinii.

Class 14 Three Lithops. 3 entries
1st Mr. and Mrs. W. F. Maddams. L. bella, L. lateritia, L. schwantesii.
2nd Mrs. P. Poulter, L. lateritia, L. peersii, L. umdausensis.
3rd Dr. and Mrs. G. C. W. Randall. L. aucampiae, L. christinae, L. kunjasensis.

Class 15 One Agave. 4 entries
1st Mrs. I. Horan. A. victoria-reginae.
2nd D. T. Best. A stricta.
3rd Mrs. M. Leach. A. filifera.

Class 16 One Kedrostis, Jatropha, Cissus or Testudinaria. 2 entries
1st Mr. and Mrs. W. F. Maddams. Cissus hypoleuca.
2nd Mrs. I. Horan. Kedrostris nana.

Class 17 Six Stemless Mesembryanthemums. 3 entries
1st Mr. and Mrs. W. F. Maddams. Psammophora longifolia, Lithops terricolor, Conophytum truncatellum, Fenestraria aurantiaca, Aloinopsis schoonesii, Titanopsis schwantesii.
2nd Mrs. A. Whicher. Dinteranthus microspermus, Lithops heerei, Berrisfordia khamiesbergensis, Conophytum vanrhynsdorpense, Dactylopsis digitate, Fenestraria aurantiaca.
3rd J. C. Hughes. Conophytum scitulum, Pleiospilos sp., Aloinopsis malherbei, Lithops olivacea, Cheiridopsis candidissima, Fenestraria rhopalophylla.

Class 18 Three Succulents. 2 entries
1st Mr. and Mrs. W. F. Maddams Pachypodium saundersii, Cissus bainesii, Testudinaria paniculata.
2nd Mrs. A. Whicher. Aeonium smithii, Monadenium coccineum, Haworthia tortuosa.

Class 19 Six South African Succulents, in pots not exceeding 4½ in. diam. 4 entries
1st Mr. and Mrs. W. F. Maddams. Ceraria pygmaea Adromischus leucophyllus, Anacampseros buderiana, Haworthia bolusii, Lithops lesliei, Huernia loeseneriana.
2nd Mrs. A. Whicher, Monilaria moniliformis, Crassula namaquensis, Aloinopssis peersii, Euphorbia meloformis, Adromischus marianae, Haworthia aspericula.

3rd J. C. Hughes. Faucaria tuberculosa, Adromischus salicolus, Decabelone grandiflora, Mitrophyllum mitratum, Lithops aucampiae, Conophytum sp.

Class 20 Succulents raised from seed. 2 entries

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

2nd J. C. Hughes.

Class 21 Three Succulents in pots not exceeding 6 in. diam. (for members who have not won a first in classes 9-19). 3 entries

1st J. C. Hughes. Sarcocaulon burmannii, Pleiospilos magnificus, Euphorbia valida.

2nd A. Sidaway. Conophytum scitulum, Dactylopsis digitata, Monilaria moniliformis.

3rd Dr. and Mrs. G. C. W. Randall. Huernia pillansii, Conophytum elishae, Aloe reitzii.

Class 22 no entries.

Class 23 One Cactus and one Succulent, in pots not exceeding 6 in. diam. 4 entries

1st Mr. and Mrs. W. F. Maddams. Dorstenia foetida, Mammillaria pennispinosa.

2nd D. T. Best. Haworthia truncata, Astrophytum asterias.

3rd R. H. I. Read. Haworthia bolusii. Parodia sp.

Class 24 Miniature Garden. 4 entries

1st Dr. and Mrs. G. C. W. Randall.

2nd Mrs. B. A. Baldry.

3rd Mr. and Mrs. W. F. Maddams.

Class 25 Group of Cacti and/or Succulents. 1 entry

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

Awards

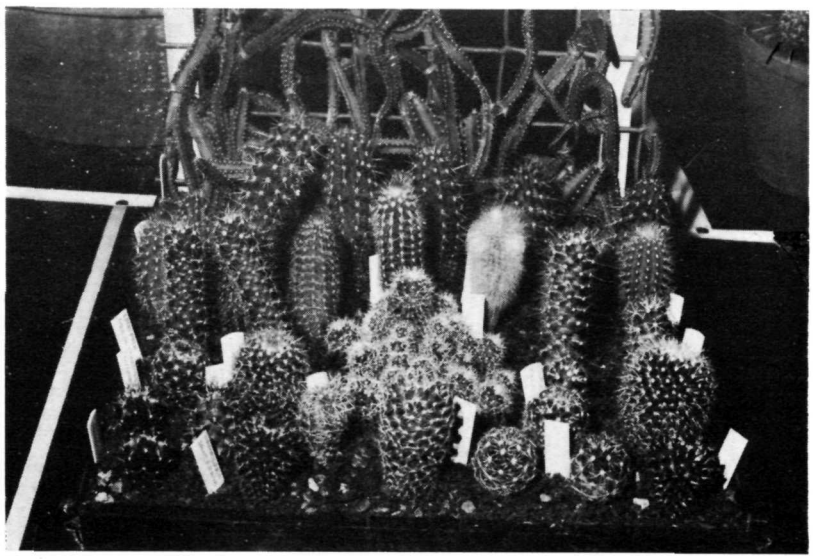
Junior Shield: N. Randall.

Pullen Cup: Dr. and Mrs. G. C. W. Randall.

Sir William Lawrence Cup: Evelyn Theobald Cup, Collings Cup, Pryke Howard Cup, Hedges Cup, Farrow Cup, Denton Medal, Banksian Medal, Best Cactus Spoon, Best Succulent Spoon: Mr. and Mrs. W. F. Maddams.

The Autumn Show, 1974

by R. B. Pearce



Autumn Show 1974: First Prize 'Succulents Raised from Seed' (photo: Maddams)

THIS YEAR the Society's Autumn Show, held in conjunction with the Royal Horticultural Society's October Show in the R.H.S. New Hall, Westminster, was on October 8th and 9th. Arriving at the show my first impression was of a disappointingly small number of plants on the two tables allocated to the Society. Closer inspection confirmed the truth of this impression, although some classes had attracted a respectable number of entries. The overall standard of plants exhibited was quite good, giving the author an attack of the well-known show syndrome of "Why do I bother—compared with these, most of my plants belong on a compost heap!" One gains but little comfort from the realisation that what one sees at a show is the cream of a number of collections.

There were a good many heavyweight plants exhibited, which must have provided their owners with substantial transport problems. One must be thankful that exhibitors take the trouble to bring these eye-catching plants—without them the show would be immeasurably poorer. Class 1, for 'Three Cacti' contained some of these giants, notable among which was a beautiful *Ferocactus acanthoides,* with lovely reddish spines and much evidence of recent flowering. Also in this class was a plant of *Machaerocereus eruca,* with four offsets, growing in a wooden trough, the only suitable container for a plant of this nature. Seeing the prostrate growth habit and powerful spination of this species brings home the appropriateness of its common name, the "Creeping Devil".

The entries in the next class, for 'Three Coryphanthanae', included sizable clumps of *Cochemia* and *Mamillopsis*. Large plants were also in evidence in Class 3, 'One Cereanae'. A four-headed plant, some two feet or so tall, of *Espostoa huanucensis,* entered in this class, won the 'Best Cactus in the Show' award for Mr. and Mrs. Maddams.

One of the entries of 'Three Plants in Echinocactanae', in Class 4, included one of the most talked-about plants in the show. This was a clump, some six or seven inches in diameter, of *Notocactus magnificus*. The many offsets differed strikingly from the parent, mature head; the areoles on these did not join along the ribs, as on the parent body, and the ribs themselves were much less prominent on the offsets. Another Echinocactanae class, for plants in pots up to 3½ inches in diameter, was one of the better supported classes, presumably because these plants are among the easiest to transport, on account of their smaller size. There were seven entries. Among the plants entered were *Ariocarpus kotschubeyanus, Pilacanthus paradinei,* several *Turbinicarpus* species, *Aztekium, Obregonia,* and a *Blossfeldia*. In contrast with the preceding class there was only a single entry in the 'Grafted Cactus' class, a large *Mammillaria guelzowiana* v. *splendens*.

One plant shown in Class 7 (Six Cacti) was *Mila caespitosa* v. *grandiflora,* a representative of one of the "misfit genera" which are not often seen on the show bench, since they do not fit into the usual show classes, and usually can only be shown in classes such as this. Another interesting plant in this class was a *Parodia mutabilis* v. *carneoflora,* which looked as if it might be beginning to go cristate; some elongation of the growing point was noticeable. Also on show was a fine specimen of *Rhipsalis ceruscula,* cascading down from a raised stand.

Among the Euphorbias in Class 9 one of the most eyecatching plants was *Euphorbia oncoclada,* which superficially resembles some of the cacti in the Rhipsalis group (e.g. *Hariota*). A fine plant of *E. valida* was one of the group that won the P. V. Collings Cup for Mr. and Mrs. Maddams. In the class for Asclepiadaceae, Class 11, a plant of *Fockea crispa* was included in the winning entry. A close inspection showed many of the small green flowers on this plant. Class 12, for 'Three Liliaceae', was won by an entry of large plants; second was an entry of miniature species, including the unusual triagonal columns of *Haworthia viscosa* v. *concinna*.

Classes 13 and 14 (for Conophytums and Opthalmophyllums, and Lithops respectively) had many flowering plants among the entries. Outstandingly attractive among the plants when I visited the show was a pan of *Lithops laterita,* with flowers open on all but one of its many heads. It was pleasing to see some of the lesser known genera on display in the class for 'Six Stemless Mesembryanthemums'; the plants shown in this class included *Psammophora longifolia, Berrisfordia khamiesbergensis, Dinteranthus microspermus,* and *Dactyliopsis digitata*.

Class 16, for 'Kedrostris, Jatropha, Cissus, and Testudinaria' attracted only two entries, a *Cissus hypoleuca* with much evidence of flowering and a few fruits, which won the 'Best Succulent in the Show' award, and a *Kedrostris nana,* bearing its small yellow flowers. A plant of *Cissus bainesii,* some three feet tall towered over the other entries in Class 18 (Three Succulents). Also in this class, a plant of *Monadenium coccineum* attracted instant attention with its carmine-red flowers at the top of the plant.

The 'Seedling Succulents' class was won by Mr. and Mrs. Maddams who had a superb display, including seedlings of species of *Pachypodium, Ibervillea* and *Dorstenia*. The latter were in flower, with their peculiar and distinctive inflorescences. The Maddams also showed another flowering *Dorstenia, D. foetida,* in the class for 'One Cactus and One Other Succulent', the other half of their entry being a *Mammillaria pennispinosa*. Flowering was much in evidence in the succulent classes; the *Euphorbia valida* that won the 'Novices Succulent' class was in flower, as were many of the plants in the sole entry in the 'Group of Plants'. This was a mass of colour, with various species of flowering Mesembs., along with a few other cacti and succulents. There was, however, rather little flower among the cacti, but this is to be expected, to a greater or lesser extent, at the Autumn Show.

In the 'Bowl Garden' class, succulents predominated over cacti in the arrangements. The S. J. Pullen Cup was won by a most attractive arrangement of plants, which included only a couple of cacti, the rest being a wide assortment of succulents.

Overall then, I suppose I would rate the show as interesting, but not outstanding. This has not been a very good year for growing xerophytes, having had the dullest and coolest summer for some years. This may well have affected the flowering of some of the genera (e.g. *Ariocarpus*) that are often seen in flower at the Autumn Show. I suppose that this in turn may have affected the size of the entry, but, sadly, these shows so often seem to be the same people competing against each other, often with the same plants, at show after show.

Why not start a New Branch?

by D. T. Best

For some time now the formation of new branches has been the subject of very serious thinking by the Society's organisers. Some progress has been made recently with the establishment of three entirely new branches, all of which seem to be on a very firm footing. A lot still remains to be done to realise anything like the number deemed achievable, however, and it is with this in mind that I have been asked to write an introductory article.

The Journal is, quite probably, all that some people require to maintain an essential contact with forward-looking observation and modern development within our fascinating hobby; some of us, that is, but certainly not all. It is very obvious that much inspiration is acquired when group discussions get under way anywhere, even when quite spontaneous. By virtue of simple comparison, needfully carried out in the ideal atmosphere, the opportunity of a new dimension in successful cultivation seems to emerge. New and lasting friends are often made as a result; despite their always seeming to have larger and better grown specimens than oneself. It is the continuing quest in trying to establish just how they manage it that provides the challenge. Anyway, leaving plants aside for a moment, what's wrong with a few extra friends?

Why not have a go? There are certainly no major problems involved and anybody with but meagre organising ability will, I'm certain, succeed. A few criteria are necessary in my view and they are briefly:—

(a) Mutually agreed dates for an initial meeting may be the first hurdle. Be positive, give a firm date and time and twist arms very lightly. Do not change the arrangement to suit a minority interest.

(b) Decide on the venue, which may have to be in somebody's house until better things are possible. Who's going to take the Chair?

(c) Success will ultimately depend upon the nature of your locality, where it is situated and the relative density of established members. One can always get interested people to join to improve a poor density.

(d) One must be prepared, at the outset to run things, to look after simple correspondence and to provide as it were, a focal point. In other words you will be a branch secretary.

(e) Funds will inevitably be required, although on a small scale, together with one or two items of equipment. As things progress it will be essential to appoint a treasurer to keep order, normally by means of a simple 'receipts and expenditure' account.

(f) Remember that a policy and a programme must be established, ideally at the first meeting and for as far ahead as is practicable. Minute all points carefully. Give firm dates for all subsequent gatherings and change these at one's peril. Failure on any of these items may bring about a rapid dispersal of the flock.

The Society is, quite naturally, prepared to offer assistance to any prospective branch organiser in any way possible. Additional information will be sent on application in the interests of removing doubts and fears. Essentially, I envisage that amplification of the foregoing main points will be all that is necessary to effect this. Don't think about it—do something! Write a line to me at the following address:—

D. T. Best,
16 Ashleigh Gardens,
Sutton, Surrey.

I am presently preparing hints and ideas for publication in the May issue. These will be the views of persons who have successfully undertaken the mission of 'branch-maker'. Please don't wait for this before acting; who knows, you could fill the category yourself by then.

Correspondents

Why No Flowers?

It is almost certain that any cactus grower who has a fair number of plants will have found that one or more of the plants never flowers. The conditions in the greenhouse can hardly be blamed for this as most other plants flower generously. Among a large number of plants I have found that certain species never flower or if they do it is very unfrequently, whilst I have seen the same species at a show with plenty of flowers. One often hears a grower state that a plant in his collection never flowers whilst a listener says that his plant of the same species is very floriferous. The grower with the plant which does not flower then goes home and repots his non-flowering plant or places it in a different position to try to improve the flower potentiality.

However it is not always the fault of the grower when a particular plant fails to bloom. I have found that certain cacti of the same species will not flower whilst another of the same species, growing in close proximity and of the same age will flower profusely. There must be something in the make up of such plants which fail to flower as the same potting compost may be used with both plants and the watering and staging conditions are identical.

As a proof of the variation in flowering of plants of the same species and raised under the same conditions I can quote a happening which I witnessed a few years ago. I raised some seedlings of *Mammillaria guelzowiana,* and they were kept in close proximity under exactly the same conditions. I parted with several young plants and kept just two. At about two years old one plant had five grand large flowers whilst the other one has never yet flowered. The only strange thing about this is that the one which has not yet flowered has grown more than double the size of the one which flowered. This plant as well as growing so large, has also produced two or three off-sets round the base but the one which bloomed shows no signs of making any.

From this one can deduce that it is not always the fault of the grower but that certain plants of the same species and of the same age will differ greatly in their development. I think that it is only when one has the opportunity to raise and keep a number of seedlings of the same species that the truth of my findings can be obtained. If one has a plant which never flowers but which is kept under conditions equal to other flowering plants, then I suggest that the grower obtains another plant of the same species, not necessarily from a different seedling batch, and tries out the new plant under the same conditions which existed for the non-flowering plant and it is probable that the fresh plant will flower, thus proving my point that different specimens of the same species can react strangely under similar conditions.

Arthur Boarder,
30 Sunstar Lane,
POLEGATE, Sussex.

A Flowering Problem

The August issue of the C. & S. J. of G.B. arrived last week and I would like to say how interested I am in the article "Will they ever Flower". I have a Stapelia which was given to me twenty-two years ago and in all that time this plant has never flowered. It is a very small and thin-stemmed variety and as a plant has grown extremely well over the years but never a flower nor even a bud. I have tried different mixtures, various locations in the glasshouse and shadehouse and even different types of containers—wooden, china, earthenware and plastic but still no flowers.

Over the past five years I have distributed rooted cuttings to friends in Australia and Britain but as far as I know these too have not flowered. I do not know the name of this stapelia but it could be a variety of *S. variegata.*

Mrs. D. Malcolmson,
208 Campbell Road,
Green Lane,
AUCKLAND,
New Zealand.

Succulent Snippets

by Sally Cornioides

Our President, Mrs. Shurly, with Mr. David Hunt at the 1974 Dinner. (photo: P. Whicher)

IT WOULD MAKE a much more interesting Journal if we heard from more of you about how your plants are growing—or dying—and particularly how successful you have been with germinating and growing Society seed. As I suspect I have commented before, the demand for seed increases every year and if it was all set and germinated there would be plenty of bulging greenhouses in a few years time.

To continue with the flowering theme for a moment, latest reports show that epiphytic plants do not seem to have been deterred by the poor summer and soaking autumn we have had in England. Rhipsalis flowered away happily into December and Schlumbergeras in variety are opening their buds in many homes ready to give a good Christmas show; in fact, I hear that many of the usual early ones such as *Schlumbergera bicolor* have been earlier than normal. No doubt because these are 'short-day' plants and with all the dull weather the daylight became shorter earlier in the autumn than usual.

Talking of autumn, the Autumn Show seems a long way past and details appear elsewhere. No doubt the Times comment "it was as usual a walkover for Mr. and Mrs. W. F. Maddams" was true, but why should this be the case? The reports of Branch shows in the Home Counties tell of fine plants on display, so if only their owners would make the effort to bring them up to Westminster what a better display there would be for the large number of visitors to see there. In the meantime there is no excuse for anyone not bringing a few plants to the one-day Show if you are within 100 miles

of London! Such a once a year effort in midsummer should not be beyond any real enthusiast's exertions. If you do not think your plants are worth seeing, just come along on June 14th and you will probably wish you had brought some of your plants, too!

Back to November and the Dinner which was a success again thanks to the untiring efforts of Secretary Bob Read. Strange that three of the speeches should have 'religious references'; the Chairman told a story about monks, Mr. Stillwell, for the visitors, and Mrs. Shurly referred to clergymen in their tales. David Hunt in toasting the Society referred to his schoolboy's diary of many years ago and how his first visit to Mr. Collings and Mr. and Mrs. Shurly really started him on his way to collecting succulents. The Chairman continued the reminiscences by quoting from some of David's first articles in our Journal (over ten years ago) and could not help quipping that while David's latest efforts were far more profound while his own present cultivation articles were rather lighter stuff than the efforts of W. F. Maddams on Gibberilic acid and the like more than ten years ago!

Another comment of Mr. Hunt's was that it must be a very special occasion because Gordon Rowley was not only wearing long trousers but a jacket as well! For the fashion conscious, Gordon had an orange sweater underneath the jacket! Incidentally, he succeeded in getting through the evening without knocking over any sherry glasses or committing any of the other usual Gordonisms, but some of the slides David Hunt showed afterwards depicted Gordon in the usual more unexpected poses, such as looking a "Creeping Devil" in the eye and trying to photograph Idrias.

Notes and News

Forum

The appearance of the first "Forum" has been held over until the next issue of the Journal. Contributions on any aspect of the genus *Lovibia* are still welcome, so if you have any information that you think might be of interest, or personal observations on these plants, please write to me (by the end of February if possible) at the following address:—

R. B. Pearce,
Department of Botany & Microbiology,
University College London,
Gower Street,
London, WC1E 6BT.

The subjects of the next two "Forum" articles will be the genera *Ariocarpus* and *Frailea*. Contributions on these genera are also wanted, and I will be pleased to receive any letters with information on these topics also.

Remember—the content of these articles will depend on your response, so if you know anything that might be of interest please write in—only if I get plenty of letters can the venture be a success.

Saturday Show June 14th 1975

THE Society's first Saturday Show in London is to be held at St. Saviour's Church Hall, St. Georges Square. Pimlico, on Saturday 14th June and it is hoped that even if members from outside London do not feel they can enter they will at least come along between 2 p.m. and 6 p.m. to see the Show. However, it is even better if they can have a go at some of the classes as the Show Committee have tried to provide something for everyone. The classes are detailed below so that members have several months to sort out what they can enter. Entry forms can be obtained from Branch Secretaries in the near future or send a stamped addressed envelope to Mrs. Hodgson for your copy if you do not belong to a Branch. Staging can take place from 9 a.m. to 11 a.m. on June 14th and all entries must be cleared by 7.30 p.m.

There are seventeen classes in the Section A—Cacti —and these include three special classes designed for those with small collections or just starting the hobby as they have a pot size restriction of $3\frac{1}{2}$ or $4\frac{1}{2}$ in. The other classes are similar to our usual June Schedule, starting with six cacti with a chance to see fine large specimen plants. Class 2 for 3 Lobivias and,or Rebutias should be colourful as these should be flowering at that time and there is an additional class for three Rebutias in pots up to $3\frac{1}{2}$ in. diameter which many newer growers should manage. Class 4 for three Mammillarias gives a chance to show the larger growing species while class 5 for six Mammillarias in $4\frac{1}{2}$ in. pots or under is planned for showing the dwarf species such as *M. shurliana, M. solisioides, M. herrerae,* etc.

Class 6 is for one Notocactus which gives a wide selection for most growers but for those who have the smaller growing types class 7 asks for three notocacti in $4\frac{1}{2}$ in. maximum pot diameter. Three Echinocactanae again allows a wide choice and you only have to check through previous Show results to see the different genera that have been successful in this class. The classes 9 and 10 are for three Gymnocalyciums and/or Weingartias but class 10 has a pot size restriction of $3\frac{1}{2}$ in. again a chance for newer growers. Class 11 is for two Echinocereus and class 12 for a specimen Mammillaria. Class 13 again calls for a large mature plant, this time any cactus but class 14 should give a chance to many more members with 6 cacti in pots up to 6 in. diameter. Even if your plants are not as big as that class 15 is for 3 cacti in pots up to $4\frac{1}{2}$ in. diameter.

A considerable number of packets of seed are sent out in the Distribution each year, so there should be plenty of opportunity to set out your resultant seedlings in a 15 in. by 15 in. container if they have been raised since 1st January 1973. Please show those involved in the seed distribution that their efforts are not in vain! Finally, in the cactus Section a class for Junior members for three cacti; there are a good number of Juniors in our Society and it is hoped that they can encourage their parents to help with transporting their plants for this special event.

Section B is for succulents other than cacti and class 18 is for a specimen plant which gives a fine range possible. Class 19 should not pose any problems either as three Euphorbiaceae can be selected not only from Euphorbias themselves but also Monadeniums and Jatrophas to mention only two other genera in this large family. Again, in class 20, three Liliaceae, the range is wide including Aloes, Gasterias, Haworthias and Bulbines. Class 21 is another that should encourage newer growers as most people have either an *Aloe variegata* or *Aloe aristata* in their early collecting days and just one good plant is required. Another popular class is 22 for two Asclepiadaceae; many Stapelias, Huernias and Ceropegias may well be in flower at the time which should add to the attraction. Another wide selection is possible amongst two Crassulaceae in class 23 including Echeverias, Dudleyas, Adromischus and many others. Then follow two classes for three other succulents, class 24 has no pot restriction so fine specimen plants can be staged while class 25 is for the dwarfer types with a 4½ in. pot size restriction. Class 26 gives the Juniors a chance to show three succulents.

Finally, there are three 'general' classes. One cactus and one other succulent should show some interesting contrasts or similarities and there is no doubt of the interest shown in class 28 for a miniature garden and the 18 in. by 18 in. group should muster a display of good condition plants most of which could well be in flower at that ideal time of the year.

B.M.

Calling all Junior Members

CAN you produce a poster? If so, enter our Show poster competition and you may win a useful prize. Here are the details:

1. You are invited to send a poster on strong paper not less than 8 inches by 12 inches or more than 12 inches by 20 inches using poster colours or pens.
2. This should be eye-catching and may include drawings, etc. but the following details must be included:

   Cactus and Succulent Society of Great Britain Show on Saturday June 14th, 2 p.m.-6 p.m.

   At: St. Saviour's Hall, St. Georges Square, Pimlico (Near Pimlico Station). Admission 10p.
3. Posters should be sent rolled or flat (NOT folded) to reach The Publicity Officer, Mrs. B. Maddams, 26 Glenfield Road, Banstead, Surrey SM7 2DG by March 31st. They will be judged by a selected panel and all suitable posters will be used to publicise the Show. Outstanding ones, including the prize winners will be first exhibited at the Society meeting at the R.H.S. Hall on April 16th.
4. Please remember to put your **name and age** on the back of the poster and include a slip with your name, address and membership number, also a stamped label if you want your poster returned afterwards.

Come along Juniors, show us what you can do.

The Essex Branch in 1974

THE Essex Branch enjoyed in 1974 another year of interesting and widely varied activities, resulting in several new members and well attended meetings. The Annual General Meeting in January was surprisingly well attended and the Chairman and Committee were all re-elected *en bloc*. They like to feel that this was because of their past efforts and not from apathy on the part of members.

For February we had a welcome return visit from Lucy Whickham and Ray Knight of the Tunbridge Branch of the NCSS. They gave their talk in their usual humorous manner, featuring slides of collections ranging from Lancashire to Somerset. In March we went behind the Iron Curtain with Ron Dale, who showed slides taken on his visit to Eastern Europe, with many excellent private and public collections of our plants. Several botanic gardens illustrated put to shame our own public collections with their tired and tattered plants. Even though they are rather cut off from the Western world, new introductions appear to be propagated very quickly there and soon distributed widely among the enthusiasts.

The Branch Annual Dinner, also in March, was a success. The meal itself was followed by a showing of two Gordon Rowley films, one of which was the prize winning 'Cactus Polonaise', followed by a full length feature film 'Once upon a time in the West'. This latter with its beautiful panoramic views of Monument Valley and most moving music brought a memorable evening to a close.

In April Mr. and Mrs. Tree gave their lecture 'Plant and Flower'. Their presentation was unusual, featuring two projectors, one of which was used to show the plants while the other showed their flowers. Many of the newer cacti were shown, some of which are rather beyond our reach these days because they demand higher greenhouse temperatures. This was followed in May by Mrs. Stillwell who gave a most interesting talk on Mesembryanthemums, after which she showed slides of Chamarcereus and Paramount Echinopsis hybrids with their brilliant coloured flowers. Also in May we had our Annual Show at East Ham Town Hall, which was most ably judged by Mrs. Stillwell and Mrs. Hodgson. The show was well supported, as usual, and many fine cacti and other succulents were exhibited. Our Treasurer, put on his fine collection of Bonsai trees, while Mr. Stringer of the Sempervivum Society, aided by our Secretary, provided a joint exhibit of Sempervivums.

At Whitsuntide the Branch paid a return visit to Mr. De Herdt's nursery in Belgium, which proved to be even more enjoyable than the 1973 trip because of the extra day we had. Arriving at Antwerp at the unearthly hour of 5.30 a.m. we quickly repaired to the nearest bar for breakfast then enjoyed a short sightseeing tour of the city before leaving by coach for the nursery. Here we

found the quality of the plants very good with several eye-catching novelties, among them an *Aylostera muscula* with a long spine and *Sulcorebutia hoffmanniana* smothered in the most lovely three-coloured red and yellow flowers. In the sales house we found a large bed of imported *Ferrocactus acanthodes* heavily armed with stout, bright red spines. Considerable variation in spine thickness and degree of hooking in the spines was observed. But our enthusiasm was somewhat dampened on finding that prices for these plants worked out at between £15 and £20. A visit abroad does make one aware of the devaluation of our pound and the comparative lowering of our standard of living. Our tired but happy band of travellers returned to our hotel in Brussels. This we found most comfortable and pleasantly old-fashioned, and the food a vast improvement on our 1973 trip. Sunday was devoted to an organised trip around Brussels, which included an ascent of the Atomium and sight-seeing in the Grand Place. On our way to Zeebrugge on Monday a couple of hours were passed pleasantly in Bruges, including lunch in perfect weather by the beautiful canal. We finally arrived at Barking well loaded with plants, presents and duty free goods.

The June meeting was devoted to prize giving. It was noticed that plants that had won prizes at our show were not in the first three at another show, which emphasises that judges are individuals and that plants of prize winning potential do not always get a prize. A plant auction concluded the evening, with much needed results for the branch finances. In the month following our Secretary showed many slides taken on his visit to the Riviera. Featured were the Jardin Exotique at Monaco, Monsieur Marnier Lapostolle's garden at Cedres St. Jean, Cap Ferrat and the commercial nursery Et. Kuentz at Fréjus.

We were fortunate in having Eddie Cheetham in August to give us a well illustrated talk on Echinocereanae. Many interesting plants were illustrated, and it was clear that Mr. Cheetham is a 'lumper' and not a 'splitter'. His forthcoming book on this group is looked forward to with anticipation as it should do much to clear up a lot of the confusion which has resulted from the many trade introductions over the last decade or so. Also in August the Branch ventured abroad again, this time to Holland and the nursery of Mr. Van Donkelar.

For October we had a return visit from Mr. John Williams of Woking with a talk on seed raising. His illustrations were of a high quality with many macrophotographs of seeds and the internal parts of flowers. Close-ups of stigmas and stamens, particularly of Echinocereanae, showed what a lot is missed when flowers are viewed from a distance without magnification. Following this meeting a member has assured us that seeds soaked for 24 hours in undiluted seaweed fertiliser (i.e. Maxicrop, etc.) germinate much more successfully.

To close our season we had Peter Chapman to talk on Echeverias. Like the previous speaker Mr. Chapman is noted for excellent photography, and his talk went some way to redress the preponderance of talks on cacti.

F.B.

Gardeners' Sunday

This is the 20th year of the Gardeners' Sunday Scheme and thousands of people have discovered the pleasure of garden-visiting while, at the same time, providing money which has been of enormous help to Gardeners' Charities. The 1975 issue of "Gardens to Visit" will be available at W. H. Smith & Son and other bookshops at the end of March, price 15p.

Aloes

In 'Notes on the Aloes of S. Tropical Africa with four new species and a new Variety' (Journal of South African Botany, 40 (2): 101-122). L. C. Leach describes *Aloe lepida, A. scorpioides, A. vallaris* and *A. procera* all from Angola.

Stapelieae

The genus *Tavaresia* is reviewed and a key to the species provided by L. C. Leach in 'Stapeliae from South Tropical Africa: XI' (Kirkia, 9 (2): 249-358). The name *Tavaresia* Welw. is supported against *Decabelone* Decne., and *T. grandiflora* is considered a synonym of T. barklyi. (*note:* reprints of the above are available on loan from the Librarian).

I.O.S. Survey of Succulent plant collections

Response so far has been excellent, thanks to maximum publicity from all editors of British journals who have co-operated nobly in making the survey known. Collectors are clearly taking the request seriously, to judge by the length and detail of many answers. Several replies have been received from abroad, although as yet no scheme has been organised for surveys outside of the British Isles. The body of information so far received fully justifies sorting and indexing so as to form a permanent data bank which can be added to and kept up to date as time goes on. To do this will require willing hands and financial help, and the subject will be discussed at the next I.O.S. Sub-committee Meeting in November. In addition to its importance for revealing which succulents are most cared for by collectors and which are overlooked, and where the specialist collections lie, the index would have great practical value for putting specialists in touch with others of similar or overlapping interests. So if you have not already sent in details of your collection, please do so as soon as possible.

G. D. Rowley, Department of Agricultural Botany, The University, READING, Berkshire.

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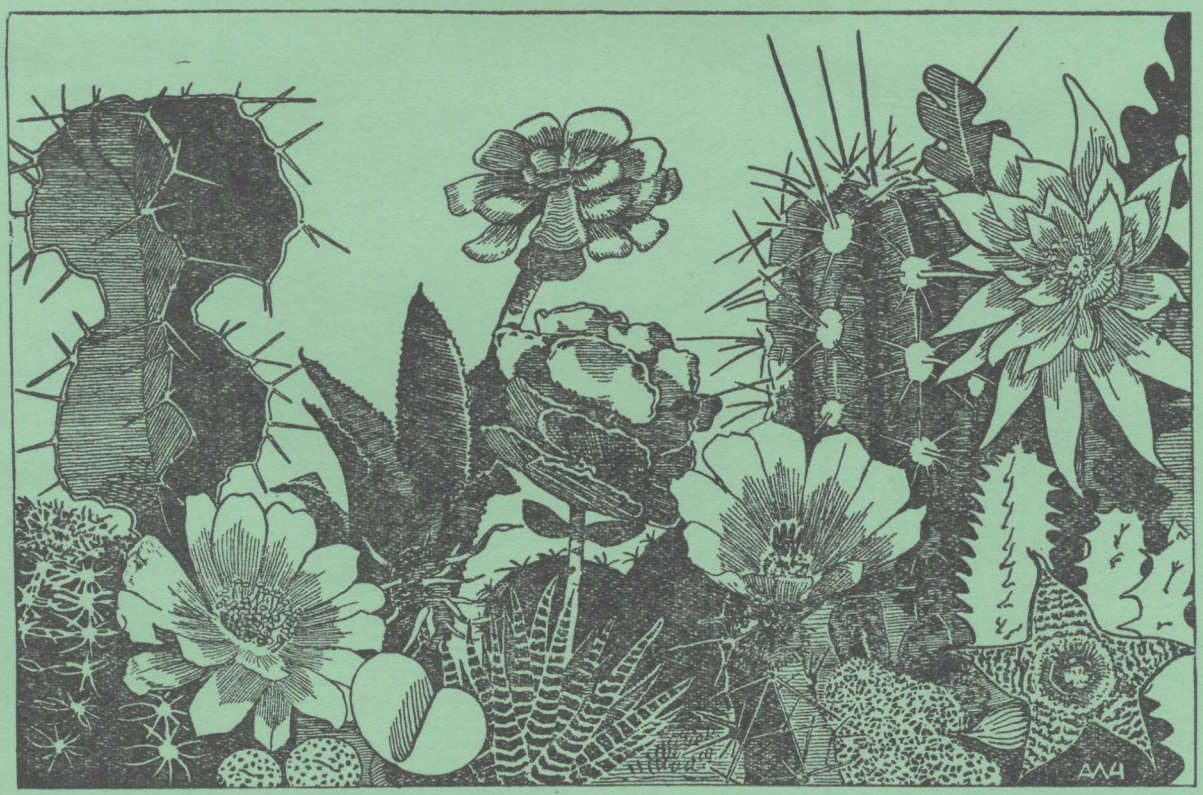

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A Booklet on the Classification of Cacti and Succulents is now available from the Show Secretary. The price is 5p each plus postage. Branch Secretaries can obtain them at 12 for 50p plus postage. Postage is 1–8 copies 3½p, 9–11 copies 5½p. Postal Order or cheque, NOT stamps, please.

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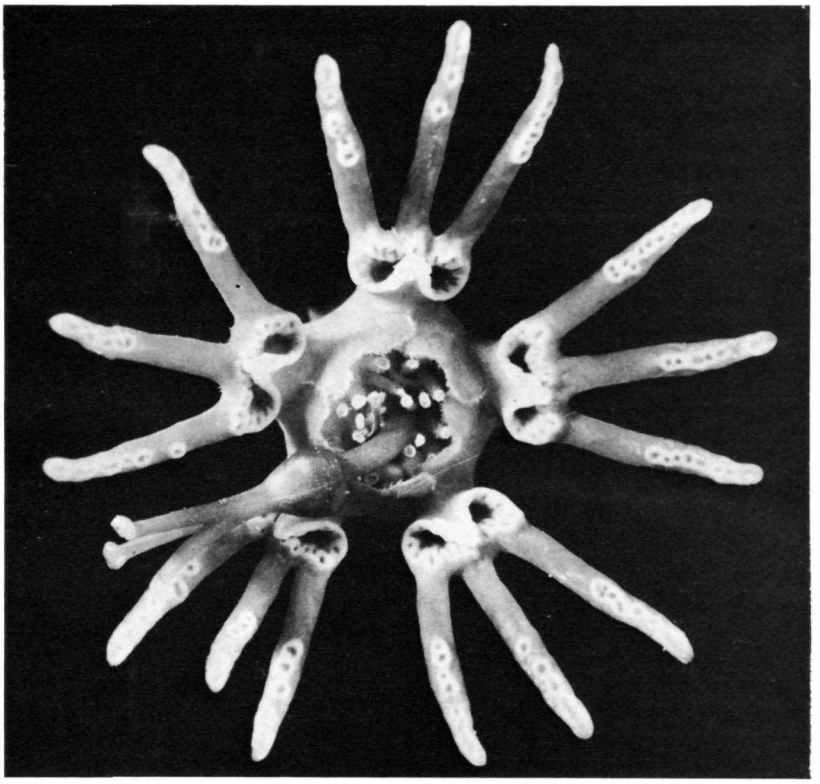


Flower of Euphorbia globosa—10 mm diam. (photo: P. R. Chapman)

CONTENTS

A Message from the Chairman

INFLATION and apathy are in evidence all around us and are the twin dangers which will beset the Society during the coming months. The Income and Expenditure Statement for 1974 is to be found elsewhere in this issue and I hope everyone will read it carefully. When allowance is made for subscriptions received in advance the credit balance at the end of 1974 was a mere five pounds more than twelve months earlier. It therefore follows that our income will be insufficient to meet our expenditure this year and I am sure I do not need to point out the very obvious implications so far as 1976 is concerned.

