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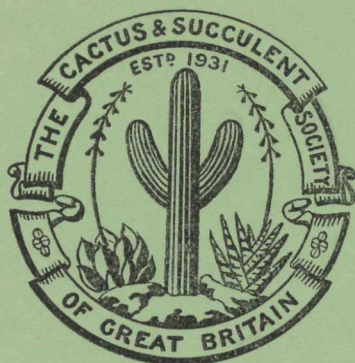
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SOCIETY NEWS

1952

January

No meeting.

February 12th

Annual General Meeting. 7 p.m.

March 12th, WEDNESDAY

Lecture by Howard E. Gates, with one hundred coloured Kodachromes of
"Cacti in Baja, California," read by E. Shurly. 6 p.m.

April 8th

Covent Garden Succulent Corner. 6 p.m.

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AND SUCCULENT
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Vol. 14

JANUARY, 1952

No. 1

EDITORIAL

With this issue, we publish, as an inset, the first instalment of Professor Dr. G. Schwantes' new book "The Cultivation of the *Mesembryanthemaceae*." It is an extremely comprehensive account of a Family which so many members find intriguing and interesting and has a special interest as these plants come exclusively from a part of the British Commonwealth. The book will become a standard work on the subject ; its author has already long established himself as the leading authority on these plants. We are very grateful to have the honour of publishing this study and we also greatly appreciate Professor Schwantes' generosity and kindness in contributing this to our Journal. Unfortunately, printers' costs have increased so much that we must leave the illustrations to the end of the work, instead of reproducing some with each instalment. However, so that members will be able to see some of them, we are including a pageful in our ordinary illustrations. These, however, will be reprinted at the end of the work, which will conclude with title page, index, etc., as well as some scores of illustrations, so that the instalments can be bound together as a separate volume.

We are equally grateful for the generosity and kindness of Dr. Tischer's contribution on *Conophytum*. This work will also be found to be of such a high quality that its authority will stand for a very long time and, again, we are grateful that our Journal should be chosen as the medium in which it appears.

I wonder what members will think of "The craziest thing that grows"? An American friend sent me "Saturday Evening Post" in which the article appeared, and it intrigued me so much that I wrote and obtained the kind permission of the Curtis Publishing Co. to reprint. Unfortunately, it is not possible to reproduce the many illustrations with the article. It does, however, give us a good idea of the scornful, but rather interested attitude of an author. Notwithstanding the caustic note in some places, it is extremely well written and contains material that certainly is of interest to us.

In addition to continuation of Dr. Tischer's article and the further inset of Professor Schwantes, I have very interesting articles from Mr. Stearn, on *Aeonium simsii* ; Dr. Elkan on photography ; Mr. Hall, on a week in Windhoek ; Mr. Uitewaal, on *Haworthia attenuata* ; a very nice article on an outdoor cactus garden, by Captain Delacour (by the kindness of Major Pam) ; one of Mr. Janse's fine *Euphorbia* articles, and a very interesting letter and photos. from Mr. Fuaux, of Australia. These, I hope, you will enjoy in the very near future.

CACTUS CULTURAL NOTES

By A. BOARDER

I have been asked by a member how the spirals are counted on *Mammillarias*. This question arises out of the descriptions in Craig's *Mammillaria* handbook, in which he shows that the spirals on these plants are arranged in series, both in a clockwise and anti-clockwise fashion. They run from the top of the plant to the base, and if the plant is examined from the top, the spirals will be seen quite easily. If a small piece of tissue paper is fixed to one of the tubercles as a guide, the plant can be turned round and the spirals counted back to the mark. Craig gives the number of spirals of most of the species of *Mammillarias* and states that they can be recognised by these numbers of spirals. This may be of some use when dealing with mature plants in America, but I do not see that it can assist us very much in this country where so many of our plants are grown from seed. When I came to test the value of the spiral count I chose a *Mammillaria rhodantha* var. *pfersdorffi* which had been raised from seed by me from a parent plant raised from seed obtained in 1927 from Haage in Germany. Craig gives the plant, *M. rhodantha* as having 13 one way and 21 the other. My seven-year-old plant from seed has 21 spirals one way and 34 the other. This caused me to examine the other plants I had raised from seed of the same variety and found that a one-year seedling showed no noticeable spirals at all, whilst a second-year plant from seed had 10 spirals. A five-year plant had 21 spirals. It is quite obvious to me that one cannot possibly expect to find the large number of spirals on the plants he describes on a small seedling *Mam.*, and at what age the plant is expected to develop the necessary spirals by which it can be recognised we are not told. I consider that the rate of development of the spirals will depend on how quickly the plant matures. It certainly appears to me that the number of spirals are likely to increase as the plant increases in size, and I shall make a note of the plants in question to see if the spiral count changes.

In the October issue of the Journal I gave a list of Cacti species suitable for a beginner and I now add a further list of different genera so that the grower can extend the range with other plants some of which are not so easy to grow or yet to acquire. I have raised from seed plants that are mentioned and so it is not impossible to obtain these kinds, although I must admit that some of them were grown before the war. They are: *Ancistrocactus scheeri*, *Ariocarpus fissuratus*, *Aztekium ritteri*, *Bartschella schumannii*, *Cleistocactus straussii*, *Cochemia halei*, *Epithelantha micromeris*, *Frailea schilinzkyana*, *Harrisia bonplandii*, *Homocephala texensis*, *Lophophora williamsii*, *Mamillopsis senilis*, *Neobesseyia missouriensis*, *Pelecypora aselliformis*, *Selenicereus grandiflorus*, *Solisia pectinata*, *Thelocactus bicolor*, and *Stenocactus lamellosus*.

Included in the above are a few plants which are more difficult to grow from seed than the previous plants mentioned, but with some care in the early stages it is quite possible to get reasonably-sized specimens in a year or two. The *Mamillopsis senilis* is a fairly quick growing kind from seed but after about four years many of these plants seem to go wrong. Such plants as *Epithelantha micromeris* and *Ariocarpus fissuratus* are slow from seed and beginners will be well advised to let someone with more experience raise these for them; the latter species is particularly slow from seed. In a later article I shall give a few more uncommon ones and gradually deal with some fresh species of some of the Genera mentioned.

I promised in the previous Journal to give a complete guide to growing Cacti from seed. I know that I have dealt with this subject before, but I get so many enquiries on this subject that I feel sure that it will be well worth while to deal with seed raising once more. Most growers find it difficult to believe that I can get my seedlings to grow as quickly as I do, and the plants which I usually take with me to a meeting of the Society are examined, as a rule, with amazement, and I am always accused of having blown them up with a bicycle pump. I was able to tell the members at the meeting on November 6th, that I now had another pump; one which blew the flowers on them as well. This because I showed a *Mammillaria rettigiana* plant which had been raised from seed sown in February this year which was already in prominent flower bud. Since that meeting I have noticed a seedling, sown at the same time, of *M. schiedeana*, which also shows two flower buds.

This proves once again that it is not the long winter's rest which assists the formation of flowers, nor being pot-bound. It ties up with my constant reminder that a plant will flower if it is grown well. I notice that an article on raising Cacti from seed was published in the March Journal of 1933, being a resumé of a talk I gave to the Society, and a photograph of a number of my seedlings was published at the same time. It is interesting to note that my methods have not changed very much since then, but it is surprising that as I have been regularly giving away my methods since that time there are so many members who say that they cannot get anywhere near the same rate of growth. I am at a loss to know why this can be and to clear up any doubts once and for all I will give now the exact method which I use, and then if this is carried out there is no earthly reason why everyone else should not be able to grow Cacti from seed equally as well.

For raising my seedlings I use four inch half pots. These I find much better than wooden boxes which can warp and contain spores of fungi, etc. The half pots are similar to ordinary pots except that they are not so deep. The pots are sterilised by soaking in a strong solution of permanganate of potash and are well scrubbed. The seed is obtained from many sources, but I do find that seed which I have saved from my own plants invariably germinates better than some of the imported seed. Some seed will retain its virility for a number of years, especially the larger black kinds, whereas some of the smaller brown *Mammillaria* seed does not germinate as well if it is over four years old. I use a note book for listing all my seed and each kind is given a number. This number is marked on the side of the pot but it can be placed on a very short label if preferred. The seed should be free from dust and pod casing which will only start a mold on the surface of the soil. I buy some John Innes Seed Compost from E. J. Woodmans, of Pinner, and use this soon after it is obtained. Using a small sieve I have made with perforated zinc, I then sieve a quantity of the compost. A large crock of broken flower pot is then placed over the drainage hole and a little granulated charcoal is added so that it just covers the base. The coarse compost is then added to a depth of nearly half way up the pot and then some unsifted compost goes in next. The top inch or so is filled with the finely sifted mixture and this is brought nearly up to the top of the pot. If I am sowing seeds which I have purchased I then divide the top with either strips of glass or celluloid labels so that I make four equal divisions. This is because as a rule only about a dozen seeds are found in each packet and it would be a waste of valuable space to use a whole pot for one kind of seed. The seeds are then very carefully sprinkled on the surface of the soil and the corresponding number is placed on the side of the pot. When the pot is sown the surface is gently pressed down but the seeds are not covered. I have proved that many failures with seed raising are caused through covering the seed too deeply. Make sure that the seeds are not sown too thickly; there is not much fear of this happening with a packet of purchased seed, but if you are sowing some of your own produce it can easily happen. The seeds will generally germinate well if sown thickly, but once they begin to develop they will soon cover the surface of the soil and it is possible that some will be forced right up from the top by the swelling group of plantlets and these may be starved if not completely killed. Also, when the whole surface becomes covered with tiny seedlings it is very difficult to see whether the soil needs watering or not, with the consequence that they are either under watered when they will stop growing, or they keep too wet when they will surely rot off.

The pots must now be watered carefully. This may be done with a fine spray, but my method is to place the pots in a shallow container with sufficient water to come part way up the pot. The whole of the water should be soaked up into the pots so that none remains. It will need a little experimenting to decide how much water is necessary but if a little is added at a time until all is absorbed it will be all right. What you must avoid is to allow a quantity of water to run out of the drainage hole from the pot when it is lifted. In this water will go some of the valuable soluble minerals, fertilisers, etc., on which the seedlings should depend for some time. When all the soil in the pots is well damped the pots should be placed in the propagating frame. This can be anything in which a temperature of about 70 degrees can be maintained. I use a frame in my greenhouse which is six feet long by 18 inches wide, being about six inches or so deep. This frame has a six-foot electric heater in the base and then a number of fairly large baking tins are stood over this.

The tins are nearly filled with peat which is always kept damp. The pots do not actually stand in water as I consider that this is asking for trouble in the form of damping off. The tins each hold six of the pots and when they are placed in position a piece of glass is placed over each pot so that most of the moisture is conserved. I sometimes use a piece of brown paper instead of the glass as this appears to prevent some of the condensed moisture from dropping back on the seeds. I have a thermostat in the frame which is set at 70 degrees and the frame is kept fairly close whilst germination is expected. Either shade the whole frame or else shade the separate cover glasses with a little whitewash or similar substance as it is imperative that the strong sunlight must not reach the seedlings at this early stage. Once the seeds have been sown you will only need a little patience and care with any necessary watering. Whilst the seeds are germinating the soil must not dry out, but yet it is as important to see that the soil is not always really wet. There is a great difference between dampness and wetness and until you are able easily to recognise the difference you are not likely to succeed. Remember, there are three important things necessary for germination; they are: Air, moisture, and warmth. The time of the year when you sow will depend entirely on what temperature you are able to maintain. I sow in February as I consider that this is the best month for me under my circumstances. I have sown many times in January but find that generally those seeds sown in February catch the others up. If you cannot fix up some form of heated frame then do not sow until April. It is, however, quite an easy matter for anyone to make a small heated frame if only a night-light is used under a biscuit tin. Small wattage electric lamps can also be used and it is surprising how even a couple of five-watt lamps can keep a small frame warmed if all draughts are excluded.