However, it would be quite wrong to suppose that the mere willingness of members to pay a subscription commensurate with maintaining the Society in a viable financial position will guarantee success. What we require is enthusiasm and zest, of the sort which our President displays in such measure. This is needed both for special activities, such as the forthcoming one-day Show on 14th June, and the prosecution of the quite ordinary but very necessary range of jobs involved in keeping the Society running smoothly.

Inevitably, much of the burden will fall on members of the Branches in London and the Home Counties and it must be shared as evenly as possible; I make no apology for returning to this theme. I should like to express my thanks to those who have worked on behalf of the Society during 1974 and I hope that others will join them during 1975. A greater sense of involvement is the key to success and the Society stands or falls by the level of activity of the average member.

Cultivation of Succulents

by Mrs M. Stillwell

ALTHOUGH it was a very mild winter, there was so much rain that dampness in the greenhouse has been a problem. I was loathe to water too early in case of mildew, which could prove a great enemy. Together with the dampness was the absence of sunshine, caused by the continual overcast skies. These conditions make one thankful for a good, watertight house with a full concrete floor. To those who are thinking of a new greenhouse at this time of year I would suggest thinking of all the adverse conditions of the winter and realising that a few extra pounds spent on the foundations will pay dividends later on. Any wooden structure should be stood on curbs, or at least one brick high off the ground, to make sure of a damp course to allow the rain to run clear of the woodwork.

Both of my plants of *Pleiospilos nelii* have aborted their flower buds this year. I feel sure that this was caused by the damp atmosphere, as neither of the plants had been watered, this being absorbed by the leaves with the result that the buds would have been squeezed out of existence, The Titanopsis all bloomed freely in February, as did *Nananthus malherbi* with its large apricot coloured flowers and attractive shell-like edges on the leaves. I find *N. malherbi* another of those plants that like to be kept dry all winter until the flowers have opened, otherwise the buds have the habit of not opening.

In spring many of the more rampant succulents make nicer plants if they are restarted from fresh growth or cuttings. This is the case with the Kalanchoes or *Rochea falcata,* which become sprawling after a while instead of erect. I noticed the latter in bud very early this year, together with the charming *Crassula* cv. 'Morgan's Beauty', which keeps its white firm texture if grown in full sun and on the dry side. I was pleased to see a large white terminal flower on *Astridia hallii* for the first time. *Jacobsenia kolbei* was also showing its branching head of buds in February, and this is an interesting plant to watch if you can obtain one.

The Lithops should be getting back to their normal, attractive selves in May, having almost lost the old bodies. This is the time to repot, when it is easier to remove any accumulation of dried skins. It is advisable not to disturb the roots any more than is necessary, since they have a habit of refusing to grow for several months in protest and becoming quite shrivelled as a result. It is advisable to water about one week prior to repotting so that soil clings around the roots. Conophytums should have been given one good soak about the end of March and then left to rest for the next three months or until they split and reveal the new bodies. This is the time to repot and to divide if necessary, just at the start of the growing season. Any pieces accidentally becoming detached will soon root up. Conophytums usually grow quite quickly from young plants, particularly the bilobe types which are easy to grow and very showy when in flower. There are numerous hybrids with outstanding, large flowers, including some rare ones in orange and tangerine. All Conophytums seem to grow true to type in plastic pots if given a very open compost free from dust, and one that never remains waterlogged. They

appreciate the addition of limestone grit or chicken grit. A top dressing of coarse aquarium gravel gives a neat appearance and provides good drainage by keeping the soil from crusting over, particularly in districts where the tap water is hard. Rain water is preferable to tap water, particularly as it is free from any of the chemicals we hear about being added to our water supplies these days.

One usually finds a few mealy-bugs after the winter rest and a dose of systemic insecticide is advisable, having first of all given the plant a good watering so that it will penetrate the soil and not just sit on the surface. The ideal way is to water from the base if you can, particularly with those succulents that resent water on their foliage. Although we are given to understand that Crassulas are sensitive to systemic insecticides I have never found them to be affected if the soil only is watered.

By the beginning of June it should be safe to put many of the commonly grown succulents outside for the summer. This provides more space for cacti in the glory of their summer flowering. You will be amazed how well these succulents grow out of doors; the larger aloes and agaves make attractive tub plants and in the front garden create much interest for the passer-by. Echeveria offsets make a charming edging to a border, quickly reaching adult size. They can be stored during the winter crowded together in old enamel or plastic bowls, complete with the clod of earth as they have been dug up, and they come to no harm if kept almost dry. In the spring the old soil is broken away and the dead leaves removed from the base of the rosette ready for bedding out once more.

Baja California 1974

by Gordon Rowley

"I ASK myself: if I were a *Mammillaria schumannii,* where would I grow? Then I go out there and find it." The speaker was Reid Moran (Fig. 1) at the wheel of a mighty Chevrolet which took us over 1400 miles from one end of the peninsula of Baja California to the other. David Hunt by contrast detects species by extrasensory perception. I personally saw him jump from the car in darkness, climb a steep bank by torchlight and return with *Mammillaria schumannii* all in a matter of seconds. David Minnion, the novice of the party seeing cacti in habitat for the first time, uses more orthodox methods, but early distinguished himself by spotting *Wilcoxia striata* from its disproportionately large prickly fruits: the only visible portion above ground since the thin twiggy stems completely merge into the supporting bush. The occasion was a post-Congress tour last September—not one of the official trips, but laid on specially for us by Dr. Moran as sequel to a three-day visit I made with him and Len Newton in 1968. (See Nat. Cact. & Succ. J. XXIV: 82-83, 1969). Since then much has changed. A paved road now runs the whole 800 mile length of the peninsula—a mixed blessing, because although it helps the botanist explore a range of contrasted habitats in minimal time it opens the way to land development and the inevitable destruction of wild life. Already the roadsides have been cleared for 200 feet on either side (Fig. 2) and we photographed great heaps of bulldozed, rotting succulents. A string of garages and motels has sprung up, the owners having scoured the neighbourhood for suitable succulents to adorn their premises. Here we found an interesting study in the variation in local populations of *Ferocactus:* flowers in every shade from yellow through pinkish orange to red, and central spines ranging from narrow to dagger-like, or long and needle-like (*F. rectispinus*), long and twisted (*F. tortulospinus*), stout and hooked (*F. peninsulae*) or all spines dark red (*F. coloratus*). How many of these "species" can be maintained, I happily leave to Dr George Lindsay who is working on a long-awaited *Ferocactus* monograph.

To us the most interesting of the many regions was the forest of *Idrias*—or *Fouquieria columnaris* as it is now known. They occupy a long stretch about midway down the peninsula. To camp amid a particularly fine stand and sleep beneath a starlit sky to the distant sound of coyotes yelping is one of those experiences that one never forgets. Although we climbed the hill at crack of dawn and secured passable movie and still shots of the sun rising over the gaunt skeletal silhouettes of the unearthly "boojums", no pictures can do justice to the feeling of unworldliness one gains on walking among them. South of the forests of boojums, and somewhat overshadowed by their fame, grows another monstrous species, *Pachycormus discolor,* which is only slightly less bizarre (Fig. 3). The swollen, lumpish trunk is covered with a fine silvery bark, and populations of them in all sizes cover landscape of the most rugged and varied form. I was reminded of *Pachypodium lealii* ssp. *saundersii* in Natal, on similar terrain. The tallest specimens were 3m. or more in height; seedlings make superb bonsai plants but are extremely difficult to obtain as they grow wedged immovably in rock crevices, and any attempt to dislodge them damages the root. The flowers are small but numerous, and dullish pink. *Bursera,* which occurs in the same area, and certain other desert shrubs develop a similar pachycaul habit and become unique

Baja California: fig. 1, Reid Moran (left) and Fred Boutin amid Machaerocereus gummosus. fig. 2, the new road, showing the wide area bulldozed through forests of 'Boojum'. fig. 3, Pachycormus discolor, the 'Elephant Tree'. (photos: G. Rowley) fig. 4, defending ourselves against the advancing hordes (photo: D. Hunt)

features of a unique landscape.

Every cactophile has heard of the 'Creeping Devil' (*Machaerocereus eruca*) whose long cylindrical branches with broad spine daggers lie flat on the ground and root as they grow. It was something we just had to see. Although most stems creep in one direction, not all do, and some go their own sweet way. We all agreed that it had a sinister look about it (Fig. 4), and were somewhat relieved to survive a night in its company with no worse hazard than some of its frightful spines penetrating the soles of my shoes. It is quite local and depleted by road building, so its conservation demands attention. The related but less bizarre *M. gummosus* (Fig. 1) occurs over a much wider area, including the spot where *M. eruca* grows. Both have long trumpet-shaped blooms of whitish pink with a bronze overlay and flower synchronously, but no hybrid has ever been reported and we wondered what the isolating mechanism was. Seeing cacti in the wild raises so many interesting evolutionary problems. Another, in the same region, concerned parallel evolution. *Opuntia invicta* is fairly familiar in Europe as imported joints. In nature it forms great mounds several feet across: a frightful natural pincushion with the short-cylindric joints scarcely visible beneath the spines. When Reid said that we were actually looking at *two* separate species, I thought this was just another of his frequent jokes: anyone could see double after a night among Boojums and Creeping Devils. But he was right: the other was *Echinocereus berlandieri,* with very similar fiercely spined joints. Proof came when I found one in flower. In cultivation neither grows as fiercely armed and the difference then becomes more obvious. Stout spines seem a feature of the Baja California cacti. *Ferocactus* excels in them, too. A plant of *F. peninsulae* var. *vizcainensis* had talons so fierce that once I became hooked it didn't let go until I was back in Reading.

Travelling South one passes through regions of contrasting vegetation, and the difference is especially noticeable where the road crosses from the Western (Pacific) side to the Eastern (Gulf) coast. Here everything looked green and lush, the result of recent heavy rains. Even Reid, who must be familiar with every inch of the peninsula by now, was seen to raise the left eyebrow $12\frac{1}{2}^{\circ}$ in surprise here. We passed within telephoto distance of the site of that mysterious cactus *Morangaya pensilis,* aloof and unattainable on its lonely mountain peak. It is a half day's journey on mule-back to the mountain, and

one glimpse of those sheer cliffs was quite enough for me!

We ended our trip at La Paz near the South end of the peninsula a week after we had set out, wishing as always that there had been more time to explore those areas so tantalisingly sampled: the cliff overhanging the sea where everything above seemed to have dropped its seed to create a natural nursery below; the outlandish wildernesses of giant boulders tumbled in heaps, with a succulent gem wedged in every crevice, and the no less exciting flats where *Mammillarias* like *blossfeldiana* and *glareosa* (=*dawsonii*) lay hidden below soil and unseen until one went down on hands and knees and prayed for them to reveal themselves. For all this, and memories of wonderful company, we must thank Reid Moran, who made possible a trip we shall always remember with delight.

Seasonal Cactus Care

by W. F. & B. Maddams

AT THE TIME of writing, early in March, it seems that we have escaped the clutches of winter. This is the more surprising because towards the end of 1974 the pundits, almost without exception, were forecasting hard weather. We may yet have a period of chilly eastern winds and frosts but with the length of day now about equalling the period of darkness greenhouses warm up appreciably, even on comparatively dull days, and this is reflected in a higher round the clock average temperature. Needless to say, in this era of inflation, the mild winter has been most welcome as it has substantially reduced the size of the heating bill. Those who keep a minimum temperature of about 40°F. will have had to spend very little on fuel and even in the range of 45°-50°F. the saving has been substantial. In that we come into this latter category we expect the normal growth and flowering pattern and, indeed, it is beginning to emerge. Some differences may arise in the case of members who submit their plants to more spartan conditions and if this proves to be the case we hope that they will let us know or will publish their observations in the correspondence column.

In our previous article we concentrated on propagation from seed and this will also be our major preoccupation now. We shall be concerned both with the progress of seed sown in artificial heat in February and also with propagation under normal conditions early in the summer. This is a very acceptable method for those without a propagator; indeed, we have heard enthusiasts for this method claim that they achieve better results than those who use a propagator and sow early in the year. It does give one a little less leeway in that the seedlings have, at most, a growing season of about six months before their first winter but this should suffice.

These notes will be read by about the middle of May. Hence, members who followed our suggestions for an early sowing in heat will, assuming an average germination time of two weeks, have seedlings aged some ten or eleven weeks. We are now concerned with their progress during the summer months but before we come to this topic we make no apology for repeating the point made previously, that if germination is slow or erratic do not give up hope at this stage. So far as Society seed is concerned we try to ensure that what is distributed is fresh, but of course, we have no means of knowing its age when it reaches us. Hence, if for one reason or another the seed is a little past its prime (and the age at which this occurs varies considerably among the genera of cacti), the germination may be somewhat erratic.

At ten or twelve weeks of age the young seedlings should be of sufficient size for the pieces of glass to be removed from above the pans. This will lead to a somewhat more rapid drying out of the surface but this can be countered by more frequent spraying and occasional soaking. If the compost is too dry, and this should be fairly obvious from a casual inspection, the rate of development of the seedlings will be slowed but they will come to no great harm. If the compost is too wet there is a danger of damping off or rotting. Wet composts also almost invariably proliferate a collection of algae, mosses and other curious green vegetation which we cannot name but which we know well from our own past experiences. The major difficulty with these is that they tend to form a layer on the surface and if the tiny roots of the seedlings have not secured a hold before such layers form they find difficulty in rooting through it. It is possible to check such algal growths to some extent. Potassium permanganate solution, of such a strength as to be a deep pink colour, is sometimes recommended and is probably of limited value. A few years ago we undertook experiments with a proprietary material sold for clearing garden paths of algal growths and it certainly proved successful. However, we obtained what seemed to us to be an unusually high proportion of double- or multi-headed seedlings and we are not prepared to recommend it without this reservation. The secret of success is, undoubtedly, correct watering and this can only be learned by experience.

By mid-May artificial heat during daylight hours will be unnecessary but we prefer to prevent the temperature from dropping too low overnight. This is where a propagator with a thermostat, albeit a simple one, proves particularly useful. The degree of shading re-

quired will depend on the placement of the seedlings and we can only advise in general terms. The aim should be to give them plenty of bright diffused light. If they are on a greenhouse staging in an exposed position they will need covering with two layers of tissue paper or butter muslin whereas in a less open position one layer may suffice. The seedlings should be inspected daily, if possible, and if signs of reddening are found extra shading should be supplied. It is best to leave the shading in position even during dull spells because if the sun breaks through unexpectedly damage can be done before corrective action can be taken if the covering is not in position.

The other pitfall for the inexperienced and the unwary is the sciara fly or, rather, its larvae. There is little doubt that this pest has been on the increase in recent years and this may be connected with the increased use of soilless composts. Nevertheless, we are firm believers in this type of compost and find that if precautions are taken the sciara fly does not present a significant problem. This little black insect, which runs quickly across the surface of the compost and takes to wing if disturbed, is more readily apparent than its larvae. These are small almost transparent grubs, a millimetre or two in length. Almost invariably the first sign of trouble is the collapse of seedlings. When these are examined they prove to be hollow shells containing, perhaps, a grub or two. It is easier to keep the sciara fly at bay than to eradicate the larvae once they have a hold. One of the proprietary systemic insecticides, used regularly, is effective and a few crystals of paradichlorbenzene in the compost, or pyrethrum, can also be recommended.

At ten to twelve weeks old the seedlings will, to varying degrees, be showing obvious signs of developing into recognisable cacti. During the initial stages of growth they will be little more than green blobs a millimetre or two in diameter. Some will show very clearly the two triangular-shaped cotyledons just above soil level. They are readily apparent in Opuntia species and Epiphyllum hybrids, less markedly so with the various Cerei and are virtually absent with Mammillaria species. In those cases where the cotyledons are marked the body proper will emerge from between them and even at three months of age this second stage of development is well under way with the Opuntia species which, by and large, grow quite rapidly. In the case of Mammillaria species, and other types where the cotyledons are vestigial only, the small green globule grows gradually and incipient tubercles and small spines appear. At the first stage of growth, before the plant proper begins to develop, the root is little more than a fine thread and if it is broken the seedling will almost certainly die. It may be necessary to raise seedlings which are lying almost horizontally but this should be done with great care. They can, with advantage, be propped up with pieces of grit a millimetre or two in diameter. Unless there are imperative reasons for doing so, and the only possible case which comes to mind is a rampant infestation by sciara fly larvae, the seedlings should not be transplanted until the characteristic body is forming and the roots have thickened. We much prefer to leave the operation until late July or early August and so the relevant comments and instructions will appear in our next article.

What has been said up to this point, in this article and in the previous one, excepting the comments on propagators, is very relevant to propagation using natural conditions. This may be done in a greenhouse or indoors in a light position. By mid-May the average temperature will be high enough to give good germination, although a little more slowly than at a steady temperature of 70°F. The raising of seedlings indoors should present no problems; choose the brightest position and shade if necessary. Rather more care is needed in a greenhouse, because the seedlings will be spending their first few weeks of life at a time when the greenhouse temperature may reach 100°F. if there is seasonal weather in June. Great care must be taken to ensure that the compost in the containers does not dry out completely and a daily inspection is very advisable. It is also unwise to sow the seed in small containers such as two and a half or three inch square plastic pots. It is better to use larger trays and to divide them into sections. An alternative method, one which we have not tried but about which we have had good reports, is to place the containers in plastic bags the necks of which are twisted and secured with elastic bands. This creates a moist micro-climate which seems to be conducive to good growth.

May, June and July are the best months of the year for rooting cuttings; hence, a few words on this topic will not be out of place. There are three major reasons for taking cuttings. The first is to propagate the plant in question vegetatively and from the point of view of obtaining additional material it is to be preferred to seed production in the artificial environment of a greenhouse. Now that there is increasing emphasis on conservation vegetative propagation has become particularly important. Nevertheless, the ordinary collector is primarily concerned with growing attractive specimens of plants which, by and large are not rarities, and he should hesitate before breaking up a good caespitose plant to obtain cuttings. Such plants usually represent the result of quite some years of effort and this should not be thrown away lightly. In some cases, Echinopsis species being a good example, offsets are detached readily and the plant is not scarred. In other cases, and *Mammillaria plumosa* is typical, it is not so easy to remove a single head.

The second reason for taking cuttings may be described as cosmetic. If a plant is constricted near the base or is scarred it can, over a period of years, gradually be grown into a presentable specimen. However, if the top portion above the blemish is removed and re-rooted, the same result is achieved more quickly. Finally, cuttings are sometimes taken as a rescue or life-saving

operation and this calls for the greatest degree of care.

With cuttings of the first and second type it is only necessary to wait a day or two until the exposed surface is calloused over lightly. In the case of 'rescue operation' type of cuttings it is better to err on the side of safety and to leave them in a warm shady place for little longer to ensure that there is no further decay. When the cuttings are ready they may be rooted by one of several methods. The best known of them is to use a peat/sand mixture and as soil-less composts come into this category they are very suitable. Vermiculite was hailed as the wonder rooting medium about a decade ago and it is undoubtedly useful but as it contains no nutrient the plants must either be transferred to a conventional compost or must be fed once rooting begins. It is also quite easy to root plants by sitting them on top of an empty pot; from the purely practical point of view this is easier to arrange with a globular plant than with one which is columnar. Once roots begin to appear the plants must be potted up in the usual way and with care as the new roots will be tender. From the point of view of minimum disturbance the peat/sand mixture is the best. The temptation to lift the plant from time to time to check on its progress should be resisted; once rooting has occurred new growth will be evident. During the rooting process the peat/sand mixture should be kept very slightly moist, particularly at the base of the pot, to encourage the root to go down and to avoid the risk of rotting at the cut surface. This basal moisture is best obtained by standing a pot in a plastic saucer into which a little water is poured from time to time. While rooting is in progress, the plant should be in a warm but not too sunny position as it will be unable to make up for water lost by transpiration.

Finally, and with some reluctance, a few comments on the rooting of imported cacti may be useful. In giving these we are not condoning the extensive importation of plants; we do not approve of it and believe it is unnecessary. The average collector, in distinction to the serious student of a group of plants, does not need imported material. He can raise his collection from seed; this will give him cleaner and more attractive specimens and will aid conservation. However, most of us, whatever our views, do come by the occasional imported plant and it is important to establish it without undue delay. These plants are usually devoid of roots and should be treated as cuttings. They are often corky at the base and it may be necessary to cut some of this hard material away to reach the softer tissue which is capable of sending down roots. Alternatively, if the corkiness is not too pronounced soaking the base of the plant in warm water can have a beneficial effect. When this pre-rooting treatment is complete the plant should be treated as a cutting and the routine described above followed. In some cases rooting will be rapid and new growth will be quickly apparent. In other cases, particularly with the slow-growing Echinocactanae, new growth may not appear for some time and until it does water should only be given sparingly and from the base.

Report of the Council for the Year Ended 31st December, 1974

ANOTHER year has passed and, as the author of this Report of Council, I would dearly like to be able to say that it had been a year of great achievement and one of which the society could feel proud. Whilst it has not disgraced itself by any means, nevertheless attendance at Westminster and the number of exhibits at our shows seems to have shown a further decline rather than an improvement.

Could it be that one meeting a month is sufficient to satisfy the average cactophile and that as near to home as possible since the Westminster trend does not appear to be reflected in the branches and that people don't like two day mid-week shows with parking difficulties thrown in for good measure? As regards the former, 1975 may well be your last chance to prove to the Council that these meetings at Westminster are wanted at all and, as to the latter, Council will be looking eagerly and closely at the forthcoming one day June Show which is being held on a Saturday.

The loss of one of our Vice-Presidents and Founder Members—Mr. P. V. Collings—towards the end of the year after a relatively short illness was a further blow to the Society which Council have to report with great sorrow.

With power cuts and other restrictions at the beginning of the year it was found necessary to alter the date of the January meeting from Wednesday 30th to Thursday 24th at which meeting Mr. and Mrs. Tree gave us an interesting slide show. Other speakers during the year included Dr. Noble, Mrs. P. Read, Messrs. Brewerton, Jenkins, Dale, Smeaton, Featham and Dr. Mace, to all of whom the Council offers its sincere thanks coupled with the name of Mr. Miller for his kind loan of projection equipment which he regularly brings to our Westminster Meetings.

Our exhibit at Chelsea Show was a great improvement on the previous year, with far more colour and overall arrangement and was reflected in the award

which we obtained namely a Silver Flora. Council's thanks are again extended to Messrs. Clare and Hurley for their efforts both before, during and after the event and to those members of the branches who supplied plants.

In his short term of office the society's new Treasurer —Mr. R. D. Burton has shown one thing namely that, despite inflation, it is possible by indirect means—in this instance an internal society Grand Draw—to offset rising costs and be able to maintain subscription rates at the same level. However this method has proved to be somewhat controversial and will certainly not become an annual event at least not in its present form.

Miss E. Brown who for many years has distributed the society's seeds has notified Council that due to moving she is unable to continue in this office. Council have already expressed their warm thanks to her for her past services and welcomes Miss N. Sullivan as her successor. Over and above the free distribution, the Society sold £105 of seeds to members at a profit of £71.

The Annual Dinner was again well attended and the organiser, Mr. R. H. I. Read, would like to thank those members who sent in their applications more promptly as a result of his appeal—long may it continue. Mr. David Hunt of Kew Gardens gave the guests an excellent slide show afterwards, with mouth-watering pictures of Mexican and other cacti for which Council extends its warmest thanks.

Although our President does not attend our meetings quite as often as in the past she acts as befits her position as an exemplary figure-head and shows us at all times that the Society is very close to her heart, and those who are responsible for its management cannot fail to admire her keen interest.

Everyone cannot be mentioned by name in a report such as this and Council wishes to conclude by offering their sincere thanks to all the senior and junior officials of the Society, to its own members, and to the Journal Editor and Distributor and all the Society's Branch Officials, and to all members who assist in any way with the organisation of the Society or the stewarding of its shows.

R. H. I. READ
(Honorary Secretary)

Treasurer's Report

STATEMENT OF RECEIPTS AND EXPENDITURE YEAR ENDED 31st DECEMBER, 1974

RECEIPTS

	£	£	£
Balance: brought forward from 1973:	(509.81)		386.16
Subscriptions:			
1974	(1168.87)	1,110.13	
1975	(14.55)	277.83	1,387.96
Raffle and Plant Sales	(47.10)		29.33
Donations	(1.50)		3.00
Other Postage Refunds	(9.42)		10.23
Sales of:			
Special Publications	(7.04)		3.82
Seeds Sold			105.60
Annual Dinner			216.00
Annual Dinner Raffle			7.70
Christmas Draw			181.65
Booklets			87.02
JNL—Advertising			121.74
Overseas and Home Journal Sales			95.49
General Sales			181.07
(Last year's figures in brackets)			
			£2,816.77

EXPENDITURE

Journal: Printing ..	(999.04)		1,028.91
Journal: Postage ..	(149.15)		169.52
R.H.S. Affiliation Fees	(5.00)		10.00
Booklets	(89.66)		.60
R.H.S. Hall Hires ..	(52.53)		60.70
Refund of Subscriptions	(3.38)		4.97
Seeds	(61.89)		33.92
Shows, Cup Engraving, etc. ..	(90.48)		50.51
General Postage ..	(119.61)		83.88
Annual Dinner:			
Mecca		224.43	
Less Refund.. ..		3.00	227.43
Christmas Raffle:			
Prizes		49.70	
Printing		38.50	88.20
Printing and stationery	(149.09)		126.87
Purchases:			
Ties			82.27
Binders			99.99
Sundry Expenses			94.33
			2,162.10
Balance carried forward to 1975	(386.16)		654.67
			£2,816.77

SIGNED:
R. D. BURTON *(Honorary Treasurer)*
V. ELLIS and
A. WILLIS *(Honorary Auditors)*

I DO NOT consider a detailed explanation of the accounts is necessary, since the Statement of Receipts and Expenditure is clearly defined and of similar construction to the previous one.

Starting with items under 'Receipts', it will be seen that subscriptions are just holding their level over previous years. The total income from subscriptions shows a substantial increase over the previous year due to a greater number of 1975 subs. being received in advance, and, of course, this does not indicate an increased membership. When we look at Raffle and Plant Sales they are slightly down over previous years, Seed Sales are showing a very nice increase. Booklets, Badges and Other Sales have all held over previous years, at this point I feel a big vote of thanks is due to the few people that are responsible for these sales. Once again the Annual Dinner showed only a slight loss so was no drain on society funds as this was more than covered by last year's profit.

I think at this point we should look at our venture into a Christmas Draw which took place this year. This showed a profit to not only this balance sheet but also to the branches that sold tickets. Since it also offended some people, to these I would say how sorry I am for this.

When examining expenditure it will be seen that we have now reached four figures on journal printing costs —a sign of the inflationary times we are now in. On the postage side this also took an upward surge. Advertising continues to supply a vital input and at £121.74 shows a slight decrease over last year. The hire of lecture halls shows an increase over last year of £8.17. I think we can look at all expenditure and know that it will show an increase month by month in future.

In the final assessment, what really counts is the balance we carry forward to 1975; when we takeoff subscriptions in advance for 1975 the figure left is slightly down on last year at £376.84. We are proceeding into 1975 with our subscription rate once again unchanged and I feel sure all members will appreciate this, but having said this I must say as outgoing Treasurer that I see no other way out this year but to raise our subscription level to keep the society financially workable.

I must conclude by asking you all to extend a warm welcome to my successor Dr. Rolfe of the Essex Branch, to whom I wish every success in his undertakings in pursuit of the society business. Many thanks for your support.

R. D. BURTON,
Honorary Treasurer.

Forum 1 The Genus Lobivia

Compiled by R. B. Pearce

1. Appeal of the Genus

Lobivia is a large and varied genus that has been little studied, and, botanically at any rate, is less well understood than many other cactus genera. Perhaps because of this, it is not a popular genus in cultivation. Though a few Lobivias are found in most collections, they rarely form a major part of any display. Possible reasons for their unpopularity, suggested by John Hopkins, are:

1. Few species have the appeal of, for example, the very popular white-spined Mammillarias, and, unless they are grown with care, Lobivias can easily become bloated and weakly spined (though, when well grown, some species, e.g. *L. varians, L. boliviensis, L. hastifera,* and *L. longispina* may have spines up to 10 cm. or more long. The interlacing pectinate spines of such species as *L. arachnacantha* are also most attractive).

2. The flowers, though among the most colourful and beautiful in the cactus family, are short lived. Most can be expected to open for two days in succession; though some of the Argentinian species (in particular) often have flowers lasting for only one day, depending, in part, on conditions in the greenhouse.

3. Collectors are, in general, quite particular regarding the accurate classification of their plants. Lobivias have a bad name in this respect; as well as the deliberately produced hybrids (often with *Echinopsis*), many of the plants available from nurserymen are either wrongly named or of hybrid origin. Terry Smale also makes this point, saying: "The most unreliable thing about Lobivias is the name on their labels." Many of the Lobivias described a long time ago are now difficult to identify with certainty. These plants, which include *L. backebergii, L. hertrichiana,* and *L. binghamiana,* cannot now be traced in the wild, and the status of plants labelled as such is open to question.

The best source of almost all cacti is imported seed from a reliable supplier, and this is especially true for such readily hybridising genera as *Lobivia.* The other trustworthy source is plants propagated vegetatively from collected material (much of which has, in recent years, become available from the collections of Lau and Rausch).

Having thus mentioned the disadvantages of this genus, John Hopkins goes on to discuss the advantages.

The plants, if grown well (in light and airy conditions, and not coddled) can be quite attractive. Many species readily form clumps, which will produce masses of flowers; a well flowering clump of *Lobivia* is one of the most impressive and beautiful sights one is likely to see in the greenhouse, furthermore many species are fairly small growing; quite a respectable clump can be comfortably housed in a 5-inch pan. One such clump, labelled '*L. segawae*' produced seven large and beautiful purple flowers in my greenhouse last summer.

The flowers, as have already been mentioned, are among the most colourful in the cactus family and are unusual in that blue occurs as an irridescence in some of the red flowered species (notably in the *L. cinnabarina* group). *L. segawae,* mentioned above, shows this well. A true blue flower colour does not occur in the *Cactaceae,* though it is approached in some of the mauve and purple flowered species.

2. Cultivation

In general, Lobivias are of easy cultivation. Terry Smale writes:

"Cultivation of *Lobivia* seems to present little difficulty. I grow most of mine in a John Innes type mix, although I grow some of the slow growing kinds in Arthur Bowers' compost, because I regard it as kinder to plants with a weak root system. The only plants which have caused some trouble have been those with thick tap roots. These roots have sometimes become diseased and the plant has taken some time to recover again. Most Lobivias are plants from high in the Andes, and I suspect that should we have a 'snowblitz' or prolonged power strike, they would be among the last cacti to disappear from our greenhouses."

Brian Davis tends to confirm this last point in his letter, in which he mentions that when moving home two years ago all his Lobivias (which include *L. hertrichiana, L. jajoiana, L. binghamiana, L. ferox, L. leucomala* and *L. caespitosa*), remained out of doors until late November, standing on benching and open to all the elements, during which period they survived wet, frost, and long periods of dull weather, with no apparent ill effects. The only trouble Brian Davis has encountered is with *L. jajoiana,* which suffered damage to the growng point last summer, due either to sun-scorch or effects of a systemic insecticide (or perhaps a combination of both?). He grows his plants in Arthur Bowers' compost or a Levington compost based mixture of his own.

There are probably as many techniques for the cultivation of Lobivias as there are growers, so any comments are bound to be fairly personal. I grow mine in my standard compost (a mix of John Innes compost, peat, and sand, with added bonemeal) and with about average watering. I keep my Lobivias in semi-shaded parts of the greenhouse, where they seem to do quite well. Doubtless they could take full sun, but there are other plants whose need is greater.

I have never had any particular problems with this genus, although they do seem to be more prone than many to the disfiguring surface damage that begins as a slightly raised area of cuticle, which looks thicker and rather waxy. The tissues below this turn to a paler green and finish as a brownish scar. This is especially noticeable on my plant of *L. binghamiana.* I have never succeeded in finding any pest associated with this, and often wonder if it might be due to a virus. I should be interested to hear from anyone who has encountered this problem—ideas could be incorporated into a future "Forum".

Propagation is quite straightforward. There are no special difficulties in raising from seed—a plant of quite respectable size should grow in 3-4 years. Seed collected in the greenhouse should be regarded with caution as Lobivias readily hybridise. Clumping species can easily be propagated by detaching offsets. These are often well rooted while still attached to the parent plant and establish quickly.

3. Classification

The genus *Lobivia* was named by Britton and Rose in "The Cactaceae". Plants of this genus are found in the highlands of Peru, Argentina, and Bolivia. (*Lobivia* is an anagram of Bolivia).

When originally described this genus comprised 20 species (previously referred to *Echinopsis* and *Echinocactus*), and included plants later to be transferred to *Weingartia* and *Soehrensia.* There were about 70 species known when Borg's "Cacti" was written; now there are about 200 described species and varieties.

If one considers the relationship of this to other genera or the relationships of plants within the genus, the current state of knowledge is confused.

On the relationships of the genus, Terry Smale writes: "There are no obvious cut-off points between *Lobivia* and *Echinopsis, Pseudolobivia, Acanthocalycium, Chamaecereus,* and *Trichocereus.* There is a movement towards submerging most of these plants into the genus *Echinopsis,* but the eminent German cactophile, Dr. Friedrich has suggested a division into *Lobivia* and *Echinopsis* (including *Trichocereus* and *Acanthocalycium*). However in doing this, several plants which are now known as *Lobivia,* e.g. *L. densispina* and *L. arachnacantha* would be moved into *Echinopsis.* The characters used in this separation include the rib formation; which in *Echinopsis* is straight, whereas in *Lobivia* the ribs tend to be offset above each areole, giving a spiralling, hatchet-shaped effect to the ribs. On the flowers of *Echinopsis* the hairs on the tube tend to be longest at the top, while in *Lobivia* the lower hairs are longer. The exact position of *Chamaecereus* is a little obscure. Dr. Friedrich places it close to *Rebutia* but David Hunt submerged it into *Lobivia* in his classification. If the production of hybrid plants is taken as a criterion of specific relationships then the *Chamaecereus* must be very close to *Lobivia* because it is known to form hybrids with many of them. My

Lobivia:
above, L. schreiteri, Lau 489
below, forms of Lobivia Lau 459
(L. dryveriana var.)
(photos: John Hopkins)

father has produced crosses with *L. densispina* and *L. peclardiana,* and the latter hybrids are certainly themselves fertile."

Intergeneric hybrids are also produced between *Lobivia* and *Echinopsis:* these include the commercially produced "Green Gold" and "Paramount" hybrids. Apart from epiphyte hybrids, these are the only group of horticultural hybrid cacti to have been widely produced and to have gained acceptance in our collections. These hybrids are often given the name *Echinobivia* or *Lobiviopsis.*

Of the other genera having affinities with *Lobivia,* mentioned above, *Acanthocalycium* has been the subject of study by John Donald, who has suggested that this genus has little to do with either *Lobivia* or *Echinopsis.*

Speculative phylogenetic trees are frequently produced for the cacti; these usually give *Lobivia* a *Trichocereus/Echinopsis* ancestry, and suggest that *Rebutia* and the *Gymnocalycium/Weingartia/Sulcorebutia/Neowerdermannia* group had a *Lobivia*-like ancestry.

On the evolution of the genus, Terry Smale writes: "The genus probably originated in Peru, and from there spread through Bolivia to northern Argentina. It is thought that the most primitive species are the Peruvian ones which carry areoles and spines on the flower tube. These include *L. westii* and the small group of plants that Backeberg separated off as *Acantholobivia.* As he defined the new genus, it contained *A. tegeleriana,* and *A. incuisensis,* but undoubtedly two recently discovered species; *L. oyonica,* and *L. churinensis* are of this kinship. Most Lobivias are self-sterile, but the *Acantholobivia* types are self-fertile and produce large (c. 20mm. diameter in *L. churinensis*) fleshy fruits which tend to be spiny. Their flowers are open at night."

John Hopkins has studied in detail the seed and flower morphologies in *Lobivia,* and he writes on this

topic: "To look at the range of flower shapes one would think that several genera were inextricably mixed up! The range varies from short to long tubular, small to moderately large bell-shaped, and small to quite large funnel-form. Examples are:—

Small tubular:	*L.*'s. *maximiliana, cariquinensis, pseudocariquinensis.*
Large tubular:	*L.*'s. *caespitosa, miniatiflora, hermanniana, sp.* KK813.
Small bell-shaped:	*L.*'s. *schreiteri, breviflora.*
Medium bell-shaped:	*L.*'s. *polaskiana, haageana, jajoiana.*
Large bell-shaped:	*L.*'s. *cinnabarina* (group).
Medium funnelform:	*L.*'s. *johnsoniana, leucorhodon, incacia* (complex)
Large funnelform:	*L.*'s. *winteriana, mistiensis, westii.*

"Despite the different flower forms, microscopic examination of the seeds reveals a probable common ancestry. For example, the tubular flowered plants are in the same seed group as the funnelform flowered species of the *pentlandii-boliviensis* complex. Indeed, species with flowers of intermediate form have been found, e.g. *L. charazanensis*. The same type of seed is to be found in many species of *Lobivia* over the whole habitat range, from Central Peru (Acantholobivias), through S. Peru and Bolivia (*pentlandii-boliviensis* complex and *maximiliana* forms in the north of this area), into N. Argentina (*L. hastifera*). In this latter region we find the *L. jajoiana* group (*L.*'s *vatteri, uitewaaleana, glauca,* etc.) which have a similar seed form in many respects, but the flower is bell rather than funnel shaped. However, the recently discovered plants, *L. sp.* Lau 919, and *L. salitrensis* from S. Bolivia again show flowers of intermediate form, but lack of seed precludes any further speculation at this stage.

"With about 200 described species and varieties, the whole situation regarding Lobivias is far from simple. There are some authorities who would have us believe that they should be wholly or partly merged into *Echinopsis*. That there is a link with the latter genus cannot be doubted, but the precise relationship is another matter. It could be that the link is from *Echinopsis* via *Lobivia* (or *Echinopsis* or *Pseudolobivia*!) *aurea* to the very variable *L. densispina* complex (which has nothing to do with *L. famatimensis*) or it could be via the very variable population of plants around *E. obrepanda* (*callichroma, calorubra, rojasii, raushii,* etc.) to the variety of *L. cinnabarina* recently described by Rausch as *grandiflora,* to the rest of the *cinnabarina* group, all having very similar seeds. Having proposed these two links, it is far from obvious how the *densispina* and *cinnabarina* groups join up with the remaining large number of species. However there seems to be no end to the discovery of new plants, and it could be that with further field work and systematic study a clearer overall picture will emerge."

The picture thus obtained of this genus—many related species, with a range of linking types—is, as with many of the genera in the *Cactaceae,* one of a genus currently undergoing rapid evolution. Once this rapid phase has ended there is a tendency for intermediate forms to disappear, species and groups becoming more clearly delimited.

4. Comments on some species

There is insufficient space in an article of this nature to cover a representative sample of species, so I will merely mention a few that have been commented on in letters.

L. famatimensis: The identity of this plant has caused some confusion. Those plants bearing this label in most collections are, in fact, forms of the very variable *L. densispina.* The true *L. famatimensis* is usually to be found under the name *'Reicheocactus pseudoreichianus'*. It was named thus by Backeberg, who believed it to be related to the *Neoporteria* complex. This plant is, on flower and seed structure, a *Lobivia,* although resembling in body form plants in *Chileorebutia,* a genus related to *Neoporteria.*

L. densispina: A very common *Lobivia,* often masquerading as *L. famatimensis* (see above). A variable species, the flower colour of which can vary from cream to deep red, and with varying spine formations. Perhaps as a result of *Lobivia* being a relatively unfashionable genus, this, and other species have not suffered at the hands of the 'splitters' as much as some from more popular genera.

L. zoyonica: My specimen of this was grown from the Society's seed, some four years ago. It is of rather columnar habit, and has a dense covering of white wool, quite unlike any other *Lobivia* I have seen. Superficially it resembles a seedling *Espostoa* (I have in fact often wondered whether the seed had been wrongly labelled!). I have not yet seen a description of this plant, and I wonder if other members' plants, either from this batch of seed, or from some other source, are similar. Any comments would be welcome.

Terry Smale writes on some species as follows:

L. oligotricha: "This is the only member of the complex of plants about *L. cinnabarina* that I have so far flowered. These Bolivian plants grow as a single head, and most of them are flattened in form. The ribs are broken up into hatchet-shaped tubercles and the spines tend to interlace around the plant. This complex is the link to the genera *Weingartia* and *Sulcorebutia.* These Lobivias resemble the other two genera in seed and flower morphology, the flower tubes are generally hairless. My *L. oligotricha* is now 75mm. in diameter and 60mm. high, with 21 ribs. There are about 12 radiating stiff reddish-brown spines, up to 15mm. long. The red flowers are small (ca. 30mm. dia.), but freely produced. Some members of the complex have quite large flowers, up to 80mm. dia."

L. peclardiana. "This is a gem of a plant, because of its free-flowering habit. The 45mm. diameter shining light-violet flowers are produced over a period of several months during the summer. The plant is small growing; mine has a flattened dark-green body, 60mm. diameter, and the ribs are completely divided up into plump 5-sided tubercles. There are about 15 thin radiating reddish-brown spines up to 15mm. long. Backeberg in his 'Lexicon' suggests that this plant is a hybrid between the Bolivian *L. tiegeliana* (which it strongly resembles) and a *Pseudolobivia.*"

L. argentea. "This is another plant with a useful characteristic for the working man; the flowers remain open in the evening. They are about 50mm. in diameter and a beautiful pale lilac in colour. This is set off by the stamens which form a white hymen in the centre. The plant bodies are not quite so distinguished: clustering, elongated, dark green, with 17 ribs and areoles in notches. There are about eight greyish radial spines and one central which sticks straight out and can be quite long. Habitat is given as Oruro in Bolivia."

L. westii. "This is a plant which is immediately identifiable from its flower which is orange-red in colour and is very long tubed. Thus the flower is about 70mm. long and only 40mm. diameter. I have never seen the flower fully open; the innter petals tend to stand near the style. The plant bodies are clustering and elongated, about 50mm. diameter, bright green. There are 13 spiralling ribs with the areoles in notches. The spines are thin, light brown, with about six radials of various lengths, and two upwards curved centrals, up to 40mm. long. My specimen is an offset from a Lau collection, but I do not know its number. Lau collected several different forms of this species in Peru."

5. Further information

There are many books and articles which mention Lobivias, but two sources that have been brought to my attention are the 'Chileans', 23-26, and the Hungarian journal, 'Kaktusz Vilag'. In this latter L. Nemes has extensively described the species in a multi-part article 'The Genus *Lobivia*'. This commenced in April 1973, and the latest part I have seen, part 9, was in the Autumn 1974 issue. My thanks go to Mrs. Whicher for bringing this to my attention; however, as for the information they contain—I don't know any Hungarian . . .

6. Conclusion

This has been in no way a comprehensive account of the genus, but merely a review of the information readers have brought to my attention since my first request for information on Lobivias. May I take this opportunity to thank all those who wrote in and contributed to this feature; without these letters, this 'Forum' could not have been written. If anybody has any further comments to make on this genus, please write in-if there is enough material a second part to this *Lobivia* 'Forum' will be written.

The next 'Forum' topic is the genus *Ariocarpus,* this is to be followed by *Frailea,* Your letters on any aspects of these genera are required if successful articles are to be written, so please send any information or observations to me at the Department of Botany & Microbiology, University College London, Gower Street, London, WC1E 6BT.

Book Review

CACTACEOUS PLANTS: Their History and Culture. By Lewis Castle. London 1884. Facsimile edition with portrait and foreword by Harry R. Skallerup. Runeskald Press, Annapolis, 1974. $6.00.

Although Bradley's book on succulent plants dates from the early 18th century, it is surprising that no single volume devoted exclusively to the cactus family in English came out until 1884. (I except a pamphlet by Tyas in 1843 since it was merely one chapter reprinted from a general work). The author of "Cactaceous Plants", R. Lewis Castle, was an accomplished horticultural journalist who also wrote a book on orchids, another on flower gardening and contributed to many horticultural periodicals. If he ever had a cactus collection of his own, nothing seems to be known about it, but his training included work on his father's nursery and three years at Kew. He died in Kingston in 1922.

His 93-page book on cacti is not merely a nostalgic collector's item. It is packed with information on the relatively few species then known and makes fascinating reading. The nomenclature is archaic, but it is not too difficult to recognise the modern equivalent of most names, and the cultural details are very full. It gives a thorough portrait of the state of knowledge at a time when cacti were only just emerging from a long period in eclipse, and undoubtedly contributed largely to this revival of interest. "Cactaceous Plants" has received less credit than is due to it, because a year later another author, William Watson, began a series of articles in "The Bazaar" which became the basis of his well-known "Cactus Culture for Amateurs" in 1889. Thanks partly to its very superior illustrations (90 engravings, mostly borrowed from America) this rapidly overshadowed Castle's work and ran into several editions, paperback versions appearing as late as the 1920's.

Now an enterprising American firm has made "Cactaceous Plants" available again in an excellent facsimilie edition $3\frac{1}{2}$ cm. taller and proportionately wider than the original, making it more attractive and easy to read than the tiny cramped type of 1884. True, the 15 line engravings have gained contrast and lost detail in the shadows, but this is the only drawback to an otherwise admirable venture. A portrait and two-page introduction by Harry R. Skallerup have been added. It may be had by sending cash to The Runeskald Press, P.O. Box 612, Annapolis, Maryland 21404, U.S.A.

G.D.R.

Huernia Guttata (Masson) R. Brown

by R. W. K. Holland

Huernia guttata (photo: R. W. K. Holland)

ALTHOUGH stapeliads are not very popular among succulent fanciers, it is surprising this very showy flower is not more commonly seen in collections.

Huernia guttata is a South African species with a fairly wide range of distribution. It has been reported from the extreme south of the Republic and in several of the western districts. It may even be present in South West Africa.

In their division of the genus White and Sloane put this species and its allies into a section they termed the Somalica-Guttata Group. The main distinguishing feature of the group is the presence on the flowers of a raised ring or annulus round the mouth of the corolla tube. It is a character which has earned them the name of the 'lifebuoy' Huernias and can be clearly seen on the photograph. In H. guttata the annulus is smooth and shining, though there are a few stiff hairs around the mouth of the tube. The purplish-red spots, which are present over the whole of the inner surface of the otherwise pale yellow corolla, coalesce on the annulus and further accentuate it. The flower is described as being $1\frac{1}{4}$ in. to $1\frac{1}{2}$ in. in diameter, though those on the plant in the photograph, which is of unknown origin, are nearer 2 in. across. Otherwise they tally very well with the description. The greyish green stems are rather short, for they should reach 2-3 in. However, cultural conditions can have very pronounced effects on stapeliad stems and they may be responsible for the reduced stature.

Huernia guttata is easy to grow in any well-drained compost and will withstand winter temperatures at least as low as 40 F. It will grow and flower in fairly heavy shade. The flowers are produced spasmodically in late summer and autumn.

FIVE YEAR INDEX—Volumes 26–30, 1964-1968 of this Journal.

An Index covering the above Volumes and years is now available and can be obtained either from the Hon. Secretary or Publicity Officer upon payment of 25p (Post free 33p Second class).

CORRESPONDENCE: Will Members and other readers of this Journal please note that it is essential when writing to any of the Officers of the society to enclose a stamped-addressed envelope if the correspondence in question requires a reply.

The Chemical Taxonomy of the Cactaceae

by Dr. Patrick Moyna

THE taxonomy of the Cactaceae is a baffling problem to collectors and scientists alike. It has been tackled in various ways, with widely differing outlooks and results. The plants present a limited range of morphological and anatomical characters, compared to those present in other botanical groups; they seem to be particularly sensitive to their habitat, as well as quite prone to hybridize; they are difficult to herborize correctly, and most samples available in herbariums have little in common with the actual plants. Adding to these problems there is the more human difficulty that most botanists working on them come from countries where cacti are not native—and so have to consider very expensive travelling and collecting, or rely on collectors and greenhouse specimens. Thus, there are a good number of reasons for the present situation, where their taxonomy is confusing and sometimes quite speculative, and the classification of a plant is quite difficult.

One of the new approaches to the general problem of botanical taxonomy is based on the study of the chemical composition of plants; what is called chemical taxonomy. This approach has been made possible due to the vast information amassed by chemists working on natural products all over the world. It has gathered momentum in the last decade or so thanks to the development of very powerful and specific analytical techniques (such as thin layer chromatography and gas-liquid chromatography) that make possible the isolation of compounds present only in minute amounts, and to the more advanced physico-chemical methods for structural elucidation for the compounds so isolated (infrared spectrophotometry and mass spectrometry, to name but two).

To be useful as chemotaxonomical "markers", chemical compounds have to present some characteristics. They have to be stable, for unstable compounds can suffer decompositions, and the artifacts so produced can give erroneous clues. They have to be present in amounts that make their isolation possible. This limit is always going down thanks to the better isolation techniques that are being devised. What is more important, the frequency with which a compound is present in a group of plants can limit its usefulness. For example, the presence or absence of chlorophyll is useless to classify higher plants (where it is always present), but is useful to classify algae (where it is sometimes absent). The presence of a compound in only one one species will only be useful to identify this species, but will seldom give us an idea as to its relationship with other plants. As a further problem, ,'chemical races" have been found to exist within apparently homogeneous species. This can reflect local conditions, or even incipient species-formation. Thus the selection of appropriate chemotaxonomical "markers" requires the previous elaboration of sound criteria for their relative usefulness.

Facultad de Quimica, General Flores 2121, Montevideo, Uruguay.

In the Cactaceae the first chemical studies were directed at the isolation of the very active alkaloids present in some species (*i.e.* mescaline in peyote). The first results were obtained by Heffter in the early 1900's, and their structures were studied by Späth in the '20's No taxonomical goals were then sought. During the '50's Prof. Carl Djerassi and his group carried out very interesting studies on cactus sterols and triterpenes. The work was discontinued when other plants showed more promising results. This was most unfortunate, for Prof. Djerassi elaborated on the relationship existing between his chemical results and the botanical taxonomy of the Cactaceae. The first real chemotaxonomical success came, when in the early '60's, their red and purple colouring matters were identified as betacyanines. These compounds, which contain nitrogen, are common to the Order Centrospermales (which also includes *Beta, Phytolacca, Chenopodiaceae,* etc.), and so settled the disputes as to their rough kinship. During the mid '60's the growing interest in hallucinogenic plants renewed the work on their alkaloids, and several research groups have enlarged our knowledge in this area (McLaughlin and Kapadia in the U.S.A., Agurell in Sweden.)

In our group at Montevideo we have tried to establish a more specifically chemotaxonomical approach. We have been fortunate in having associates with solid botanical training, and a very keen and serious collector (Mr. Miguel A. Muriel) helping us. Also important is the availability of native wild plants. Uruguay is rich in *Wigginsia, Notocactus, Frailea* and *Gymnocalycium. Opuntia* can be considered a pest, and *Cereus* species are quite common. One has to bear in mind that chemical methods usually imply the destruction of the plants, so they have to be cheap. When working on *Gymnocalycium netreleanum* alkaloids, we used over 20 pounds of plants (each weighing an average of 2 ounces). This probably sounds as pure sacrilege to a European collector, but was quite sensible when done in Uruguay.

Our results so far are not definitive, but some are quite encouraging. The presence of alkaloids seems to follow no clear pattern, exception being made for some atypical basic compounds detected only in *Notocactus,* which are not the more common phenyl-ethyl-amines

of other cacti. Colouring matters, usually some of the best "markers", have given discouraging results. Betacyanines are chemically unstable, and the colourations present in the Centrospermales have been found to arise from a very restricted number of compounds. Surprisingly polysaccharides (which form the inner mucilages of cacti) seem quite useful for associations at the generic level. Of the few plants analysed, *Notocactus* species have been found to be poor in gums, whereas the three *Opuntia* species tried were very rich. There were only minimal differences in the composition of their polysaccharides as well. The mucilages from *Wigginsia erinacea* was quite similar to that from *Cereus peruvianus*. but not quite so with those from the *Opuntia* species. We have also worked upon surface waxes, but here we are only in the very first stages. Even so, an interesting result has been the detection of n-octanol (or a similar alcohol) as part of the wax. Usually the alcohols present in plant waxes are two or three times the size of octanol.

As mentioned above, we are working in close association with the Botany group of the University, and Cactaceae histology is being studied by them. Several characteristics that seem to be specific of certain groups have been found, so there we will have another group of data to correlate. All the plants worked on have been classified against those present in the collection of Mr. Muriel, as a way of keeping a register of their origin and presently accepted genera and species.

As the reader will have noticed, there are few clear results as yet. But what we have tried to emphasize is that there are encouraging signs. For one thing, cacti fascinate scientists in much the same way they do collectors, so new enthusiasts for their study will always be found. For a scientist, a plant that has evolved into such peculiar shapes, and adapted to such a rigorous ecological niche, must have done so by one or more biological "tours de force" that must have necessarily resulted in interesting chemical compounds. Their adaptations will be of interest to more practical areas also, such as the study of water use by plants, or drought resistance, which are important. Our hope is that by slowly and patiently collecting chemical data, and then coupling this information with these obtained by the more classical botanical methods, a clearer picture will emerge for the benefit to all those interested in these most amazing and interesting plants.

Some Cacti and Succulents of New Mexico *(continued)*

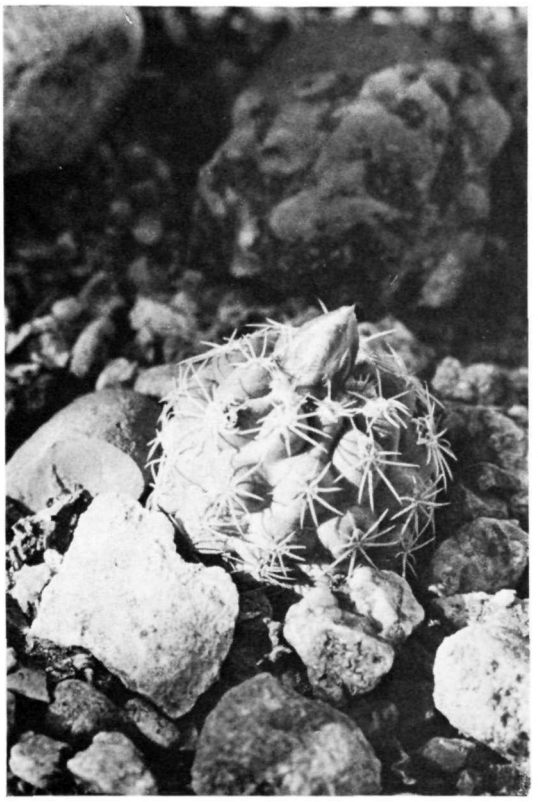
by Doug Rowland and James Daniel

9 **Coloradoa mesae-verde Boissevain 1940**
Subsequent to Boissevain's original description, this small cactus was described by Benson as *Echinocactus mesae-verde* and again as *Sclerocactus mesae-verde*. It is a plant of eroded, alkaline hills and will always be rare in our collections here because of its very special adaptation to a particular environment and apparent inability to contend with ordinary greenhouse conditions.

The plant bodies are usually solitary, globular between 2 and 4 in. tall and wide, with a slightly depressed top, and pastel grey green in colour. Normally they grow in the open with little or no other vegetation, blending subtly with the greys and greens of the soil. The distinct ribs are spiralled, the radial spines numbering 8 to 11 in most cases. Central spines are not often present but may occur singly in each aerole, up to $\frac{1}{2}$ in. long and grey with a dark tip.

Flowers vary between $\frac{3}{4}$ and $1\frac{1}{4}$ in. in diameter. They are whitish cream inside, brownish outside, fragrant and appear from the apex of the plant usually several together. Fruits are light green, drying to a brown skin and splitting in early July to shed large, shiny black seeds, $\frac{1}{8}$ in. long and bean-shaped. At a touch these seeds slide down the plant into the many surface cracks in the soil in this ultra dry and windswept area.

Adapted to such extreme dryness, this is one of the rarest cacti in the American Southwest, existing only in a strip some fifty miles long in the 'Four Corners' area. That is to say in south-west Colorado, north-west New Mexico, north-east Arizona and south-east Utah. It occurs only in very special locations, on low hills around the eroded columns that rise up from the desert at this point. The soil is extremely alkaline, much of the country is given to Indian Reservations and oil wells and access is strictly limited. One of these locations occurs near Jannington, New Mexico where we found this species growing in a kind of alkaline, dried sandstone mud, hardened by the sun. Some plants were almost buried by the continual erosion of the towering column of rock above. We found plants on these low hills beneath the eroding columns and nowhere else. Scarce neighbours were no more than a few plants of *Selenocactus whipplii* and a prostrate *Opuntia sp.* growing a little further out into the desert. Here and there an odd blade of grass struggles to survive, but in general vegetation is very sparse in this arid and desolate region. On the day of our visit, a rare overnight shower had penetrated only one inch, and below this the soil was bone dry. In 1971 we had counted about a hundred plants at this location; three years later the count was



Coloradoa mesae-verde in habitat (photo: D. Rowland)

about the same, so the species is surviving quite well in spite of borer grubs and galloping horses. One plant we found with seven heads, a happy sequel to galloping horses which had damaged the growing point but not ruined the plant entirely.

Cultivation of *C. meso-verde* in England on its own roots is difficult. Its roots are comparatively soft and fleshy so they injure easily and allow entrance to infections. Small collected plants are best grafted and as they offset freely, further propagation is simple. We think that seedlings should be grafted on to Pereskia, Pereskiopsis or Cereus stock soon after germination. Since 1971 we have propagated many new plants in this way.

10 Echinocereus viridiflorus Engelmann 1848

This little Echinocereus is affectionately known as the 'Varied Hedgehog' or the 'New Mexico Rainbow Cactus'. 'Viridiflorus' means literally green flower, which is not quite correct for this plant as the blooms can lighten to yellow or darken to brown hues. It is the most northerly of all Echinocereus, surviving on the cold, open prairies of eastern Wyoming and Colorado. It was originally described from a locality in north-east New Mexico. Further eastwards and to the south a somewhat larger but similar species, *E. chloranthus,* is found.

The plant bodies are small, spherical to slightly columnar, between one and six inches tall according to the form. They are usually to be found single, but may occur in clusters. The rib count is usually 13 to 15; the spines are very variable, white, dark brown, variegated, red, yellow or white, the colours often appearing in zones to give the appearance of being banded in different colours. Radials are adpressed, numbering from 12 to 20, radiating evenly around the areole. Central spines, when present, number one or two, porrect. Many plants lack these central spines. The bases of all spines are slightly bulbous.

Flowers are very small, only $\frac{3}{4}$ in. diameter and about one inch long, brownish, green or yellowish in colour, arranged in a circle around the sides of the plant far below the apex. These little plants are difficult enough to find in the grass as the inconspicuous flowers are little help in the springtime, and in winter they pull well into the ground.

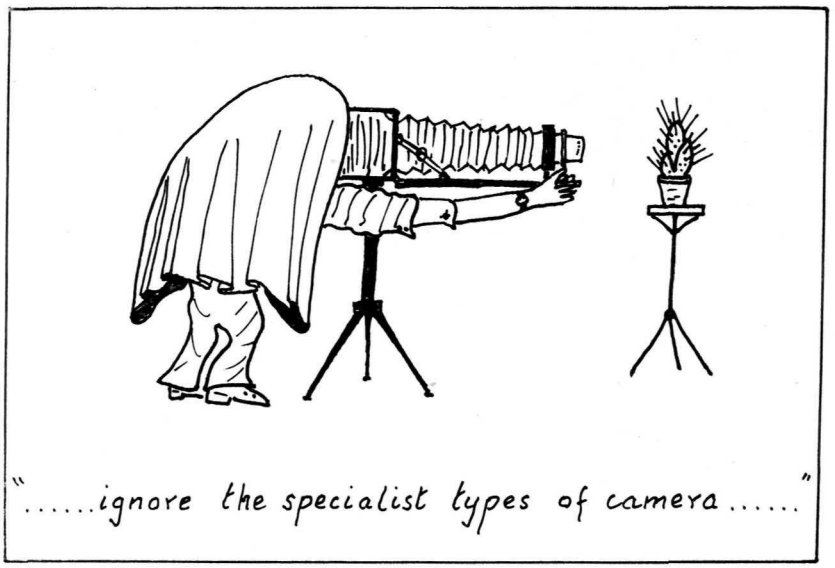
E. viridiflorus is common in the east and north of New Mexico State. In its more northerly habitat, north-east of Santa Fe, it is a small egg-shaped plant greatly shrunken in winter and surviving cold winters. A more southerly area lies from Roswell, NM, to the Gandolupe Mountains, around El Paso and then east and south into the Big Bend area of Texas, and here the plants are larger with cylindrical stems. These are more easily seen and collected by Texas plant dealers.

Cultivation in England is comparatively easy as plants root well and flower profusely. Propagation from seeds is also fairly easy. It is popular with collectors because of its small size, early maturity and ease of cultivation. The coloured zoned bands of spines make it a good looker all year long.

Echinocereus viridiflorus (photo: D. Rowland)

Do YOU Have Trouble with Your Close-up Photography?

by J. A. Burness



AMONG those who get satisfaction, or indeed frustration, from collecting succulents there are many who reach for a camera every now and then to put on record a particular plant or flower. It may be that a rare plant has been acquired or a recalcitrant one has flowered after years of waiting, or it may be that some of the collection of plants are routinely photographed as a record of progress. Whatever the reason, the photographer will wish to do justice to the subject and I take the liberty of outlining or underlining some of the problems to be overcome and in some cases suggesting a solution. If you habitually take first class photographs, or are perfectly satisfied with the results you get, however indifferent, then I suggest you skip the rest of this article and turn to another page.

The main emphasis of this article is on the problems involved in filling the frame with the subject to be photographed and ensuring that the desired degree of sharp focus is obtained. I use the words 'desired degree' since it is plain that the criterion for sharpness need be less exacting if the photographer is going to be satisfied with contact prints than if enlargements are required. The principles are the same whether the end product is to be a transparency for projection or a negative from which enlarged prints will be made. I know that some may argue that if prints are to be made it is possible to enlarge only a portion of the negative and that, in this case, the frame need not be filled with the subject. This argument only holds good under certain special circumstances and in general it is far more satisfactory to keep the degree of enlargement only as much as is necessary, even if only to reduce the problem of graininess. The time to ensure that your results will look 'pin sharp' is when taking the photograph. No amount of expensive optics is going to permit a fuzzy negative to produce a sharp enlargement. Some of us may have large plants but the majority will be photographing relatively small subjects and, in some cases, very small subjects such as individual flowers or spine clusters. These subjects come into the category of macro-photography (where the subject is reproduced on the film at or near life size). With most cameras there is no problem in obtaining sharp focus when photographing plants or groups of plants which fill the view-finder at a range of 3ft or more, although even then it is as well to bear in mind that the optimum point of focus is about 1/3 of the distance along the subject matter to be covered. Thus, if the subject extends from 6ft. to 15ft. from the lens of the camera, the whole subject will appear most sharp if the camera is focussed on 9ft. To explain this fully would take a lot of words, but it is a rule which holds good for all ranges although the actual sharpness is dependent on the correct choice of aperture setting, F– number or stop if this is adjustable. Filling the view-finder with the desired subject matter only becomes a problem when it becomes necessary to move the camera closer to the subject than the focussing scale permits or, in the case of a fixed-focus camera, closer

than the recommended minimum distance.

At this point it is necessary to digress to describe the capabilities of various groups of cameras in common use by amateurs. I intend to ignore the specialist types of camera normally only used by professionals and I propose to discuss the remainder under three general groups:

1. Reflex cameras.
2. Focusing cameras.
3. Fixed-focus cameras.

Reflex cameras are further divided into two main types viz. single lens and twin lens. They are similar in that the subject to be photographed is seen through either the same, or, in the case of the twin lens reflex, an identical, lens on a screen which represents the same format as the film frame.

Focussing cameras include a large group spread right across the price range. Some have coupled range-finders, in some cases interchangeable lenses can be used with the range-finder suitably compensated; in some cases the exposure settings are made automatically. They all have one feature in common—they have some means by which the point of best focus can be adjusted.

Fixed-focus cameras are to be found at the least expensive end of the price range. They used to be popular as 'box cameras', but the list now includes some equally popular models of the 'Instamatic' type which, although easy to operate, are quite sophisticated.

Returning to the reflex cameras, the chief merit is the facility of being able to compose the picture in the certain knowledge that what is seen in focus on the viewing screen will be in focus on the film. When certain cheaper twin-lens reflex cameras are used for close-up work it may be necessary to make an allowance for the fact that the viewing lens is placed above the taking lens. This 'parallax' adjustment is catered for in the majority of better models. The similarity between single- and twin-lens reflex cameras does not go beyond the facility mentioned earlier and, when one considers that, with the twin lens reflex, lenses and accessories have to be bought in duplicate (unless the tiresome business of swapping from viewing to taking lens is practised) it is evident why, other considerations aside, they are not as popular as the single-lens type.

Single Lens Reflex (S.L.R.) cameras have increased in popularity immensely over the past couple of decades. It used to be argued that they were too bulky, but present day models are much more streamlined and bear little physical resemblance to the Kine Exakta of a few decades ago which was my first introduction to the breed. There are few other types of camera for which such a bewildering range of telephoto lenses, tele-converters, mirror lenses, extension tubes, bellows extensions, wide angle lenses, zoom lenses, supplementary lenses, and special effect devices are available. With some quite moderately priced models Through The Lens (T.T.L.) metering is available and, for those who like it, this facility can be fed to an electronic shutter setting mechanism which makes the whole system automatic. T.T.L. metering has removed one of the bug-bears of using extension tubes, tele-converters or bellows to enable close-up photography with lenses normally focussing down to 3ft or so. To explain this it is necessary to refer briefly to the factors involved in controlling the exposure. An exposure meter is a device for measuring the amount of light which is reflected from the subject to the lens. By pre-setting the film sensitivity or 'speed' on the meter the factors affecting exposure which are variable between the lens and the film can be read off. These are the Iris diaphragm or stop and the shutter speed. Under normal conditions of lens positioning this would result in the correct exposure of the film. But, if the lens is displaced by the addition of extension, this is not so and I must digress into a dissertation on the stop numbering system in order to explain why. In order that the meter readings can be transferred to a lens of *any* focal length and give the correct exposure the F-number system of marking lenses was evolved. The cone of light reaching a film through a lens of 1 in. diameter at 3 in. from the film is the same as that reaching the film through a 2 in. diameter lens at 6 in. from the film. Exposure is thus determined by the ratio of the diameter of the aperture, or stop, to the focal length of the lens. Expressed in the F-number system this means that a lens of f/4, commonly written as f4, would have a diameter of 1 in. if the focal length was 4 in. or $\frac{1}{2}$ in. if the focal length was 2 in. It would pass the SAME AMOUNT of light in either case. The F-number relates to the diameter of the aperture but the amount of light reaching the film is directly dependent on the area of the aperture. Thus the exposure required at different stops will be proportional to the square of the F-number. So to find the stop requiring twice the exposure of f4 we have to multiply 4 by the square root of 2, i.e. 1.414. This gives the figure of f5.6 and explains why the F-numbers appear to follow an odd sequence.

To return to the exposure setting problem which arises when extra extension is added between lens and camera. The cone of light passing through the lens to the film will now have a narrower angle and it is necessary to calculate the 'effective F-number' which would have produced this angle of cone under normal use. If the F-number is increased by the ratio of the extra extension to the focal length of the lens and this new figure is the one used when calculating the shutter speed the correct exposure will result. This 'effective F-number' is NOT used on the lens, it is only used in the calculation of shutter speed. The easiest way is to adjust the pre-set film speed on the meter by the appropriate ratio and use the meter normally, but remember to set the correct film speed when you remove the extension. From the foregoing you will understand why I, for one, welcomed the provision of T.T.L. metering By

metering the light value after it has passed through the whole lens system no allowances need be made.

While it is possible to use extension tubes with some non-S.L.R. cameras which have interchangeable lenses it is more usual to use supplementary lenses for close-up photography. These are fitted to the front of the camera lens and, because they do not involve a change in the lens to camera distance, no 'effective F-number' has to be calculated. If a positive (convex) lens is fitted the combination will be of a shorter focal length than the camera lens on its own. This will enable the camera to be moved nearer to the subject and the latter will thus appear larger on the film. Supplementary lenses can be bought in specific focal lengths, say 18 in. If the camera lens is set to 'infinity' and the subject is placed at 18 in. from the front of the lens it will be in focus. Sometimes supplementary lenses are sold in Dioptre values. To find the focal length the dipotre number is divided into one metre. Thus a 2 dioptre lens has a focal length of $\frac{1}{2}$ metre or approx. 20 in. By making use of the range of variable focus provided on the camera lens it is possible to obtain a series of supplementary lenses which will allow focusing over a continuous range. Thus, for a camera which will focus from infinity down to 3 ft. such a series could have focal lengths of 36 in., 18 in. and 12 in. and the following additional ranges would be available:

Full length of supplementary lens	*Range of focus*
36 in	36in–18 in
18 in	18 in–12 in
12 in	12 in–9 in

Plainly it will be necessary to devise some method of allowing for the considerable parallax error when using the camera view-finder during close-up shots.

The use of supplementary lenses is also the only practical way of using fixed focus cameras for close-up work. Since the lenses will be used at specific distances from the subject, i.e. the focal length of the supplementary, it is possible to make up a wire frame to attach to the front of the camera which indicates the area covered by the lens at the position of sharp focus. In fact some of the camera kits include just such a device, either in the purchase price or as an optional extra.

Having explained how to get in focus close-up shots of your subject I must now caution you about overdoing it. By using extension bellows and a 2 in. lens it is possible to get a sharp picture when the subject is almost in contact with the front cell of the lens. The distortion of the image would be considerable and it would be better to seek a solution which used a longer focal length lens to overcome this.

Having taken great care to set up your camera in accordance with the foregoing suggestions all the value of pin-sharp focus will be lost if camera shake is introduced at the moment of taking the shot. I am not going to be pedantic about the slowest shutter speed feasible for hand-held photography but I would advise the use of the fastest practicable speed and would be very wary of anything below $\frac{1}{50}$th sec. At slow speeds it is safer to use a camera support or a tripod together with a delayed action or a cable release. The delayed action release is also useful for hand held shots since it enables the photographer to concentrate on holding the camera steady until the shutter has been fired.

Finally a word or two on background and lighting. If it is possible to arrange for a background which will give a tonal or a colour contrast to enhance such features as spines or flowers the end result will be that much more pleasing. Similarly an element of side lighting will add modelling and texturing to most subjects.

SOME DOs and DON'Ts

1. The zone of sharpest focus lies 1/3 closer to and 2/3 beyond the actual plane of focus. So choose your focus setting with this in mind.
2. The zone of sharpest focus is extended by stopping down, i.e. increasing the F-number. Use this to advantage.
3. The closer the subject is to the camera, the smaller is the zone of sharpest focus for any given F-number. Give this matter extra care when taking close-up shots.
4. The zone of sharpest focus can be varied as outlined in 2 above, but it is also dependent on the focal length of the lens. The shorter the focal length, the greater the zone. This is why some small-format cameras, having a short focal length lens, require no focus adjustment for shots taken from 'infinity' down to as close as 3 ft.
5. When considering stopping down for the reason suggested in 2 above, bear in mind that, for a given light level, the shutter speed will need to be reduced Camera shake at slow shutter speeds can undo all the benefit gained by stopping down. Take steps to avoid it.

Peromyscus eremicus

by R. J. Harrow

Peromyscus eremicus, a South African caudiform?
No.
Not another name change?
No.
American?
Yes, but not a succulent.
Well, just what is it.
It's a mouse.
A mouse!!

Yes, you see I thought that readers of the journal should be reminded that our plants do not grow in solitary splendour but, form part of an ecological community. This community consists of the whole range of plants and animals. Starting with the soil bacteria and fungi up through the flowering plants to mammals and birds. Whilst occasional references are made to other plants, it is rare to find references to the other creatures that live in the same habitats as our plants.

An account of *Peromyscus eremicus,* popularly known as the cactus mouse, will perhaps illustrate how animals have adapted to survive in the same conditions in which our plants grow.

This diminutive member of the rodent family, weighing no more than 25 grammes, is widespread through the southwestern states of America and northern Mexico. The cactus mouse is found up to elevations of approx. 3,750 ft. living in plant associations of mesquite, cactus, ocotillo, yucca. Other members of the animal community include the rock mouse and the canyon bat. The cactus mouse, being especially tolerant of water shortage, is restricted to arid regions.

Animals that live in desert or semi desert habitats have to overcome the problem of little or no water at least during some months of the year. The plants which we grow have solved this problem in many ways; similarly animals living in xeric habitats have evolved numerous methods of conserving water. It is perhaps not surprising that parallel methods of water conservation have been evolved by both plants and animals. Cacti have reduced the number of stomata and thickened their epedermal walls so that water evaporation is lessened, hence conserving their internal water reservoir. Some desert animals such as the gerbil reduce the water content of their urine so much so that a virtual solid is passed, hence conserving their internal water reservoir.

Growth of many succulents ceases during the dry season, similarly some desert animals aestivate during the dry season. Aestivation is the opposite of hibernation; i.e. assuming a state of topor during the summer. It is one of the methods that the cactus mouse uses to survive the dry season. MacMillen writing in 1965 concluded that the mice aestivate in their burrows in response to lack of water, but Lewis in 1972 states that a combination of lack of water and high environmental temperatures may be needed to trigger aestivation, at least in central Arizona. Dense spination and the habit of growing in the shade of other plants and rocks helps protect plants from the direct heat of the sun. The cactus mouse achieves this protection by being mainly nocturnal staying in its burrow during the heat of the day.

Like most mice the diet of the cactus mouse is omnivorous in nature, some water is possibly obtained direct from plant tissue, probably with more success than the tales desert travellers tell of beheading a Ferocactus and drinking the strained juice from the mashed insides.