CULTIVATION OF SUCCULENTS

By W. DENTON, B. E. M.

Although these notes are due to appear in the January issue of our Journal, one has to think about the subject well in advance of this date. I have never known such a late season for the flowering of stemless Mesembs. On the 10th October I noted the following *Lithops* in flower : *terricolor*, *peersii*, *verruculosa*, *helmuti*, *comptonii*, *fulviceps*, *bella*, *karasmontana* ; numbers of others have buds just appearing and I am afraid will not develop fully as they must have sunshine to give of their best. The *Conophytums* are in bloom and make a brave show. The following are full out on the same date : *pellucidum*, *polyandrum*, *exertum*, *tumidum*, *notabile*, *wettsteinii*, etc.

These are charming little plants that have a much larger colour range, comprising shades of pink, straw, deep yellow and white. It is a pity that the *Lithops* do not give us a few different colours, yellow and white are the only two I know of in this genus. With me the *Conophytums* will be kept steadily growing through our winter till about March. This does not mean that you should water frequently, but just a little in the fine spells we sometimes get in our winters. They are making new roots now, a certain amount of the old rooting system having died away. September is a good time to take cuttings of these. For good results, great care should be taken to see they are trimmed right, numbers of the plants, after a few years, develop hard woody stems sometimes an inch long and even more with the very old ones.

Do not attempt to plant your cutting with a piece of the stem attached to it, it may not root at all. Cut back as close as possible to the growth, just leaving enough to give you a scar. You will find they root well in Vermiculite or ordinary compost. I do suggest that a layer of sand should be used on top of the compost for cuttings to go directly into. They will find their way down to the good material soon enough. Unlike most of the stemless Mesembs., they are very shallow rooting subjects and do not require deep pots.

Lithops will go to rest directly after flowering with me and will remain dry till about next May. Another interesting plant in flower with me at this date is *Pleiospilos bolusii*, this is rewarding me this year with eight flowers, it is one of my favourites, having been in my possession twenty years and has four nice growths. I have had several queries about the cultivation of this plant during the past season. It is very easy to manage and should be kept perfectly dry while the new leaves are developing, they are doing so at the expense of the old ones. When these old stems persist in the form of dried skins, that is the time to give a little water. Unlike some others in this Family, there should never be more than two leaves present on each growth at the time of flowering. When in full growth, two leaves coming and two going is the correct procedure. *Pleiospilos nelii* is a much more difficult plant and not nearly so free flowering, or so I find it. It will, most times, throw a bud long before the old stem has died away and this always appears on new growth coming, but still I never water this while the old stem is green and succulent. My plant of this is a fairly large one and I have not watered it at all this year, because of the four leaves present. In fairness, I should state that my plants are plunged in sand and frame grown and that I know there is always a certain amount of dampness present under these conditions. I am not afraid of the plant dying for the want of water, however, they do not mind a long dry spell.

Both these plants have been in the same pots three years now and are due for an overhaul and re-pot next spring. I expect to find a certain amount of root bug present, they are very subject to this pest. It is as well, at this time of the year, to go over the stemless Mesembs. and carefully remove any dead skins remaining on the plants. A pair of blunt tweezers are suitable for this and care should be taken not to in any way injure the new growths. My reason for this is, owing to our usually damp winters, these old growths sometimes absorb any atmospheric moisture present and this is liable, in some cases, to cause rot at the back of the plants. In their native habitats the atmosphere is always very dry and bright and, remember, they are out of doors and not under glass. On imported plants you can often count seven or eight, or even more, old skins and this gives you a good idea of the age of the specimen.

You will find this cleaning up of old plants a slow, tedious job, especially with a clump of the small growing *Conophytum* types, but it is well worth it.

I know that numbers of people will be using paraffin lamps for heating small greenhouses this year in lieu of electric tubular heaters which are subject to cuts in supply. These should be quite satisfactory if kept clean and the wicks trimmed frequently. It is better to use two smaller pieces of apparatus rather than one large one ; you can keep the flames low and avoid the drawing up of the flame in a sudden warm spell. It is a very bad business to come out to look at your plants and find them covered with soot. This will only happen if you are running them at top capacity.

In my greenhouse I have a forty gallon tank filled under the staging. I keep this filled with rain water which

is by far the best for the plants. They require so little they deserve the best. I offer this as a suggestion, to people willing to go to the trouble, as well worth while. Keep the tank top covered to keep the water clean and avoid algae forming, as this only happens when light is able to reach the water. I have another old tank in the garden ; this is useful for washing pots, etc. If you are able to leave any dirty pots soaking for a fortnight, you will find them clean up like new with very little scrubbing. Perhaps I am a little out of date, but I do like the old hand-made pots we were supplied with years ago. The present day smooth machine-made articles are not nearly so porous and, in my opinion, not so satisfactory.

The long wet spell we had in November was very bad for our resting plants, especially the Mesemb. ; this, combined with the rather warm weather for the time of year, is not so good. Remember, the plants must have air. A warm temperature in a greenhouse, without ventilation, will ruin numbers of specimens.

One job I am going to do this spring, is to cut down my *Echeverias*, some of these, in the *gibbiflora* section, are now two feet tall and have become very leggy and ugly. I do this about every three years and find the plants do much better and regain the nice large leaves that look so well on these. Just cut them off the length to suit you ; leave to dry for a couple of weeks and re-pot. Use the double pot method you all know about, it is a simple operation and should be no trouble.

The winter care of stemless Mesemb. seedlings is one of the most important jobs, especially *Lithops*, during their first winter. I know a good many people were sowing seed as late as last May, these are difficult to bring through, as the watering of them requires a certain amount of extra care. They must certainly not dry right out, but still should have a period of rest. If kept in a moist condition, the true form of the *Lithops* will force its way through the little green globe of its first growth and will look spindly and very much elongated. This is very unsatisfactory as you do want the first growth to die away and give you the true round form of the proper plant.

Here again, is the advantage of the plunged pot. You are able to give just that little dampness necessary to keep them going through the winter.

It is one of the pleasures of seed raising to note the little plants developing and see all the slight differences in each one, although they all may have been taken from the same capsule. Again, some grow much faster than others.

I note among my seedlings sown last March some that are much more forward than others, but all have had the same treatment. *Lithops wernerii*, *fossulifera*, *mennellii* are among the best. *Lithops dorothea*, *marginata*, *verruculosa* are more backward.

You can start to raise a few seedlings in February, if you are able to keep a constant temperature in the propagator of not less than sixty-five degrees, seventy degrees would be better. I thought we might have a chat about this in our April issue, as I consider this is quite time enough to start seed raising.

In addition to the meetings given on the inside of the front cover, the Council have arranged the continuing programme for 1952. On May 12th, there will be a general discussion on *Rebutias*, *Parodias* and *Lobivias*. The discussion will be opened by Mr. Boarder. There will be no R.H.S. Show coincident with this date. June 24th and 25th will be our Summer Show, with a meeting on the evening of the 24th, when the judges will comment on our exhibits. July 22nd, Mr. E. Shurly will give a talk on *Mammillarias*. August 26th, there will be a lecture on Stemless *Mesembryanthemums* and it is hoped to get a leading authority on these plants to give the lecture. September 24th and 25th will be our Autumn Show, with comments by the judges on the evening of the 24th. October 21st, *Euphorbias* by Mr. W. Denton. November 18th will be an interesting evening devoted to the reproduction of photographs from members by an Epidiascope and members are asked to bring along any photos they have of cacti and other succulents. December 2nd, there will be talks and discussion on Propagation by cuttings, Succulents by Mr. S. Pullen, and Cacti by Mr. K. H. Walden. In all cases the meetings start at 6 p.m., the time at which the R.H.S. Show closes ; it has been decided by the R.H.S. that shows should close at this time in future, instead of 7 p.m. during the summer. Members are requested to bring along a few specimens of types of plants covered by the lectures so that we can have a good meeting table display.

Mr. Boarder writes : " I have been swamped by enquiries for free seeds and many more members are trying their hands at this fascinating pastime. I have packeted over eight hundred lots so far with enquiries still arriving. Some seeds were in short supply and quickly disappeared, but others were not in such demand and if any member wants a few more seeds and will leave the selection to me, I will forward them under the same conditions as on previous occasions. Many are left of the *Puyas*, *Cereus gonianthus*, *C. horridus* and the mixed cactus seeds. I also have *Echinopsis campylacantha*, *Dyckia rariflora*, *D. montividentis*, *D. remontia*, *D. altissima*, *D. sulphurea*, *Beschorneria yuccoides*."

THE SCIENTIFIC APPROACH TO SUCCULENTS

By GORDON D. ROWLEY

INSTALMENT FIVE

Practical Experiments for the Amateur

January is the month for planning the year's work in the glasshouse, and as good a time as any to take the plunge and prepare for some constructive experimenting. Here, then, are details of just a few more obvious projects.

1 Propagation problems

Finding novel ways of multiplying rare plants is a never-ending source of amusement. I recall my own surprise and delight on receiving a robust *Pelargonium echinatum* grown from a snippet of a flower stalk; on raising *Pereskias* from leaves stuck in Vermiculite like *Crassulas*, and on watching discarded bulb scales from an old *Bowiea* sprout bulbils until I had so many I didn't know where to put them all. No less strange is the way that many promising leaves come to nothing. Some may root, but fail to grow a shoot—a common experience in *Haworthias*, *Kleinias* and *Ficoidaceae*. Would treatment with rooting hormones have the desired stimulating effect, I wonder?

Of particular interest to the propagator are those curious succulents to which I have applied the name "caudiciform¹." These have in common a stout, fleshy, perennial trunk or "caudex," and slender, leafy, often short-lived branches. Owners of rare plants like *Testudinaria*, *Idria*, *Fockea*, *Stephania*, and the tuberous *Adenias* would earn our lasting gratitude if they could work out means of reproducing them from cuttings of roots or side branches. The case of the Medusa-head *Euphorbias* that require two steps before side branches can be induced to form symmetrical heads has never been satisfactorily thrashed out, and bristles with possibilities for the keen experimenter.

2 Grafts and Chimaeras

Cutting fat plants into pieces and sticking them together again has a great appeal for many growers, and the suggestion that this may serve useful ends should set razors stropping all over England. What happens when a cactus is grafted upside down? Do new shoots arise from its lower or upper end? I cannot say: perhaps some enterprising reader will enlighten me. How does one species react to grafting on different stocks? In the world of fruit trees we recognise stocks which influence vigour and form of growth. Is it true that for best results the stock and scion should be genetically related—a *Cereus* on *Cereus* stock, *Opuntia* on *Opuntia* stock, and so on? Also, why among succulents is grafting almost the exclusive privilege of the *Cactaceae*?

Then there are in cultivation those very strange plants that we call chimaeras. A chimaera consists of two plants in one: a skin of one over a core of the other. In this side by side welding of tissues, each layer preserves its identity, but character expression is dependent on a sort of internal tug-of-war between them. A break in the skin exposes the core, and if a shoot arises here (as when plants are grown from root cuttings) it will be different in form and all of one tissue. Often this happens naturally, or shoots may appear composed of the surface tissue only: three different forms on one plant! Variegated plants are often chimaeras and sort themselves out in this way: the striped form of *Aichryson domesticum*, for instance, always throws some branches that are wholly yellow. *Sedum telephium variegatum* when raised from root cuttings reverted to the original green form: an example well worth following up for variegated *Sedums*, *Agaves*, and any striped succulents. If root cuttings cannot be raised, try scooping out all the buds from the stem and forcing new shoots to break out from the interior.