The main breeding season of the cactus mouse occurs during favourable spring rains (April and May), though some breeding occurs during most of the year. Unlike mice in Great Britain the litter size is fairly small; only one, two or three young are born at a time, averaging 2.3. Although the gestation period of the mouse under laboratory conditions is 28 to 30 days, individual females seem to have two or three litters in succession, then a rest of two or three months. The young stay close to their mother until they are weaned, the weaning process is a gradual process starting on the 20th to 22nd day after birth and by the 30th day after birth the mice are fully weaned. Juvenile mice are mature by the 40th day, but they do not usually start to breed until two or three months old. This low controlled birth rate avoids the overcrowded condition that triggers off lemming migrations, and uses the resources of the environment when they are most abundant.

Obituary

Denis Cowper

IN recording the passing of Denis Cowper, probably on 29th November 1974, I do so with a great sense of personal regret. I had first corresponded with him, then met him during his visit to England in 1966 and, finally, my wife and I came to know him very well when we stayed with him at the outset of our American trip in May 1969 and travelled with him from his home in Belen to the American Cactus Convention in Los Angeles. That he went out of his way to make us welcome and to help us may in part result from the fact that he was born in England and educated at Westminster School; however, he was fundamentally a friendly character and anyone who was prepared to talk about cacti was assured of his attention.

Nevertheless, he possessed individuality and enterprise and his professional career, as a lawyer, which is too involved to relate in this tribute, reflected his independence and determination. This was also evident in his cactus collecting and study activities, where he blazed a lone trail and, unfortunately committed very little of his considerable store of knowledge, particularly of *Mammillaria* species, to paper. The manner of his passing is, perhaps, typical of him. He left home, alone, on 22nd November, for a two week holiday in Mexico, to study cacti and butterflies and reached Puerto Vallarta, on the west coast. He left his hotel and did not return; several days later, after extensive searches, his body was found in the nearby jungle. He had, apparently, succumbed to a heart attack. His passing, at the relatively early age of 52, is a great loss as he was still full of enthusiasm and had much to give.

W.F.M.

Correspondents

Plant Hunting in Peru

In June of this year, I hope to travel to Peru in order to collect seed, living material and herbarium specimens of cacti, bromeliads, alpines, bulbs and shrubs.

The first six weeks of my visit will be spent in the Callejon de Huayles, in the department of Ancas. This valley starts at approximately 3,000 metres above sea level at the southern end, and the surounding peaks tower to heights of up to 7,000 metres. Numerous species of interesting cacti are found on the slopes of the two cordilleras forming the Callejon. *Opuntia floccosa* and *O. lagopus* are just two of the plants, forming cushions in the alpine zones resembling mounds of snow.

From this area I shall be travelling by road via Cetto de Pesco and Lake Junin to spend a week collecting bromeliads for a botanist at Kew. Then I shall fly back to Luna to meet my associate, Miss Pamela Hunt, whence we shall spend a month travelling along the coast collecting xerophytes, bulbs and ephemerals which appear during the season of heavy mists until we reach Mollendo. Up from here the expedition will climb through the various vegetation zones to Arequipa, Lake Titicaca, Puno and Cuzco, where the remainder of our time and funds will be spent in collecting on the dry *punas* (grasslands) and sierras of this region.

At the moment I am having difficulty in obtaining sufficient funds to make the venture possible and thus I offer shares at a minimum of £25 in return for habitat collected material. Should, for any reason, I am unable to make the trip, all donations will be returned in full, less any expenses that might be incurred. I should be grateful if anyone interested would contact me as soon as possible.

Colin N. Munn,
104 Mortlake Road,
Kew, Richmond,
Surrey, TW9 4AS.

Notes and News

Attention Wiltshire Members

The Malmesbury Garden Club is staging their 'Annual Rose, Sweet Pea and Cactus Show' at the Civic Centre, Malmesbury, Wilts. on July 12th. Exhibits may be staged from 7 to 9 p.m. on Friday evening or between 7 and 10 a.m. on Saturday. The six classes for Cacti and other Succulents are open to all, and the total prize money is £5, plus assorted medals and certificates. Full details are available from Brian C. Davis, 12 the Caravan Park, Burton Hill, Malmesbury. These classes are staged for the benefit of succulent growers and to interest members of the general public in our hobby. Anyone living within easy reach of the M4 is within easy reach of Malmesbury, a most picturesque and ancient market town, well worth a visit.

Steirische Kakteenfreunde

The Steirische Kakteenfreunde, a cactus society based on the beautiful Styrian town of Knittelfeld, celebrated its 10th anniversary in March. When it began in 1965 the society had a membership of 56 and its survival was by no means certain. However, today it has reached a nice three-figure number and from a local circle of cactus fanciers has become an international association with members in the German Federal Republic, Eastern Germany, Switzerland, Denmark, Norway, Sweden, Finland, Belgium, Netherlands, Czechoslovakia, Hungary, Poland, Italy, Malta, Israel, Mexico, New Zealand U.S.A. and Ghana.

This rapid development within a few years is largely due to the untiring efforts of the chairman Mr. Josef Vostry and his close friends. Mr. Vostry is editor, and publisher, of the society's mimeographed monthly publication "Nachrichten der steirischen Kakteenfreunde". In twelve pages this carried interesting articles, news of the association, and important information from all over the world wherever cactus fanciers may be found. It is of handy size and has a strong cover.

Membership of the society, which includes the journal, is OS 58 per annum, with an entrance fee of OS 5. Applications and payments (by International Money Order) should be sent to Mr. Josef Vostry, Josef-Kohl-Gasse, 3, A-8720 Knittelfeld, Austria.
(Herr Karl Zöpf, Tuttlingen, W. Germany)

The First London One-Day Show

If you are exhibiting on June 14th be sure to obtain your schedule and entry forms from your Branch Secretary or the Show Secretary, Mrs. Hodgson, as soon as possible. Those entering five or more classes will be given a free entry ticket for the Show; admission for others is 10p (5p children and junior members). If you are coming in a Branch party please let the Publicity Officer know and she will arrange for tickets to be supplied beforehand (special rate for more than 12 Branch members).

The venue is St. Saviours Church Hall, St. Georges Square, Pimlico—a few minutes walk from Pimlico (Victoria Line) Station—the church is along the left fork from the station and the Hall is behind it.

There will be plants for sale, a Grand Draw and refreshments available while the Show is open (2 p.m.–5.30 p.m.—presentation of awards). Adequate parking is available including a multi-storey car park within five minutes walk.

Be sure YOU help make this a memorable event.

Assistance will be needed with stewarding and providing and serving refreshments. Please let your Branch Secretary know if you can help or contact the Publicity Officer direct.

SOCIETY SALES

Binding Cases—green cloth binding cases with gilt lettering on the spine, taking 12 issues (3 volumes) of the Journal ... ... £1 post free

Labels—triangular white ivorine plant labels in packets of 100 ... 30p post free

Badges—identify yourself with the Society's attractive lapel badge ... 30p post free

Booklet for Beginners—'How to grow Cacti and Succulents' by E. Shurly with an appendix on 'Seed raising and Window Culture' by A. Boarder; eleventh edition ... ... 19p post free

The above are available to members from Mr. D. T. Best, 16 Ashleigh Gardens, Sutton, Surrey. Postal orders and cheques should be made payable to the Cactus and Succulent Society of Great Britain.

Pens—ball-point pens in yellow and blue with the Society name in bundles of 25 ... ... £1.20 post free

Car Stickers—useful publicity for the Society, per packet of 10 ... £1.60 post free

Ties—in navy, maroon or green ... ... £1.05 post free

The above are obtainable from the Publicity Officer, Mrs. B. Maddams, 26 Glenfield Road, Banstead, Surrey. Branch Secretaries are invited to obtain these in bulk for resale at Branch meetings.

The Cactus and Succulent Journal of Great Britain

An Index of Plant Names
1964 to 1968

Compiled by G. G. Leighton Boyce, this index gives references to plants named and illustrated in five volumes, 26 to 30, since an annual index was discontinued. (25pp., 250 x 180mm.)

Price 25p. (by post 33p.)

from the Hon. Secretary,
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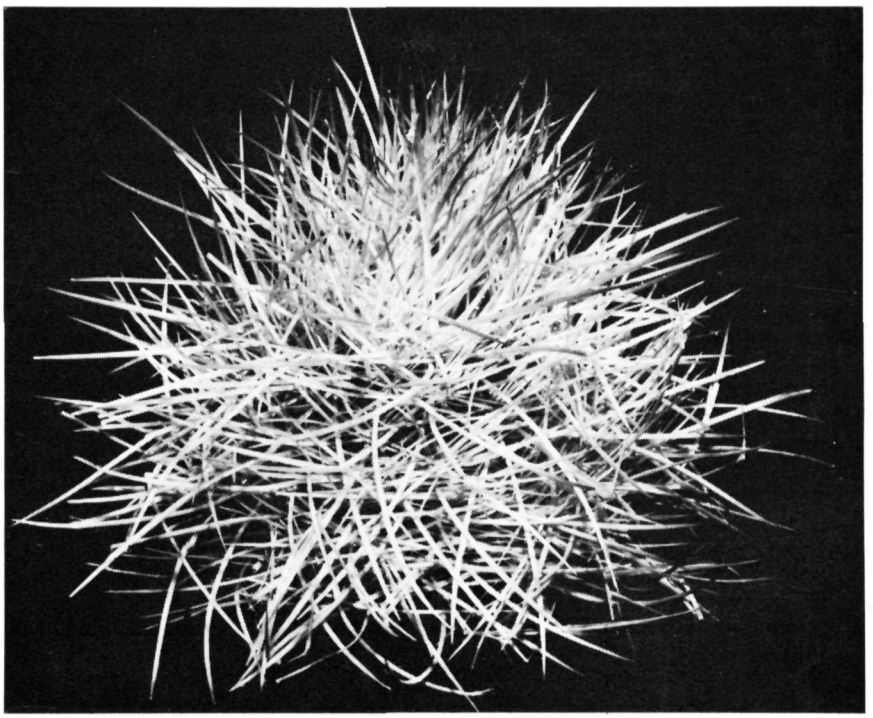

Parodia roseoalba Ritt. (photo: Helmut Broogh)

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Editorial

IN HIS REPORT to the Annual General Meeting of the Society for 1950, the Hon. Editor said that his work would be easier if more members contributed articles to the Journal. It is in no spirit of nostalgia that we refer to this. One thing which has avoided the current spiral of inflation is the number of manuscripts reaching the editorial desk.

A victim of the much publicised advance of modern technology has been our postal services, particularly mail travelling by sea. Airmail charges are prohibitive for normal interchange of journals, and, no doubt, numbers of our overseas readers have wondered from time to time if we have forgotten them, or even ceased publication. We, certainly, have wondered. For example the Cactus and Succulent Journal of New South Wales for September, 1974 reached us just one week after the March, 1975 issue. The New Zealand Journal has been taking three to four months until the April, 1975 number came in six weeks. As for Mexico, we are inclined to think the Spaniards got their treasure ships across the Atlantic in shorter time—though we hasten to add that Cactaceas y Suculentas Mexicanas is well worth waiting for.

It is frequently suggested that Society members who are not within reach of a branch meeting or Westminster are at a serious disadvantage. By coincidence this question is ventilated in two of our contemporaries in their January numbers. The New Zealand Society reprints the editorial of September, 1950 which includes the following remarks bearing on this point: "Members who are unable to attend branch meetings certainly get something extra—but remember it costs them more. No part of the annual subscription goes towards running these branches. They are financed by means of 'bring and buys', competitions and other schemes to bring in the odd sixpence. Active membership quite often means a lot of hard work for those willing and able to become a cog in the society's organization. But 'away' members can help also. It is only by their criticism and suggestions that we are able to judge the success of their efforts".

Turning now to the other side of the world, we read in Cactus and Succulent Information Exchange from Canada in the editorial for January: "It is not uncommon for members in isolated locations, small towns or rural communities, to envy those who have other collectors within visiting distance, and they particularly yearn to attend 'cactus meetings'. However, after the initial advantage of attending meetings wear off, having to go to the specified place at a set time, on a certain day which comes only once a month—regardless of weather, health, inclination and other commitments, loses some of its appeal. In fact one begins to wonder if people look for reasons to *not* come to meetings, unless the topic is of particular interest to them! Be that as it may, isolated members have their bulletin each month, and perhaps this way has more advantages than you think! You read them at your own convenience, studying articles all you wish (rather than listening to a talk and hoping you remember the pertinent information). There are several articles on assorted topics, rather than the one chief program topic usual at a two-hour meeting. You talk to other members by reading their letters, and sometimes writing one yourself. (You don't have to put up with a business meeting either!). And you *don't* have to go out into the weather, or worry about getting or offering rides, or toting flats of plants and other paraphernalia. Company can't drop in and spoil that once-a-month meeting for you—you just read the bulletin another day."

What's in a name?

(Mr. E. Shurly's Editorial in the July, 1950 number)

I HAVE HAD a difference of opinion with a very prominent member, and a very well informed person, too; not a serious difference, of course, but I am going to hang on this difference the opportunity of a little homily that I hope will clear the air in a far wider sense than the difference in question.

I had the temerity of correcting this friend of us all when he mentioned *Mammillaria pusilla*. I pointed out that the plant was *Mammillaria prolifera* and that *M. pusilla* was simply a synonym. He replied he got the plant as *M. pusilla* and under that name it would remain; what was in a name, so long as we grew fine plants names did not matter. I rejoined that he was an "apostle of chaos!"

He is the leader of what I call the "horticultural" section of our community, and considers a fine plant is the only desiderata, but, unfortunately, names are necessary. Just imagine thousands of people born in a town, none of them having names, but subject to physical culture to make them the master race! We would have to go into long descriptions when the police "wanted" them, or the authorities wanted to collect rates and taxes, but, possibly, in such an ideal (?) state there would be none!

The comparison between humans and our plants' naming is not absurd. Take John Smith. The genus is Smith and the species is John, and probably, a plant name would be *Smithsia Johniana*. Have we to go into a long description of the person or plant, taking, say, something like half-an-hour when *Smithsia Johniana* or *Mammillaria prolifera* is all that is needed? John Smith might have a common or garden name, or a synonym, we call them nicknames, such as Smiler, but he would still remain John Smith. If we are going to have endless names for the same plant there can only be chaos and there is enough without perpetuating the old. Our job is to clear the air, not vitiate it.

Mammillaria prolifera was first named by Miller in his "The Gardener's Dictionary" in 1768, *Mammillaria pusilla* by De Candolle in his "Catalogue Plantarum Horti Botanici Monspelienus" of 1813. Britton and Rose and other competent botanists recognise them as the same plant. *M. prolifera* has priority and *M. pusilla* is a synonym. Unfortunately, the issue is further confused because M. pusilla has been confused with *M. multiceps,* particularly in the variety *mexicana,* but *M. pusilla* has nothing to do with *M. multiceps* and the variety should be *M. multiceps mexicana.* The confusion between M. prolifera and M. multiceps is due to the parallel description, but the two plants are distinct.

Gasterias

by Robert D. Swan

Gasteria maculata
(photo: M. J. Martin)

GASTERIAS are worth growing whether you grow your plants on a window sill, under artificial light or in a greenhouse. The reason for this is that they tolerate a wide range of conditions. Most important, they do not require a lot of light and will grow satisfactorily in the low light level of a northern window or artificial light. In their south and southwest Africa habitat they exist in the shade of rocks or bushes and thus are protected from full sun, which they cannot stand.

Gasterias also tolerate a lack of water and most other forms of neglect present in modern homes, such as hot and dry air in the winter time. Their extensive root systems survive even if cramped in a small pot. Keeping them evenly moist should help prevent root loss, but these plants will survive if given only a little water. If growing conditions are cool during the winter less water is required. Temperatures down to near freezing do not usually harm these plants. While they tolerate much abuse, like other plants they respond well to better treatment.

The growth form of Gasterias may differ over time. While they are seedlings they look much alike, but as they mature their differences become more apparent and identification becomes easier. Leaf markings may change as may leaf position. Leaves on young plants and on some mature species grow opposite each other in pairs. Leaves of other species fan out in a rosette form when mature. The number of leaves on a mature plant may vary from four to five to 30 or more. The growth rate of Gasterias in general is such that they reach maturity in a few years, but one or two species such as *Gasteria armstrongii* are very slow growing.

They may be propagated by several methods. Raising them from seed is easy and the seed germinates within about two weeks. Because young plants look so similar it may be two or more years before the plants show their differences plainly. A problem with seed raising is that Gasterias hybridize freely with each other. They will also hybridize with other succulent members of the Liliaceae family to which they belong, such as Aloes and Hawor-

thias. The resultant intergeneric hybrids are called Gastroleas and Gasterhaworthias respectively. Many Gasterias produce offsets freely which may be removed and grown on. G. *armstrongii* rarely offsets. In addition individual leaves may be removed and rooted with the result that new plants will be produced. A fascinating feature of this genus is that even a small piece of leaf will, with care, root and produce new plants. Leaves and pieces of leaves are slower in producing mature plants than offsets. Still another possibility for producing new plants is the flower stalk. It may be removed and rooted or sometimes it generates a new plant while still attached to its plant. Either way, removing the flowers may encourage offsets to form. The flowers give the genus its name; the word *Gasteria* refers to the stomach-like shape of the flowers. The flowers vary between pink and red in colour, with green tips. This colouring adds to the attractiveness of the numerous small flowers which appear on a single, tall flower stalk.

Gasteria leaves come in a variety of sizes, shapes and markings. Plants of large species such as G. *verrucosa* may grow to a foot in diameter; there are others even larger. If a plant grows too large for its allotted space, simply replace it with one of its smaller offsets. For a long time the smallest species was thought to be *Gasteria liliputana* which is about three inches in diameter. In addition to its diminutive size, it has an attractive appearance and clumps readily. Currently, however, G. *minima* takes first place as the smallest, being little more than one inch in diameter; it also clumps easily. There are several score of species between these extremes, many of which are worth collecting for their differences in size, leaf shape and leaf markings.

Two unique and desirable species are G. *batesiana* with its rough, sugar-like coating of both green and white tubercles and G. *armstrongii*. The latter is a very slow growing and seldom offsetting plant which is somewhat rare for these very reasons. Its half dozen or so thick leaves are two or three inches long each and paired opposite each other. The plump leaves give it an unusual appearance. Supposedly there are several forms of G. *armstrongii,* but these may well be hybrids. If a hybrid or unusual form is attractive and appeals to you, grow it. A specific name is not necessary for the enjoyment of the plant. Not only are they easy to cultivate but they also offer a variety of interesting designs and markings.

Seasonal Cactus Care

by W. F. & B. Maddams

THESE notes are being written in mid-June following a spell of hot, sunny weather which, coming immediately after rather extended cold, dull conditions may prove to be a mixed blessing. Certainly, we have all been waiting for the seasonal conditions which should encourage our plants to flower to best advantage but, on the other hand, the growth earlier in the season has undoubtedly been somewhat soft and this is condusive to scorching when there are long periods of sunshine and high temperatures. The unfavourable conditions in May will undoubtedly have retarded or even prevented the flowering of some species. Among our own plants, *Mammillaria guelzowiana* is only now beginning to show buds and is something like three weeks behind its usual schedule. As yet there is no sign of flowers on *Leuchtenbergia principis,* a plant which we find must have good light and high temperatures to come into bloom. But, given the right conditions, there is ample time for it to redeem itself as we have had flowers on it as late as September. On the other hand, the absence of buds on our *Ferocactus acanthodes* almost certainly means that we shall not be getting blooms this year. This species, which is capable of flowering when it reaches about eight inches in diameter, only seems to do so if it receives very good light in April and May. We have also suffered a little from scorching and, surprisingly enough, the plants affected are not all those which one might have supposed would suffer. In particular, two specimens of *Ferocactus gatesii* in four inch pots have been affected, one rather badly. We have also heard of a large specimen of *Ferocactus wislezenii* that has been marked, and this is very surprising.

There is always difficulty in understanding fully why particular plants scorch. There are a number of factors which predispose towards it but this does not seem to be the complete answer. Inadequate ventilation will certainly greatly increase the chances of trouble and if the plant is very close to the glass the same is true. Nevertheless, there does not seem to be any real evidence to support the burning glass effect due to imperfections of the glass; if this were true localised burning would occur whereas it is usually found over a considerable area of the plant body. Some genera and species are more prone to scorch than others; in the genus *Mammillaria, M. rhodantha* and allied species seem to be particularly tender. Finally, and this is particularly so in the case of smaller plants, if they are allowed to dry out unduly as a result of insufficient watering the general dehydration

of the plant tissues could well lead to scorching in adverse conditions.

Prevention is obviously better than cure but unless the affected plant is badly disfigured and is near maturity it should not be regarded as beyond redemption. Given that it is capable of the usual growth rate the marked areas will usually work towards the base of the plant in globular species and will not be greatly in evidence after two or three years. If the plant is then dropped half an inch or so when repotted it becomes very presentable. If the growing point is damaged the result will be more permanent and the subsequent growth will probably be atypical. For example, offsets will appear on normally solitary species and the plant will be at a disadvantage for show purposes. Nevertheless, it should still be possible to obtain a flowering specimen in due course and this, rather than a show plant, is the primary aim of the majority of cactophiles. Seedlings which have been subjected to excessive light will turn red and stop growing and it is certainly not easy to get them on the move again. Nevertheless, they should certainly not be disregarded. Given that mishaps of this kind have been avoided many of the seedlings from seed sown in February or March will be ready for pricking out by the time that these notes are read. Most species of Mammillaria, Rebutia, Lobivia, Echinopsis, Notocactus, Gymnocalycium and a number of other genera will have attained a diameter of one quarter to one half an inch and if the germination has been reasonable will be touching their neighbours. The earlier they are moved in August the better, to give them opportunity to settle in and grow on before the end of the season which, unless artificial heat is used, will be towards the end of October.

Young plants seem to be gregarious and it is better to keep them together in fairly large containers. Quite apart from this they certainly should not be potted up individually into so-called 'thumb' pots. These are far too small. It is difficult to keep sufficient moisture in them to sustain growth and during sunny weather they heat up rapidly and bake the roots of the seedlings. For some years we have used plastic boxes; these are ten inches square and three inches deep, have adequate drainage holes and are readily available.

At this stage the seedlings will not have an extensive root system and the best approach to the job is to take the compost, which may be one of the soil-less type or John Innes No. 1, and fill the plastic box almost to the top. The compost should be firmed down gently, particularly around the edges; if this is not done there will be a tendency for water to run straight through between the compost and the walls of the container. The seedlings are then removed carefully from the container in which they have been growing. If there is only one sort they can be removed en bloc and the roots carefully separated with a skewer or similar object. If several types are growing in the sectionalised type container we recommended in the February 1975 issue a little more care will be required to separate the roots. A hole is made in the compost in the new container. This can be done with a pointed object such as a pencil; the diameter and depth of the hole should be judged in relation to the amount of root on the seedling. This may be held gently in one's fingers or with tweezers and when it is in position soil is pushed around the roots and is gently firmed with the flat end of a pencil. The spacing of the seedlings will depend upon their size but at this stage it should be somewhere between an inch and an inch and a half except for particularly robust and vigorous young plants. Given a reasonable growth rate they should not then require a further move until well into the following summer. The compost should be slightly moist at the outset and it is then not necessary nor advisable to give additional water for a few days, to allow any damage to fine roots to mend. The seedlings will still require some shading but by about mid-September they can gradually be exposed to normal greenhouse conditions. Nevertheless, careful watch should be kept and if there is incipient reddening some shading should be restored.

These notes will reach members during the height of the holiday season and we hope that the weather will be appropriate to the occasion. However, one must look ahead and we are therefore turning to the topic of greenhouse heating, as we did in the August 1974 issue. We then dealt primarily with gas heaters but on the present occasion a more general survey of the position will not be out of place, both for established greenhouse owners and for those who have to heat one for the first time. Recent winters have been abnormally mild and this will have induced complacency; in saying this we are trying to be realistic rather than pessimistic. The important thing is to estimate in advance what heating capacity will be required to maintain the desired temperature during the worst conditions. To discover that the system cannot cope during an arctic spell is to be wise after the event.

There are various formulae for calculating the required heat input for a greenhouse. These are to be found in some of the catalogues issued by manufacturers of heating equipment and in occasional articles in the gardening press. The point that must be stressed is that these calculations only give approximate answers, partly because the formulae are themselves approximate and also because there is usually the assumption that the minimum outside temperature will not fall below 20 F. This will certainly happen in a really bad winter when, in many parts of the country, the temperature will drop to at least 10°F. for short periods. If the minimum greenhouse temperature is set to 45°F. this still gives a safety margin but anyone working to, say, 38°F. will obviously run the risk of freezing if the outside temperature falls ten degrees below that assumed in calculating the heating capacity required. The second factor which is almost universally ignored is the effect of wind

although in our day to day comings and goings we are all very well aware of the problem of keeping warm in sub-zero temperatures and a cutting wind. The major component of the heat loss from glasshouses is due to wind. The rate of heat loss increases with wind speed, doubling as the speed increases from zero to fifteen miles per hour. An analysis of meterological records shows that the highest rate of heat loss occurs in strong winds and not usually at the lowest outside temperature, which tends to occur on still, clear nights.

The new greenhouse owner may be forgiven for wondering how he is to find out what heating capacity he will need. It is undoubtedly a help if there is someone in his neighbourhood with experience of heating a greenhouse who can give him advice, as conditions in a particular area should not vary too much. In our own case the larger of our two greenhouses measures nineteen feet by eight feet three inches and we have found over a period of years that heating equipment with a total output of 5 kilowatts will maintain a minimum temperature of about 45°F. through the worst conditions. Similarly 2 kilowatts is adequate in our smaller eight foot square structure. As we are in a rather exposed position on the top of the North Downs these values should be more than adequate for the rest of south east England and particularly so for the south coast and the south west. They should also be a good guide for the north west. On the other hand, rather more heating capacity will be required in the midlands and north east.

Once a decision has been reached as to the amount of heating required the greenhouse owner has two options open, to install the whole of it permanently or to keep some in reserve for bad weather conditions. In the case of heaters with thermostats there is really no problem. If, for the sake of argument, 4 kilowatts of electrical heating are installed, in the form of two fan heaters, and if only 2 kilowatts are required on a particular occasion, thermostats will ensure that no more than this comes into use. The same comment applies in the case of gas heaters. The only common type of non-thermostatic system is the paraffin heater but this poses no problem. In particularly cold weather a paraffin heater can be run at its full rating to provide the basic source of heat and it can be supplemented to the desired level by a thermostated electric or gas heater. We have used this arrangement for a period of years, initially with an electrical fan heater and, for the last two winters, with a gas heater. The paraffin heater has the added advantage that it is readily portable and we find it is very useful to have one or two of them to hand, filled and available for instant use, to cope with the emergencies which beset all greenhouse owners once in a while. This brings us to our final point. All heating equipment should be inspected in the early autumn before cold weather arrives. The wicks of paraffin heaters should be examined and if they have nearly burned down they should be replaced. Similarly, if the inspection window in the chimney is becoming opaque, as gradually happens, a fresh sheet of mica should be inserted. These maintainance jobs should be done at leisure, not under duress during a spell of wintry weather.

Reconsideration of the Reasons for Grafting Cacti and the Management of Grafted Plants

by Leonard Jeffries

THE BENEFITS to be gained by grafting cacti are not fully appreciated in Great Britain. It is widely believed that grafting is a temporary expedient, and that one should ultimately attempt to re-root such plants; I disagree with this view.

There are two well-founded reasons for grafting cacti. The first, and from the viewpoint of conservation the most important, is to ensure the rapid propagation and distribution of plants grown from authentic habitat collected seed. In this way, many of the South American cacti, notably notocacti, neoporterias and sulcorebutias that have been described during the past decade have, through the efforts of continental dealers, become readily available to collectors within a short time of their discovery. Such vegetatively-propagated plants are more likely to resemble plants from habitat than are many of those grown from much of the seed that is readily available and is of greenhouse origin. If propagation by grafting had been applied more extensively in the past, when newly described species were first introduced into cultivation, the labels on many of the better known plants, such as *Notocactus apricus,* in our collections might be more meaningful than they are.

The second reason for grafting is to speed the growth of plants that are either slow to develop on their own roots, for example sulcorebutias, or are, like many parodias, short-lived in cultivation. Also, plants tolerating only a limited range of soil conditions may be

Mammillaria theresae—cristate form grafted on Harrisia stock. (photo: Helmut Broogh)

grafted on to more widely tolerant stocks.

It is frequently stated that plants that have lost their roots are suitable subjects for grafting; I have found this to be completely erroneous. Unhealthy plants cannot be grafted satisfactorily because the technique is only applicable to young, healthy and vigorously growing stocks and scions. Attempts to graft aged, lignified plants, or those suffering from infections, are notably unsuccessful.

On the basis of only limited, but encouraging, experience I would tentatively suggest that cacti may be less susceptible to infestation with red spider mite when they are grafted. I am convinced that red spider mite will only attack and disfigure unealthy, debilitated plants, and species of *Coryphantha, Rebutia* and *Lophophora* are notoriously susceptible. It has also been my experience, and that of most collectors with whom I have discussed it, that red spider mite infestation in cacti has proved to be resistant to control by the limited range of chemicals available. Although this may be due in part to the selection of insecticide-resistant strains of the parasite, I would suggest that it is mainly because the parasites lie deeply embedded in wool, flower-remains and seed pods and are thereby protected from insecticide sprays and systemically-absorbed insecticides. The ubiquitous presence of this parasite in the air of rural areas, as shown by air-sampling techniques, suggests that infestation of plants in greenhouses is encouraged by conventional ventilation. Air-filtration as a means of control has been satisfactorily applied under experimental conditions, but this is likely to be impracticable and too expensive for the amateur grower.

Grafting technique

Flat grafting, in which both stock and scion are cut horizontally, is employed for most cacti, and my experience has been limited to this method; wedge grafts are frequently used for thin scions of epiphytes, such as schlumbergeras.

Although commercial growers employ a variety of stocks for grafting, I consider *Trichocereus* species to be the best, and of these *T. spachianus* recovers more rapidly than most. Rooted cuttings make sturdier grafting stocks than do plants grown from seed, but unfortunately some dealers use inadequately rooted cuttings thereby prejudicing the chance for survival of the grafted plant. *Harrisia* stocks tend to shrivel markedly in winter, with adverse effects upon the recently grafted scion. *Myrtillocactus geometrizans* stocks are liable to rot at temperatures below 10 C and *Echinopsis* stocks frequently lack vigour. In the absence of suitable trichocerei, I have successfully used as stocks *Armatocereus matucanensis* and *Clistanthocereus samnensis:* since it is likely that many columnar cacti would make suitable grafting stocks, further experimentation would be worthwhile.

Because they have been available, I have mostly used 18 month old seedlings of *T. spachianus* about 2 in. tall. May to August seems to be the best time for grafting. After removing the areoles from the top of the beheaded stock, the cut surface of the scion is applied and secured with two elastic bands, which are left in position for about a week, during which time the pot is kept shaded.

The maintenance of grafted plants

With the exception of certain cristate cacti, which are best grown well above soil level, and which make attractive 'standard' plants, cacti grafted on tall stocks look inelegant. However, since the recently grafted plant is initially dependent upon an adequately photosynthesising stock, it follows that very low grafts are unsatisfactory. Once the union between stock and scion is complete, the stock serves only for anchorage and absorption of nutrients and water. The stocks should therefore be buried progressively over several years; when this is accomplished, the base of the scion will usually produce roots. It is both unnecessary and highly undesirable to attempt to re-root mature and successfully grafted plants. To those who regard the cultivation of grafted cacti as too simple, and for this reason despise them, I would point out that the maintenance of correctly grown grafted plants, in which the stock is buried, does require a measure of skill. Furthermore, the removal of offsets and the areoles from which they arise on the buried stock can be time consuming. These efforts are well worthwhile, since they avoid the gamble of degrafting and attempting to re-root, and thereby to risk a set back to mature plants.

Are grafted plants atypical?

If typical plants are regarded as those closely resembling the ones struggling for survival in habitat, then most of the plants that have survived in my collection, whether grafted or not, are atypical: any that become typical are promptly discarded. Whilst a grafted plant is becoming established, and before the stock is buried, it may well be bloated and open in spination, as indeed are most well-grown young seedlings on their own roots. However, I have found that once the stock is buried, very few grafted cacti are distinguishable from well-grown plants on their own roots. It, therefore, follows that if a judge penalises a plant because it is obviously grafted (i.e. badly presented), then the exhibitor has only himself to blame.

In concluding, might I suggest that grafting could profitably be applied to many of the common cacti in cultivation which lack vigour because they form inadequate root systems: *Cephalocereus senilis, Astrophytum asterias* and many parodias are obvious examples.

Cultivation of Succulents

by Mrs. M. Stillwell

FIRST I would like to thank and congratulate all those people who worked so hard to make a success of the one-day show at Pimlico on June 14th. It was a joy to see so many fine plants on display, and also to see so many visitors to the show.

I cannot remember the sun having such burning powers as it had this year, and for the first time in my growing career I have been forced to use shading on my greenhouse glass. I tried without success to obtain 'Varishade', a new preparation which, it is claimed, clears during rainy periods and clouds over when the sun comes out. I settled for 'Coolshade', another new product which proved quite successful. It is reputed to be unaffected by the heaviest downpour yet it will wipe off with a dry duster. Mixing needs to be done strictly according to directions as if it is too thick it will keep out ultra-violet rays.

Euphorbias like a little protection during the hot weather and benefit from a pot allowing plenty of room. Providing the soil is made very porous by the addition of extra coarse grit they can take ample water. I like to repot mine about June, when they are in active growth. It is essential to wash off any latex that adheres to the hands while so doing, as it is said to be poisonous. I still prefer to grow euphorbias in clay pots where they will probably not grow quite so quickly but will remain hard and firm and less likely to be lost from overwatering. Those species with a caudex, such as *E. squarrosa, E. stellata* and the like, should be planted with the caudex at least half way above the soil surface and given a top dressing of coarse grit as an additional protection.

The dead, lower leaves of Haworthias, Gasterias and Aloes should all be removed at this time of the year as this greatly improves their appearance and removes a potential hiding place for pests. Single heads of Haworthias in a pot give one a much better idea of the markings and character of the plant. There seems to be little point in keeping large pans of the more common species which show little variation from one head to another. Echeverias that have developed a leggy stem require to be beheaded and re-rooted. The old stems can be planted out in the garden where they will make offsets. Echeverias seems to root better if stood on top of an empty pot and kept quite dry.

In August the stemless mesembryanthemums should be looking their best. The old dead skins of the Conophytums should be removed before the flowers come, but this is an operation which requires great care as the heads are easily detached. The bilobe types are among the first to flower and may require to be watered before the smaller types. The taller growing mesembryanthemums such as Mitrophyllum, Conophyllum, Monillaria and Phyllobolus are also growing well at this time, although some of them for only a short period.

Watering should be watched after about four months and gradually reduced as growth slows down.

Many people are fascinated by the caudiciform succulents, many of which will never be seen in their true adult form in the average collection, but many do make showy plants of somewhat unusual types. For example, *Ibervillea sonorae* in its natural habitat will frequently weigh many pounds. It has numerous fibrous roots. During the long winter resting period one wonders if it is alive or dead, but it comes to life about May when a few small leaves appear from the top. Once this type of plant is successfully rooted it is fairly easy to maintain, but imported plants not infrequently arrive minus roots and may require bottom heat and your pet rooting medium to start them off. I have yet to find anything better than a mixture of equal parts of very coarse vermiculite and equally coarse sand or washed river grit, allowed to stand in enough warm water thoroughly to wet the medium. Thoroughly dry plants or cuttings are placed in this and, if kept warm and sprayed from time to time, roots should appear within a few weeks. The same medium can be used over and over again and so last for years. It is possible to examine the roots from time to time as the vermiculite will cling to any new roots and the plant can be returned to the pot without any damage being done. Over-watering will cause rotting so do not stand the container in water. Pot up in your usual compost when the roots are strong enough.

Towards the end of the growing season be ready to turn out all unwanted or sick plants and make sure nothing is left to give trouble during the winter, to provide a breeding ground for mealybug or, as with rotting vegetable matter below the staging, attract woodlice.

Jatropha berlandieri, a caudiciform succulent from south-west U.S.A. and Mexico. (photo: M. J. Martin)

Correspondents

Society Seed—a correction

In the Forum on *Lobivia,* there appeared a reference to *L. oyonica* which had been grown from Society seed. The seed in question, was on the 1971 seed list as No. 602, and all the plants that I have seen from this source have turned out to be an *Espostoa,* probably *E. lanata.* The true *L. oyonica* is a dark green, flattened-globular plant, with 12 or more acute ribs and a few curving spines which are more or less stout.

The seed for the Society's distribution is normally bought in from reputable dealers (as the above *Lobivia* was), and generally turns out to be true to name. If any other erroneous species are known to members, perhaps they would let me know, so that any corrections can be published.

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Contributions for the November Journal should reach the Editor not later than September 10th.

Annual Dinner — November 29th.

Application forms will accompany the November Journal. Please note the date.

Slide Competition

Full particulars of the slide competition to be held at the Westminster meeting on December 10th will be given in the November Journal.

The Summer Show, 1975

ALTHOUGH the primary purpose of this article is to comment on some of the interesting plants that were to be seen at the Summer Show, it is not out of place to preface these remarks with some of a more general nature. The Show represented a new venture in that it was a one day effort, replacing the long-standing two-day event at the R.H.S. Hall. This change was prompted by two major factors: to attract increased support and to make it financially self-supporting. It was undoubtedly successful on both counts. When questioned why they have not supported past shows quite a number of members have said that they would much prefer a one day Saturday Show and this assertion was supported to some degree by the entries on 14th June. There were 162 of them from twenty five competitors, a very useful entry both in quantity and quality, but one which still leaves room for improvement, particularly on the part of one or two Branches.

Mr. Jeffries made a welcome return to the show scene after an absence of two or three years and showed that he is still very much a force to be reckoned with. Nevertheless, Dr. and Mrs. Randall, who have gradually been emerging as serious contenders during recent years, really made their mark and narrowly beat Mr. Jeffries into second place for the highest points aggregate. This gained them the Amateur Gardening Red Ribbon Award. The new Society Treasurer, Dr. Rolfe, gave members outside the Essex Branch the opportunity to see his plants for the first time and showed that his skill extends beyond financial matters. However, it would be wrong to dwell too long on the top exhibitors; any show depends very much on the support of those whose successes may be limited to one or two lesser awards. Hence, we are much indebted to all who provided the plants for what was undoubtedly a varied and interesting display.

It is therefore gratifying that the attendance was good and while we were pleased to welcome members from quite a wide area the support given by the public was equally pleasing. Three of the Vice-Presidents were present and there was a particular welcome for Mr. Boarder, looking his usual fit and cheerful self, who had travelled up from the south east coast for the occasion. An event of this type would not succeed without the dedicated work of those behind the scenes. Our thanks go to the Show Secretary and the members of the Show Committee; their task was more onerous than with the previous shows in the R.H.S. Hall and they surmounted various difficulties before and during the event. We are also indebted to the ladies who provided and served the refreshments and to Mr. Grantham for organising the Draw which, as hoped, was a reliable fund-raiser.

Turning to the plants on show, class 1, the premier class for six cacti was, appropriately enough, sited adjacent to the entrance so that the impressive plants to be found there caught the eye at once. Mr. Jeffries gained the first prize and the Ibbotson Cup with a very strong team. Outstanding among his six was a fine large plant of *Wigginsia erinaceus,* quite without blemish, that deservedly gained the award for the Best Cactus in the Show. Mention must also be made of his *Parodia maxima,* which was unusually large and clean. The second prize winner, Mr. Oliver, produced an intersting selection including a clump of *Coryphantha greenwoodii,* a relatively new species, and a medium-sized plant of *Mammillaria magnifica* in flower. This is also a new species and one which clearly grows well from seed; it is safe to predict that it will figure prominently on the show benches in a few years time. However, probably the most interesting plant in this entry was *Micranthocereus polyanthus.* Those who can maintain a winter temperature of about 50 F. should certainly grow this attractive yellow-spined columnar species. The third place went to Mr. Braun and among his six a clean specimen of *Echinopsis campylacantha* and a good plant of *Parodia chrysacanthion* merit mention.

Mr. Jeffries also emerged a clear winner in the second class, for three Rebutias and/or Lobivias, and his multi-headed clumps of *Rebutia pygmaea* and *Mediolobivia torrecillasensis* were much admired. However, for sheer beauty the *Aylostera muscula* in Mr. Oliver's second prize entry could not be bettered. This relatively new species, with white spines and ample orange flowers, must surely supplant some of the long established favourites. The related class for three Rebutias in 3½ inch pots produced a useful range of the somewhat smaller growing species, including one or two plants of *Digitorebutia.* Nevertheless, this size restriction is a little severe and plants in 4½ inch containers would have looked more impressive in terms of flowers.

The most attractive plants in the class for three Mammillarias did not figure in the first prize-winning entry. Both Mr. Taylor, who came second and Dr Rolfe, in third position, produced specimens of *M. zeilmanniana* about nine inches in diameter and in full flower. The largest plant in this class, in the winning entry of Mr. Jeffries, was an impressive multi-headed specimen of *M. lanata* and this was backed up by smaller but clean plants of *M. schiedeana* and *M. guelzowiana,* the latter having several flowers.

Although the next class, for six Mammillarias in 4½ inch pots, produced the usual good entry, too many of the competitors have not yet realised that immature plants of large growing species will not come into the

reckoning. Mr. Oliver demonstrated the type of plant required, particularly with *M. glassii, M. saboae* and *M. carretii,* and Dr. and Mrs. Randall, the second prize winners, also emphasised the point with a fine *M. humboldtii* backed up by *M. theresae, M. aureilanata* and *M. magallanii.*

M. magnifica may well prove to be a popular show plant of the future but *Notocactus magnificus* has certainly arrived. The class for one Notocactus contained two creditable examples but they were not of wholly adult size and were deservedly beaten by Dr. Rolfe's flawless specimen of *N. submammulosus,* some five inches in diameter. Dr. Rolfe also took first prize in the next class, for three Notocacti in 4½ inch pots, and his *N. uebelmannianus* is a particularly clean, well-grown specimen. However, the plant which caught the eye, in N. P. Taylor's third prize entry, was the pure white *N. scopa v. candida.*

The sub-tribe Echinocactanae encompasses a range of genera of diverse form and some interesting examples were to be seen in class 9. Mr. Jeffries, who collected the first prize, had the most imposing plants in terms of size comprising *Gymnocalycium kurtzianum,* six inches in diameter and full of buds, a mature *Neoporteria senilis* in flower and, above all, a nine inch tall specimen of *Arequipa erectocylindrica.* There is an increasing tendency to include the Arequipa species among the Cereanae and the cylindrical habit of this particular specimen will have gained converts for this point of view. The second prize winning entry of Dr. & Mrs. Randall demonstrated clearly that smaller well-grown clean plants can succeed. Their specimen of *Obregonia denegrii* was a gem and it was rivalled by a single-headed specimen of *Lophophora williamsii* with unusually woolly areoles. J. H. Taylor, in third place, once again showed his fine dark spined plant of *Stenocactus vaupelianus.* Mr. Taylor also produced three old friends to win the class for three Gymnocalyciums and/or Weingartias and of his trio the fine multi-headed specimen of *G. lafaldense,* about 7 inches in diameter and full of flowers, was notable. A word of consolation for an 'also ran'; Mr. & Mrs. Pearson must have come very close to displacing Mr. Bowdery as third prize winner with their creditable *G. mostii, G. delaetii* and *G. quehlianum.* It was disappointing that no *Weingartia* species were to be seen in this class but Mr. Bowdery had a relatively immature specimen of *W. cummingii* in his winning entry in the next class, for three Gymnocalyciums/Weingartias in 3½ inch pots. It was surprising that no plants of *G. cardenasium* were in evidence as they are ideal for such a situation. The class for two Echinocerei was, relatively speaking, poorly supported in terms of the number and the quality of the entries. Nevertheless, this stricture did not apply to Dr. Rolfe's two plants, *E. fitchii,* recently in flower, and *E. salm-dyckianus* bearing many colourful orange blooms. Of the remaining plants *E. melanocentrus,* in the second prize entry, deserves mention; it has the qualities to make a consistently good show plant.

Those of us who have visited the North London Branch Shows of recent years and have been impressed by Mr. & Mrs. Pearson's fine plant of *M. multidigitata* (which featured in the November 1974 issue) had hoped that it would appear at this Show. We were not disappointed but it must have provided a headache for the judge as it was competing against Mr. Jeffries' equally impressive multi-headed *M. elegans.* In the event the latter prevailed, but only marginally, one suspects. Most shows produce a controversial decision and, in terms of general opinion, it was Mr. J. E. Taylor's large multi-headed *M. hahniana,* which was unplaced, which filled the bill on this occasion. It is true that one small but manifestly dead head was readily visible but what penalty should this blemish incur? Fortunately, Mr. Taylor should have no difficulty in performing minor surgery to cosmetic advantage and it will be surprising if this impressive plant does not collect still more prizes in the future.

One visitor was heard to remark that Mr. Read deserved first prize in the class for one cactus on account of the effort involved in transporting his large specimen of *Ferocactus acanthodes.* However, this does not do justice to a good clean plant and one that is well in growth, in distinction to many that have appeared at shows in various parts of the country of recent years. Dr. Rolfe deservedly took second place with an unusually large and beautifully clean specimen of *Hamatocactus setispinus;* it had no trace of the black mould that frequently spoils this plant. Dr. Holland also deserved his third prize for the nine-headed specimen of *Mamillopsis senilis,* several of the heads having flowered earlier in the year. It was gratifying to see three interesting and contrasting Opuntias in this class. They were *O. basilaris,* with lovely purplish red pads, *O. aciculata* with attractive short yellowish spines and the jointed, strongly spined *O. invicta.*

The class for six cacti in six inch pots has always produced some good entries and although the standard on this occasion, perhaps, did not measure up to the best in the past it was, nevertheless, creditable. Appropriately enough Dr. & Mrs. Randall had *Trichocereus randallii* in their winning entry but their two eye-catching plants were *Escobaria runyonii* in flower and a bright, clean *Parodia aureispina.* Mention should also be made of two interesting plants in the unplaced entry of Mrs. Dennard; *Mammillaria buchenauii,* which is probably synonymous with *M. crucigera,* is a distinctive and attractive species, and *Coryphantha werdermannii,* which has rather long whitish spines and flowers without too much difficulty, is sure to become popular once it is more readily available. The class for three cacti in 4½ inch pots was included to give an opportunity for those exhibitors who lack larger plants and the fact that it produced twelve entries speaks for itself. These contained a number of interesting

plants; *Encephalocarpus strobiliformis,* well-grown, was an obvious choice and, not surprisingly, *Mammillaria magnifica* was also in evidence. The attractive yellow-spined *Submatucana myriacantha* and a plant of *Notocactus graessnerii* with really yellow flowers also took the eye.

The cactus classes were completed by one for three year old seedlings and one for three cacti for Junior members. The former produced four entries, an improvement over recent years. The one from N. P. Taylor was the clear winner; it contained a varied assortment of well-grown young plants, some in flower, including the little-known *Neobesseya wissmannii.* The unplaced entry of Dr. Rolfe was of quite young but sturdy seedlings and if he is able to keep them growing he should be a strong contender in the 1976 Show. The Junior class produced some keen competition and the judge must have had difficulty in separating the first three. The outstanding plant, in the second prize entry, was a ten inch tall specimen of *Cochemiea poselgeri* in almost pristine condition and a credit to its owner.

The first of the classes for the other succulents, for one specimen plant, could not match the corresponding cactus class for quality but the entries were very commendable. The first prize went to Mr. Oliver for his *Brachystelma barbariae.* This was in full growth and bud; in view of the well-known malodorous nature of its flowers it was fortunate that these buds had not opened! Mr. Grantham's thriving *Dorstenia foetida* came a good second and he collected the first prize, in the next class, for three Euphorbiaceae. His plants of *Euphorbia cylindrifolia* and *E. decidua* are good examples of choice small growing species of the genus. The exhibitors in the class for three Liliaceae had, in principle, a wide choice covering large and small plants. Mr. Jefferies prevailed with specimens of the former type and his *Haworthia viscosa,* quite free from the rusty patches which are sometimes found on plants of this type, was particularly good. Mr. Grantham, in second place, opted for the small growing types and his *Aloe descoignsii* was a good example of what to use in these circumstances. This class also included plants of *Haworthia truncata* but of a fairly modest size. It was hoped that the class for one *Aloe variegata* or *A. aristata* would attract entries from novice members. Very surprisingly it failed to do so and the two plants, both of *A. variegata,* came from members with previous show experience.

There were only four entries in the class for two Asclepiads but they included a useful proportion of out of the ordinary material. The first prize entry from Dr. Holland consisted of a very sound specimen of *Decaibelone (Tavaresia) barkleyi* and a plant labelled *Hoodia* ARS29. This latter, which had several stems, was particularly intriguing as the body colour is yellowish green, not the blue-green hue one associates with Hoodia species. Other plants deserving mention include *Raphionacme hirsuta* and *Pectinaria asperifolia.*

The various entries in the class for two Crassulaceae provided plenty of contrast. The two rather diminutive Crassula species which gained first prize for Mrs. Poulter were rather overshadowed physically by the two second prize Echeverias of N. P. Taylor. Further variety came in the form of *Sedum hintonii* in the third prize pair. Perhaps the most disappointing class of the whole show was the three succulents. This offered a great deal of scope but it attracted only two entries. Mr. Grantham deservedly won with a useful trio *Ceropegia dimorpha, Dorstenia foetida* and *Anacampseros alstonii.* The first of these is a branched, upright species from South Africa and the last-named plant was in full flower. In contrast to this open class the one for three succulents with a pot size restriction, $4\frac{1}{2}$ inches, produced ten entries. N. P. Taylor was the winner and had a plant of *Lithops pseudotruncatella* with several heads all of which had come well through with no signs of the previous year's growth. The second entry had an attractive plant of *Titanopsis fulleri* and *Sarcocaulon burmannii* was to be found in the third prize entry. The entry which earned Highly Commended included a colourful *Conophytum notabile* flowering on eight heads and there was a well-grown plant of the true *Aloe haworthioides* in Mr. Read's unplaced trio. Only two Juniors could manage their class for three succulents but all six plants involved were very presentable; perhaps there will be better support on the next occasion.

Mr. Jeffries made his final mark with one cactus and one other succulent where, apart from collecting the first prize, his *Euphorbia obesa,* some four and a half inches in diameter and height and in flawless condition, was judged to be the best Succulent in the Show. Dr. Rolfe's second prize winning entry had a seven inch multi-headed *Notocactus ottonis* in full flower but its partner, an unnamed *Dyckia* species, was not its equal. Surprisingly, there were only four entries of miniature gardens and one or two specialists in this area were noticeable by their absence. Few would dispute that Dr. & Mrs. Randall deserved first prize and it earned them the points that took them to success in the overall aggregate. Last, but certainly not least, the three groups were very presentable. Mrs. Poulter probably owed her success over Mrs. Dennard to a greater proportion of flowering plants. She had managed to coax several yellow flowered Echinopsis hybrids into bloom and they added a touch of distinction. Mr. Bowdery, in third place had a useful set of plants but the overall effect would have been more marked if he had banked them up so that those at the rear showed to better advantage. These three entries were a fitting close to some one hundred and eighty feet of staging fairly closely filled with plants which, without exception, were a credit to their owners. We hope to see them, and many others, at future shows.

W.F.M.

Show Results

Judges:
Cacti: Mr. N. Ivory
Other Succulents: Mr. W. C. Keen

Class 1 Six Cacti. 4 entries

1st L. Jeffries. Wigginsia erinacea, Astrophytum ornatum v. mirbelli, Mammillaria neopotosina, Mammillaria plumosa, Parodia Maxima, Hamatocactus hamatocanthus.
2nd B. C. Oliver. Coryphantha greenwoodii, Mammillaria magnifica, Notocactus haselbergii, Obregonia denegrii, Notocactus magnificus, Micranthocereus polyanthus.
3rd F. Braun. Mammillaria bombycina, M. geminispina, Echinopsis campylacantha, Weberbauerocereus johnsonii, Cleistocactus species FR175, Parodia chrysacanthion.

Class 2 Three Lobivias and/or Rebutias. 6 entries

1st L. Jeffries. Rebutia pygmaea f. pygmaea, Mediolobivia arachnacantha v. torrecillasensis, Lobivia sublimiflora.
2nd B. C. Oliver. Aylostera muscula, Rebutia krainziana, Lobivia torrecillasensis.
3rd Mr. & Mrs. Pearson. Rebutia calliantha, Rebutia krainziana, Lobivia famatimensis.
HC F. Braun.

Class 3 Three Rebutias in pots not exceeding 3½ in. diameter. 4 entries

1st Dr. R. Rolfe. Rebutia krainziana, Aylostera muscula, Mediolobivia orurensis.
2nd Dr. & Mrs. G. C. W. Randall. Digitorebutia haageii, R. ritteriana, R. winterii.
3rd J. E. Taylor. Aylostera cujasensis, R. species FR 1113, R. marsoneri v. sieperdaiana.

Class 4 Three Mammillarias. 7 entries

1st L. Jeffries. M. lanata, M. guelzowiana, M. schiedeana.
2nd J. E. Taylor. M. spinossisima, M. plumosa, M. zeilmanniana.
3rd Dr. R. Rolfe. M. geminispina v. nivea, M. elongata, M. zeilmanniana.
VHC F. Braun.

Class 5 Six Mammillariais in pots not esceeding 4½ in. diameter. 10 entries

1st B. C. Oliver, M. schwarzii, M. glassii, M. saboae, M. matudae, M. carretii, M. pottsii.
2nd Dr. & Mrs. G. Randall. M. perbella, M. eriacantha, M. humboldtii, M. aureilanata, M. magallanii, M. theresae.
3rd F. Braun. M. plumosa, M. schiedeana, M. candida, M. magnifica, M. elegans, M. theresae.
HC R. Worrall.

Class 6 One Notocactus. 5 entries

1st Dr. R. Rolfe. N. submammulosus.
2nd L. Jeffries. N. magnificus.
3rd K. H. Grantham. N. magnificus.

Class 7 Three Notocacti in pots not exceeding 4½ in. diameter. 6 entries

1st Dr. R. Rolfe. N. uebelmannianus, N. braziliensis, N. magnificus.
2nd Dr. & Mrs. Randall. N. crassigibbus, N. magnificus, N. haselbergii.
3rd N. P. Taylor, N. scopa v. candida, N. concinnus, N. magnificus.
HC F. Braun.

Class 8 Three Echinocactanae. 8 entries

1st L. Jeffries. Arequipa erectocylindrica, Neoporteria senilis, Gymnocalycium kurtzianum.
2nd Dr. & Mrs. Randall. Neochilenia napina, Obregonia denegrii, Lophophora williamsii.
3rd J. E. Taylor. Stenocactus vaupelianus, Astrophytum myriostigma, Leuchtenbergia principis.
HC R. B. Pearce.

Class 9 Three Gymnocalyciums and/or Weingartias. 5 entries

1st J. E. Taylor. G. eytianum, G. mostii, G. lafaldense.
2nd B. C. Oliver, G. zegarrae, G. baldianum, G. species.
3rd D. Bowdery, G. mostii v. kurtzianum, G. marsoneri, G. zegarrae.

Class 10 Three Gymnocalyciums and/or Weingartias in pots not exceeding 3½ ins. 8 entries

1st D. Bowdery, W. cummingii, G. denudatum, G. leptanthum.
2nd H. P. Jones. G. andreae, G. saglione, G. gibbosum.
3rd Dr. & Mrs. Randall. G. baldianum, G. nigriareolatum, G. mihanovichii.
HC Mrs. M. Leach.

Class 11 Two Echinocerei. 5 entries

1st Dr. R. Rolfe. E. fitchii, E. salmdyckianus.
2nd Dr. & Mrs. Randall. E. melanocentrus. E. pectinatus.
3rd B. C. Oliver, E. viridiflorus, E. chloranthus.

Class 12 One Specimen Mammillaria. 6 entries

1st L. Jeffries. M. elegans.
2nd Mr. & Mrs. Pearson. M. multidigitata.
3rd Dr. & Mrs. Randall. M. baumii.

Class 13 One Cactus. 9 entries

1st R. H. I. Read. Ferocactus acanthodes.
2nd Dr. R. Rolfe. Hamatocactus setispinus.
3rd Dr. R. Holland. Mamillopsis senilis.
HC Mrs. M. Dennard.

Class 14 Six Cacti in pots not exceeding 6 ins. in diameter. 6 entries

1st Dr. & Mrs. Randall. Escobaria runyonii, Notocactus schumannianus, Parodia aureispina, Gymnocalycium saglione, Trichocereus randallii, Astrophytum ornatum.
2nd Mrs. M. Leach. Mammillaria dolichocentra, Wigginsia erinacea, Mammillaria celsiana, Pachycereus pringlei, Espostoa melanostele, Astrophytum ornatum.
3rd R. H. I. Read. Epithelantha micromeris, Soehrensia schaferi, Ariocarpus furfuraceus, Parodia chrysacanthion, Obregonia denegrii, Oreocereus ritteri.
HC D. Bowdery.

Class 15 Three Cacti in pots not exceeding 4½ in. in diameter. 12 entries

1st Mrs. M. Leach. Weingartia neocummingii, Gymnocalycium denudatum v. paraguayense, Encephalocarpus strobiliformis.
2nd Dr. & Mrs. Randall. Stenocactus albatus, Coryphantha elephantidens, Neoporteria paucicostata.
3rd Dr. R. Rolfe. Neoporteria senilis, N. subgibbosa, Submatucana myriacantha.
HC N. P. Taylor.

Class 16 Cacti raised from seed. 4 entries

1st N. P. Taylor
2nd H. D. Jones
3rd Mrs. M. Leach.

Class 17 Three Cacti (Juniors). 4 entries
1st J. Meldrum. Mammillaria zeilmanniana v. alba, Rebutia deminuta, Pseudolobivia kratockvilliana.
2nd N. Randall. Cochemiea poselgeri, M. zeilmanniana cristata, Gymnocalycium monvillei.
3rd A. Bulaitis. M. camptotricha, Cephalocereus senilis, M. hahniana v. giseliana.

Class 18 One Specimen Succulent. 5 entries
1st B. C. Oliver. Brachystelma barbariae.
2nd K. H. Grantham. Dorstenia foetida.

Class 19 Three Euphorbiaceae. 4 entries
1st K. H. Grantham. E. squarrosa, E. cylindrica, E. decidua.
2nd Mrs. Leach. E. obesa, E. horrida, E. oncoclada.
3rd Mrs. R. Horan. E. valida, E. resinifera, Jatropha berlandieri.

Class 20 Three Liliaceae. 5 entries
1st L. Jeffries. G. liliputana, H. maraissii, Haworthia viscosa.
2nd K. Grantham. Aloe descoingsii, A. parvula, Haworthia truncata.
3rd Mrs. Poulter. Haworthia truncata, H. albicans, Gasteria batesiana.

Class 21 One Aloe variegata or A. aristata. 2 entries
1st Mrs. Dennard.
2nd Dr. & Mrs. Randall.

Class 22 Two Asclepiadaceae. 4 entries
1st Dr. Holland. Hoodia ARS 29, Decabelone barkleyi.
2nd K. H. Grantham. Raphionacme hirsuta, Huernia longituba.
3rd B. C. Oliver. Huernia pillansii, Pectinaria asperifolia.

Class 23 Two Crassulaceae. 6 entries
1st Mrs. Poulter. Crassula corymbulosa, C. alstonii.
2nd N. P. Taylor. Echeveria shaviana, Echeveria sp.
3rd D. Bowdery. Sedum hintonii, Crassula interrupta.

Class 24 Three Succulents. 2 entries
1st K. Grantham. Ceropegia dimorpha, Dorstenia foetida, Anacampseros alstonii.
2nd Mrs. R. Dyson. Euphorbia bupleurifolia, Echeveria hoveyii, Gibbaeum neobrownii.

Class 25 Three Succulents in pots not exceeding 4½ in. diam. 10 entries
1st N. P. Taylor. L. pseudotruncatella, Crassula deceptrix, C. montis-trogones.
2nd Dr. & Mrs. Randall. Haworthia otzenii, Euphorbia obesa, Titanopsis fulleri.
3rd Mrs. Leach. Taveresia grandiflora, Sarcocaulon burmanii, Euphorbia monteroi.
HC Mrs. Dyson.

Class 26 Three Succulents (Juniors) 2 entries
1st N. Randall. Adromischus cooperi, Echeveria affinis, Crassula tecta.
2nd L. Bulaitis. Echeveria sp. cristata, E. X Paul Bunyan, Adromischus festivus.

Class 27 One Cactus and one other Succulent. 6 entries
1st L. Jeffries. Euphorbia obesa, Astrophytum myriostigma.
2nd Dr. Rolfe. Dyckia sp., Notocactus ottonis.
3rd N. P. Taylor. Euphorbia stellata, Mammillaria microhelia.

Class 28 Miniature Garden. 4 entries
1st Dr. & Mrs. Randall.
2nd D. Bowdery.
3rd J. Meldrum.

Class 29 Group of Cacti and/or Succulents. 3 entries
1st Mrs. Poulter.
2nd Mrs. Dennard.
3rd D. Bowdery.

AWARDS

Mrs. Luty Wells Cup. Ibbotson Cup, Sarah Cutler Memorial Cup, Spoon for Best Cactus and Spoon for Best Other Succulent: L. Jeffries.
Amateur Gardening Red Ribbon Award for highest points in Show—Dr. & Mrs. Randall.
William Denton Memorial Trophy—Mrs. P. Boulter.
Shurly Cup—N. P. Taylor.

SHOW PRIZE DRAW WINNERS

Electric Iron	—A. Woodward, Epsom, Surrey
Sherry	—D. Wooster
Pruner	—Mrs. I. Boote, Wirral
Stainless Steel Tray	—E. M. O'Brien, Wapping
Book	—K. Murdoch, Newcastle upon Tyne
Six Glasses	—Mrs. T. Maddams, Rushden
Stainless steel Jug and Basin	—K. Brown, Luton
Book	—P. Charnos, Bournemouth
Clothes Brush	—G. Cryer, Tolworth, Surrey
Tin Shortbread	—A. Hardingham, Leeds
Tea Towels in case	—B. C. Oliver, Upper Belvedere, Kent
Eau de Cologne	—Mrs. B. Davies, Hatfield and P. Snell
Doll	—Mrs. Vy, Bournemouth

JUNIOR POSTER COMPETITION WINNERS

1st Prize—Janet Balchen, Romford, Essex
2nd Prize—Dawn Lawson, Romford, Essex
3rd Prize—Nicholas Randall, Carshalton Beeches, Surrey

Book Reviews

THE SUCCULENT EUPHORBIAS. By David V. Brewerton. The National Cactus & Succulent Society, 21 :Windmill Gardens, Kibworth Harcourt, Leicester. 1975. 55p (post free in U.K.)

Succulent euphorbias are not well represented in general collections apart from such old favourites as *E. obesa, E. caput-medusae* and some of the more cactus-like forms. To the specialist, however, the immense number of species and the great variety of forms offer a challenge. Mr. Brewerton is an enthusiast for this genus and has set out in this booklet to capture the attention of the non-specialist. He discusses briefly the botanical characters with the aid of diagrams, adds a note on cultivation and concludes with short accounts of 32 species, mainly from South Africa, which he has himself grown. These species are illustrated by photographs or line drawings.

This, the second in a series of handbooks published by the N.C.C.S., is greatly improved in format, particularly as regards the illustrations. It will be of interest to many who do not have access to the larger books on succulent plants.

W.V.H.

SUCCULENTS: A Glossary of Terms and Descriptions. By R. B. Ivimey-Cook. The National Cactus & Succulent Society, 21 Windmill Gardens, Kibworth Harcourt, Leicester. 1975. £1.70 (post free in U.K.)

Reactions to "Succulents . . . " will essentially be of two types: "What a dry old text-book" or "What an invaluable and long awaited masterpiece". Whilst I feel some sympathy for those who wince at the sound of botanical or other technical terms they will mostly admit, I think, that there is a need for a book to which one can refer to seek, e.g. the derivation of a name, the meaning of a scientific term or the status of a dubious 'genus'. A great deal of precise and careful research has obviously gone into this book and the author is to be congratulated on a work which is both welcome and difficult to criticise. The book will, I am sure, be used intensively by keen plantsmen (not only students of succulent plants) and, with this in mind, I think it is a pity that it is not bound more strongly than by card jacket and plastic ring spine (no doubt a more durable system would have doubled the price!). The only other way in which this excellent book might be improved is by the inclusion of a section which explains certain botanical terms by the use of diagrams—this would probably be appreciated by those who are not already well versed in botanical terminology.

This book is good value for money and I would commend it to all whose interest in succulent plants is more than skin deep.

A.R.

CHECK LIST OF STAPELIADS PUBLISHED SINCE 'THE STAPELIAE'. 1937-71. By Fred Keller. A. Woodward, West Park Hospital, Epsom, Surrey. 1975. 15p (postage extra).

A bibliographical list originally published in the Journal of the Cactus and Succulent Society of America

Opuntia aurantiaca — A Major Problem

by Dr. V. C. Moran *

THE cactus, *Opuntia aurantiaca,* is native to South America but during the last century was introduced to eastern Australia, where it is known as "tiger pear" and to southern Africa where it is called "jointed cactus". It has become a weed of major importance in both countries where this aggressive, invasive plant is costing millions of pounds annually.

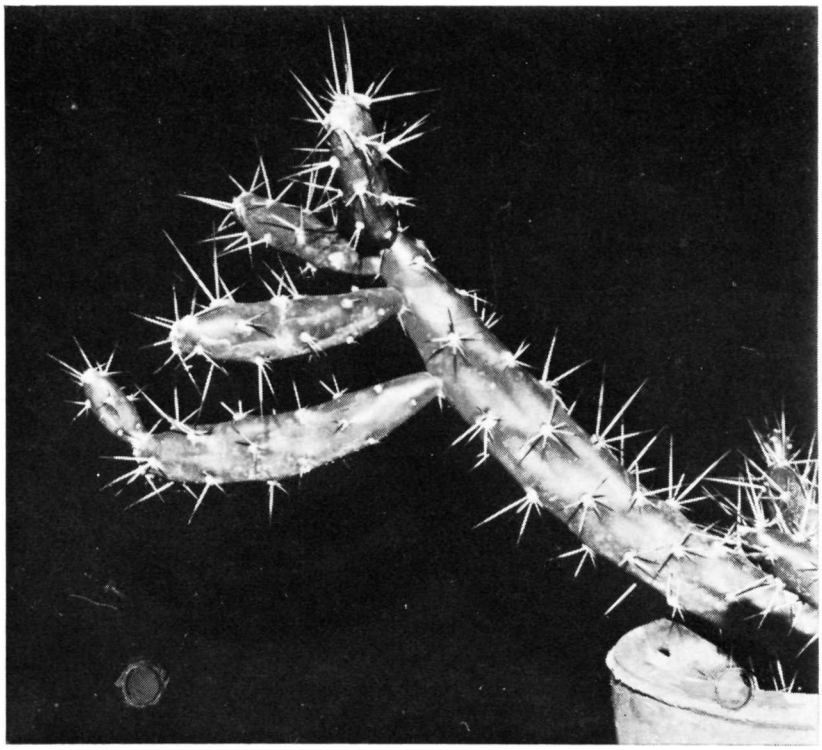
For about 40 years reliance has been placed on mechanical control methods and more recently on herbicides. Both methods are unsatisfactory; control effects are continual and increasingly costly and have failed to eradicate the weed even in restricted areas and it is spreading relentlessly to new areas.

Within the last few years, serious and sustained efforts have been made in the exploration for natural enemies of the cactus in South America—mainly for insects that feed on the plant or on related cacti. Biological control of the weed using these organisms has a real chance of success and there are encouraging precedents in which insects have been successfully exploited for the biocontrol of other aggressive cacti. Nevertheless, the research entomologists and botanists involved in this project are encountering problems in their exploration for natural enemies because they have been unable to discover the exact area in South America which is the original native home of *O. aurantiaca.*

All *O. aurantiaca* infestations in eastern Argentina and in Uruguay seem to be secondary, unnatural distributions in botanically disturbed places, around towns, along fence lines and at abattoirs. In every locality the cactus seems to be a recent colonist and these are not the places in which it would be likely to find the complete fauna of natural enemies which have co-evolved with the plant. *O. aurantiaca* is a xerophyte which also suggests that the plant is a recent colonist in eastern Argentina which is a high rainfall region. In addition, the insects associated with this species of cactus in Argentina are all commonly found on other related opuntias in the same area. Where then is the original native home of *O. aurantiaca*? Clearly, a study of the published literature is important in attempting to answer this question.

Opuntia aurantiaca was first described in 1833 by Dr. John Lindley, of the London Horticultural Society, who wrote, "A native of Chile, whence it was originally sent to this country, in 1824, by Mr. Nugent. It has also been brought home by Dr. Gillies whose unpublished *Cactus aurantiacus* it appears to be". This seems to be the reason for the choice of specific name (meaning orange coloured). As a result of detailed investigations of the biography, letters and exploits of Dr. Gillies, we now know that he could not have collected *O. aurantiaca* while he was in South America because this species did not occur in any of the areas he visited. His manuscript description of *Cactus aurantiacus* most probably referred to *O. longispina* which is somewhat similar to

*Imperial College Field Station, Silwood Park, Ascot, Berks.



Opuntia aurantiaca, a menace to agriculture. (photo: V. C. Moran)

O. aurantiaca and a form of which is common in Mendoza Province, Argentina where Gillies collected his plants. The Mendoza Province *O. longispina* has striking orange flowers but *O. aurantiaca* has clear bright yellow flowers which are illustrated in the colour painting in Lindley's original description of the plant as well as being referred to in the text. This confusion has been perpetuated in the many published accounts of the plant over the past 140 years. To compound the confusion, *O. aurantiaca* apparently does not occur nor did ever occur in Chile; why Lindley should have said that the plant was, "A native of Chile . . . " is not known. However, with this in mind, a knowledge of Mr. Nugent and his travels becomes vital in tracing the origin of this cactus and in the exploration for potentially important biological control agents. Specifically then, information is required on three questions related to this investigation:—

(1). Who was Mr. Nugent and where did he obtain the specimens of *O. aurantiaca* that he sent from South America to England in 1824? He does not appear to be listed as a botanical collector and we know nothing of his nationality or occupation. To whom did he send his specimens in England?

(2). Where are Gillies' original manuscripts and drawings of *Cactus aurantiacus*? The manuscript was seen and used by Lindley in describing *O. aurantiaca* although Gillies' manuscripts and drawings of many cacti collected in Argentina, were sent originally and exclusively to Professor W. J. Hooker at Glasgow. They are not now to be found at Glasgow, Edinburgh, Kew, the Royal Horticultural Society or the British Museum (Natural History).

(3). Lastly, it is obviously desirable to study the fauna and the growth forms of cacti of South and Central America which are closely related to *Opuntia aurantiaca.* These include *discolor, tayapayensis, pestifer, depauperata, curassavica, repens, pumila, pubescens, pascoensis,* and *taylori.* It is possible that one of these species will prove to be a synonym of *aurantiaca* for their published descriptions are mostly brief and imprecise. In particular we urgently require living plants of three of the species we have not yet seen, namely *pascoensis, taylori* and *militaris.* Where can these be obtained?

Any information which may assist in answering these questions would be most gratefully received by the Author at Silwood Park.

There's No Business Like . . .

by Frank N. Stein

THIS business of showing can appear very forbidding to one who has never lifted a plant from the greenhouse staging and held it up for the approbation of others, apart from the attitude all too often encountered among older, that is, more experienced growers, which is "I never show my plants", or "I can't be bothered with that sort of nonsense". The inference appears to be that exhibitors are rather childish 'show-offs'!

Although there is some element of one-upmanship involved in showing, there is much more to it than that. If you have even the smallest bit of competitiveness in your make up it can be an extremely enjoyable aspect of our hobby. It is also, I feel, something of a duty which each and every cactus and succulent grower owes to the pastime, since there is no doubt in my mind that a great many new 'fans' are attracted in this way. Club exhibits and stands at local Flower Shows are very commendable, and a useful adjunct to these events, but the very scale and, hopefully, magnificence of these displays are such as to tend to be rather off-putting to John Public, who compares the expanse of Agave, Cereus or Opuntia with his own windowsill-grown Chamacereus and Mammillaria gracilis, stops for a short chat with the attendant at the stand and hastens onward. I am not denigrating the often incredible amount of hard work which is done by those few willing volunteers who are to be found in every club, and which serves to advertise the existence of the organisation to the general public, though I feel that the people mainly attracted are those who have already seen sufficient succulent plants as to be already more than a little interested, the semi-converted, perhaps. It is in the competitive classes that the raw recruit will find the plants which may turn them into afficionados, from someone who had just enough interest to stop and look. It is in the competitive classes that you find plants in three and four inch pots, small and, to the uninitiated, insignificant plants which look little or no better than the one or two on the window-sill at home. I know, because this is how I got 'hooked', when showing dahlias, I stopped and looked at a class of cactus and decided that apart from their greater variety, they had nothing that my few plants had. I approached one of the prizewinners, who I knew slightly, was given several cuttings, offsets and seedlings, and the dahlias were soon on the way out, although I had some modest success with them.

This little piece, then, is intended to give a little nudge and a little guidance to those who have for one reason or another never entered a show, or perhaps, who feel that their plants are insufficiently immense to warrant their being placed on the competitive bench. Try it—take the first step, no one will ridicule your efforts, least of all the established showman. He is only too pleased to see any increase in entries which could in turn increase prize money and safeguard the future of the show, not to mention the beneficial effect on club funds.

For the rankest novice, the first thing to remember is that there are two very distinct types of show, the Village Fete type General Horticultural Show which includes one or two classes for cactus and succulents (though don't forget that you can also enter flowering or foliage pot plant classes if you wish). These are almost invariably judged by a 'general' judge, who may or may not know the difference between a Mammillaria and a Notocactus. Show him a beautifully grown Ceropegia or Hoodia and, unless it is in flower, and possibly *even* if it is, he will plump for a whacking great Cereus, an Oliveranthus or a scruffy, too green, too soft Echinopsis. You have to fight fire with fire and take a chance by staging something which is big and as showy, or visually unusual as possible, and preferably with a flower on it.

The second type of show is a totally different kettle of fish and it is here that your 'firsts', 'seconds' and 'thirds' begin to mean something. Again, it may be a 'general' horticultural show but with something of the stature of the Stroud, Bristol or Taunton shows, with a specialist cactus or succulent grower as judge. It may even be your own local Cactus Club, Group or Society Show which will almost certainly have a higher standard of competition than any general show, with few exceptions. It is for these shows that you really need to give your entries all possible consideration and you will be surprised how time consuming this job can be. A show of thirty or forty classes will often take me two entire days in selection, not to mention the loading of the car.