Chimaeras arise in nature by mutations, but can be synthesized by grafting. If a number of grafts are cut back leaving a thin film of scion covering the stock, a chance bud arising just at the point of union may contain a mixture of the elements of both species. Stem succulents should prove ideal subjects for chimaera production, being simple to graft and having a large area of union. An excellent picture of a cactus chimaera is shown by J. J. V. Wolthuys in his book "The Enigma of the Origin of Monstrosity and Cristation in Succulent Plants" Ed./2 (1948) 77, though the author's fanciful remarks about "vegetative splitting" of a hybrid are clearly inadmissible in the light of the chromosome theory.

3 Fasciations

The occurrence of fasciations, nowhere more frequent or more startling than in some families of succulents, has long puzzled botanists, and it is evident that no one theory will account for the origin of all such forms. Like callus-formation, fasciation is a reaction against some irritant, whether that irritant is an external injury, a nutritional upset, a pathogenic infection, or a straightforward genetic factor. Sometimes it is inherited; sometimes only the tendency to fasciate is passed on, needing only some shock to start it off; sometimes neither takes place. Undoubtedly more information is needed here, and any reader fortunate enough to have blooms on a crested plant

should make every effort to try to raise seedlings. A chance remark at one of the Society meetings in 1949 raised the question of propagating cristate *Echeverias* from leaves: would they "come true" or revert to normal growth? I didn't know. Nor, apparently, did anyone else. So it was decided to try. The following spring a large plant of *E. glauca cristata* was cut up and sufficient leaves obtained to give six different people uniform samples of 100 each. Another year will be needed before all the plantlets can be confirmed, but estimates so far suggest that both cristates and non-cristates appear, and in about equal proportions. An extension of the work to cover other *Crassulaceae*, with controls testing leaves from non-fasciated plants, would be most desirable.

4 Breeding

Nowhere is the scope for innovation greater than in the field of plant genetics. And until you have raised seedlings from your own plants your hobby is static: a one-generation blind alley; a futureless nine days' wonder. Two courses are open in selective seed raising: (i) the propagation of true species, and (ii) the creation of varieties superior in form, floriferousness and hardiness for a particular climate and country. The former involves "selfing" (bagging unopened buds) or, where that fails, crossing between two individuals of the same species. Bagging can be dispensed with if the plant is isolated from insect visitors or if no others of the same family are in bloom at the same time. Raising progeny from such a selfing gives an idea of the natural variation within the species, and is an essential undertaking for anyone attempting a study of the species grown outside their native land. The geneticist may be in an even better position here than the field worker, who sees only those variants sturdy enough to survive. In a glasshouse, all have equal chances—the stoutest and the most fragile. Hybridisations should not be made, however, unless one is patient enough to maintain the work to at least the second generation, and strong-willed enough to reject all but the most promising novelties. Deciding which to retain and which to scrap is where the real skill (and luck) of the breeder come in, for, as we have seen, characters can lie dormant, and a scruffy, undersized runt yet prove a valued source of improved varieties.

5 Self-fertility and self-incompatibility

A good footing for the above work would be a knowledge of which succulents set seed with their own pollen, and which do not. Reference books tell us airily that "Cactaceae are self-fertile" and "Ficoidaceae self-sterile," but these are wild generalisations, and in addition some very queer happenings have been reported. Thus, our fellow-members in the German Cactus Society, who organise their research on these problems with unrivalled zest and seriousness, claim that some Cacti are self-sterile, but under the influence of foreign pollen set seed which reproduces the female parent exactly². Hybridisation has not occurred; instead, some stimulus to selfing, or parthenogenesis (in the widest sense). Such behaviour would indeed be extraordinary, but is not altogether unknown in certain other plants³. First, a catalogue is needed of as many succulents as possible grouped according to whether or not they set viable seed when selfed. Then, having selected a suitable self-incompatible species with as many buds as possible, let us divide them into three batches and treat each as follows: emasculate (1) and (2), and give (1) and (3) pollen from an unrelated species. Successful setting from (1) would typify normal hybridisation, to be confirmed by raising the seed. Viable seed from (2), without any pollen, should reproduce the mother plant exactly, having arisen abnormally without the intervention of a male parent. Seed from (3) but not (1) would be even more abnormal, and indicate the outside stimulus to selfing that the German workers report.

If readers care to send me the results of any pollination trials they have made, I will gladly collate them in index form, and publish them if the response justifies.

6 Co-ordinated research

On October 21st this year, fourteen earnest-looking specialists on succulents met round a table in London to try to foster greater co-operation between the private and research workers in this country and abroad. Excellent work is going on everywhere in small collections; yet valuable results never get known outside the immediate locality. Distance, isolation, language difficulties, lack of contacts and petty rivalries have cut off continental workers from those in this country and America. Nobody wants "directed labour": the go-as-you-please attitude is essential to a hobby like succulent-growing, but the problems raised in cultivation are too many and too great to be dealt with by a few scattered people unaided. Given the support it deserves, this little nucleus of students, the British Section of the I.O.S., can go far to meet the problems of the small grower. And I hope no-one will be so foolish as to imagine that this is no concern of his—for have you ever met the cactophile who did not ask a dozen queries on pest control, overwintering, choice of soil, and identification?

References:

- 1 ROWLEY, G. D. in Nat. Cactus and Suc. J. III 102-3 (Dec. 1948).
- 2 SCHULTZ, B. in loc. cit. IV 69-70 (Dec., 1949).
- 3 ROWLEY, G. D. in loc. cit. V 9 (March, 1950).

THE SYSTEMATICS OF CONOPHYTUM N.E. Br.

By Dr. A. TISCHER

Translated by E. Engler

When in the year 1922, N. E. Brown, by separation from *Mesembryanthemum* L., formed the genus *Conophytum**, about fifty species, that were adjudged to this genus, were known. Already Brown himself felt the need to group these species according to definite characteristics. In the meantime, the number of described species and forms has grown to nearly three hundred. The necessity for a systematic arrangement of this large number of species, has prompted a number of scientists to suggest a division into groups and sub-groups. Such proposals emanated from N. E. Brown, L. Bolus, Herre and especially Schwantes**. The most comprehensive systematics, up to the present, was recently published by Schwantes in "Kakteen und andere Sukkulente," year 1950, No. 5, and 1951, Nos. 1 and 2. The work represents a continuation of his earlier systematic studies, but deserves special notice for the reason that here, for the first time, attention is drawn to the limited geographical distribution of the members of each group. According to these writings, conclusions in regard to the systematic affinity of a species can already be drawn from the place of occurrence. At all events, for future finds, the systematic grouping will thereby be considerably facilitated. It is regrettable, though, that Schwantes had only limited plant and flower material at his disposal. Thus, a number of species could not be taken into consideration in the grouping, others were grouped wrongly, due to insufficient knowledge of the flower. Nevertheless, all further systematics of *Conophytum* will have to build on the findings of Schwantes.

According to the fundamental rules of modern Botany, for the grouping of species, it is, in the first place, the sex characteristics which count. In future systematic examinations of *Conophytum*, we shall have to pay attention to these principles even more than in the past. In this task the examination of seed, ovules, or even of the chromosomes will perhaps bring us knowledge of affinities which we were not able to have up to now. First of all, we shall have to concentrate chiefly on the characteristics of the flowers. I myself had the opportunity, during the past years, to study not only an extensive plant material of this genus, but also to observe the flowers of a large number of species. I was assisted in my work by means of hints, plants and literary material, particularly by Messrs. Bates, of Hounslow, Captain Dunne Cooke, of London, Dr. de Boer, of Haren, Herre, of Stellenbosch, Jacobsen, of Kiel, Professor Schwantes, also of Keil, Graessner, of Perleberg and Triebner, of Windhoek, to whom I would extend my special thanks here.

My studies enable me partly to supplement the systematic findings of Schwantes, partly to amplify them, so that I can now submit suggestions for a systematic grouping of all species known to me as having been described.

The body shapes of the *Conophyta* allow them to be traced back to a number of fundamental types. Already in 1922, N. E. Brown set up a table of types, which comprised types of body shapes***. The large number of species and forms, which have become known meanwhile, make a still more thorough characterisation of the fundamental types desirable. I have, therefore, enlarged the number of types set up by Brown and established a new type table. In the following systematics of the genus *Conophytum* the types belonging to the groups have been mentioned individually.

The systematics given in this work does not replace a key to the species of *Conophytum*. But, in order to facilitate the ascertainment of species for the benefit of those who are interested scientifically, or of friends of these attractive plants, I have added to each species, in parenthesis, the colour of the flower and the type of the type table. In this connection, w means white, c—cream or ivory, y—yellow, o—orange, co—coppery or salmon coloured, r—red, rs—rose red or rosy, p—purple or magenta, v—wine coloured. For instance (y/10) means "flower yellow, type 10 ; (r36/39) means flower red, type about 36 and 39. The figure indicates only the contour of the little bodies, seen laterally, but does not signify the size of the bodies, which may be larger or smaller.

CONOPHYTUM N.E. Br.

Sub-genus ; *Fenestrata* N.E. Br.

Plants with short stems, or stemless, forming cushions. The small bodies — cylindrical to obconical, flat to convex above, partly ± bilobate due to small fissure on the upper surface, lobes flat or slightly convex, not keeled,

* The Gardener's Chronicle 1922, p. 198 and 450.

** N. E. Brown l.c., Schwantes in Gartenflora 1927, page 424, L. Bolus in Notes on Mesemb., Part III, H. Herre in the Cact. and Succ. Journal of Gt. Britain, Vol. 10, page 56 et seq., N. E. Br. in the Journal of the Cactus and Succulent Society of America, Vol. II, page 425.

*** The Gardener's Chronicle, Vol. LXXI, pages 214 and 450.

upper surface of the bodies or lobes $\pm$ translucent like a window. Colouring light green, grey-green, clay coloured to reddish brown, flower white or red.

1st Series ; *Pellucida* Schwant.

Transparent dots distributed $\pm$ irregularly over the upper surface, and interspersed with opaque dots or zones, upper side partly pitted or gibbous. Colouring brownish red, clay coloured or dark grey green. Flower white or red, partly with staminodes.

Types : 9, 13, 14, 28-31.

Type species : *C. pellucidum* Schwant.

Occurrence : Little Namaqualand, from Vanrhynsdorp-Div, as far as the Orange River, Bushmanland.

C. cupreatum Tisch (w/10/13), *C. fenestratum* Schwant (w/29/30), *C. lithopoides* L. Bol (p-rs/8/9), *C. pellucidum* Schwant (w/30), *C. primosii* Lav. (w/28), *C. roodiae* N. E. Br. (w/28), *C. rubroniveum* L. Bol. (w/14-15), *C. terricolor* Tisch. (w/29-30).

2nd Series ; *Subfenestrata* Tisch.

Translucent dots mostly uniform and regular, absent (?) in *C. cylindratum* Schwant. upper surface smooth, not pitted or gibbous. Colouring light green to yellowish green.

Types : 13, 14, 19, 20, 25-27, 30.

Type species : *C. subfenestratum* Schwant.

Occurrence : Little Namaqualand and Bushmanland.

C. acutum L. Bol. (w/31), *C. concavum* L. Bol. (w/19-20), *C. cylindratum* Schwant. (w/31), *C. edithae* N. E. Br. (?/30), *C. pillansii* Lav. (r-p/14-15), *C. subfenestratum* Schwant. (r/23).