The first job is to read the schedule. Sounds obvious doesn't it, but after you've read it, read it again, only properly, this time, and you will be shocked to realise how much you missed the first time. If you are entering your first show it will help you if there is a sentence which says "No competitor may take more than one prize in any class". This means that you *may enter more than one plant,* hence if you are in doubt about which may be the better of two plants—enter 'em both and let the judge decide for you. He may not give either of them a card and you'll be no wiser than you were when you started, but if he does grant you even a 'Commended' on one of them, you will know that for some reason he preferred it to the other, you can then reappraise them both with opened eyes.

In selecting your plants you will need to look for reasonably mature, unmarked specimens. In classes for

more than one plant, whether of the same genera or not, you need to aim for as wide a variety of shape, form, size and habit as you can, while bearing in mind that quality is the first consideration. If you are having difficulty in making your selections and there is a more experienced exhibitor in your vicinity, then NEVER hesitate to call on him for advice. Do remember though, that he can only advise you, and even the best expert in the world cannot always be right—the responsibility and final decision over which plant to enter must remain your own. The specialist showman who will mislead you in order to safeguard his own first prize may exist but I have yet to meet him.

As you become more experienced you may well establish a "show squad" of plants—receiving that extra 'egg with their steak' throughout the year which can make all the difference between a nice plant and a real prizewinner. Never forget, however, that every little seedling in your greenhouse is a living entity—and today's little seedling may well be tomorrow's cup winner.

Until that time the procedure must be roughly as follows:—

(i) Check with your schedule that the genera is in accordance with that required.

(ii) That the pot size is in accordance with the schedule. If in doubt measure it; to the inexperienced a 3½ in. pot is very close to a 3½in. pot, and though this would be acceptable being within the limits, 3 in. can be just as close to 4 in.

(iii) Check the numbers of plants you require in each class.

(iv) The date and other details of entry.

(v) That you've filled in the details correctly, on the entry form. (DON'T FORGET YOUR FEES.)

(vi) Try and select plants of an appropriate size and shape, applicable to the genus concerned . . . globular types must not be elongated, columnar types should show the absolute minimum of kinks or bottle necks. Normally dark or grey bodied plants should not look green, indeed the "harder" a plant is grown, the better most judges appear to like them, even to the extent of some 'bronzing' on a normally green variety.

(vii) The plant should be as "clean" as possible, That is, free from scars, blemishes, lost spines, areoles, etc. But, in this respect, remember that there are very few perfect plants around, and the judges will overlook a certain number of flaws in an otherwise well-grown plant. It is obligatory, however, to ensure that the plant and pot are free from insect life. Should any come to light on the showbench you could well find your plants banished from the hall, and possibly from the show for a year or more to come.

(viii) Flower—evidence of flowering (yes, leave those dead flower heads ON!) or fruit—will gain you a couple of points in a close scramble.

(ix) Difficulty of cultivation and rarity—a couple more points here—though not as many as you might think. A quite common variety, well-grown and mature, could well surprise you by taking a card.

The important items are undoubtedly (vi) and (vii) with (viii) close third and (ix) probably least important, since even two judges may not agree on what is difficult and what is not.

Well, you've entered the show, selected your plants and arisen on the exhibition morn. Get you to the venue on time, with time to spare preferably. You will be surprised how long can be taken up with staging—as opposed to just dumping your plants on the tables. A card could be lost because you failed to turn a plant around so that a blemish was on the side farthest from the judge. He'll most likely spot it anyway but I have got away with it on rare occasion. After staging your plants, to what you consider their best advantage—as neatly as possible, and wiped off their pots with a damp cloth (taken with you for that purpose), check over each entry once more.

Right number of plants in each class, right size pots, right genera?

Class card in the right place, right side up—with your name concealed?

NOW you can go and have breakfast or a large scotch, or both.

When you go back into the hall, whatever has been your fortune NEVER be heard to complain in a loud voice, nor go off into a corner and sulk. Have a look at each class and try to follow the judges thinking, it will give you some insight into their methods next time. If, after consideration, you still cannot see how the judge has reached his decision then approach the steward who went round with him, he may be able to help, if not, then by all means approach the judge himself. If you refrain from addressing him as 'turnip head' or 'obnoxious one' he will be delighted to explain his thinking to you. Even if they do not always agree with me that I grow superlative plants I have found them a very helpful and obliging species—almost human, in fact.

It only remains for you, dear reader, to go to it and put these ideas into practice. I wish you all the sincerest of good luck—as long as none of you beat me.

Forum 1

The Genus Lobivia, Some Further Notes

Compiled by R. B. Pearce.

IN RESPONSE to the *Lobivia* "Forum" in the last issue of the Journal, I have received a letter from John Donald, commenting on some of the points made, especially in connection with the taxonomy of the genus.

Firstly, he points out that Dr. Friedrich is Austrian rather than German, and that he is probably better regarded as a 'good practicing botanist' rather than an 'eminent cactophile'.

On the hybridisation of *Lobivia,* he writes:

"*Echinopsis* does not cross with *Lobivia*!
Lobivia does not cross with *Chamaecereus*!
Echinopsis will cross with *Chamaecereus.*
Ergo some '*Lobivia*' must be *Echinopsis,*

i.e. *L. densispina* and *L. peclardiana,* plus a whole host of others with straight ribs, their seeds check with *Echinopsis* also.

Lobiviopsis, Fric. is not a hybrid genus, but, as its name implies, is for plants like *Lobivia* but which are not true Lobivias, i.e. the *Echinopsis* group with relatively short tubed coloured flowers—*L. aurea, L. densispina,* etc."

On the relationships of *Lobivia* with other genera he says: "Some Lobivias are Sulcorebutias. *L. pseudocinnabarina* is a true *Sulcorebutia* with typical flowers, fruits and seeds. *L. oligotricha* is not a member of the *L. cinnabarina* group. The former is a form of *L. pseudodocinnabarina*—the large flowered *L. cinnabarina* is probably *Echinopsis* in origin.

Neowerdermannia has nothing whatsoever to do with *Weingartia;* its origins are probably with *Neoporteria. Weingartia* and *Sulcorebutia* are virtually synonymous—the link with *Gymnocalycium,* it it exists at all, is most tenuous."

He has kindly supplied considerable further information on the status of *L. oyonica.* (Due to a printing error, this was described as '*L. zoyonica*' in the previous article). He states:

"*Lobivia oyonica* Akers n.n.≡*L. oyonica* Hort.! Originally these plants were white flowered as received from John Akers—they were self-fertile—seedlings raised from this batch of seed produced red flowered (*L. tegeleriana*), orange flowered (*L. incuiensis*), yellow flowered, and white flowered (*L. oyonica*) plants. Subsequently the 'species' seems to have settled down with me as pale orange dominant. The plant looks like a short spined, flattened form of *L. tegeleriana.* The '*L. oyonica*' from Society seed is an *Espostoa*—the seed must indeed have been wrongly labelled. Similar seedlings have been raised from '*L. oyonica*' seed ex Rausch from several continental sources!"

Another of the species mentioned in "Forum" was *L. argentea*; in addition to the lilac flowers described, other colours, ranging from full red to white, also occur, the colours depending on where the plant was collected.

John Donald questions the idea expressed in the previous article on the origin of the genus being in Peru. This suggestion he attributes originally to Dr. Friedrich, but says: "I see nothing primitive in the flowers of *L. pampana/mistiensis*—nor in *L. westii*—*L. tegeleriana*—*L. intermedia*—rather the reverse, I see new species in evolution, quite the other end of the scale! *L. westii,* as stated, has two quite distinct forms, one with spinescent areoles on the floral tube, and one with normal hirsute scales—if it is primitive it would surely have stabilised by now!"

On the use of floral and seed characters in the classification of the genus, he says: "I have much respect for the work undertaken by John Hopkins, but I find myself at variance with his interpretation of the facts. Much of this problem is due, I am sure, to the source of the material studied, and the size of the sample used. There is, without doubt, much abuse of the genus *Lobivia* by nurserymen, who will sell anything without verification of name. The majority of collectors have only one plant of each taxon, which stands, in *Lobivia,* a 50% chance of being wrongly named. How else could John Hopkins classify together *L. winterae* (not *winteriana*), with its large, rotate, short tubed flower, with *L. westii,* which has a small flower and a very long, slim tube? Perhaps by imposing *L. mistiensis* between them as he suggests—no, not even then. I find his use of tubular vs. bell vs. funnelform confusing, as I do not accept the flowers of some of the plants he mentions as having these shapes in common.

The seed studies also are very vexing, and very much, I regret, in the eye of the beholder—you see it, or you don't see it if it doesn't fit your scheme—it's too easy to do this, as I have found myself in the *Sulcorebutia/Weingartia* problem."

Any further contributions on *Lobivia,* either in response to this, or on any other aspect of the genus, are still welcome, and will be included in a later "Forum". The next genus to be covered will be *Ariocarpus.* Contributions are still required for this "Forum"; if you have any ideas or information that may be of interest, please write in—there can be no article without your contributions! Letters on anything related to this genus are welcome; I am not only after 'high-powered'

taxonomic material. Many members must grow plants of this genus, and any observations on growth rates, cultural methods, ease of flowering, setting seed, etc. are bound to be of some interest, The more that is contributed, the more of value that can be published.

Similarly any notes on *Frailea* are welcome—this is to be considered after *Ariocarpus*. Please send any contributions to me as soon as possible at the following address:

Department of Botany and Microbiology, University College London, Gower Street, London, WC1E 6BT.

Succulent Snippets

by Sally Cornioides

COMMENTS on the June Show appear elsewhere and the results show that it will be very worthwhile for most of the entrants there to make another effort at the Show in the Royal Horticultural Society's New Hall on October 7th, 8th. Please obtain your schedules from your Branch Secretaries or write to Mrs. Hodgson (16 The Braid, Chesham, Bucks) for one enclosing a *stamped-addressed* foolscap envelope, as soon as possible.

The classes are practically the same as in the October Show last year as most of them, particularly those for cacti, proved quite popular. The cacti classes need little explanation. Three cacti gives a wide range for good specimen plants and in three Coryphanthanae there should be Coryphanthas and Thelocacti looking their best as well as Mammillaria and other related genera. One plant in Cereanae gives a good choice as well. The class for three plants in Echinocactanae with no pot restriction is the one for the larger growing plants, while the next with a $3\frac{1}{2}$ in. diameter restriction gives a chance for Strombocactus, Turbinicarpus, Aztekium and some of the other slow growing types to be seen. Little mention need be made of Six Cacti in pots not exceeding 6 in. diameter as this is always a well-supported class with good quality plants from a wide selection of genera. There is also a class for beginners and Juniors for 3 cacti with a 5 in. pot restriction.

The other succulents come to the fore in the autumn and, as usual, there is the class for three Euphorbias and three Crassulas. Only two plants in Asclepiadaceae are called for and it should be no hard task to bring up, say, a Huernia and a Stapelia. The three plants in Liliaceae should offer a wide selection from Aloes, Gasterias, Haworthias, Astrolobas and others. The Mesembryanthemum classes are the same; Three Lithops, three Conophytums and/or Ophthalmophyllums and six stemless Mesembryanthemums for the Denton Medal. The class for six South African succulents as usual brings the Pryke Howard Cup for the winner and there is a good number of genera that can be shown here. Two other classes have been changed; there is now a class for three other succulents in $4\frac{1}{2}$ in. maximum diameter pots and one for a specimen succulent which should give a good opportunity to see some interesting plants. There is also a Beginner's and Intermediate class for three succulents. The latter is intended for those who have won a first prize in the Beginners' class but not in any of the open classes. There is also the usual seedling class.

The remaining classes are the same as last autumn: one cactus and one other succulent in pots not exceeding 6 in. diameter, a miniature garden of cacti and/or other succulents and a group of cacti and/or Other Succulents arranged for decorative effect, to cover a space not exceeding 18 in. by 18 in.

Remember staging can take place from 5 p.m. to 9.30 p.m. on Monday 6th October and until 10 a.m. on 7th October. All plants should be cleared by 7.30 p.m. on Wednesday 8th.

THIS is of necessity a rather show theme Journal, but it is always worth seeing these events from all angles. There were many members unable to reach Chelsea or Pimlico, although visitors chatted up at both events came from all parts of the world; even a Russian gentleman visited us on June 14th and was very thrilled with all he saw!

Congratulations must go to the Essex Branch for their efforts for our Chelsea stand. Brushing aside the inevitable comments about 'something from Ben Hur' and 'expecting to see cowboys and Indians peeping out between the "turrets" ', the 'hanging gardens of Babylon' effect showed some beautiful plants off to good advantage and before the end of the week there were some fine flowers opening to impress the general public ('of course they won't flower again for seven years!'). 'Top of the Pops' this year was the large clumping plant of *Mammillaria zeilmanniana* with one mass of purplish pink flowers.

Our show at Pimlico was a real trial run and the Show Committee and all helpers must be congratulated on a very successful afternoon. It was very good to see some new names among the prize winners, too; perhaps not so many as were hoped but they were from different parts of the Home Counties at least. A pity some of our members from more distant parts were not adventurous enough to take part but at least some came to see the show so they may consider entering next year, and make an even more colourful display.

The ladies did a fine job with the teas, too, many thanks to all those home-made cake makers and to the ladies of North Surrey who were busy serving refreshments all afternoon. However, there, as in general stewarding and help with staging and clearing more hands to help would have meant lighter work for all and less exhausted Show Committee and Officers at the end of the day.

Notes and News

North London Branch

Our annual show this year was held in the mobile greenhouse lent to us by Capel Manor Horticultural Centre during the weekend of 31st May/1st June. Mr. and Mrs. Tree were the judges and the Cup winners for 1975 were as follows:—

Championship Cup for the highest number of points: Mrs. J. Pearson

Ivory Cup for three Mesembryanthemaceae: Mrs. R. Dyson

P. V. Collings Euphorbia Cup: Mrs. R. Dyson

Group Cup: Mrs. H. Guirl

Worrell award: Mr. & Mrs. Hankin

There were fewer entries than last year but the standard was, if anything, higher, particularly in the beginners' section. Another closely fought class was class 3—one Ferocactus, won by Mrs. H. Guirl with a *F. townsendianus,* having two splendid heads. Two well matched plants of *Cephalocereus senilis, Oreocereus celsianus* brought victory in class 4 to Mr. J. Shipman, while the now famous *Mammillaria multidigitata,* thrice winner of the best cactus, was coupled with a fine *M. bocasana* to win class 6 for Mr. & Mrs. Pearson. The Rebutias and Fraileas of class 9 made a very colourful display with the flowers fully opened in the afternoon sunshine and here once again Mr. & Mrs. Pearson were successful with *Rebutia calliantha krainziana,* while class 10 for Echinocactus produced one of those interesting situations where the entries were all of the same type—in this case six grusonii of varying sizes. However, the best was not the largest, but a clean well-grown specimen belonging to Mr. J. Shipman. The class for Epithelantha, Copiopoa and Lophophora had some interesting entries and a *Copiopoa marginata* and a *Lophophora williamsii* brought success to Mr. N. Taylor. Two fine, well-grown plants of *Neoporteria tricolor* and *Parodia gracilis* of Mr. R. Dale were judged the best plants of class 13. The class for Epiphytics and Aporocactus was won by a novice, Miss I. Jones with an unnamed Epiphyllum, showing a good display of partly-opened red buds. The Astrophytum class produced four very fine entries which impressed the judges and they gave first prize to the superb specimens of *A. myriostigma* v. *tamaulipense* and *A. mirbellii* of Mr. J. Shipman. The best cactus in the show was once again won by Mrs. J. Pearson, this time with a formidable *Machaerocereus eruca* growing strongly over the end of its long container but owing to an indifferent spring, showing no flower buds. This plant provoked comment and a photograph in the local press. The *E. horrida* and *E. bupleurifolia* entered by Mrs. R. Dyson in the Euphorbia class won first prize and enabled her to retain the P. V. Collings Euphorbia Cup. Class 23 for Agave was won by Mr. R. Dale with a splendid plant of *A. victoriae-reginae* and he was also the victor in the class for Aloe and Gasteria with a very fine *G. lilliputana.* Class 25 called for Asclepiads other than Stapelia and was won by Mr. N. Taylor with a *Diplocyatha ciliata* and a *Huernia keniensis* complete with seed horns. The *D. ciliata* also won the award for the best succulent in the show. Mrs. R. Dyson won the class for Mesembryanthemumaceae with three very fine examples of *Mitrophyllum mitratum, Gibbaeum nebrownii* and *Lithops salicolor* and among the plants in her winning entry in the class for Lithops was a superb *L. optica rubra.* The outstanding exhibit and the winner in the Haworthia class was a plant of *H. truncata* of Mr. R. Dale, who also showed a very large *Mammillaria rhodantha* cristate which gained first place for class 34, cactus or succulent in cristate form, while in class 35, a group of six plants in $2\frac{1}{2}$-$2\frac{3}{4}$ in. pots in a seed tray was Mrs. H. Guirl's winning collection of *Euphorbia bupleurifolia, Mammillaria pitcayensis, Echinocereus viridiflorus, Notocactus ubelmannianus, Pelecyphoa aselliformus* and *Rebutia krainziana.* In the novice section the plants were very good, some being of open class standard. Class 38 was won by Mr. R. Rubin, a junior member, with a good specimen of *Opuntia leucotricha.* The class for Asclepiadaceae was won by Mrs. P. Drummond with a very fine *Decabelone (Tavaresia) Barkleyi.* The six succulents or cacti in pots not exceeding $4\frac{1}{2}$ in. for the Worrell award produced twelve entries of a very high standard, the winners being Mr. & Mrs. Hankin and besides the normal placings, there were four Highly Commended entries. This year, we introduced a new class for junior members under 16. That for cacti was won by D. Shaw, who also won the succulents class with a good *Kalanchoe blossfeldiana.*

Society Christmas Cards

A new design of Society Christmas card is now available, a smaller type with the Society badge and greetings in red. These are obtainable from the Publicity Officer at 5p each or 45p for ten, including envelopes. Please add 10p for bulk orders by post.

East Surrey Branch

The first Branch Show was staged in May and kindly judged by Mr. G. Southon. Although only a small branch as yet, there were many entries in most of the classes and generally speaking the plants were of a high standard. First prize winners in the Novice Classes were Mrs. Brooks, Mrs. Gutteridge, Mr. Ashley and Mr. Ingrams; in the novice classes Mrs. Walton took three firsts; in the advanced classes Mrs. D. Finch, Mrs. E Blote and Mr. D. Knight were first prize winners. Mr. Southon discussed the plants on show after judging.

The June meeting took the firm of a members' discussion. In July a coach trip has been arranged to Mr. B Steven's nursery at Hastings.

North Surrey Branch Annual Show

As usual, this event is being held in conjunction with the Carshalton Show at Carshalton Park on Saturday, September 6th. Judging starts at 11 a.m. and the Show opens at 2 p.m., there will be a sales table and grand draw. Most of the classes are open to all and members of Home Counties Branches are particularly invited to exhibit. If you would like the schedule please send a stamped-addressed foolscap envelope to Dr. T. C. Smale, 25 St. Leonards Road, Epsom Downs, Surrey, as soon as possible. At any rate, do try and come along; there are things for all the family to see and do while you are looking round the cactus marquee!

Asclepiadaceae

Mr. Alf Woodward is to be congratulated on having nursed his quarterly journal "Asclepiadaceae" safely into its second year. As he, himself, remarks in his editorial in part 5 "the interest shown exceeded my most optimistic expectations". This has given him the confidence to accept annual subscriptions in advance (£1.50). No doubt it will not be long before we hear of 'asclepiadophiles' if this movement spreads.

The following soil mixture for stapeliads is taken from the Cactus and Succulent Journal (New South Wales) for March:

2 parts old cow manure
4 parts old leafmold and peatmoss
1 part garden loam
2 parts coarse river sand.

Mix well and always put a layer of coarse sand round the neck of the plant.

New Cacti

The following new cacti are described in "Kakteen und andere Sukkulenten" volume 26, parts 1 to 6 (January to June, 1975):

Echinopsis arachnacantha H. Friedrich var. *vallegrandensis* Rausch, from Bolivia;
Discocactus ferricola Buining et Brederoo, from Brazil, Matto Grosso;
Rebutia (Digitorebutia) diersiana Rausch, from Bolivia;
Sulcorebutia cardenasiana Vasques, from Bolivia;
Pyrrhocactus pachacoensis Rausch, from Argentina;
Pseudopilocereus werdermannianus Buining et Brederoo, from Brazil, Minas Gerais;
Discocactus cephaliaciculosus Buining et Brederoo, from Brazil, Goias;
Facheiroa cephaliomelana Buining et Brederoo, from Brazil, Bahia;
Rebutia (Aylostera) leucanthema Rausch, from Bolivia.

New Euphorbias

L. C. Leach has published the fourth part of his study of the genus *Euphorbia* in Angola (Carcia de Orta. Ser. Bot. Lisboa **2** (1), 1974, 31-54). In this well illustrated account he establishes the validity of *E. candelabrum* Welw. and reduces *E. conspicua* N.E.Br. to synonomy. Seven new species are described, three of these being tree species close to *E. candelabrum*, and four related to *E. hermentiana* and *E. negromontana*.

Psychologically Speaking

Psychoanalytic theory, as developed by Freud and others, tells us that many objects in our everyday world have unconcious meanings that are unexpected. Of course, since we are not aware of these reasons, I can't list them, but I believe that some of them are operating in making what appear to be irrational choices for the selection or elimination of certain species. If Freud had been a cactus collector, I'm sure he would have written a paper that started out pointing out that globular cacti were female and cereoid cacti were male. You can take it from there. If you dream about cacti a lot, consult your phone book for a local psychoanalyst. He needs your money so he can expand his collection.
(Prof. Lee H. Bowker, in CSIE, June, 1975)

Another Succulent?

One of the plants which attracted much comment at the recent Chelsea Flower Show was *Rechsteineria leucotricha*, with its whorls of tubular, pink flowers backed by grey foliage. It is a close relative of Gloxinia and Corytholoma and like these possesses a tuberous root from which new growth develops each year after a dormant period. It was originally found in the Brazilian state of Parana, growing on rocky crags around a large waterfall. For many years it has been grown as a choice conservatory or houseplant, more particularly on the Continent, but in recent years it has become more widely distributed by nurserymen as a succulent.

An Interesting New Crassula

In 1972 Mr. A. B. Lau collected an Echeveria-looking plant in a remote part of Mexico near the Sonoran border in Chihuahua. Its large red flowers produced on subsequent cultivation indicated a useful addition to known Crassulaceae. This has now been described by Moran and Meyran (Cactaceas y Suculentas Mexicanas, XIX (4), 1974) as both a new genus and a new species under the name *Tacitus bellus*. It has a compact rosette of from 25 to 50 leaves, the floral stems arise from near the centre and have up to 10 individual flowers. Closely related to *Graptopetalum*, it differs in a number of floral details. An illustration in colour accompanies the article.

Postage increases

Owing to a considerable increase in postal charges for small packets members are asked to add a minimum of 10p when ordering items such as Guide to Genera or booklets; this will also help defray charges for envelopes and packing.

SOCIETY SALES

Binding Cases—green cloth binding cases with gilt lettering on the spine, taking 12 issues (3 volumes) of the Journal ... ... £1 post free

Labels—triangular white ivorine plant labels in packets of 100 ... 30p post free

Badges—identify yourself with the Society's attractive lapel badge ... 30p post free

Booklet for Beginners—'How to grow Cacti and Succulents' by E. Shurly with an appendix on 'Seed raising and Window Culture' by A. Boarder; eleventh edition ... ... 19p post free

The above are available to members from Mr. D. T. Best, 16 Ashleigh Gardens, Sutton, Surrey. Postal orders and cheques should be made payable to the Cactus and Succulent Society of Great Britain.

Pens—ball-point pens in yellow and blue with the Society name in bundles of 25 ... ... £1.20 post free

Car Stickers—useful publicity for the Society, per packet of 10 ... £1.60 post free

Ties—in navy, maroon or green ... ... £1.05 post free

The above are obtainable from the Publicity Officer, Mrs. B. Maddams, 26 Glenfield Road, Banstead, Surrey. Branch Secretaries are invited to obtain these in bulk for resale at Branch meetings.

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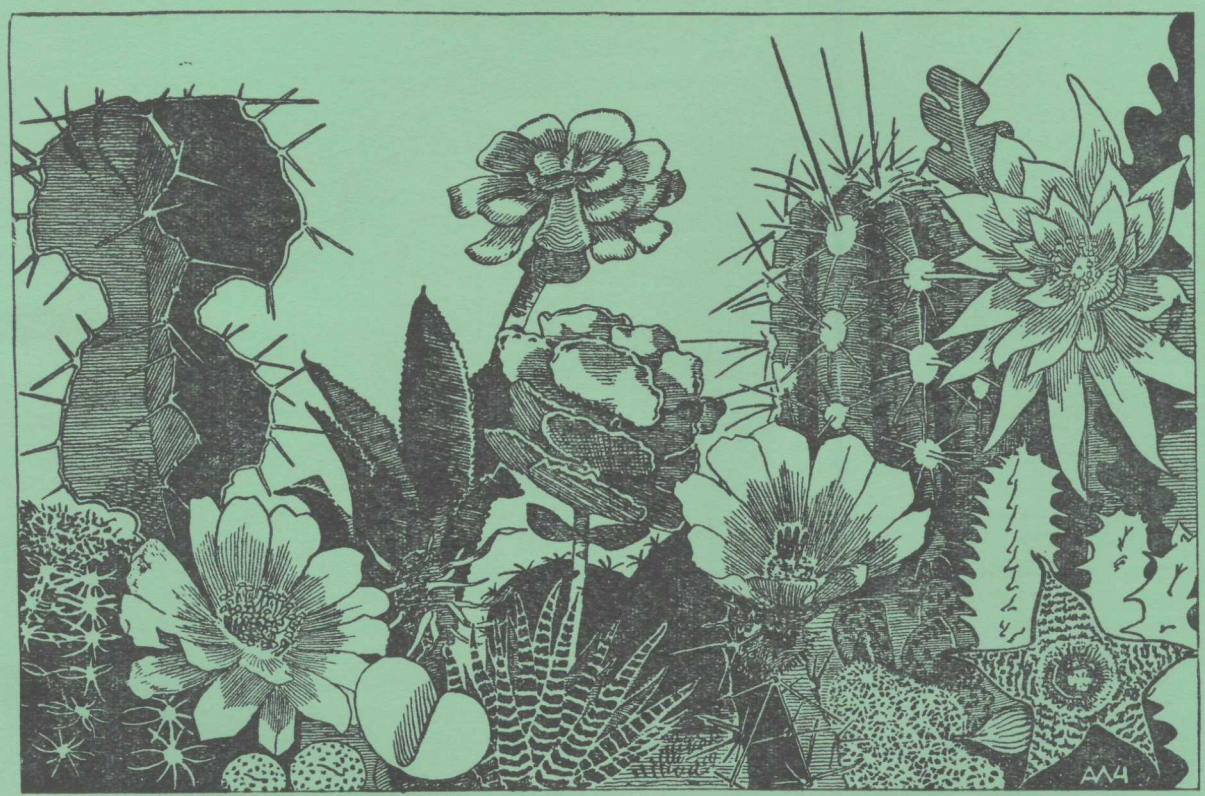

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SUBSCRIPTION RATES 1976

Full Membership	£2.50
Joint Membership	£3.50
Associate Membership	£1.00
Junior Membership	£1.50

Residents overseas are now required to join as 'full members' and subscriptions for 'journal only' are not available. Postage by surface mail is included in the charge; airmail postage will be extra. Payment should be made in sterling, cheques, etc. being made out to 'The Cactus & Succulent Society of Great Britain'.

Owing to greatly increased postal charges correspondents within the United Kingdom are requested to include a stamped addressed envelope if a reply is required.

ADVERTISEMENT RATES 1976

Full page	£9.00 per issue
Half page	£6.00 per issue
Quarter page	£3.00 per issue

In addition SMALL ADS are accepted at 12p per line, minimum 36p.

Inquiries to Dr. G. C. W. Randall,
150 Banstead Road, Carshalton, Surrey.

BACK NUMBERS of the Journal are obtainable from Mr. A. W. Heathcote, Southwold, Station Road, Bishopstone, Seaford, Sussex, BN25 2RB; price:

Vol. 20–22	15p per number
Vol. 23 onwards	25p per number

Postage extra overseas.
Each volume is made up of 4 numbers.

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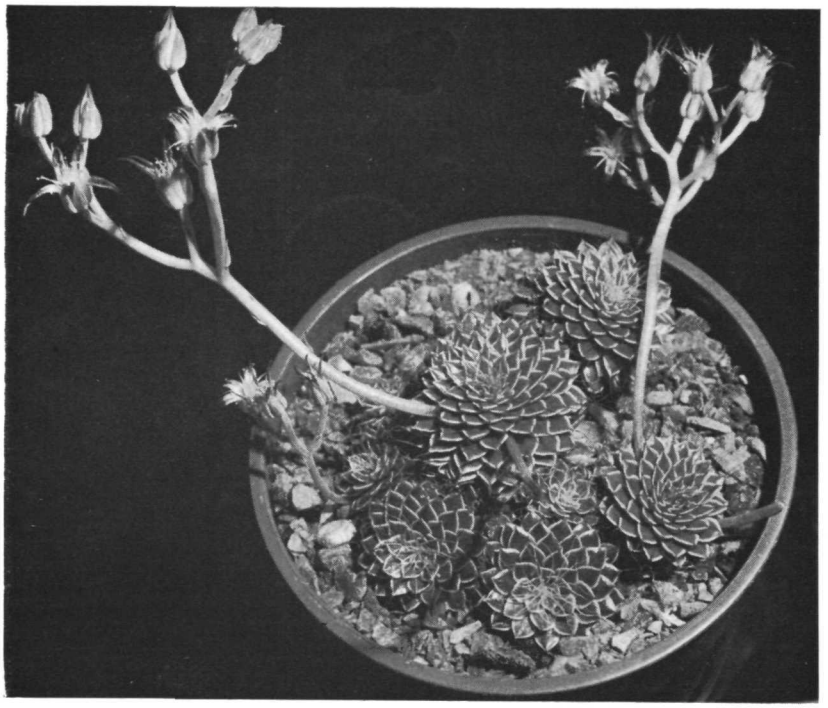

Graptopetalum filiferum (photo: M. J. Martin)

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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, 31st March, 1976 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) & (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 9 weeks prior to the Annual General Meeting, that is, not later than Tuesday, 27th January, 1976.

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

Chairman	Mr. W. F. Maddams
Honorary Secretary	Mr. R. H. I. Read
Honorary Treasurer	Dr. R. Rolfe
Members of Council	Mesdames R. J. Dyson and A. Whicher, Mr. A. F. Clare.

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

Membership Fees, 1976

SINCE becoming Honorary Treasurer of this Society I have had the misfortune of inheriting a diminishing bank account. With the present rate of inflation and proposed price increases, especially postage, I have estimated that there would be a loss of the order of £100 for the year ending December 31st, 1975. I hope, however, that the small surplus of money carried forward from earlier years will be enough to cover this potential loss. Therefore in order to provide adequate funds for the running of the Society, Council has agreed to membership fees being increased as follows for 1976:

Full member	£2.50
Joint members	£3.50
Associate member	£1.00
Junior member	£1.50
Foreign member	£2.50

In addition, advertising rates will be increased by 50 per cent:

Full page	£9 per issue
Half page	£6 per issue
Quarter page	£3 per issue
Small ads.	12p per line, minimum 36p.

You may wish to note that the following rationalisation of membership fees has been carried out:

(i) Joint members, usually husband and wife, will pay the equivalent of full plus associate membership, although both will have full voting rights.

(ii) Junior members have their subscription increased to a figure that will just cover the cost of printing and posting the Journal.

(iii) Foreign members are offered full membership of the Society as it has been found that in some cases more money was being expended in posting journals abroad than was being received towards postage from "overseas journal only" subscribers. Subscriptions for the Journal only will no longer be accepted.

The Society's main expenses arise from the printing and posting of our Journal, and there is little we can do to effect savings here. Indeed printing costs have already increased by about one third this year and by the end of the year postal costs will have virtually doubled. However, whilst carrying out my duties as treasurer it soon became apparent that a substantial saving in postages could be made if the method of dealing with society sales was amended. Therefore society sales to individuals have been suspended for the time being until a small committee has had an opportunity to discuss and, hopefully, centralise such sales. Bulk orders from branches will, however, be dealt with as usual. Individual members are to accept my apologies for any inconvenience this may cause.

R. Rolfe. Hon. Treasurer.

The Flowers of Opuntia glomerata Haw. and Opuntia andicola Pfeiff.

by Gilbert Leighton-Boyce

Opuntia glomerata in flower (photo: G. G. Leighton-Boyce)

RELUCTANCE to flower in the conditions available in Great Britain is noted in the literature on the glomerata/andicola range of Opuntiae, so it is a pleasure to be able to document a couple of instances in which it has happened on plants well established in different parts of this country, with the welcome inference that there may be others.

One concerns Mr. Stuart L. Carter of Scarborough whose plant flowered for four days in June 1974 when it was 5 or 6 years old from a two joint cutting taken from his father's plant obtained elsewhere in Yorkshire some 12 years before then. When it flowered the plant was in a 6 inch plastic pot of mixed Levington compost and washed beach sand, having been re-potted from a loam-sand mixture. The flower opened at noon on 4 June closing each evening until the evening of 7 June. Mr. Carter's description is, as far as I know, the first reasonably full one to be published and is as follows:—

"A fairly typical Opuntia flower. Colour of petals pale yellow, tinged greenish-brown at the tips. 9 lobes on stigma, each 1.5 mm dia. pale greenish white, 4 to 5 mm long. Style stout, 3 mm dia. tapered narrower to top. Stamens white, anthers cream. Petals approx. 1 cm broad. Ovary 2½ cm long, 1 cm broad at base, 2 cm broad at top, with a few spines near top (up to 2 cm long). Inner petals number about 15. Leaves on ovary merge into petals."

He describes the plant as having "conical joints, about 4 cm long, and with very vicious spines, flattened, up to about 6 cm long, glassy white, tipped yellow to reddish, one to an areole on new joints, up to four on older joints." This would suggest *prima facie* a position for the plant towards the larger (*andicola*) end of the range.

Earlier published information is silent on the floral characteristics of *glomerata sens. strict* and very brief on *andicola* so this flower by itself can hardly affect the case for treating them or not treating them as separate species: but the longitudinal furrows remarked by Hauman on the style of his andicola seem either to have been absent or not noticeable.

The writer has duplicated some of this experience on a similar plant in London in June 1975. In a miniature heat wave under unshaded glass the flower opened earlier in the morning (about nine o'clock) on 10 June closing in the evening, repeated the opening on 11 June but was then finished. The plant which has about 20 joints had been re-potted the previous year into a 4 inch clay pot containing (as an experiment) plain Levington and had been bone-dry throughout the winter, with extreme difficulty in re-wetting in the spring (which

mixing this compost with coarse sand can, of course, to some extent overcome). The following description of the flower varies in some quantities slightly from Mr. Carter's and adds further detail:

"16 petals (strictly, petaloid perianth parts), pale yellow with a satin sheen, brownish towards the tip, width variable but most about 1 cm broad, some with a distinct brownish line to a small point in the top edge, which is usually uneven and rather wavy, length about 25 mm, opening in full sun only to an angle of about 45 degrees from the top of the ovary tube; 8 sepaloid perianth parts of a greenish brown colour; ovary tube about 15 mm dia. at top and about 20 mm long (overall length of flower about 45 mm) its brownish green outer surface slightly tuberculate and having 16 or more aeroles about 10 mm apart bearing white wool and a short green leaf, with glochids just appearing out of the wool in most, the upper two-thirds of the aeroles bearing also spines 4 or more in number uneven in length and progressively longer in the higher areoles up to 20 mm or more. Inside the flower a wide cylindrical style (white) over 10 mm tall, thickening at the bottom, bearing 10 unevenly divided stigma lobes (yellow with a slight greenish tinge) surrounded by many stamens shorter towards the centre with pale yellow filaments and cream introrse anthers."

This plant came from the stock of a well-known nursery in Sussex years ago, labelled "russellii". The spination on the ovary tube tends to confirm that this is (as one had concluded for other reasons) the wrong name, because Britton and Rose specify for *russellii* that the globular fruit is spineless and it seems incredible that all the spination should disappear during ripening. The plant has a very impressive growth of many extra long glochids close together like a shaving brush in the lower areoles of the older stem-segments and these areoles have no spines. The conical segments (2½ cm long, 1+ cm largest diam.) are not much bigger than the ovary tube which is of a similar but inverse conical shape. The aeroles on the upper half of mature segments bear one or occasionally two long flat white spines with red-brown tips (this being a survival of the colour which goes right down the spines as they first grow on new segments when they have a darker brown tip). The longest spines are 4 cm in length springing outwards and upwards occasionally accompanied by 1-2 short, wispy spines, appressed and irregular in direction. The new segments have small greenish brown leaves and the areoles also exhibit some short wool with glochids barely noticeable above it.

Another older (but so far non-flowering) plant of the same sort in the writer's collection shows some spines up to 5 cm long and some stem-segments nearly 3 cm long: various considerations suggest that so far as one can distinguish them the London plant is nearer *Opuntia glomerata* Haw. and the Scarborough plant nearer *Opuntia andicola* Pfeiff.