N. E. Brown has placed the species with transparent, window-like upper surfaces together in a group of their own, *Fenestrata*†, whereas Schwantes tables them as a sub-group within the sub-genus *Derenbergia*. The species of this group are so different from the proper bilobate forms in regard to shape, colour and flower, that they have to be placed as a separate group by the side of the bilobate forms included in *Derenbergia* Schwant. N. E. Brown has correctly recognised this. Within this group, in turn, two sets of forms can be discerned, which differ from one another by the colouring of the bodies, the formation of the upper surface and by the characteristics of the flowers. I suggest, therefore, a sub-division into two series, one of which is already specially characterised by the type species, *C. pellucidum* Schwant. First of all, I have included in the Section *Pellucida* also *C. roodiae* N. E. Br. and *C. primosii* Lav. as the authors point out a close affinity to *C. pellucidum*. But in the case of these species which are not clearly marked with windows, there appears to me to exist a closer affinity to forms like *C. turritum* N. E. Br. or *C. edwardsae* Lav. This question has yet to be examined. Also in the case of *C. rubroniveum* L. Bol. investigations have yet to be made as to whether there is not a closer affinity to the forms of the *Subfenestrata*. The systematic place of *C. cylindratum* Schwant. is also not yet cleared up. Habit and flower place it in the vicinity of the other forms included under para. *Subfenestrata*, although the translucency is not stated as being so distinct as with other species of this group. Schwantes has previously created a Section *Cylindrata* Schwant. of its own for this species††, but in his new Systematics, left the systematic position of *C. cylindratum* open. *C. caroli* Lav., according to its flower, as well as its habit, is an *Ophthalmophyllum*, which, therefore, I have re-named *Ophthalmophyllum caroli* (Lav.) Tisch. Likewise, the species described as *C. maughani* N. E. Br. is a genuine *Ophthalmophyllum*. For this genus there is especially the partial cohesion of calyx tube and flower tube, which is characteristic†††, in addition the cup shaped cavity of the upper side of the ovary. The latter characteristic is not so pronounced in the case of *O. maughani* as in other species of this genus. On the other hand, the calyx tube and flower tube of this species are joined together to the extent of about 2 mm. Also present are the staminodes which are characteristic of *Ophthalmophyllum*, furthermore, this species has six stigmata. I myself possess a plant of it, which was sent to me by N. E. Brown and on which I was able to observe the characteristic features of the flower. The absence of the cup-shaped recess in the ovary, stated by L. Bolus††††, does not prove to be true. Admittedly, it is less deep than on other species, but, nevertheless, it is indicated. Also the remaining characteristics of the flower clearly refer the species to the genus *Ophthalmophyllum*. Schwantes, therefore, was right in re-naming this species as *O. maughani* (N. E. Br.) Schwant. Neither is the systematic place of *C. edithae* N. E. Br. unequivocally clarified. The flower of this species has, so far, not been described. Neither have I had an opportunity to observe

† Journal of the Cactus and Succulent Society of America, Vol. II, p. 425.

†† Gartenflora 1927, p. 424.

††† Compare Kakteenkunde 1934, p. 58.

†††† Notes III, p. 206.

UNCOMMON SUCCULENTS

By G. G. GREEN

During a recent visit to Mr. Shurly's home, I was pleasantly surprised to notice that his well grown plant of *Bowiea volubilis* was in full bloom. The miniature greenish-white flowers, so similar to those of the *Asparagus* fern, were fully opened in their hundreds at the top of the branching stem, and though not to be called beautiful, were nevertheless, very pretty.

The surprise was really in the forwardness of the growth, for the Editor is no believer in coddling, but prefers to give his plants as much ventilation as possible, which results in much stronger specimens. I told him that mine had not yet flowered, and indeed, it was two weeks later that the first tiny blooms opened, showing that the difference in latitude between the north and the south has a great deal to do with the times of growth and blooming of the majority of plants.

This difference accounts, no doubt, for the fact that many amateurs who follow the usual routine of watering and rest, do not, in some seasons, get the amount of growth and bloom that is to be found in the south. In the north of England the summer begins much later and I think the watering and growing periods should be extended slightly in the autumn to enable the plants to have as much time as possible in which to develop and ripen.

So long as there is no fear of heavy frost, I see no reason why growth should not be encouraged right up to the end of September, and the slackening off in watering, etc. during the latter part of October. This extra time, for us up here at least, will be welcomed by the Succulents as a whole, and they will then have a more normal season of growth. In their native homes, the plants are used to a much longer period than they can possibly get in these islands.

I have many times pointed out to disappointed collectors that their plants have suffered from too short a season of growth, caused by the premature drying-off when they are just coming into the full flush of growth. This is seen in many cases, by the failure to develop of late flower buds and the shrinking and browning of the tissues at the growing points, or the dropping off of leaves by the succulents. More satisfaction and success will be found if this growing period is not curtailed so soon.

Bowiea volubilis, from South Africa, has not much to recommend it as a collector's piece, but when properly grown it can provide an attractive background subject, as the fern-like foliage is very useful for space filling or training up the lean-to wall. Actually, the foliage is part of the inflorescence and there are no leaves, as such, on the plant. What do form drop off very quickly.

The stems, generally two on mature plants, arise from an onion shaped bulb of a shining green colour, and similar to a hyacinth during the resting period. It is customary to plant the bulb in rich sandy soil so that only one third is below ground level, in order to prevent rotting during the resting period when no water should be given.

During late spring and summer, liberal watering can be given until the stems begin to wither or dry up and no more until the following spring or until new shoots appear.

The plants are easily propagated from seed sown in the usual way, or from pieces of bulb taken from the outer layers. These should be carefully removed during the resting period, in portions similar to those of the garden lilies such as *lancifolium* or *madonna*, and fixed upright in a mixture of sand and peat. New bulblets will develop at the base the following spring and will soon make good plants.

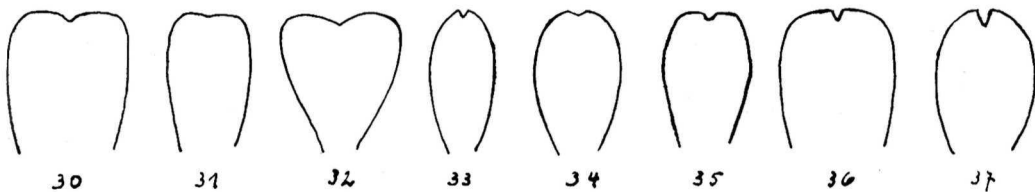
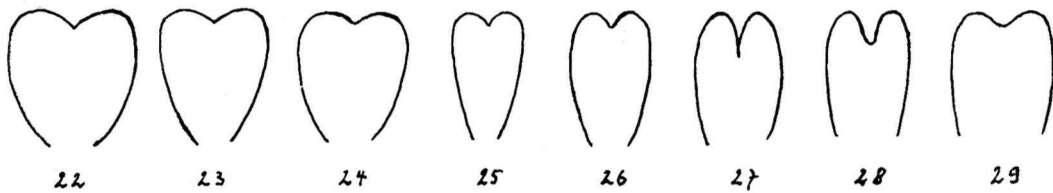
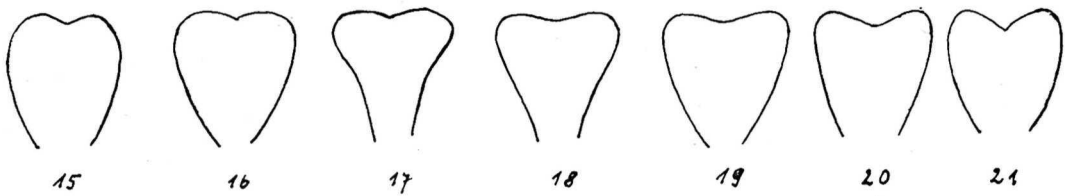
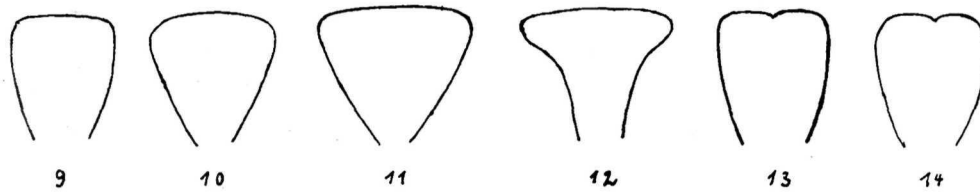
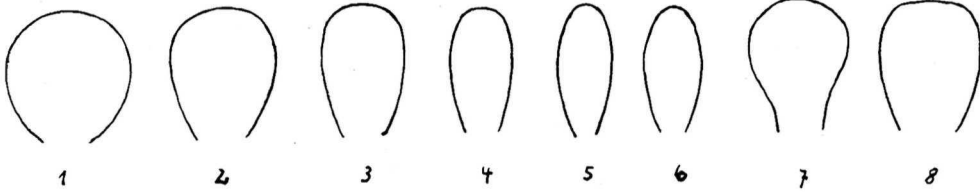
Another unusual genus, and one that for some unknown reason is rather rare in collections, is the *Pelargonium*, of the family *Geraniaceae*. These succulent members of this great geranium family are most interesting and unusual, and fairly easy to grow. Some species develop beautifully coloured flowers and foliage, and are in bloom for several weeks during early summer, making a most attractive display.

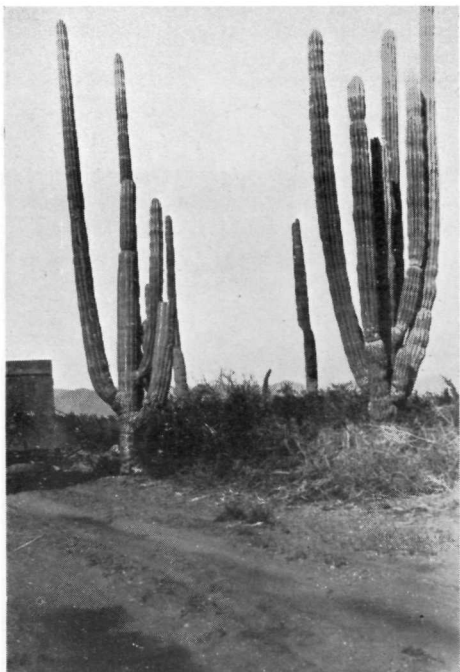
The very succulent stems gradually harden with age either into short, spiny and irregular growth, or are semi climbing with long slender branches. The taller species branch very freely and can be trained into compact bushes, or supported on canes into very handsome specimens.

The leaves are smaller than those of the ordinary greenhouse *Pelargonium* and are prettily marked in green and reds, with minute silky white hairs and curling edges. The flowers of these species are brightly coloured and veined in pinks and purples looking like small orchids, and are very freely produced during the early summer.

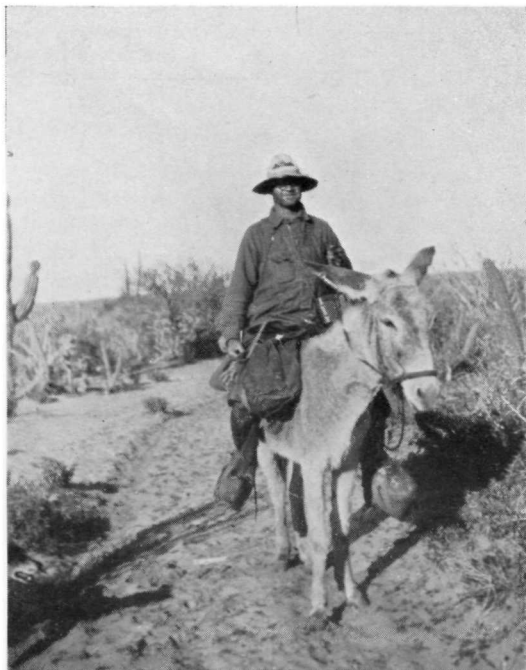
The smaller, or low growing species, generally have thick, swollen, tuber-like stems with many notches and spines, the remains of previous growth. The branches are thin at first, being thickened at the nodes and bearing the leaves on very long stalks. They like a well drained gritty soil that must be porous, for the stems soon rot if they have to endure prolonged dampness. A sunny position will prevent any leggy growth and will ripen the stems ready for the resting period during our winter.

Types of Conophytum.

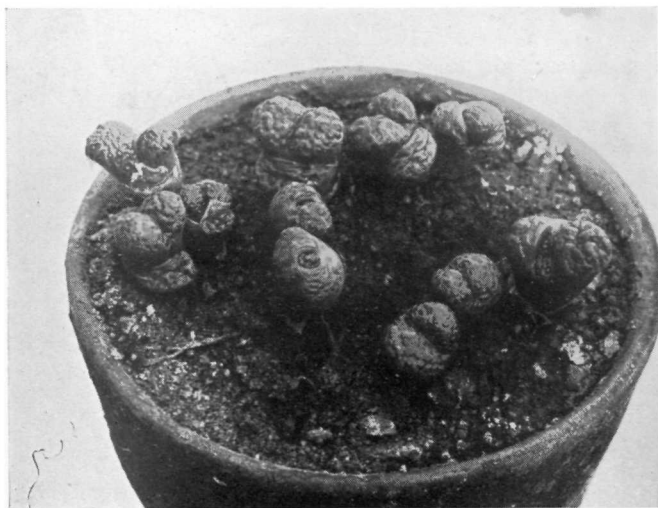


30 ft. high *Cereus* in Lower California!

Howard E. Gates

Howard E. Gates, cactus collecting
in Lower California

Howard E. Gates

*Conophytum pellucidum*

Dr. A. Tischer

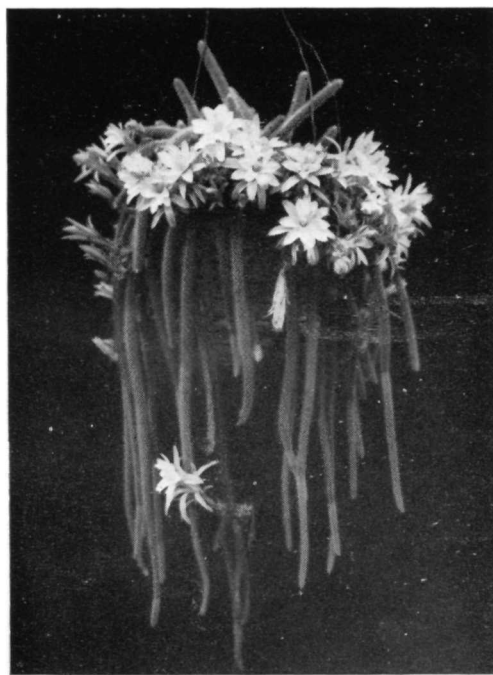
*Leuchtenbergia principis*

S. J. Pullen



Astrophytum ornatum

W. Beeson



Aporocactus flagelliformis

W. Beeson



Gymnocalycium leptanthum

W. Beeson

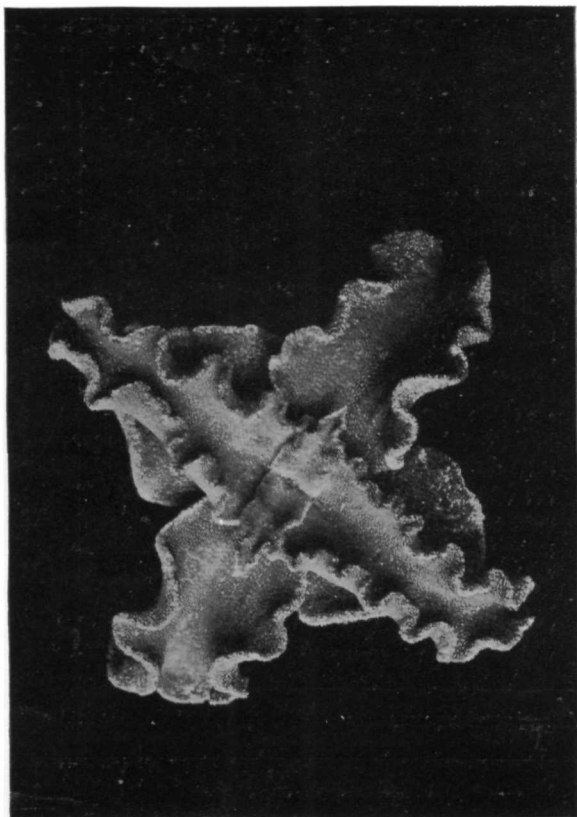


Gymnocalycium platensis

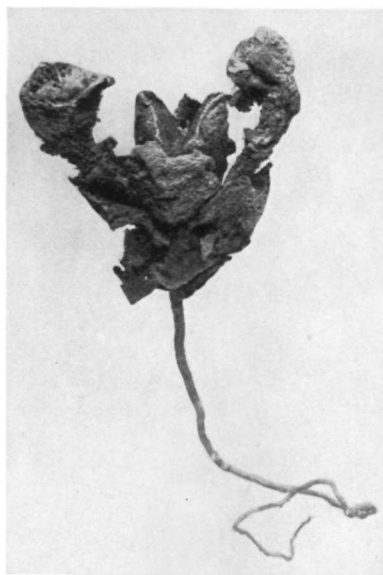
W. Beeson



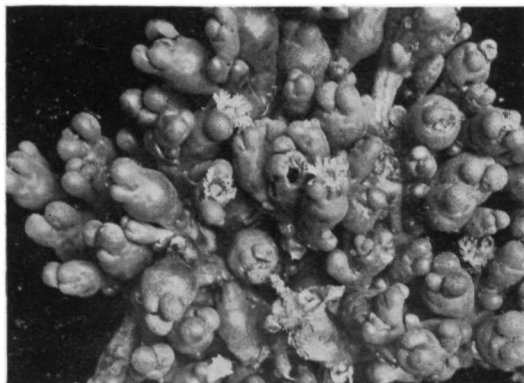
Aptenia cordifolia



Mesembryanthemum grandifolium



Derenbergiella luisae



Hydrodea sarcocalyca

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

As the flowers fail, the leaves wither and drop and very little water should be given in order that the plants may have the rest so essential to good growth. Cuttings can be taken at any time of the year, but preferably in early spring, and I find it best to break them off cleanly at the joints rather than cut across a stem.

These can be placed in very sandy peat until roots have formed, only a little water being given from underneath. Large pots are the best medium for holding cuttings which can be arranged round the edge. Watering after a week or so, by standing the pots in water for a few minutes, is then much easier, and the stems will not bend or fall.

The easiest grown species, and one of the best, is *P. tetragonum* which has long, four sided, rounded stems and very bright pink flowers on long stalks. This plant looks well if the branches are kept down to three joints and supported on thin canes, when a fine bushy specimen will result.

P. echinatum is a smaller growing species with spiny stems and pretty leaves. The flowers are lilac coloured with purple veins, and in bloom for long periods.

P. carnosum and *P. crassicaule* have thickened woody stems, rounded and notched, with hairy leaves on very long, upright stalks. The flowers are pink and white respectively, needing as much sun as possible to encourage free blooming.

All the above, with their distinct flower formation and bright colourings, are well worth a place in the collection.

Zygophyllum fontanesii used to be a very popular plant before the war, but it is most difficult to find in a collection today. This easy grown succulent seems to have lost favour, as so many plants do, and has had to give place to the more popular species at present in vogue. It is, however, a charming plant with shining green to golden yellow leaves, short and narrow and flattened on the upper sides. These are borne in twos on the short stems and fall off during the resting period in winter. The root system is very strong on mature plants and larger pots are necessary, with a rich, gritty compost containing a fair amount of leafmould.

The small, star-shaped flowers, produced in great profusion during early summer, are pale pink in colour, and are followed, later on in the season, by the rounded fruits that turn colour from green to orange. The colour and appearance of the plant, together with the brightly coloured berries, gives a twofold attraction that is most charming, and it is remarkable that so few can be found.

The propagation from seed takes rather a long time as they are slow to germinate, but cuttings may be taken in May and rooted successfully.

There have been rumours that the new edition of Borg's "Cacti" is now out of print. We are glad to say that this rumour is incorrect, and members can still obtain copies from the publishers as given in the advertisement on the outside of the back cover.

It is with the deepest regret that we have to record the passing of Mrs. Caroline Schmoll. Mrs. Schmoll, with her husband, the late Ferdinand Schmoll, contributed very largely to our knowledge of our plants and their passing will be of considerable loss to us. We are informed that their nephew, Willi Wagner, will continue the business, but, unfortunately, is not able to give the same amount of help with identification as was so much the principle of the business in the past.

THE SYSTEMATICS OF CONOPHYTUM N.E. Br. (Continued from Page 9)

a plant of this species myself. The habit described by N. E. Brown reminds one strongly of types of *Ophthalmophyllum*. It will be necessary to go into this question thoroughly. If *C. edithae* N. E. Br. is to be left in the genus *Conophytum*, it is to be included in the sub-genus *Fenestrata* N. E. Br., as already suggested by N. E. Brown himself. According to its habit and its colouring, it belongs to the series *Sub-fenestrata* Tisch. The species described by N. E. Brown as *C. rufescens* N. E. Br. and *C. longum* N. E. Br., must be included in the genus *Ophthalmophyllum*. Of both species I have received type plants from Brown. To judge by their habit, the translucency, the colouring and the nature of the substance, they are indubitably true *Ophthalmophylla*. Unfortunately, I was unable to observe the flower. Already, previously, I have re-named *C. rufescens* N. E. Br. as *Ophth. rufescens* (N. E. Br.) Tisch. Also *C. longum* N. E. Br. must be re-named *Ophth. longum* (N. E. Br.) Tisch.

(To be continued)

THE CRAZIEST THING THAT GROWS

By NEIL M. CLARK

(Reprinted from the "Saturday Evening Post" of April 7th, 1951, by special permission of The Curtis Publishing Co., of Philadelphia, U.S.A.)

The two deck hands stowed the last of the six cases in their assigned places. "Special handling," the labels said. One-by-twos nailed along the sides of the cases, jutting out at the ends for handles. Each case had small screened windows and was about the size and shape of a small doghouse with a gable roof.

"Wonder what's in them?" said the first hand.

"Don't you know?" said his mate scornfully. "This here's that new kind of cactus. Grows on deserts an' don't hardly need no rain. You feed cows on it, they get fat in no time. What you want to do, my lad, if you got a rich uncle that'll lend you a pile, is buy up a lot of this rotten-cheap land in Australia. Plant this cactus, buy cows an' lay back in yer hammock. In no time or less, you'll be richer'n Rockefeller."

Naturally, he didn't know a darn thing about it. But he was repeating a dream that many a "smart" man has believed in, and that nobody except sharpsters has cashed in on yet. And in fact, as his quick eyes had discovered through the windows of fine-meshed screen, the cases did contain great fat stems of prickly-pear cactus. This strange cargo went aboard a steamer in the harbor of Buenos Aires in March, 1925. It sailed the high seas for ten weeks and 14,000 miles, finally arriving at Sherwood, a suburb of Brisbane, in Australia. Actually, those six cases contained a small company of remarkable "soldiers" destined to win one of the toughest wars ever waged against one of man's life-and-death enemies—weeds—and they contributed as brilliant a chapter to the history of entomology as has been written since bug study became a science.