The London plant which flowered was inaccessible without damage at the back of a staging, so the illustrations to this article are taken through glass with a limited choice of viewpoint.

Reference

Leighton-Boyce, Gilbert and Iliff, James. "The Subgenus Tephrocactus", 52-7, 62 (1973).

Ferocacti for Flowers

by W. F. Maddams

ALTHOUGH Professor Borg described *Ferocactus* as "this princely genus of cacti" his accolade does not seem to have stirred the enthusiasm of the average cactophile for this group of plants. Whereas the eminent Maltese writer was undoubtedly referring to the majestic proportions and spination of adult plants the ordinary enthusiast is apathetic towards the genus partly because the plants grow large and also because he assumes it is only when they are large that they will flower. So far as the first point is concerned, it is perfectly true that many of the species do eventually attain quite a size but they are comparatively slow growing and they take a good many years to attain embarrassing proportions. Secondly, there are a number of species which will flower readily and reliably at a comparatively early age, as is becoming increasingly clear from snippets of information which appear from time to time. It is the purpose of this short article to collect together and collate this information, primarily to encourage more cactophiles to grow a few flowering *Ferocactus* species. It is also hoped that it will stimulate others to provide information, to extend what is written here and to correct any errors, since no claim to complete accuracy or full coverage is made.

Without doubt the species which is quite reliable in its flowering habits, by common consent, is *F. glaucescens*. Blooms appear when plants reach about five inches in diameter and for a well-grown specimen this probably means from about eight to ten years of age. The buds usually start to appear around the end of March and the yellow flowers at the end of April or in the first half of May, depending on the temperature and the amount of sunshine. A relatively modest sized plant, say six or seven inches in diameter, will often produce ten or twelve bloims per year. Even when it is not in flower, *F. glaucescens* is quite an attractive species; the

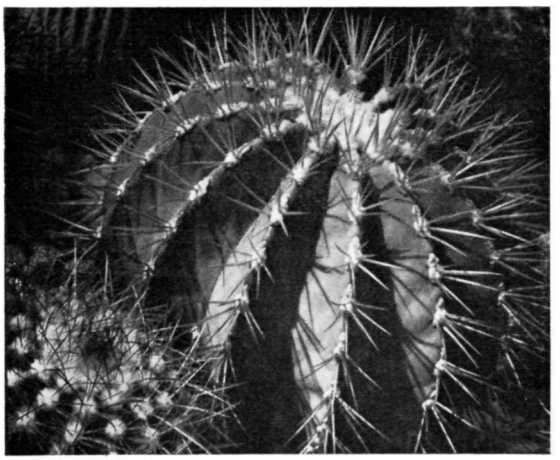
yellow spines contrast well with the glaucous bluish-green body and it deserves to be widely grown.

F. latispinus has also flowered in quite a number of collections in Great Britain, usually when the plant reaches about six inches in diameter. Borg describes the blooms as mauve to deep violet blue but I would call them a dusky deep red colour, a hue not often found in the Cactaceae. It is probably true to say that this species needs a very good light, better than for *F. glaucescens,* to induce flowering. However, as its body is flat and globular it can easily be placed on a shelf close to the glass.

There has been something of an influx of *Ferocactus* species from Baja California during the last year or two and, as a result, it is evident that *F. fordii* flowers reliably when it is six or seven inches across, usually obliging some time during May. Although most of the plants on which these comments have been based are established imported specimens, this species grows well from seed and it is reasonable to surmise that it will reach flowering age at about the same time as *F. glaucescens*. *F. viridescens* is another species from Baja California that looks to be one of the best for flowers. Indeed, the September 1974 issue of the *National Cactus & Succulent Journal* has a cover photograph of a plant with one bloom, and the body of the plant is only three and a half inches in diameter. It is obviously of great interest to be able to confirm that this is a regular occurrence with plants of this size. *F. townsendianus,* also from Baja California, has flowered in some British collections but on the basis of the limited evidence available to date it does not do so as reliably as the four previous species.

The south-west of the U.S.A. is the home of two imposing species, *F. acanthodes* and *F. wislizenii,* which attain considerable dimensions at maturity. Not surprisingly, therefore, they need to be somewhat larger before they flower and it is also fair to say that sunny weather in April and May is more or less mandatory for success. *F. acanthodes* will begin to flower when some eight inches in diameter but somewhat larger plants will produce rather more blooms. It should also be said that the plant must be in active growth for this to happen. Consequently, some of the larger imported specimens paraded to no avail around shows of recent years, because they have not rooted, cannot be expected to oblige. *F. wislizenii* needs to be rather larger; on present limited evidence ten to twelve inches seems to be the minimum size so owners of plants approaching these dimensions may look forward with anticipation.

I am not a serious student of the genus and therefore do not know a great deal about its taxonomic aspects; however, I suspect that *F. echidne,* from Hidalgo, must have distinct affinities to *F. glaucescens*. It is therefore not surprising to learn that the former is not too difficult to flower, probably when it reaches six or seven inches in diameter. Likewise, I have seen *F. victoriensis* or *F. echidne* v. *victoriensis* according to Dr. Lindsay, the



Ferocactus glaucescens (photo: H. Broogh)

American authority on the genus, in flower at much this size. To my uncritical eye *F. alamosanus* also belongs to this general group and it has flowered in Britain, too. E. W. Putnam, editor of the *National Cactus and Succulent Journal,* has recorded blooms on a plant four inches high and five inches wide which he believes is about twenty years old. I have a plant of much this size and I am therefore hopeful of seeing its flowers within a year or two.

Last, but certainly not least, mention must be made of *F. macrodiscus,* an attractive flattened globular species from the central Mexican state of San Luis Potosi. Although it eventually reaches about ten inches in diameter it flowers easily and consistently at about four inches, a size which should encourage anyone who believes that he does not have enough room for a flowering Ferocactus. Unfortunately, it is not too readily available at present and it is to be hoped that seed will come onto the market. It is worth noting that a plant of this species was exhibited by Holly Gate Nurseries at an R.H.S. Show on 3rd/4th April 1973 and received an Award of Merit as an ornamental flowering plant for a temperate greenhouse.

Secretary's Notes

THIS YEAR's Dinner will take place as usual at Mecca Ltd., Colonial House, (William & Henry Suite), Mincing Lane, London, E.C.3 on Saturday, November 29th at 6.30 p.m. for 7 p.m.—Price £3.60 per head.

Mr. Peter Peskett (editor of *Garden News*) and his wife will be our Guests of Honour and we shall look forward to seeing some films from Peter Ashley as our after-dinner entertainment.

YOUR IMMEDIATE ATTENTION TO YOUR APPLICATION FORM ENCLOSED IN THIS JOURNAL IS REQUESTED.

Cultivation of Succulents

by Mrs. M. Stillwell

IN ALL the years I have been growing plants I have never known such burning heat as there has been this summer. With all possible ventilation, it has been absolutely necessary to apply shading to the glass in order to prevent scorching. This is something I have always been loath to do, but this year there was no alternative. The new products now on the market are very easy to apply and can be just as easily removed with a dry duster when the time comes. They are quite unaffected by rain. My plants suffered a tremendous amount of scorching, particularly in the mesembryanthemum section, when I took an early holiday and the heatwave started unexpectedly. I have been anxiously waiting to see if the new bodies of Lithops, Conophytum and Argyroderma, etc., are going to come through, but in many cases, sad to say, they have been burnt right through and the growing points destroyed.

It is very sad to see large established groups reduced to one or two heads. To anyone who has had a similar experience I would say to them—do not break up the plants until next growing season and give them a chance to right themselves.

We shall soon be thinking of how to get our plants safely through the winter. With the present price of fuel, whatever system one favours, is bound to prove expensive. I always try to get the majority of plants all in the one house where they are packed as tightly as possible, including most of the floor space leaving just room to walk. Any plants that I am not too fond of have to take their chance in the old house, which has to act as potting shed and store for soil, pots and the like. This house was left unheated last winter, which I admit was mild, and on particularly cold nights the plants were covered with newspapers, but nothing came to any harm. One has to be drastic and only keep in the heated house those plants that are in first class condition, leaving the rest to take their chance. If it is possible to arrange some of the plants in the cold house in trays, these can be removed without difficulty either indoors or temporarily on to the precious floor space left in the heated house.

Many of us tend to keep a lot of unnecessary succulent plants, such as large clumps of the commoner Crassulas, Aloes and Haworthias. They take up lots of valuable space, and a small pot of each to represent the species is all that is required. Even if you are show-minded and must have large plants, remember it is the choicer plant that usually gains most marks, and you have a lot more space for the little gems if you dispense with some of the large plants that are past their prime. Succulents of the leafy kinds keep much more attractive if they are restarted every few years, and they grow much quicker as the old stems become woody with age and grow slowly. Stapelias, in many cases, make large plants in a short time and flower freely on the new growth. It is necessary to remove old growth every few years to keep them at flowering peak.

People who are forced to grow their plants on window-sills may find that these grow better when placed together in large pans or bowls rather than in individual pots. This is because the plants respond to the extra root room they enjoy. Indoors the atmosphere tends to be drier, especially in winter when the central heating is on. It is now possible to buy large polystyrene troughs that fit nicely on a window-sill and in these the plants can be arranged attractively, either directly into a suitable compost or kept in their pots and bedded in peat. The peat can be kept damp during the winter and this removes the danger of soil being saturated around the neck of the plant and causing rotting. Either way, the whole trough can easily be removed from the window-sill on a particularly frosty night, or for cleaning purposes. A room facing north is ideal for such plants as Aloes and Gasterias, which give a lot of pleasure in their variations without the necessity for lots of sunshine. If mealy-bugs appear paint them with a little surgical spirit straight from the bottle; this will not harm the plants. Keep the soil open by adding coarse grit such as aquarium gravel or cornish grit, and make sure that water runs straight through the soil so giving the plant roots a chance to breathe and remain healthy. Soil that clogs together in a tight mass will slow up growth through lack of air and moisture to the roots.

It is possible to have a number of succulents in bloom at Christmas, including Trichodiamea, Faucaria, Gibbaeum, Fenestraria and dwarf Aloe, among many others. These will need water, of course, from time to time and should not be allowed to go so dry as we tend to do with cacti. Try to ventilate the greenhouse as much as possible during the winter. Our plants benefit by a good current of fresh air and one window at least should be left slightly open at all times to prevent a stagnant atmosphere.

February Journal

The Editor would appreciate having articles and notices for the February number not later than December 10th. This is essential if prolonged delay due to Christmas and New Year holidays is to be avoided.

Caralluma incarnata var. alba (G. Don) N.E. Br.

by R. W. K. Holland

Caralluma incarnata (photo: R. W. K. Holland)

CARALLUMA is something of a dustbin genus among the stapeliads. Plants which do not fit comfortably into any of the other accepted genera become placed here. As one would expect, therefore, the range of flower type and stem form is considerable. Among the smaller flowered species is *C. incarnata* (Lin. fil.) N.E. Br. Having passed through *Stapelia* and *Piaranthus* it has, at least for the time being, found a home in this most accommodating of genera.

The species is fairly widely distributed in the western area of South Africa but the variety *alba* appears to be confined to the more southerly parts of this range. The plant shown in the photographs was grown from seed stated to be collected near Wuppertal, Clanwilliam District.

Stems are about 15 cm tall and 12 mm or so thick. They are 4-angled, though the ribs are less easy to count on the upper parts of the stem in the region where the inflorescences are produced. Here they spiral or even become discontinuous. Flowers are produced in clusters of 3 to 5 but are developed successively. They are larger than in the var. incarnata, being 15-25 mm in diameter. In the plant illustrated they are at the lower end of the range. The epithet *alba* is something of a misnomer as they are pale cream with a pinkish reverse. Around the mouth of the tube the inner surface is scantily clad with short pink hairs. The smell is rather curious. It could not be described as pleasant, having a sickly sweet overtone.

Although the individual blooms are not showy they are produced in great profusion and contrast well with the dark green stems. The plant first flowered for me in late April of this year from inflorescences produced last autumn. As I write, at the beginning of July, further buds are appearing and I am therefore hoping for another display in the autumn.

The descriptions of *C. incarnata* and *C. hottentotorum* (N.E. Br.) N.E. Br. are very similar and both species come from the same area. Several varieties of the latter species have been described, showing variation in flower size and corona form. In view of this, one wonders whether further studies will indicate that *C. incarnata* should also be included within that species, representing simply a slight extension of the currently accepted variation.

Seasonal Cactus Care

by W. F. & B. Maddams

THERE is a great temptation to write retrospectively towards the end of a year and this is no bad thing if it is done in a constructive way. Both we and the readers should ask ourselves what have been our successes and failures and why they have occurred. It is all too easy to reminisce about the wonderful display of flowers and to forget those plants that disappointed. This is particularly the case of recent weeks when the warm, sunny conditions have led relatively shy blooming species to do better than was the case in 1974. This tends to produce a state of euphoria.

This point is well illustrated by reference to the Series Ancistracanthae of the genus *Mammillaria*. These are the species, the best known of which is *M. sheldonii/swinglei,* with the large colourful flowers which, in a good summer, appear from early June until late in September. This group of species has undoubtedly done well this year, both by our own experience and from what we have been told by others. Although *M. sheldonii/swinglei* flowers quite readily in warm and reasonably sunny conditions, some of its allies such as *M. microcarpa, M. pseudoalamensis, M. boolii* and *M. wilcoxii* will only give of their best in conditions such as we had during July and August.

However, in some cases it is not only a matter of having the correct temperature and light. Species such as *M. boolii* and *M. mainae* will make buds but these often abort unless ample water is given. However, once the flowering season is over much less water must be given as the plants of this group have relatively poor root systems and are intolerant to damp conditions out of the growing season. Consequently, a number of factors usually determine whether species such as *M. boolii* and *M. mainae* flower freely and it is not always easy to decide why blooms have not been obtained from a particular plant. Nevertheless, the attempt should be made, particularly if there is reason to suppose that the plant is not in the best of health. If it looks jaded and has not made appreciable growth during the year it should be marked down for attention next spring. Plants of this type often have ailing root systems and when the next growing season arrives there is much to be said for cutting away all the old roots and making a fresh start.

If the plant is making no progress there is nothing to be lost by this course of action and, potentially, much may be gained. If a plant looks positively sick during the winter months, particularly if there are signs of rot, take immediate action. Remove it from its pot and look for the cause of the trouble. Cut away any rotten roots or body and if the surgery has been extensive keep the plant in a dry place, preferably at not too low a temperature, until the longer and warmer days return. All too often plants which begin to rot in mid-winter are excessively sappy, probably as the result of too much water in the autumn, and it is then rather difficult to

Mammillaria microcarpa v. milleri (photo: B. Maddams)

prevent a rapid spread of trouble. Nevertheless, it is worth a try.

After a long, warm summer, by the end of which watering may have become a chore, it is tempting to heave a sigh of relief when winter arrives, particularly if one has no qualms about the efficiency of one's greenhouse heating system. The inclination is to turn one's thoughts and energies in other directions. This is a mistake. There is certainly less to do but, equally, much less time in which to do it. The average cactophile will only be able to inspect his plants at weekends during the winter months and during December he will become involved with the Christmas shopping and other preparations for the festive season. Hence, time is definitely at a premium and should not be wasted.

Although renovation work on the outside of greenhouses should have been dealt with during the summer months it is still possible to deal with urgent work of this type during dry mild spells in November, December and January. Now that glazing with putty is going out of fashion the replacement of a cracked or broken pane of glass is feasible at any time of the year. We can recall one or two frustrating moments when tackling this job out of season with our larger greenhouse, purchased in 1964, which has the older type of glazing. It was difficult to keep the putty in a pliable state and it would not adhere easily to the wood because of condensation.

Another job which can be tackled out of season given favourable weather conditions is the application of wood preservative. The danger spot for decay lies at the bottom of the sloping roof glazing bars which stay wet longer than the other timbers. These should be inspected regularly and if soft wood is found it should be scraped away and preservative applied. On the sound principle that prevention is better than cure, the application of preservative to wooden greenhouses should be done on a regular basis. The frequency will depend to some extent on the type of wood involved but one should never underestimate the need for treatment. Our larger greenhouse is made of oak but, nevertheless, we found significant softening of the wood at the bottoms of the roof timbers after seven or eight years.

Another difficulty which may beset owners of wooden greenhouses for a time during the autumn months is the seepage of rain during stormy conditions. The wood dries out and shrinks if the summer is particularly warm and gaps appear both between wooden joints and between wood and glass. This situation will gradually correct itself but during the interim period a sharp watch should be kept for drips and any plants being affected should be moved promptly. If the gaps do not close it is possible to seal them from the outside with an adhesive waterproof tape. This can be bought in various widths and one form has an aluminium backing, making it easier and cleaner to apply.

There is much to be said for doing internal greenhouse work during the winter months. Anyone who has driven screws during warm weather will appreciate this point. On the other hand if a major reconstruction of the staging or something similar is contemplated this may have to be done during warmer weather because the plants may have to be moved outside temporarily. Fortunately one seldom hears of staging collapsing but it is as well to check on the state of the supports from time to time and to strengthen them if necessary. As plants grow their weight increases, particularly if large clay containers are used, and the consequences of a collapse can be dire.

The winter months should also provide the opportunity to inspect the plants at leisure, for various reasons which tend to be overlooked during the summer months when growth and flowering are the all-important factors. For reasons beyond our control the great majority of us have wrongly named plants, some known to us and others not so, and although the correct naming of a plant is not "the be all and end all" of the matter for most of us, a reasonable effort should be made. In many cases identification can be made without floral characteristics and a dormant plant is therefore as suitable as one in growth given that it is healthy. Plants assigned to wrong genera present a more serious problem particularly to those who show, and every effort should be made to correct errors of this type. Fortunately, they are not common and are usually easy to recognise.

Most of us have plants which have grown considerably since we acquired them but still retain their original labels. These are then out of proportion to the size of the plant and should be replaced. Some cactophiles attend to this matter when repotting whereas others leave it for another occasion and what better than the winter months for this job. There are various opinions about the best type of labels and there is currently a fashion for punching the names on adhesive plastic tape which is then fixed to the pot immediately below the rim. This is certainly neat although it precludes the practice, which we have indulged in for quite some years, of noting the date of repotting on the back of the label. We prefer the oblong type of plastic label but have been disappointed and irritated on more than one occasion when, having become almost standardised on a particular type, we have found that their manufacture has been discontinued.

The ever-increasing cost of fuel has led a number of cactophiles to speculate on the possibility of growing at least some plants without heat. It will not be a bad thing if some experiments are undertaken as little information is available on this point. We have had reports of plants surviving out of doors during the last winter or two but one must recognise that conditions during this period have been distinctly atypical. There are undoubtedly a few cacti which are hardy out of doors when given a modicum of shelter against excessive rain or snow. Those members who have ever visited the University Botanic Gardens at Cambridge will probably have seen

the large plant of *Opuntia cantabrigiensis* which has survived the chill winds of East Anglia for many years. It is true that it bears the marks of its rather rigorous existence and it is planted in a bed immediately to the south of a large greenhouse; nevertheless, it shows what is possible.

However, most of us will be less ambitious and will be interested only in the possibilities afforded by a cold greenhouse or frame. We can only offer some general guidelines and no firm conclusions from any experiments of this type can be drawn until we again suffer the misfortune of a hard winter. *Chamaecereus silvestrii* is certainly tolerant of a good deal of cold as are many of the *Rebutia* and *Lobivia* species. This is also true of the *Notocactus* species of the *pampeanus/mammulosus* group; the newer Notocacti from southern Brazil are comparatively tender and plants such as *N. magnificus* probably benefit from a minimum of 45°F. It is worth noting, in passing, that the recently published review of the genus *Notocactus* by Dr. A. W. Mace contains a good deal of useful cultural information on this group of plants.

There are also potentially cold-resistant plants from North America. Many *Echinocereus* species are native to the mountainous regions of Arizona and New Mexico and trials with plants of *E. engelmannii* and *E. triglochidiatus* could prove interesting. There are those who maintain that cold winter conditions lead to better flowering on many *Echinocereus* species and if this proves to be true it would be an added bonus. *Coryphantha vivipara* is widely distributed in northern areas of the U.S.A. and even spreads across the border into Canada. Hence, it is certainly resistant to cold and the only doubt relates to its ability to withstand the damp of the English winter even when protected from rain and snow. There are several *Opuntia* species which deserve trial if room can be found for them. The International Succulent Institute propagated from plants of *O. compressa* collected on Long Island, New York, and we have one of these. We are growing it on with a view to further propagation so that if one particular outdoor experiment ends in failure we shall have more plants with which to continue the trials. It is to be hoped that members with an interest in this particular topic will have the urge to experiment and report back in due course.

Four is what we wanted . . .

by Robert Foster and Charles Glass

IN LATE February of 1968 the authors undertook the following expedition into the south-eastern portion of the state of Texas and the north-eastern quarter of the country of Mexico, the express purpose being the collection of plants, and photographing of localities, of the plants in the section Dolichothele, of the genus Mammillaria. These plants have been a source of confusion for years. They have been in and out of Dolichothele as a genus, in and out of Mammillaria, in and out of Oehmea, as well as many plants being included in this section which have no close affinities with any of its members, e.g., *M. decipiens, M. camptotricha,* etc. This article is, however, not meant to be a long, dry treatise on Dolichothele, but a fast-moving, plant finding, *tequilla drinking,* photo-taking, note writing, hill climbing, *heck of a good trip.*

We left Los Angeles on 21.2.68 late in the day. (The only reason we went in February was because we couldn't go earlier.) The first two days and nights of travel through California, Arizona, New Mexico, and Texas, Texas and more Texas, were without collecting stops. (Witness our wonderful self-control!) Can you imagine 1,500 miles of cactus country and not stopping once to collect? We might be considered daft for this, but when one can visualise the treasure-trove of plants in north-eastern Mexico, it is much easier to keep the blinders on and forge ahead. When we neared the town of Marathon, Texas, the collecting urge overcame any good sense we may have had. When one can stop a tone hill, only four miles off on a side road and collect plants such as *Coryphantha nelliae, C. hesteri, C. echinus, Thelocactus bicolor, Escobaria tuberculosa, M. meiacantha, Echinocereus davisii, E. pectinatus, Echeveria strictiflora, Echinocactus horizonthalonius, Agave lechuguilla, Yucca sp.,* etc., all in great profusion, MY FRIENDS—WE HAD TO STOP. The most interesting and difficult to find of these plants is *Echinocereus davisii.* These small, globular plants (¾") are usually found in the short dry grasses, the spines so well camouflaging the plant as to make it visible only at a distance of a foot or two. Can you imagine two *distinguished gentlemen* on hands and knees and nose, looking for these little jewels? (I hope no one we know reads this part about distinguished gentlemen, most readers will never know the true *us.*) I might add at this point that the reason for the nose coming into play is because of its necessary position close to the ground, not the fact that this rare little Echinocereus has delightful citron scented flowers. Needless to say, at this location we collected, hill climbed and thoroughly enjoyed ourselves.

After a pleasant night of plant cleaning, in a motel rather than camping, we continued eastwards towards our destination. In the environs of Eagle Pass, Texas, we spotted large, disc-shaped cacti growing in the pasture land; these turned out to be *Homalocephala texensis.* (We thought this very appropriate, the so-

called "horse-crippler" growing in pastures.) Soon we began to see specimens of *M. hemisphaerica* growing in the silty flats along with *Ancistrocactus scheerii,* and an occasional cluster of *Escobaria runyonii*. By this time we were stopping every few miles, with all self-control now gone.

Mammillaria hemisphaerica is distributed over a large range, and thus has many forms and variations, a character it shares with many Mammillaria species. A very large number of the "species" of Mammillarias as now described, should be reduced to either synonyms or at best, forms. This reduction is in the offing, due to the greater number of knowledgeable amateurs now collecting plants in habitat and recording accurate field data. The series by David Hunt in the *Journal of the Mammillaria Society*, has to date been very accurate. He should be given a good round of applause for his insight into the species of Mammillarias, especially as many are plants known only from descriptions (many inadequate, at that). Much of his combining will be verified with field work during the next few years.

Enough oratory; back to the trip. After all, that's what this is supposed to be about. As we neared Laredo, Texas, we began to search for the first member of our Dolichothele group, *Mammillaria sphaerica*. We had ideas that this was a common, widely distributed species. We searched at several locals, even one that was given to us by Dr. Lyman Benson; no success. Finally, due to time running on, we crossed the border at Roma, Texas, into Tamaulipas, Mexico. As this was the species we wanted to collect most of all on this trip, we were needless to say more than a little disappointed. If we could not find this species even with definite location data, what would we be up against with the other species?

After driving south in Tamaulipas for about half an hour we decided to try our luck for one last time, as we were almost out of the known range for this species. Eureka; we climbed a slight knoll and there nestled under shrubs was our prey. Plants were scarce but we managed to find enough to give a good range of variation. As we searched through the underbrush for specimens of *M. sphaerica* we came across plants of *Wilcoxia poselgeri,* which looked like thin, somewhat furry twigs. However, when these were removed from the soil they exhibited their claim to fame, the large tuberous roots.

Feeling very pleased with ourselves, we continued south in search of the balance of our quarry. Even though it was nearly night, and the roads of Mexico are dangerous after dark, due mostly to wandering cattle, we made our way to one of the most magnificent spots in all of Mexico, Huasteca Canyon. This canyon to succulent collectors will be best remembered as the home of *Agave victoria-reginae*. Other than being a succulent paradise, it is one of the most beautiful and rugged natural wonders ever seen by the authors.

Even though we arrived at the canyon late at night, and had very little time for sleep, we were out with picks in hand very early in the morning. The play of sun and shadows on the several hundred feet cliffs of this canyon early in the morning is a sight not to be soon forgotten. Finally we tore ourselves away from Nature's grandiose beauty and began our search for its diminutive beauties. All through the several miles of this canyon, tucked in and around the rocks are plants of *Mammillaria plumosa*. Even though this plant makes an exquisite pot plant, its beauty in nature is unsurpassed. Many authors have stated that this beauty grows in full sun; we have seen many plants in the wild, and they have nearly all been growing in a situation where they have had at least partial shade during the hotter parts of the day. Normally they are tucked in amongst the rocks on a vertical plane, or sometimes almost under the overhanging rock.

Huasteca Canyon also is the first location where we located the rare *Epithelantha micromeris* var. *pachyrhiza*. This little plant also grows amongst the rocks, with its small, bluish head in the sun and its large tuberous roots in the humus-laden soil under the rocks. Also growing here was a form of *Mammillaria ritteriana* with very bluish bodies and short white spines; we even found a nice crest of this. On the cliffs, mostly far overhead, grew great quantities of the queen of all Agaves, as previously mentioned. These plants vary greatly both as to size and to colouration and leaf form. Some plants must reach a weight of 100 lbs. or more, yet seem to have no trouble remaining on vertical cliffs. Occasionally growing with *Agave victoria-reginae* are large clusters of the rare *Agave bracteosa,* having much more the appearance of an aloe than an agave.

After much photographing, collecting, etc., we continued our trek west to Saltillo, at which point we would turn south to pursue our quest. The road to Saltillo is a 50 mile cactus garden. Any stop on this road will be rewarded with at least a half dozen plants. A partial list includes such mouth-watering items as *Mammillaria melanocentra* (to 12" dia.), *M. ritteriana* (type locality), *M. plumosa, M. winterae, M. caerulea, Thelocactus lophothele* (including crest), *Neolloydia beguinii, M. conoidea, Echinomastus macdowellii, Echinocereus leonensis, Lenophyllum sp., Tradescantia sp.,* and a beautifully flowered, tuberous rooted *Calandrinia*. QUITE A ROAD.

In the interest of time, we decided to continue on through Saltillo without stop, except for gasoline, as we knew that just south of town a few miles grew the rare *Thelocactus phymatothele,* which we wanted to collect in small quantity for introduction to horticulture by Abbey Garden. This is a beautiful member of the genus, having a slate blue body, rounded tubercles, tuberous root and short, tortuous spines. After collecting this species and finding many of the precious mentioned plants again, we set out to the south in earnest. (What is meant by "in

earnest" is that it was now dark and we could drive without stopping to collect at every other hill.)

After about two hours' drive we stopped at the first likely looking camping spot, ate dinner (it was now about 11.00 p.m.), and collapsed into bed. (At this point it should be mentioned that we were travelling with pick-up truck and camper.)

Again, in the morning, we were out with picks in hand at an early hour. This area had been visited by both of us on previous occasions, as it is the habitat of the red-bodied *Thelocactus bueckii,* and a beautiful, clustering, long spined *Stenocactus.* From this point on south the large, globular *Echinocactus palmeri* and its confusing brethren are constant companions. Magnificent specimens are to be seen quite commonly.

As we prepared to leave this location and continue south, we noticed that we weren't going anywhere unless we soon filled up with gasoline. We had passed a station at a crossroads about five miles back the night before, and so decided that was to be our best course of attack. As we pulled onto the road from our campsite, the tail pipe hit a rock, knocked the muffler loose, and from then on for the next five days the truck sounded like a B29 coming into land. *So,* we roared back up the road. After the tanks had been filled we decided to take the crossroad, as it went into an area which had been explored very little by cactus collectors. This turned out to be a wonderful change of plan, as will be seen a little further on.

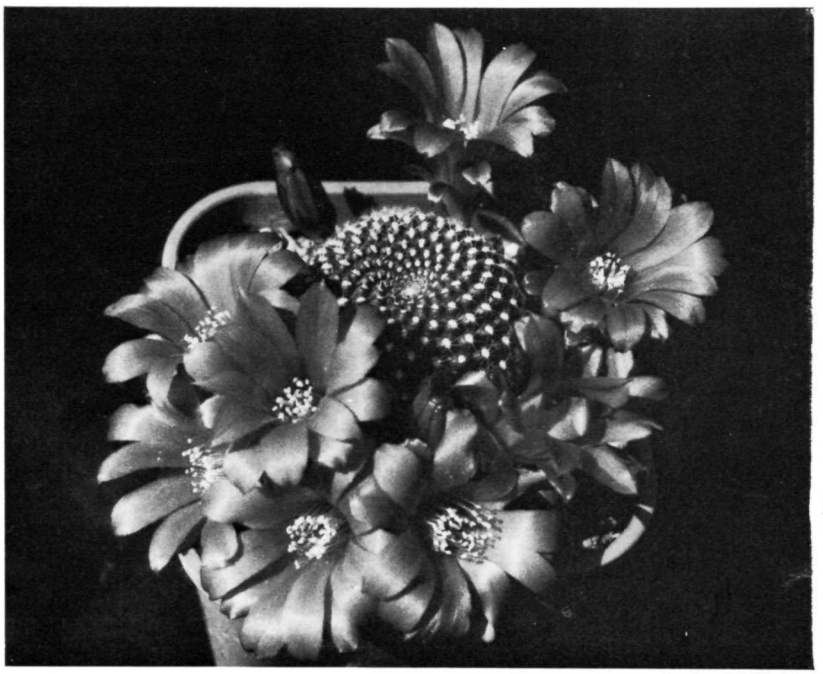
The new (to us) road left the main highway at the town of San Roberto, went east for about 15 miles and then turned south, ending at the city of Matehuala, which was our destination for the night. After we had completed the 15 miles east, we noted on the map a short road off to the north. Oh well, why not? We were only three days behind schedule now; what was a day more? This road led to a small village by the name of Galleana, and from there a smaller dirt road led to the still smaller village of Dieciocho de Marzo (18th of March, that is). Since the road ended at about half a mile beyond the town, we stopped. Ended in a river bed, that is! We were now in the foothills of the Sierra Madre Orientale, in the pine and oak forest. Seemingly not a very good area to be searching for cacti. But, we might as well look. A large 100 foot deep canyon looked like a reasonable place to begin, so we began, each taking one side of the canyon. Suddenly, a banshee wail arose from the side of the canyon that contained Charles Glass. As soon as we were re-united on his side of the canyon the reason for the wail was apparent. There on the cliff side was one of the most beautiful clusters of Mammillarias either of us had ever seen. For the next hour, as we searched for additional specimens, we probably had the highest blood pressures in the entire country of Mexico. The plant was immediately dubbed *Mammillaria glassii,* half in jest and half in sincerity. It has since been described as a new species, in the *Cactus & Succulent Journal of America,* Vol. XL, No. 4, page 132, under this name. This plant looks very much like a small caespitose form of *Mammillaria guelzowiana.* However, the flowers are very small (3-4 mm) and pink, rather than the very large (50-60 mm) purplish flowers of the latter.

Needless to say, on a trip of this nature where you're looking for specific plants, you are indebted to numerous people for information as to localities. Ed and Betty Gay, of Tarzana, California; Senor Guillermo Moeller of Saltillo; and Ing. Gustavo Aguirre Benavides of Parras de la Fuente were particularly helpful in this regard. It should be pointed out, however, that the impulsive, spur-of-the-moment stop at a likely looking hill, is often the most exciting and the most fruitful. If you just stop at the spots you were told to stop at you are likely to find only the plants you were told you would find there!

After all this excitement, we stopped along the road and had a good lunch of corned beef sandwiches and much discussion. Very little collecting was done between this point and the city of Matehuala, San Luis Potosi, much further to the south. After spending the night at La Hacienda, one of the most charming motels in Mexico, we left Matehuala a distance of a few miles to look for the rare *Turbinocarpus polaskii.* After much searching, this little gem was located. It grew only on hilltops in the rocks and grass, thus making discovery very difficult. Wedged in the rocks with the *Turbinocarpus* were also very fine, flat growing, clusters of the beautiful *M. sempervivi,* many times very difficult to extract from its rocky home because of the large tap root. The *Calandrinia* sp. mentioned before was in great abundance in this area, with its lively lavender flowers.

From the Matehuala area we set out for the area of the second of our plants in the section Dolichothele, *Mammillaria surculosa.* Continuing south, and turning east at the town of El Huizachi we soon reached the little village of Presa de Guadalupe, San Luis Potosi. On a short dirt road out of the town we found not only the plant which was the subject of our search, but *Astrophytum myriostigma,* var. *potosina, Ariocarpus retusus, Thelocactus tulensis, Bursera sp., Neolloydia grandiflora, Coryphantha palmeri, Jatropha, sphathulata, Hechtia* sp., *Mammillaria* aff. *centricirrha, M. candida* and *Echeveria strictiflora.* The plants of *M. surculosa* were in mats of heads, some up to four feet in diameter, composed of hundreds of heads. Each head topped a large tuberous root, much like an iceberg. Much more under than above. *Eureka* again; we had now found two out of two, of the main plants we were after.

Feeling very smug, we headed for the valley of Jaumave, a locality known by many cactophiles, as it is the type locality of many species. As we passed through the town of Tula on our way, we found under the shade of shrubs, the variable *Mammillaria picta.* This species is found at many locations throughout the next 100



Rebutia krainziana v. breviseta
(photo: R. Rolfe)

miles, in many forms. It is very doubtful that *M. viereckii* should be recognised as distinct from this species.

We were now in the area of the plant which was the main object of the entire trip. The plant has been in cultivation under the name of *Mammillaria melaleuca* or *Dolichothele melaleuca*. Much confusion regarding this name and this species exists, going back to Salm-Dyck. We will not pursue this problem at this time, but it can be definitely stated that this species is not *Mammillaria melaleuca* and is therefore unnamed. This will be published as a new taxon in a near future issue of the *Cactus & Succulen Journal of America*.

Specimens of this species were located near the city of Jaumave growing in the shaded hillside areas with *M. picta, Ariocarpus trigonus, M. klissingiana, Bursera* sp., *Ferocactus achidne* var. *victoriensis* and a beautiful 10″ crest of *Ariocarpus trigonus*. We were now at three species found for three species searched for. *Eureka*. Would we be able to find our fourth and final species, *Mammillaria baumii*?

After passing through the city of Jaumave, we found ourselves in beautiful mountainous country. Suddenly, we saw up on the hillsides, large specimens of the stately *Dioon edule,* a member of the *Cycadaceae*. These magnificent plants are extremely slow growing. One large specimen we found was about 10 feet tall. By the scale used to estimate age of these plants, this specimen must have been approximately 1,500 years old. Not only was this plant magnificent on its own, it had two *Mammillaria klissingiana's* growing epiphytically on its trunk.

Finally our awe of the Cycads lessened somewhat and we looked at the ground. Eureka; fourth and final. Growing right underfoot was our last of the species we were looking for, *Mammillaria baumii*. Most of the plants in cultivation of this species seem to be very caespitose, but the plants we found in the wild were almost without exception, solitary. The heads were up to 2″ in diameter and covered with a mane of golden-white spines. The plant was not common, but thinly spread over the hillsides. *M. klissingiana* was extremely abundant. Large clusters seemed to be everywhere.

Elated with our luck, and deciding to push it a bit further, we decided to try and find one of the most elusive of all cacti, *Obregonia denegrii*. Many collectors have searched for this interesting plant but very few have had success. We heard that it grew in low limestone outcroppings. Well, we saw one, stopped, looked and there by the Great Harry grew *Obregonia denegrii* in all its glory. Well, at least glory to a cactophile. These hard, turnip shaped plants were growing in full sun. On these outcroppings where they grew there were no other shrubs, so they had to grow in the full sun, like it or not. In cultivation, these plants seem to prefer at least partial shade, often burning in the sun. This seems strange as their habitat is one of the hottest, most arid imaginable.