Years before, somebody carried a prickly-pear cactus of the species *Opuntia inermis* to Australia; nobody knows who, when or why. It was an odd plant, unknown in that part of the world, and seemed only a harmless curiosity. It is known that a pot of it was taken from Sydney to Scone, New South Wales, in 1839. Neighbors begged cuttings and planted them. They grew prolifically. Forty years later the cactus from that one pot had become tens of thousands of cactus plants, and they were beginning to be considered an agricultural threat. In 1893, Queensland declared cactus a noxious weed. By 1925 it had become one of the worst plagues ever to hit the island continent, and it was estimated that it had occupied more than 60,000,000 acres, half of them so completely that other plants, or man, couldn't compete with it.

Cactus, in short, was threatening to drive man right out. People desperately dug it up, burned it and dragged it out by the roots. It was so stubborn that an Australian soldier in California, inspecting the so-called Burbank spineless cactus, warned wryly that in his homeland if you dug up a prickly-pear cactus and hung it high on a fence, it would grunt and stretch till its roots reached the ground, and the plant would go on growing. Many a settler had to give up his homestead, licked by cactus. Big holdings became memories on maps.

All sorts of expedients were tried. Would cattle eat cactus? They would if they had to. But it was found that all the cattle in Australia, eating only cactus, couldn't keep up with the annual increase, let alone the old growth. Would chemicals kill it? Yes, arsenic pentoxide could lick it, but the cost of killing cactus that way was around fifty dollars an acre, and most of the land wasn't worth a tenth of that. So they got around to the idea that maybe cactus-eating insects would do the job without pay. World-wide studies were undertaken. Cactus is almost exclusively a native of the Americas; it was almost unknown elsewhere before Columbus. But it has never been such a pest here as it became in Australia. Apparently it had American enemies, whether diseases or insects, that kept it in check. What were they? Could they be introduced into Australia?

During this period, some 350 insects that thrive on cactus were closely studied. The object was to find an insect that was deadly to prickly-pear cactus, but harmed nothing else, for any bug that could also live on wheat, grass, fruit or other economic plants could be an even worse pest than cactus. Detailed histories of literally hundreds of thousands of individual cactus-eating insects were studied, and twelve kinds were eventually established in Australia.

The miracle bug, however, when he turned up, was more or less an accident. One member of the Australian commission happened to be travelling briefly in the Argentine, and located a few cocoons of an insect said to be bad news for cactus, which went by the terrible name, *Cactoblastis cactorum*. Thinking anything was worth trying, he saved the cocoons, and in a few days butterflies emerged and laid eggs. It was those eggs that were shipped in the mysterious cases from Buenos Aires in March, 1925. They hatched as caterpillars during the voyage. The cactus in the cases was there for the caterpillars to eat.

From here on, the story moves rapidly. Approximately 2,750 eggs of this insect reached Australia in that lot. There was no second shipment. Within a year—after two generations—the number of the insects had increased to 2,540,000. The first ones to be released from close confinement were put out as eggs on some of the cactus plague spots in February and March, 1926. The caterpillars hatched and immediately went to work eating cactus. They ate it for breakfast, lunch and dinner. The cactus couldn't take it. Whole plants rotted and died under this attack.

A sober scientific paper, reporting results fourteen years later, said of these insects: "The conquest of prickly-pear has been due almost entirely to this remarkable insect. Its introduction brought a complete change in the outlook within a few years. Its progress has been spectacular, its achievements border on the miraculous. Great tracts of country, utterly useless on account of the dense growth of the weed, have been brought into production. The prickly-pear territory has been transformed as though by magic. . . . In Queensland 22,000,000 acres of former dense pear country have been selected for settlement."

Of all plants, cactus is probably the craziest, meanest, stubbornest, the hardest to kill, the ugliest, the one that takes the most different shapes and sizes and also the one that produces perhaps the loveliest flowers. For these and other reasons, cactus has become an object of affection and near worship for thousands of cactus nuts, or cactomaniacs. Cactus collecting is an absorbing hobby if you like it.

The hobby is not new. A century ago the British novelist, Charles Dickens, was berating one of his characters for liking her cactus plants too well; and at about the same time, the Duke of Bedford and others were bidding as much as thirty guineas for rare orchid cacti. It's not much different now, with the high-up financiers, Madame Ganna Walska, the former opera singer, who is apparently intent on building the world's finest private cactus collection on her thirty-five acre estate near Santa Barbara, California, recently paid a grower 585 dollars for a few cactus plants he didn't want to sell. When it's played that way, the hobby takes cash. However, for five dollars, an amateur can get quite a nice collection.

Cactomania catches up with people in different ways. Dr. Arthur D. Houghton, well-known botanist and horticulturist and an old-time cactus hound, concentrated on cactus only after a neighbor asked him to identify a plant she had. He started to satisfy her curiosity and ended by stimulating his own to such an extent that he never got over it.

Charles M. Fitzpatrick was running a gas station in Edinburg, Texas. An old Mexican slipped in furtively with a package under his arm.

"You want to see?" he whispered mysteriously.

"What you got, Jose?"

The old man took the newspaper off a tomato box which was moderately full of what he declared were the rarest specimens in the cactus kingdom. Fitzpatrick, who was fresh from Georgia and ignorant about such things, parted with five bucks to own the prize. He learned almost at once that they were just common old cactus plants, found almost everywhere. But his interest was stirred. He went on to become a collector and grower, and today he has twenty acres in commercial gardens and sells millions of cactus plants all over the country.

The classic king of cactomaniac, who does it all for love, is G. L. Berry, M.D., of Lawton, Oklahoma. Twenty years ago a friend who was moving gave Berry five plants. One was a night-blooming *Epiphyllum*, the large-flowered orchid cactus. Soon afterwards he visited the Garfield Park Conservatory in Chicago and saw a remarkable collection. He was off. His present collection is his third. The first was frozen out. The second was given away when he left home for graduate study. The third has grown steadily for eight years.

Cactomaniacs love to get together and throw around the big Latin names of their plants. In his own eagerness to become acquainted with other collectors, Berry began listing the names of all he could find. When he travelled, he called on them. He thought others might like to have the list. Last year he printed it, and it contained 2,000 names. Next year he will reprint it with, he expects, 5,000 names. He believes there are more than 10,000 serious cactus collectors in the United States.

Many collectors get a kick out of digging their own specimens in the wild. Some States frown on this. Others are glad to have the stupid stuff carted off. Berry's favorite hunting ground is the Guadalupe Mountains in New Mexico, where roads are few and competition is scarce. A gleam is in his eye when he tells of seeing mounds of *Echinocereus stramineus* with hundreds of heads literally covered with bloom; "Claret-red blossoms beautiful beyond description!" In tiny pockets of earth in lava beds, where rocks were so hot from the sun that they almost burned holes in his shoes, he has come across *Echinocereus coccineus* in equally gorgeous bloom. Those are moments collectors live for!

(to be concluded)

MEETINGS

Our twentieth anniversary celebration was a complete success and there are many expressed wishes that such events should be repeated in the future. A company of fifty ladies and gentlemen assembled at La Coquille, St. Martin's Lane, London, and enjoyed a really nice, plentiful meal, after which Mr. Shurly briefly outlined the event, twenty years ago and on the 28th November, 1931, when he called a meeting of those interested in our plants for the purpose of commencing our Society. The results of our activities since has increased the ranks of collectors many fold, and thousands today, were actively interested in our plants in addition to the hundreds of thousands of others who just simply had a plant or two. Mr. Collings seconded the toast of the continued prosperity of the Society and Mr. Boarder kindly added a few remarks of his own. After a short interval there was a lecture and a display of fifty coloured Kodachromes, half of a tour of Lower California by and from Howard E. Gates, the lecture being read by Mr. Shurly. These Kodachromes were perfect and greatly interested the company, while the lecture from Mr. Gates contained many informative and interesting facts. A very hearty vote of thanks to Mr. Gates was passed with acclamation and Mr. Shurly promised to communicate the deep appreciation of the company for his kindness and generosity. The full lecture and Kodachromes will be given in March as scheduled on the inside of the front cover, after which it will be available to any responsible body, who has or can obtain the projector, called Lightmaster, and a self fix screen four feet by five feet.

The past quarter was notable for the projection of coloured slides by Mr. S. G. Fiedler in October. Mr. Fiedler has once before given such a display with his inimitable remarks, but this occasion produced different slides. His displays are always welcome, entertaining and informative.

At the December meeting Mr. K. W. Harle very generously brought along extensive equipment for a film display of cacti and succulents with running comments by himself. There were also views of his own establishment, views of the recent Italian exhibit at the Chelsea Show and many other views which were novel and extremely helpful to all of us.

PLEIOSPILOS NELII

By H. HALL, Kirstenbosch, South Africa

The observations by Mrs. Stillwell in the Journal for July, 1951, page 69, prompts this note on its behaviour in its native country. With us it flowers three to four months after all its relatives have finished and it is flowering at the time of writing, August. Although the size of the flowers does not compare with those of most species of *Pleiospilos*, the individual blooms on healthy plants may be over one and a half inches across. They show no variation in colour, which is a pinkish-orange here. From a single pair of leaves three, rarely four, flowers form in one season, developing speedily after each other. A healthy plant, with a single pair of leaves, may measure five inches from leaf tip to leaf tip, and although they may remain as a single pair of leaves for many years, but one new pair forming as the old shrivel away, they do branch in time, forming a clump with three or four pairs of leaves, though never forming the huge clumps seen in many other species. This species forms a very stout and distinct tap-root. I do not think there are grounds for Mrs. Stillwell's view that it might not be a *Pleiospilos* at all for the capsule and seeds are almost identical with many other species, and were they mixed with them could not be readily picked out from them again.

It is extremely rare in the wild state and will always remain one of the choicest species; however, all species of *Pleiospilos* are now protected by law and may not be uprooted from their stony habitats.

Members are urgently warned that the March meeting will be on the twelfth, a Wednesday. This is an unusual day for a meeting, but it is due to the impossibility of getting the Lecture Room for the usual Tuesday.

The advice on raising Cacti from seed will be continued by Mr. A. Boarder in the Cactus Cultural Notes in the next issue of the Journal.

THE BRAVEST THING THAT GROWS

By E. SHURLY

In the July, 1951 issue of the Journal I inserted a paragraph in regard to *Chamaegigas intrepidus*.

It is indeed unfortunate that my experiment with this plant failed and I do not know whether it was my bad cultivation or the bulbs were dead. The bulbs are so minute that it is next to impossible to be sure they are alive or otherwise, but, certainly, my piece of veldt in which there were several bulbs seemed to be in good order, but although I prepared according to directions there was no result.

The plant was first mentioned by Dinter and I think it would be best if I quote verbatim from his report :—

1921, Dinter's Botanische Reisen in Deutsch Suedwest-Afrika (Fedde's Repertorium, Beihefte, Band III). Dahlem-Berlin. 1921. Page 169.

"A not less important example of a water succulent is offered by a tiny, extremely delicate *Scrophulariaceae*, Dtr. 952, which, as already mentioned above, I discovered in small, natural rock basins on the peaks of a gneiss mountain top, 12 kms. to the east of Okahandja. The nature of its place of occurrence on the hot, nearly barren hills, in basins, the largest of which only holds about one cubic metre of rain water, is indeed exceedingly remarkable. The bottom of these basins, which is always completely horizontal, is always quite dry from the end of May onwards and is covered with a layer, $\frac{5}{8}$ " to $\frac{3}{4}$ " thick, of arenaceous quartz, mixed with a 'wadding' of dulse (masses of rotted algae, dead bodies of flea lobsters, droppings of baboons and a little bit of humus formed by old floating leaves, one cm. long, of the *Scrophulariaceae* which contains the diminutive bulbs, hardly exceeding the size of a pin's head, of the little plant, one close to the other). One would think that three days of burning sun in October would be sufficient to heat through the basins, together with their thin layer of contents, and to render them lifeless. However, this is not the case. Although the air, which is completely devoid of water vapour, sweeps over the barren heights from not later than the end of May until December, and sometimes also until February, and withdraws the last atom of water from the lifeless matter, although, also, the sun heats up the rocks, from October onwards, to a temperature of up to 50°C. these mighty factors are not able to kill the latent life in the tiny bulbs of the *Scrophulariaceae*, for, only a few minutes after the first summer rain, which fills the small basins, the soil is thickly covered with subulate, sap green little leaves of about one cm. length, and on the second following day, neat, rose-violet coloured flowers, eight mm. large, borne on long, threadlike stalks, floated in the middle of the rosettes formed by four shiny, oval, floating leaves of one cm. length. This is probably the most touching example, known to me, of the educational struggle of pitiless nature against her own children, in which fight, however, the latter are the victors."

1923. Dinter's Sukkulentenforschungen in Suedwest-Afrika I. (Fedde's Repertorium, Beihefte, Band XXIII). Dahlem-Berlin. 1923. Page 7.

"For one of the most interesting phenomena of the flora of Okahandja which I described, without name, on the last page of my 'Reisen in Deutsch Suedwest-Afrika,' the little *Chamaegigas intrepidus* Dtr., which, by the whole of its nature, although it is a typical aquatic plant, nevertheless it is also a true succulent. I searched 12 kms. to the east on the arid, barren gneiss mountains between Okahandja and Otjasazu, and found it in four or five of the water filled basins. Unfortunately, it had not developed any flowers yet, but only floating leaves. We ingrafted several, so far plantless, but water filled basins with it, and took a felt like piece, of about one square foot, with us to Okahandja. Here we dried it in the sun for several days and, as samples of no value, despatched it to Hamburg, Berlin, Bautzen and Zurich. In the Hamburg Botanical Gardens and in Bautzen, the diminutive bulb-succulent, set into luke warm water, at once began to develop its awl shaped under water leaves; whether it developed there also its charming floating flowers, I have not yet heard."

I communicated with Mr. H. Jacobsen and learned that he had had experience with this plant and was good enough to send me an excerpt from his large succulent book :— "Synopsis Plantarum Succulentarum," by H. Jacobsen.

Chamaegigas intrepidus Dtr. S.W. Africa, 12 kms. to the east between Okahandja and Otjasazu. Interesting small water succulent, which, in dried up water pools, survives the period from May to December, or even longer. Succulent bulb, extremely small, hardly as large as a pin's head. After the first rain, strap like, sap green leaves of 1 cm. length form after a few minutes, on the second day rosettes form consisting of four, 1 cm. large, oval, floating leaves, in the midst of which an 8 mm. large, pink-violet inflorescence develops on a thin stem. Cultivation in shallow water containers in humus rich, heavy soil, in a light succulent house. To be kept absolutely dry during the resting period. Occurs rarely in cultivation, although the latter is not difficult.

At the time of writing I have only had one reply to my appeal for news of other aquatic succulents. Mr. Gordon Rowley sends me a copy of a mention of *Rhopalota aphylla* N. E. Br. (*Crassulaceae*), which appeared in the American Cactus Journal on pages 7 and 8, 1931. It reads: "A very dwarf, leafless annual, with articulated stems like a miniature plant of *Hariota*. It grows beneath nine inches of water and is frequently covered by ice in the winter, but apparently flowers only when the water level drops and the branches are exposed."

This is not quite the same as *Chamaeigias* which throws leaves and flowers while covered with water, but it is a very interesting addition to our knowledge of this type of succulent plant. Mr. Rowley's extract is from a much longer article by Dr. N. E. Brown and includes a drawing of this plant.

I again appeal to all our friends in South Africa and elsewhere to furnish us with details, and samples if possible, of any other plant that justifies the name of aquatic succulent, for this is a phase of our subject that has been very neglected and would add change and interest to our collections.

I have already mentioned that I was unsuccessful in cultivating the plant, but I could make some comments on what I saw. I received a piece of South African veldt about two inches square and about a quarter of an inch thick. This contained more than a dozen of the plants. The upper surface of the piece of ground was covered by dead, short, gray grass; the soil was of a very sandy nature and a separate sample of soil sent me is made up of very fine sand, some larger types of sand, like fine gravel, a small mixture of fine textured soil and quite a bit of humus in the form of whitish grey remains of short grass. Here and there glints tiny pieces of quartz-like substance. Obviously the soil is extremely porous and must absorb rain very fast indeed and this may be the cause of my failure. In its native habitat the soil quickly gets thoroughly wet and so reaches the whole of the bulb almost at once, but the piece of veldt I received was very matted and it is possible my submerging under luke warm water may not have penetrated to the bulbs.

The bulbs I measured with a magnifying glass and metre rule. They were one mm. in diameter, roundish to slightly pear shape, green, with short wavy roots. The presence of the bulbs was shown on the surface of the soil by the rosette-like remains of old leaves, or, more probably, the stems.

I hope that I may have the chance of again trying to cultivate the plant through to its flowers, for one can only echo Dinter's comment that it is the most touching example of the victory by one of her children over Nature's apparently pitiless fight. Against extremely hot conditions during its resting period, months of completely arid conditions, the bulb is able to retain stored sufficient nourishment to maintain life, even though during dormancy it does not absorb anything near as much as during its living period, then when the shallow basin in which it grows becomes covered with water, its quiescent life jerks into action in a few minutes, and one day after it flowers! The bulb remains under water, sends out thread-like stems which terminate on the surface of water, like water lilies, with leaves. In its native habitat rains may not appear for much longer periods than those mentioned in the extracts given above, yet the plant lives on. Frequently the rains are short lived and its life cycle has to be completed in possibly a very few days, then to return to its resting period for another rainfall.

If this does not typify "the bravest thing that grows," then I should like an introduction to a plant that is braver. While Dinter comments on Nature's pitiless struggle against her children, we must credit Nature with evolving adaptations of plant structure that this, one of her children, can withstand the conditions and live and flower and reproduce its kind.

Frames Tours Ltd. are running a very interesting tour covering the dates February 16th to March 1st, or March 1st to 15th and March 15th to 29th. The tour covers extensive ground and is of special interest to all interested in horticulture with a special interest to our plants. It covers San Remo, Monaco, La Mortola, Grasse, Cannes, Genoa. Members interested should write Messrs. Frames, direct.

Lists received :

- T. N. Blackburn, Woodplumton, nr. Preston ; a five-paged priced list of cacti and succulents.
- A. E. Green, Normandale Nurseries, Sheffield, 6 ; a three foolscap paged typed list of cacti and succulents.
- F. Jansen, Leyweg, 24, Loosduinen, Holland ; a four-paged priced list of cacti and succulents.

ARE CACTI SLOW GROWING?

By Mrs. K. M. GARLAND

Two years ago, I was asked to look after a few "window sill" plants and, much against my will, I was talked into doing so.

That, of course, started it! My interest grew until I felt I must add a few plants of my own. I bought numerous books on the subject, technical ones, ones with the most beautiful coloured illustrations, which, alas, I cannot read as they are in Dutch (a job for this winter, to translate them with the aid of a dictionary); also a few assorted p'ants. Then I joined your Society!

My first inclination was towards succulents, with their lovely colourings and, perhaps, because they are a little nearer, in appearance, to the garden plants to which I am accustomed.

Then, in February of this year, I had a greenhouse erected and made one side of it into a raised bed with a twelve inch depth of soil at the back, sloping to eight inches in front. The bed was to be five feet wide, then I realised I could not reach to the back, so it is now finished in bays. Nothing was planted in this until February of this year and yet now, I just do not know what to do, but I do know why most people keep their plants in pots.

Opuntia ficus indica grew, from three small pads, to twelve large ones, with a total height of thirty-one inches and *Opuntia subulata* from a six inch specimen to a lordly tree of thirty-three inches, with four new branches. *Harrisia martini*'s original stem of six inches grew to thirty-two inches and achieved a youngster of nineteen inches and *Cereus jamacaru* from a thin four inches to a very fat thirteen and a half inches. All these had to be moved as they were fast approaching the roof and so I had a fresh bed made on the floor, where they still continue to grow.

Mammillaria erythrosperma increased from a half-inch ball to a mother of eight offsets, with a diameter of four and a half inches, *M. bocasana*, *M. pusilla*, *M. decipiens* from about the same size to families of seven, ten and eight offsets, respectively. *Borzicactus straussi* from three inches to seven inches, with a youngster of three inches. *Ferocactus latispinus* grows apace and has the most lovely scarlet inch-long spines.

All the *Echinopsis*, *Mammillaria* and *Notocactus* have bloomed and even the offsets of the *Mammillaria* are, or have been, a mass of blossom, plus some scarlet fruits.

But the succulents! There is a veritable forest of *Aeonium*, *Crassula*, *Echeveria*, *Euphorbia*, etc. Shrubs of three feet square. Last year's plantlet, half-inch in height, of *Bryophyllum tubiflorum* is now forty-eight inches high, with numerous branches and full of flower buds, which will soon bloom. One *Graptopetalum* species from about three inches across is now eighteen inches wide, with three flower stems of fifty-eight inches long. My *Aeonium tabulaeforme* is an enormous dinner plate. The other one flowered with four long stems and then died. *Kleinia articulata* is a nuisance with three foot long shoots, flowering and coming up all over the place. *Titanopsis calcarea*, in a few months, has grown another head and had four blooms, and *Echeveria metallica* from three inches, is now twelve, with twenty two inch flower heads. *Dudleya pulvinata* is a pure white, many pointed star of fourteen inches.

There will have to be a drastic thinning out and I am afraid a lot of plants thrown away. I cannot give them away, nobody wants them. Even an advertisement, offering them for the cost of packing and postage, elicited no response! The trouble is everything roots and I just cannot resist the temptation of sticking every fallen leaf or broken bit in my sandy propagator.

No fertiliser has ever been used and my soil is John Innes plus extra crushed brick, old mortar, sand and pea gravel. Watering is only done when they are bone dry.

In my other greenhouse is a *Mimosa*, grown from a twenty year old seed from Australia. It is now three years old and spent its first winter out of doors. After its first year in the greenhouse, it had to be beheaded as it threatened to go through the roof and it is now an absolute mass of flower buds for the second year.

In this greenhouse I keep my few *Zygocactus*, *Epiphyllum*, *Selenicereus* and *Rhipsalis*. They do much better here, which is only natural as being nearer to their original moist-jungle atmosphere.

(Mrs. Garland, (Denham Lodge, Yelverton, Devon) offers plants, chiefly succulents, for the cost of postage—members interested should write direct).

REPORTS OF MEETINGS

November 6th, 1951 : Mr. A. Boarder—How to avoid flower failures

I do not pretend to know all the answers, but only my own observations over many years and if you get results you must be on the right track. People make statements in print and, thereafter, everyone who writes on the subject repeats them. For instance, that our plants will flower only when pot-bound. Very few of my plants are pot-bound and they flower freely. My plant of *Mammillaria bocasana* had one hundred and fifty flowers at one time during this summer. Another thing that is wrong, is that if they have a good roasting in sunshine one year, they will flower better the following year. This year's seedling of *Mammillaria rettigiana* is budding for flower and that's not from what it has received the previous year.

Mammillaria rhodantha is late flowering on this year's growth. If no new growth, no flower buds in the centre. My *Mammillaria spinosissima* has two rings of dried seed pods. The higher ones are from this year's flowers. Some will not flower on old wood, but on the current year's growth and others on the growth of the previous year. This little plant (Mr. Boarder displayed it) has flowered and produced a seed pod. It is probably self fertile. It has hooked spines. It will be interesting to see what happens. Some *Mams.* flower between every tubercle. *Astrophytums* flower at every areole, but only on new growth. *Notocactus* flower in a ring on new growth. *Lobivias* flower on last year's wood. *Rebutias* flower low down and in the following year on newer wood. The best flowers of *Stapelias* are on new growth. *Epiphyllums* will flower on last year's growth ; naturally, they grow in steamy, clammy conditions. *Mammillaria woodsii* flowers on this year's growth. *Echinopsis* will flower in a room with a small amount of sunshine, but with more sunshine there will be more flowers. Better growth—better flowers, therefore, keep them growing.