We had now arrived at the very sad part of any collecting trip; it was time to turn back, and begin the trek homeward. As evening was well upon us by this time we decided to squeeze in one more good hillside. Boy, what a hillside; it was another natural cactus garden. Specimens of *Thelocactus conothelos* abounded (to 12″ diameter), *Astrophytum myriostigma* var. *quadricostata* (to 10″ dia.), *M. klissingiana, Fouquieria* sp., *Ariocarpus trigonus, Ferocactus echidne* var. *victoriensis, M. candida,* more *Dioon edule* and more *M. baumii.*

How about one more stop before total darkness! Why not? In the near dark we stopped at a limestone hillside covered by beautiful *Dasylirion longissimum* and by getting back down on hands, knees and noses, and poking around in the rock rubble came up with of all things, *Palecyphora pseudopectinata.* At this point we had not only used up our own luck, but the luck of at least a dozen other people. It is to be hoped we never meet up with one of these luckless people, asking for its return.

Now with complete darkness we had to give up and begin the homeward trip. Retracing our previous steps, we returned to Saltillo, and turned west towards the direction of home. About 18 miles west of Saltillo, at the intersection of the dirt road that led to a village by the name of Hipolito, we decided it was time to take a look around the country. This entire area is composed of silty flats with low (18″) chapparal. Our luck held out; this turned out to be the most thickly populated area of cactus either of us had ever seen. The area abounded in *Yucca endlicheana, Epithelantha micromeris* var. *greggii, Ariocarpus kotschybeyanus, Coryphantha poselgeriana* var. *valida, Mammillaria* aff. *roseo-alba, Opuntia moelleri,* two other *Coryphantha* species, *Echeveria strictifolia, Astrophytum capricorne* and *Leuchtenbergia principis.* This last species turned out to be the most prized specimen of the entire trip. When just about to leave, we found the most magnificent specimen of this plant that we (or probably anyone else) had ever seen. Imagine a plant of this species with 6 heads all from a common trunk, the overall dimension about 30″ wide and 20″ tall, each head being in perfect condition. This plant makes the most thoroughly unbelievable cactus specimen imaginable. Now we had used up the luck of at least 10 more unfortunate persons.

Still rubbing our hands in glee, we continued west to the little town of Parras. The hills around this little town abound in *Mammillaria magallanii.* A very little known fact is that Pedro Magallan, after whom the plant was named, lived in this town; and even though this plant has no definite type locality, the original specimens surely must have originated here.

After spending hours involved in plant cleaning in Parras we again hit out west. Again, one last stop before dark, who knows, maybe we may find something not previously collected. We were about 15 miles west of Parras, it was getting dark, it was beginning to rain, we were tired. Oh well, one last hillclimb. After looking around and just about to return to the truck, suddenly lady luck tapped us on the shoulder once again. There wedged in the rocks was a plant which is almost unknown; *Mammillaria magallanii* var. *hamatispina.* This was a species which had been searched for for several years by many collectors, and to our knowledge none had been successful. The finding of this diminutive, hooked-spined Mammillaria was really the frosting on the cake, and the perfect end to a wonderful trip.

(reprinted from the *Journal of the Mamillaria Society,* VIII (5), 63-66, 1968)

Book Review

Notocactus by Tony Mace. The Editorial Board in conjunction with the Sussex Zone, National Cactus & Succulent Society. 1975. 87 pp., illustrated. £1.50.

This is another example of the good standard of literature produced and published by the Sussex Zone of the National Cactus and Succulent Society. This booklet is a very useful addition to the cactophile's library as it fills a needy gap by translating into English the descriptions of many new species in this genus which had so far been described only in Dutch or German and amalgamates them into a lexicon with those already described in English. Unfortunately it falls down like so many other books that are limited by economical reasons in that the descriptions are not accompanied by true photographs which are absolutely necessary to identify species. The booklet does, however, give an interesting outline of the history of *Notocactus* and its antecedents, geographical locations of the species and a complete appendix of field collection numbers for plants that have been and have not been officially described with provisional names for the latter.

I was rather disappointed with the quality of the sketches as I consider that in most cases they are misleading and do not properly identify the plants. The remarks following the descriptions are invaluable in most cases although I will attempt to clarify a number of points the author has failed to do.

The crassigibbi group were at first thought to have some affinity to ottones by reason of body shape and possibly flower form but the seed is so dissimilar as to make this unconfirmed. The official description of *N. arachnites* is very sparse but the author should have indicated the simplest way of identifying this species from crassibibbus by its flowering characteristics. Arachnites produces flowers right from the growing centre whereas crassibibbus produces them at the shoulders and those of the latter tend to be larger and more floppy than those of arachnites which are erect and somewhat resemble the concinnus group. But beware of hybrids!

The arechavaletai described by Spegazzini in 1905 is probably a variety of ottonis as opposed to the wigginsia form of Schumann. I am surprised no mention is made

of the species provisionally referred to as *N. neohorstii* (HU 15) and its variety *juvenaliformis* (HU 21) as these are classical little plants in the wigginsia group, having very characteristic woolly crowns which completely cover the top of the plants.

The sketch of *N. concinnus* is both poor and misleading and I do not consider that it indicates the true species. The spines are not normally so twisted and the crown is more open.

The photograph of *N. horstii* does not show the typical shape of this plant which is normally more tapered at the base. I would challenge the remarks that *N. purpureus* starts flowering at a smaller size than *horstii*. However, I shall be pleased to hear from anyone who has evidence to support this.

The stigma lobes of *N. megapotamicus* are rarely if ever red; they are more often yellow or at the most very pale pink. Again, the sketch does not do the plant justice.

The sketches of *mammulosus* and *mueller-moelleri* look more like Copiapoas. The author does not make it clear whether *N. schlosseri* was widely distributed as *Notocactus sp.* 'Schlosser 151' in error for 157. I suspect this to be the case as my 151 bears closer resemblance to this plant than to *mueller-moelleri* which the field number in the appendix indicates 151 to be.

It is a pity that the field numbers do not show the group to which the plants belong, e.g. HU 2, 4, 6, 15, 21, 33—wigginsia; HU 14—scopae and HU 8, 10, 19, 58, 61, 84, 140, 180, 299—ottonis. Whilst this method of recording new plants found in habitat is to be recommended, the provisional naming of such plants is to be deplored as this leads to a proliferation of suggested species names from which only the commercial interests stand to gain. I quote the ottonis group as the paramount example of such abuse and feel that a broader description of this species (ottonis) would be justified with only four varieties at the most.

Internal classification is the subject which for some time now has been closely looked at by an Advanced Notocactus Study Group in this country. Its original suggestion, Scheme 2 was scrapped in favour of a more suitable layout closely resembling Scheme 1 of which I approve subject to minor amendments. It is interesting to note the general feeling that *Brasilicactus* may not belong to *Notocactus* and I would prefer to keep an open mind on this until some intermediate species proves the case one way or another. Some doubt has also been cast on the inclusion of the Eriocacti but compare the flowers of *leninghausii* with those of *scopa v. machodoensis* (HU 184). This later plant is a white spined form that has yellow stigmas rather than red. This might qualify for special mention; perhaps this is the true *N. scopa v candidus* (Pfeiffer). Most *candidus* we see have red stigmas! The similarity between the flowers of *leninghausii* and this plant are quite striking!

I understand the original description of *scopa* by Sprengel covered the whole range of spine colouration. It was not deemed necessary then to make provision for these natural variants. Far be it to do so now.

Is *roseoluteus* a hybrid between *herteri* and *mammulosus*? After all they are found in the same locality. *N. allosiphon* is remarkably similar to *N. orthacanthus* and *N. vanvlietii* is close to *N. werdermannianus*. One could quote many of the provisional names which are close to officially named species which is one good reason why we should resist the proliferation of too many unnecessary species.

There is obviously much more research to be carried out on behalf of this genus but this booklet on Notocactus will serve as a very useful stop-gap until a more comprehensive monograph is produced.

K. H. Halstead

Correspondents

The Name Game

WITH the publication of Hermann Jacobsen's "Lexicon of Succulent Plants" the "other succulent" enthusiast is provided with a comprehensive and up-to-date reference work. Also, it seems to me that the realm of the "other succulent" is not plagued with taxonomic problems and pitfalls for the unwary when they show their plants. After all, an *Aloe* is an *Aloe*, a *Lithops* is a *Lithops* (and a *Cissus* a *Cyphostemma*!).

However, would you please show pity to the poor cactophile who suffers in anguish at the hands of the professional and amateur botanists. It is perhaps only to be expected that various taxonomists will disagree amongst each other, but if one studies the writings and lectures by a given authority, it will frequently be found that they change their own ideas over the years. These changes are often quite radical, and I would have thought that if a given plant had been carefully studied and comparisons made with other taxa before any initial pronouncement was made, then any future taxonomic changes should only be as a result of the "splitter"-"lumper" controversy. As an example of this vexatious situation, may I cite *Neowerdermannia* which we were told a few years ago was very close to *Gymnocalycium* and perhaps congeneric. Now the same people tell us that they are widely separated.

The problem of wandering plant names is not purely an academic one, as it immediately strikes at most of us as soon as we have the temerity to place a plant on the show bench. Are your potential prize winning specimens *Rebutia* or *Sulcorebutia heliosa; Sulcorebutia* or *Lobivia pseudocinnabarina; Lobivia* or *Echinopsis peclardiana*? Quite a few genera are inextricably mixed up, so what is the poor judge to do when deciding whether to NAS or not? This situation could be rationalised if there was a reference book available that could be accepted as the authority for show purposes, but un-

fortunately no such book is available in the English language. Whatever one's views are with regards to Backeberg, he did have the courage and diligence to put all of his experience and ideas into print with *Die Cactaceae* and *Das Kakteenlexicon* and this does provide a standard reference, albeit slightly out of date, in the German language. Are there no longer any serious students of cacti who feel fairly sure of their conclusions and are willing to compile their definitive ideas into a book?

Terry Smale,
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Epsom Downs, Surrey.

Plant Exchange Offer

I AM a very new member of your society, my fees having been paid by a generous friend who attended the Chelsea show earlier this year. I am a member of various other cactus, bromeliad, orchid and palm societies and welcome this new opportunity to become acquainted with more plant enthusiasts.

Though St. Croix is among the smaller islands of the West Indies and does not offer very much in the way of botanical variety, there are a number of interesting species which might be useful to private collectors, institutions or nurseries in England and of which I can provide cuttings, juvenile plants or occasionally seed. I will list them briefly here.

Cacti: *Cephalocereus (Pilosocereus) royenii, Melocactus intortus, Mammillaria nivosa* (only Mammillaria native to the West Indies), *Hylocereus undatus, Selenicereus grandiflorus, Opuntia rubescens* (spined or the very rare spineless form). Seeds are fairly readily available from time to time of the Hylocereus and Melocactus.

Euphorbias: *E. tirucalli* and *E. neriifolia.* Cycads: *Cycas circinalis.* Bulbs: *Crinum asiaticum* and *Hymenocallis caribaea* (the latter is now producing bulbils which appear on the flower stalks after the large very fragrant, spidery white blooms).

Orchids: *Schomburgkia humboldtii* and *Epidendrum bifidum.* Bromeliads: not much here, limited mostly to *Tillandsia utriculata* and *Bromelia pinguin,* also offshoots from my own collection when available, such as *Aechmea galeotti, gamosepala, lingulata,* etc.

I would be glad to trade any of the above in various quantities for a wide range of items: for instance, tropical or subtropical bulbs (I have not often come across really fine varieties in the catalogues), cycads, or African succulents in general including stapeliads and Euphorbias. I am also fascinated by most cacti but am predictably least interested in those requiring cool weather to flower, unless they have unusual forms to recommend them; generally, I prefer the larger growing cerei and other tropicals including, of course, the epiphytes such as Epiphyllum, Rhipsalidopsis, Lepismium, Nopalxochia, etc. Some Echinopsis and Gymnocalycium have also flowered well in our evenly warm climate (between 70 and 90 degrees F. year round); I am certainly willing to experiment with other types.

I eagerly await any correspondence from your members and hope such plant exchanges will spread the cultivation of the above species (several of which are very worthwhile and seldom found in collections) and at the same time facilitate the introduction into the West Indies of new varieties in the cactus and succulent field, which is at present very much neglected in this region.

Conrad D. Fleming,
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Frederiksted,
Virgin Islands, U.S.A. 00840.

Succulent Snippets

by Sally Cornioides

FIRST I MUST apologise to the Show Committee for last issue's vague ramblings having become mixed with their official encouragement to enter the October Show. Nothing to do with me—I think the Editor must have got his spines crossed! I only hope it did not deter anyone from entering the Show; we shall all know by the time this is in print.

Well, the great flowering season has continued into September—and the great watering season, too! The amount of water supplied to cactus and other succulents in greenhouses this summer must be more than enough to float the *QE 2.* However, reports from everywhere tell of wonderful displays of flowers and many plants flowering for the first time. Probably the most interesting point is that some plants have flowered earlier than normal, some later and some about their usual time. The big question is how and when will Ariocarpus flower this year? Last year mine flowered earlier than they often do, in fact, in mid-September but it is now mid-September again and not a bud in sight at present. Perhaps they are short day plants and are waiting for the extra light evenings we have enjoyed in the bright weather to dim down earlier or perhaps they are waiting to give a display at the Autumn Competition. I recall that a few years ago there was a fine selection of flowering Ariocarpus at that Show which must have encouraged more people to try to grow them.

Higher postage rates and higher rail and bus fares, not to mention the cost of petrol nowadays, are all problems that are going to hit the Society and its Branches. Even booking a speaker means two expensive stamps and an increasingly expensive couple of manilla envelopes or alternatively a carefully timed 'phone call. That is only the start, even if the speaker only charges travelling expenses, unless he comes from the next parish, this will certainly be from £1 to £2. Then think of Journal postage, an expensive item to cater for four times a year. Although a delivery system can be arranged

among Branches, there are many members outside their orbit and if anyone has any brilliant suggestions (not pigeon post, please) the Secretary would be only too pleased to hear them—of course, it would be also useful to know if you really bother to read your Journal or if all the printing costs and postage are in vain!

We shall all be thinking of cutting down our fuel costs this winter, too. Maybe it will be all to the good for some plants if they have cooler minimum temperatures in the darker months. I have heard tell from several sources that some of the spinier Echinocerei flower much better after winter in a cold frame and there are certainly many cacti that can withstand low temperatures when they are dry. Those who enjoy their flowers in winter have to do more careful thinking, particularly the growers of more exotic succulents. There is no doubt that sunny south facing window sills will do for Crassulas but I suspect that Othonnas and the like want more overhead light to make those flowers open. Hopefully, in the next Journal, we may read how members are coping.

I am glad that the Dinner is becoming a special annual event not to be missed. Someone at Chelsea said, "Well see you at the Dinner if not before", which was really looking ahead but the time is drawing near now and those bookings must go in quickly as I hear that Peter Peskett, editor of *Garden News*, is to be Guest of Honour this year. Having had the Pimlico Show billed as "Show of the Week" in G.N. let us hope that the Annual "Nosh-up" will be worthy of the billing, "Feed of the Week'.'

Connoisseur's Corner

Psammophora longifolia

IT IS unfortunate that this attractive member of the Mesembryanthemum family is not more widely available. The Society listed the seed at one time and this proved easy to germinate and grow on and attractive flowering plants have resulted. It can also be propagated from cuttings successfully.

The name Psammophora means 'sand bearing' and this refers to the newer leaves which have a reddish tinge and bear a sticky substance to which sand and soil will adhere, presumably, as a protection for the new shoot, particularly in its native habitat, Greater Namaqualand, South-West Africa.

The keeled and angled grey-green mature leaves are longer than in the other species (hence longifolia); they are covered with small pits which make a rough effect and are very fleshy. The flowers which emerge from the new sticky growth in mid-September to October are a brilliant white with bright yellow stamens, about 1½-2 in. in diameter. Like many of the members of the family the flowers open wide in the afternoon and each individual flower may last about a week. A plant can start flowering at four or five years from seed.

As for other Mesembryanthemums the compost must be gritty and well-drained and repotting is advisable at least every two years and good root growth makes for good clumping plants and more flowers. The growing period is from about August to November or December, according to the season, but a little water may be given earlier in a hot, dry summer to avoid undue shrivelling or scorch.

Psammophora longifolia (photo: B. Maddams)

Mealy-bug

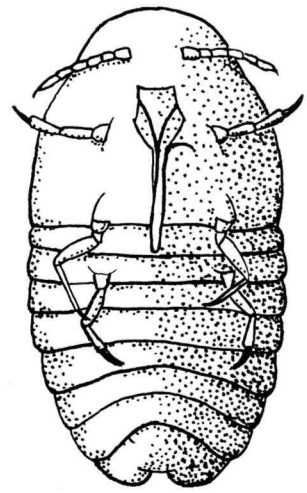
by W. V. Harris

THE mealy-bug crops up in discussions on succulent cultivation at meetings or in publications almost as frequently as it does in greenhouses. It is regarded by the beginner with dismay, by the experienced grower with disdain and by the show-judge with disfavour. It gets no more than an inch or two of space, if at all, in books on cacti together with a small illustration, and control measures briefly mentioned vary between dabs with a brush soaked in methylated spirit and drenching the soil with a systemic insecticide.

Mealy-bugs are insects related to greenfly, white flies and jumping plant lice (psyllids), all of which feed on plants by inserting mouth-parts like slender hypodermic needles into leaf and stem and sucking up cell contents and plant sap. At the same time they tend to excrete a watery fluid over the plant surface which forms a base for the growth of sooty mould. Mealy-bugs are so called because they cover themselves with a protective layer of white waxy substance secreted by two rows of glands down their backs. This wax coating increases with age until a mature insect resembles a small ball of matted cotton wool. The mealy-bugs we see are all females and they never grow wings. The males are fragile, little two-winged insects between two and three millimetres in wing-span, and unlikely to be recognised among the varied insect life of the greenhouse. As in the case of greenflies, males are not essential for reproduction in every generation and need not concern us further.

A mealy-bug is a small, oval, soft-bodied insect, pink in colour beneath the waxy covering, and with six legs. On hatching from the egg it is small and active, capable of moving around at a surprising speed in search of shelter and tender plant tissue. Growth takes place in a series of moults, the form of the insect changing but little, and the mature mealy-bug never developing wings. The eggs develop within the body until the female dies, leaving her skin, with its accumulation of waxy threads as a protection for the eggs until they hatch.

Mealy-bugs are, in the main, tropical insects. There are many different species and their identification is a difficult business. Some are restricted to particular host plants, others attack a variety of plants. Those that are pests of economic crops like coffee, pineapple and citrus have been studied in detail, but the majority have not, and this goes for those found on ornamentals and indoor plants generally. For climatic reasons the mealy-bugs that attack succulent plants are restricted to greenhouses and similar heated situations. Two distinct species are recorded, both belonging to the genus *Rhizococcus*; one of these is root mealy-bug and the other, slightly larger, occurs on stems and foliage. It is considered not unlikely that the widely distributed greenhouse mealy-bug



Young Mealy-bug seen from below, showing feeding tube doubled up inside protective sheath when not in use.

Planococcus citri is to be found on succulents as well as on house plants, while the stem infesting form of succulent mealy-bug may be equally at home on other plants.

An insect that spends most of its time sucking plant juices with a long and delicate tube carefully inserted into the host is not in a good position to dodge its enemies, so it is essential for survival that it seeks out the most sheltered situation available. That is why mealy-bugs are commonly found tucked away beneath the old skins of Lithops, dried leaves of Aloes and the intertwining stems of low-growing Crassulas, to name but a few. On cacti they flourish below the dense spines of Mammillarias and the like, avoiding, as a rule, such smooth plants as Astrophytum. Root mealy-bugs are in a position to attack most plants, irrespective of the nature of the growth above ground. Unlike those insect pests that have a passive stage passed in the soil or in cracks in the woodwork of the greenhouse, and from which they emerge to seek new hosts in due season, mealy-bugs keep in close contact with their food plants throughout their lives and are really mobile only in their early stages after hatching from eggs attached to the plant. For a brief period the young insects are very active, moving around the plant or passing to neighbouring plants in search of a suitable shelter in which to settle down.

It is a reasonable assumption that a greenhouse becomes infested with mealy-bugs only when these are carried in plants or in soil from infested plants. Once established they cannot be controlled by the usual contact insecticides such as derris or nicotine, because any formulation which would remove the protective waxy layer and allow the solution to reach the bug would also spoil the protective layer which is such a feature of succulent plants and ruin their appearance. Oil emulsion

sprays are effective when used on plants other than succulents, but have a similar unfortunate effect on cacti and the rest. Soil treatment against root mealy-bug with liquid orthodichlorbenzene would no doubt be effective if it were available generally; the solid para-dichlorbenzene which is used to protect clothes from moths is useful as a repellent if incorporated with soil when repotting, but it is less effective when simply added to soil around a plant. Fortunately systemic insecticides are now available which are absorbed by the roots and translocated to all parts of the plant, killing sucking insects wherever they feed. It does not appear to have been established just how long such insecticides remain active in a plant, and when the dose must be repeated. One drawback about the use of systemics, especially on house plants, is their rather objectionable smell.

One important factor in keeping mealy-bug infestation at a low level is frequent inspection of the collection and the removal of dead leaves. Overcrowding results in 'horticultural slums' with the inevitable multiplication of pests. House plants relegated to the greenhouse after their flowering is over should be looked on with suspicion as carriers of mealy-bug and even if apparently free should receive a precautionary spraying with a general insecticide.

Notes and News

Northern Counties Branch

For the past four years our Branch has held its annual show in conjunction with the North of England Rose, Carnation and Sweet Pea Society (Rosecarpe). Their exhibition is held annually in the Exhibition Centre, Gosforth Park Racecourse, Newcastle upon Tyne. We have been fortunate in gaining a foothold in the Rosecarpe Show and we feel, with justifiable pride, that the public has responded well. We have certainly convinced the Rosecarpe organisers that our hobby does attract considerable interest and that our show can be seen to form an integral part of the exhibition as a whole. Other Branches should certainly be encouraged to follow our examble if at all possible.

The Exhibition was held this year on Friday and Saturday, August 15th and 16th. There were 28 open classes in the Cactus and Succulent Show, including two classes for novices. To keep down our costs, two of our Branch members, Mr. A. E. Appleby and Dr. R. Nichols, acted as judges this year, arranging their exhibits so that neither would have to judge his own plants. The Jennison Shield was won by Mr. G. Charlton for a fine collection which included a large *Euphorbia hermentiana* and a 'Golden Barrel' some eleven inches in diameter. Mr. K. Pearson, with no fewer than 34 entries, took first prize in the class for three Mammillarias in pots not exceeding 3½ in. In the class for three Mammillarias in pots not under 4 in. Mr. L. Hogget took first prize with a group that included a good specimen of *M. elongata* v. *stella-aurata,* and another first in the class for nine cacti and/or succulents in pots not exceeding 3½ in. Dr. M. Watson won first prize in the class for one Stenocactus with a well developed specimen of *S. hastatus,* and another first for two columna Cereanae. Mr. Appleby included in his entry in the class for nine cacti/succulents two fine plants—*Agave victoria* which he has raised from seed sown in 1969, and *Mammillaria saboae.* Dr. R. Nichols was awarded first prize in the class for three cacti in pots not less than 4 in. with his entry that included an excellent, well grown *Parodia chrysacanthion.*

Next year will see our fifth show and naturally we trust that interest will continue to thrive. As always, success will depend upon the hard work of the members of the Branch.

The Berks. and Bucks. Show

On Friday and Saturday, July 11th and 12th, the Berks. and Bucks. Branch held their show in conjunction with the Royal Windsor Rose and Horticultural Society in the private grounds of Windsor Castle. These grounds are open to the public for just these two days in the year and in ideal weather the beautiful surroundings were seen to their advantage. There were 80 feet of cacti and succulents and all of a very high standard, providing the judges, Mr. and Mrs. David Brewerton with no easy task. The Berks. & Bucks. Challenge Cup for six cacti, which always brings in some very large plants, went to Mrs. Constance Marshall of Slough. The Bragg Challenge Cup for Novices was won by Mr. Harry Newland of Yiewsley, while the Group Cup went to Mr. Vic Ellis of Hillingdon for a beautiful arrangement 'for effect'. The 'Best Cactus in the Show' was a large *Opuntia clavarioides* cristate, for which Mrs. Muriel Stillwell was awarded the Windsor Challenge Cup. The Bird Peake Cup for the 'Best Succulent in the Show' went to Mrs. Constance Marshall for a beautiful, large flowering Trichocaulon. Other plants worth noting were fine groups of pure white Mammillarias grown to perfection, a fine selection of Notocactus which included many of the newer varieties, large Astrophytums, fine cristates including a large *Euphorbia meloformis* and a large flowering *Parodia sp.,* many caudiciformes and stemless Mesembryanthemums. Everyone's favourite plant was a really beautiful *Opuntia floccosa* with a number of heads .The ever popular classes for six cacti in pots not over 3½ in. and six succulents in pots not over 4½ in. attracted large entries, and the many choice plants and rarities gave the judges further headache.

Princess Alice paid her usual visit to the show accompanied by Sir Henry Abel Smith and his wife. The cups were presented by Lady Elworthy, wife of the Governor of Windsor Castle. This is a delightful show, well worth a visit. There are a number of large marquees devoted to various things, including trade exhibits of roses, a display by the Parks Dept., floral art and W.I. activities, a luncheon tent and enclosure for members and a buffet for visitors. Bands play throughout the afternoons and there are displays of various kinds. If Her Majesty is in residence one may even catch a glimpse of Prince Philip landing or taking off in his red helicopter.

North Surrey Summer Events

On 28th June a display was staged on behalf of the Society at the P. & O. Sports Club Gala Day at Worcester Park, as they were the nearest Branch to the venue. Seven members arranged a ten foot display of cacti and other succulents which were all in flower. There were about a hundred plants altogether including a splash of yellow Lobivias, Echinocereus and Notocactus with several Echinopsis in good flower flanking them; other plants included Mammillarias, Rebutias, Aloes and a Stapelia. Crowds thronged the tent all the afternoon and bought booklets and seeds, and prospective members took away forms. The Branch members stewarding the stand were also able to partake in the other activities of the Gala Day and enjoy an excellent tea provided.

The Branch Show at the Carshalton Show, although having slightly fewer entries than in 1974, had an impressive display of plants which barely fitted the space allocated for the forty classes. Crowds milled through the marquee all the sunny afternoon and showed great interest in the plants. There was a constant trade in seeds, journals, booklets and plants and a record amount was made on the lucky draw while several visitors decided to join the Society. Mr. and Mrs. Maddams gained the Banksian Medal and also certificates for the best Cactus (*Copiapoa hypogaea*) and best Other Succulent (*Gasteria armstrongii*) in the Show after great deliberation by the judges, Mrs. Lucy Wickham and Mrs. Hazel Hodgson. In the Novice Classes Derek Stevenson was awarded the Chuter Memorial Award for the highest points and he also gained awards for the Best Cactus (*Mammillaria hahniana*) and Best Other Succulent (*Caralluma europeae*) in the Novice Classes. A Certificate of Merit was presented to Mrs. Baldry for her first prize winning bowl garden and winners in the Junior classes were Nicholas Randall and Julian Meldrum with first prizes and Laurence Stepney, Ian Blacklee and Laurence Bulaitis with seconds and thirds.

Society Display at N.C.S.S. Show at Luton

Members of North Surrey Branch took over the staging of this display of the Mesembryanthemaceae at short notice. It was staged on ten feet of tabling and included plants representing the main tribes and subtribes of the family and also photographs depicting others in flower. A leaflet (also produced by Branch members) was available which included cultural and watering hints. Copies are still available from the Publicity Officer—please send 3p and stamped foolscap envelope.

Some Cactus Problems in Queensland

After being imported by the early settlers to be used as hedging, decoration, etc., various Prickly Pear ran riot in Queensland and by 1920 covered more than 50 million acres of land in Queensland and northern New South Wales, making many previously valuable properties useless. By 1925 the situation became desperate; the Commonwealth Prickly Pear Control Board imported 2,750 eggs of the insect *Cactoblastis cactorum* from Buenos Aires. Caterpillars from these eggs fed on the Prickly Pear and by 1940 it was considered under control. In 1932 they imported the Argentine Cochineal from South America, and along with Cactoblastis caterpillars it helped in the control of the Tree Pear (*Opuntia monocantha*), Rope Pear (*O. imbricata*) and Tiger Pear (*O. aurantiaca*).

Unfortunately the Harrisia (*Eriocereus martinii*) is also a problem, one not easily solved. The Harrisia cactus, popularly known as the Moonlight Cactus, is already a major weed pest of Queensland and its control is posing a major problem. The rate of spread of even single plants is frightening in its rapidity. . .

Eriocereus martinii was first introduced into Queensland and grown as a pot plant in the Collinsville district about the year 1900. When it outgrew its pot, specimens of the prize were generously presented to other 'pot plant' lovers in the district and the surplus was casually discarded in the nearby Brigalow scrub. Here it grew and flourished and provided good fruit for several species of birds and wild pig. Biological control has not been promising, control being largely dependent on the chemical Fenoprop Ester. The action of the spray is generally slow, taking up to twelve months to kill, respraying being necessary in most cases.

So—how does all this affect our hobby? In 1962 the law stepped in and passed the following bills:—

1. It is prohibited by a Federal law to import seeds, plants or cuttings of any plant of the family Cactaceae.
2. It is prohibited by a State law to import seeds, plants or cuttings of any plant of the family Cactaceae.

There is a 100 dollar fine plus a jail sentence for any person growing, selling or giving away any of the following plants:
Opuntia inermis, stricta, aurantiaca, monacantha, tormentosa, streptanantha and *imbricata; Eriocereus martinii* and *Acanthocereus pentagonus.*

In February 1963, Dr. V. Murray founded the Succulent Society of Queensland and members were able to sell or exchange plants by having a field day once a month at a collection on private property. While this allowed one to obtain plants, there was a limited variety unless someone took the risk and imported seeds.
(from an article by M. D'Alton in the *New Zealand Cactus & Succulent Journal* for June, 1975).

Lophophora williamsii

Those who have been encouraged to obtain seedlings of *L. williamsii* after seeing so many large, plump specimens on the show bench may feel disappointed when, after two or three years, their original plant has grown but little and has become surrounded by a rather untidy mass of offsets. It appears that *L. williamsii* exists in three forms, described by A. Reinhard in the *Cactus & Succulent Journal of New South Wales* for June, 1975 as follows:—

1. A dark bluish grey plant with several flat ribs and prominent tufts of hair on the areoles—few offsets.

2. A bright green plant with prominent tubercles and small tufts of hair—few offsets.

3. A dark green plant with five ribs, a few small tufts of hair and many offsets.

There are two other species in the genus, namely *L. lewinii* and *L. ziegleri,* both of which have more numerous ribs than *L. williamsii.*

Lithops Cultivation Summarised

Question: Is pure sand the ideal soil for Lithops? Or would sand with a little earth and a pinch of bonemeal be better? Is one supposed to wait for the Lithops to begin to grow and *then* water, or should a good soaking be given to start growth (in the spring)? Do Lithops grow better planted with others of their kind, in a 'community' pot? Should Lithops be watered into the fall, if growing?

Answer: Ed. Storms of Fort Worth, Texas who specialises in Lithops and Mesembs, uses a basic soil mix of ½ very sandy loam, ¼ sharp sand, and ¼ Perlite. He also says that Lithops will grow any time there is sufficient moisture: you can control their rest period by withholding water, and they need from two to three months of rest each year. Usually we let them rest through winter and start watering once the old body has been mostly absorbed by the new one, and it is bursting out of the old dried-up skin. They often seem to do better in a community pot than one little plant in one little pot. We winter them at about 50°F, stop watering in the fall when the weather becomes dull and cool, but some species do flower right into November.
(Cactus & Succulent Information Exchange, Canada, August 1975)

Seedlings after germination

Air and soil temperatures between 70 and 85° F. are generally recommended. Soil heating cables and any other method of keeping the soil warm encourages active root growth which is essential for good growth of the plant body. Soil should be at least two inches deep and preferably deeper; otherwise it would be so shallow that it would dry out too rapidly. Seedlings should be kept uniformly moist, but not saturated with water because this would encourage disease and rotting. If they dry out between waterings the sensitive young roots may be stunted in growth with the result that the seedlings will grow only slowly, if at all. The importance of this cannot be emphasised too much for the one thing we do most to our plants is water them. After the first year of growth, the need for uniform soil moisture is not as critical.

Light, too, should be moderate. Light that is too strong may cause seedlings to redden and consequently stunt their growth, while weak light may cause seedlings to elongate unnaturally. Any change in light (or any other conditions for that matter) should be gradual so that seedlings may become accustomed without shock.
(Robert Swan, in CSIE, January, 1975)

The following alphabetical index to plants so far featured in Connoisseur's Corner may be useful to members:—

Cacti

Copiapoa montana	**31** (1969) 58
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Notocactus horstii	**35** (1973) 39
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Other Succulents

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Brachystelma barbarae	**36** (1974) 38
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Conophytum cupreatum	**31** (1969) 83
Jatropha berlandieri	**32** (1970) 36
Pterodiscus speciosus	**35** (1973) 85

Society Sales

OWING to the considerable increase in postage, not to mention high prices of envelopes and packaging materials, Council is in process of reviewing sales goods costs and the new list should appear in the February issue. In the meantime, please note the following:—

Binders for 3 volumes of Journal £1 plus 25p postage (inland), overseas £2 post paid.

Booklet (individual copies only—bulk orders to Mr. Miller) 15p plus 10p postage (inland)

(The above from D. T. Best, 16 Ashleigh Gardens, Sutton, Surrey)

Ball point pens 10 for 50p, 20 for £1 (including postage)

Car Stickers 17p plus 8p postage. 10 for £1.65

Ties £1 plus 15p postage

Christmas Cards (Red badge and greetings) 5p each. 10 for 45p plus 10p postage

(These publicity items from Mrs. B. Maddams, 26 Glenfield Road, Banstead, Surrey, SM7 2DG)

Overseas members are requested to check with Mr. Best or Mrs. Maddams before ordering bulky items as postage rates vary in different parts of the world and regrettably these will now have to be charged to members.

A new stock of badges is on order and the price for this item will be quoted in the next issue—it will probably be around 40-50p.

Labels and marking pens are not always available but any stocks obtained will be for sale at Westminster and Branch meetings until supplies are more certain.

Branch Meetings

Berks. and Bucks. Allotment Holders' New Hall, St. Leonards Road, Windsor. 2nd Tuesday in month at 7.30 p.m.

East Surrey. Community Centre, High Street, Caterham. 3rd Tuesday in month, 7.45 p.m.

Essex. Cranbrook Methodist Church Hall, The Drive, Ilford. 1st Saturday in month, 7.30 p.m.

Hatfield & District. Hatfield Congregational Church Hall, St. Albans Road East, Hatfield. 4th Monday in month, 7.30 p.m.

Herts. Friends Meeting House, Upper Latimore Road, St. Albans. 2nd Monday in month, 7.30 p.m.

Northern Counties. Social Service Centre, Park Road, Whitley Bay. 3rd Monday in month, 7.30 p.m.

North London. Capel Manor, Waltham Cross. 3rd Friday in month, 7.30 p.m.

North Staffs. Contact Mr. J. Wilson, 5 Monkton Close, Dresden, Longton, Stoke-on-Trent, ST3 4BG.

North Surrey. Adult School, Benhill Avenue, Sutton. 1st Tuesday in month, 7.45 p.m.

Wirral. "The Grange", Grove Road, Wallasey. 3rd Thursday in month, 8 p.m.

Forthcoming Meetings at Westminster

Wednesday, January 28th. D. W. H. Clark: "Freaks".

Wednesday, February 18th. G. Hollis: "Plants in my collection".

Wednesday, March 31st. Annual General Meeting.

MAKE A NOTE OF THE DATE NOW

To be sure that you do not miss the Society's Summer Show at St. Saviours Church Hall, St. Georges Square, Pimlico in 1976—please note that the date will be SATURDAY, 12th JUNE.

Slide Competition at the Meeting on December 10th, 1975

FOR MANY YEARS the December meeting in the R.H.S. Hall has been devoted to a showing of members' slides. This year, as an experiment, we are making a modest change by having a slide competition. Those interested in participating, and we hope there will be many, are asked to read the following simple notes carefully, to ensure that this new venture runs smoothly

There will be two divisions as follows:—

Division 1—For those without specialist photographic equipment, knowledge or experience.

Division 2—For those with specialist photographic equipment, knowledge and experience.

As an approximate guide, members with single lens reflex cameras who regularly photograph succulent plants should regard themselves as coming within Division 2. We rely on members to assess themselves critically and in order to ensure some degree of parity we hope that those who should come into Division 2 will not downgrade themselves into Division 1 for reasons of modesty or otherwise. Members may compete in one Division only.

There will be three classes within each division:—

Class A—A close-up shot of a cactus or other succulent plant.

Class B—A general view of a cactus or other succulent plant.

Class C—A view of a group of cacti or other succulent plants.

Each slide will be judged according to the following criteria:—

(i) It should be a good representation of the plant in question.

(ii) Presentation and adequacy as a pictorial record.

Members may enter three slides in each class but these should be numbered 1, 2 and 3 in order of preference as only one may be used if there is a large number of entries in the class.

All slides should be handed in, labelled clearly with the owner's name, Division number, class number and title, at the meeting at Westminster on November 19th or sent to Mrs. Maddams by November 20th.

Miss Drage will judge and comment on the slides on 10th December and a small award will be presented for the one she considers best in each class.

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