There is an old saying that they should have a long winter's rest and that they should be exposed to scorching sun, but I do not find these maxims confirmed. Sun does make a difference ! agree ; *Lithops* buds may show colour and the sun will bring the flowers out. *Pleiospilos* and *Lithops* will hang fire waiting for the sun. I give no shade to my plants except for the first six months of their life. My greenhouse is open all through the summer weather.

During the winter's rest I cannot quite see why I should not occasionally give my plants a careful watering as if they are dry too long, the tiny fibrous roots die.

It is ridiculous to keep a plant in a pot for three years or more, as a lot of dead roots accumulate and get packed tight and root bug comes, sucks and damages the root and the plant dies. Some will not want larger pots, but will appreciate fresh soil. When re-potting, renew with fresh soil. If potting-on in August when the pot is outgrown, just lift out carefully and place in a larger pot, gently placing fresh soil around it—it will make better growth.

We cannot imitate the conditions in which the plants are found, so it is a wonder we flower as many as we do when one considers the vast distances apart where they grow, representing many differences in temperature and condition ; we assemble and flower them in one small greenhouse.

If you want to try old cow manure—all right, but it is one thing to use it in open ground, but entirely another to use it in a small pot. With spent mushroom compost, quite a lot of the fire and goodness has gone from it, but it is good clean stuff, although it may clog. It is good for mixing with the soil for *Epiphyllums*, but be on your guard for fungus.

I have been told I blow my plants up with a pump, so now I blow flowers on them. However, I am satisfied. There are one hundred and twenty-four genera of cacti with many of which I have been successful. *Cereus* have flowered in four years from seed. Other succulents will flower the same year from seed, if they have something good to grow in, such as, two parts loam, one part peat, one part sharp sand ; add $\frac{3}{4}$ oz. limestone, $\frac{3}{4}$ oz. sulphate of potash, $1\frac{1}{2}$ oz. hoof and horn grist and $1\frac{1}{2}$ oz. superphosphate per bushel and you can add something rough like broken brick, with a little charcoal for mature plants. Hoof and horn grist is a good long and short term fertiliser. When I say loam, I mean loam with grass stacked down ; do not throw the grass away when breaking up loam from Kettering.

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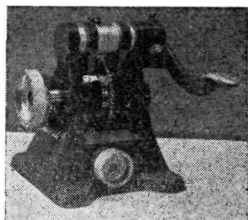
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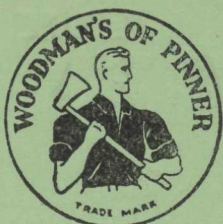
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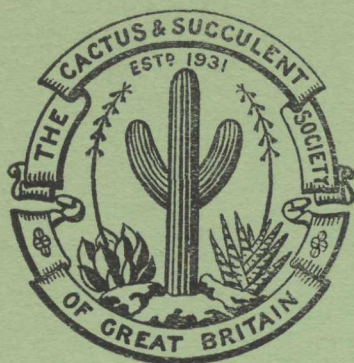
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SOCIETY NEWS

1952

May 13th. 6 p.m.

A. Boarder : Rebutias, Parodias, Lobivias.
(No R.H.S. Show).

June 24th. 6 p.m.

Summer Show and Discussion.

July 22nd. 6 p.m.

E. Shurly : Mammillarias.

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OF GREAT BRITAIN

ESTABLISHED 1931

Vol. 14

APRIL, 1952

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EDITORIAL

The April issue of the Journal seems to be a good opportunity to talk about the coming summer holidays. It is well known, and at the same time not so well known, that one of the world's most famous gardens is situated within the borders of Britain. Have you ever been to Treco, Isles of Scilly? There Major A. A. Dorrien Smith, Lord Lieutenant of the Islands, has a most magnificent garden in which can be found sub-tropical, and even tropical trees and shrubs that will interest even the most blasé. To us, interested in cacti and succulents, the gardens have a special interest as there can be found many of our favourites growing in the open under the most successful cultivation. Make a note of Treco for your 1952 summer holiday and, if you decide to go, why not get in touch with Major A. A. Dorrien Smith at Treco Abbey? He will be glad to afford you the opportunity of visiting his gardens and will extend you a hearty welcome as a fellow member and enthusiast.

Special note should be made that membership cards contain an error. The cards give our September meeting as the 24th; this should be the 23rd. We, of course, have our Autumn Show on the 23rd and 24th of that month, but the Society meeting is on the evening of the 23rd.

The recent Annual General Meeting was noted in many respects and it drew attention to the enthusiasm generated by our Dinner in November last. It was the expressed wish of members that the dinner should be repeated in November of 1952 as an opportunity of members meeting in a social atmosphere.

I have received a copy of Dr. G. L. Berry's remarkable directory of American cactus and succulent collectors. This contains thousands of names and is the most comprehensive publication of its kind that I have ever seen. Dr. Berry is desirous of extending the scope of the directory to cover other parts of the world, especially our own country and the Commonwealth. He would like to have the names of those who have good collections of around one hundred plants or more. Also information as to whether they have a greenhouse or grow them in windows, etc. Also the approximate number of plants of cacti and also of succulents that they have; further, whether a private or commercial collector or a dealer. Another useful feature would be the name and address of any public gardens in the various countries that feature cacti and succulents, with the name of the horticulturist in charge. Write direct to Dr. G. L. Berry, 1312 Cherry Street, Lawton, Oklahoma, U.S.A.

It will have been noted that the Society is completely out of stock of the first part of volume eight. If any member could spare a copy it would be gratefully received by the editor for a very good friend of the Society over many years, who is short of just this copy. The Society's library is also short of one issue of the Journal, so if any member can spare the second part of volume seven would they send it to Mr. P. V. Collings, 53 Northumberland Road, New Barnet, Herts., our librarian.

CACTUS CULTURAL NOTES

By A. BOARDER

In the January issue of the Journal I dealt with the sowing of Cactus seeds and as I had written far too much a portion of my notes had to be omitted. I will now continue the directions and then it will be possible to have a complete description by referring to the two Journals. Once the seeds are sown the subsequent watering can be a little difficult. I use a very fine spray and water from overhead, always remembering to test the spray first to see that it has not become partly blocked when it can send out a strong stream which will blow all the seeds away. Do not allow the peat surrounding the pots to dry out, but again do not let them stand in water. Raise the protecting glass each day and if there is any sign of mildew spray with a fairly strong solution of Permanganate of Potash. The seed compost should have been sterilised, but some of the pod casing may have been present with the seeds and this can soon form mildew. See that the water you use is not polluted and keep it covered so that the sun does not cause Algae to form, as this will encourage green to form on the surface of the pots.

You can expect the seeds to germinate in from four to ten days, but a great deal will depend on the genera. With my usual batch of *Mammillaria*, *Notocactus* and *Rebutia* seeds, I look for germination after about four days and it is very unusual for many days to go by without some of the seeds showing signs of life. Because of the different times taken for the germination it is advisable that when sowing you should keep the same genera in one pot.

Once any seeds have germinated in a pot it is essential that the cover glass is kept raised so that some air can get to the seedlings. If they are kept too close they will probably damp off. This damping off disease, or Black-leg, is not too difficult to prevent, but it is almost impossible to cure affected seedlings. It can happen over-night and lack of air and excessive dampness are the main points which accelerate the trouble. Once the seedlings appear and look to be growing it is not so important to keep them damp, and it is possible to treat them in a similar manner to mature plants once the plant proper is forming. You must aim at a steady and uninterrupted rate of growth the whole time, as once a seedling gets a bad check it will be a long time before it starts to grow again. These checks can be caused by excessive dryness and also from over dampness, but whereas a seedling which has received a check through dryness can soon pull round; if the cause has been over-watering the seedling may never recover. If the seedlings are unshaded and are subjected to strong sunshine this can also cause a check. The plants will turn red in colour and once this has happened it may be a long while before you are able to get them growing again. Some people raise their seeds in an airing cupboard or similar place. This will usually produce seedlings which are weak, pale and spindly and where such plants are badly drawn up they may suffer from damping off. It is better to raise seeds on an indoor window-ledge shaded from the sun than to do so in complete darkness. Such seedlings would have to be gradually introduced to the light.

Whilst you are waiting for the seeds to germinate, as long as you keep the cover glasses on the pots it is not necessary to water very often. It may well be that providing you have watered the soil sufficiently in the first place no more water need be given until the seedlings are up. Overwatering can prevent germination and cause the seeds to rot.

I have heard from one or two members that they have been bothered with red spider on their plants. At least that is what I have deduced from their descriptions. One of the worst plants for this pest is *Chamaecereus silvestris*, and the first signs are usually brownish markings at the base of the stems. It resembles a brown or reddish rust but if examined with a fairly strong magnifying glass a few tiny red spiders will be seen slowly crawling over a fine web which covers the plant. The spiders suck the sap from the plant and cause tiny scars. Some plants are more attacked by this pest than others and a close watch should be kept on all *Pleiospilos* as well as the above mentioned plant. A certain cure is to spray with a solution of methylated spirit to which has been added one part of nicotine to forty parts of meth. After about ten minutes the plant can be sprayed with some fairly hot water to which has been added a little detergent such as Dreet. This will clean away the nicotine which might otherwise cause some discolouration.

I have made a start at re-potting all my Cacti. This usually takes me over a fortnight and what with other jobs I am finding that it will take me much longer this year. All my adult plants are re-potted each year and I am sure that by this means the plants will not only grow well and flower, but it does tend to prevent root-bug, which is another pest experienced by many members. The presence of this pest can only be seen as a rule when the plant is taken from the pot. Small specks of white like flour can be seen on the insides of the pot, in the drainage and among the roots. The actual bug is like a tiny rice kernel. They do harm to the plant by sucking the juice from the roots. I am positive that an annual re-potting does tend to keep this pest in check as if a plant is taken from

a pot for the first time for several years that plant will be the one with root-bug nine times out of ten. I have so far finished about 350 plants and have only found a trace of root-bug on one or two plants. The roots should be washed well and when re-potting place a small quantity of naphthalene or paradichlorobenzene over the drainage crock as I find that this helps to keep the pest away.

I have had the usual job of trying to find room for all the plants when they are put into larger pots. Most of mine had to have a shift to a larger pot. Generally a pot which is half an inch wider is sufficient. Whilst re-potting I have been changing my labels to the small Tags sold by Woodmans. These enable one to read the names without turning the head to one side. I have used up 300 of these and have not yet completed the *Mammillarias*. There are, however, one or two duplicates, as I find that to get seed to form it is imperative that in some cases I have more than one plant of a species. I have had a quiet smile whilst working when I remember having often seen in books *Mams.* referred to as thimble Cactus. One of my *Mams.*, which I raised from seed sown in 1946, is now in a seven inch pot and many more are in five and six inch ones; some thimbles!

I always start with the larger plants as then the pots will come in for the smaller ones. Once a pot is clear it is placed in soak so that it can be scrubbed before it is used again. Failure to do this may bring you a crop of root-bug. As each plant was re-potted the label was marked on the back with the date for future guidance. My *Mammillarias* now take up a space in my house three feet wide and twelve feet long, and it is surprising that since 1946 I have been able to raise these from seed, and there are scores of other genera and species yet to be dealt with.

I have been pleased to note that my plants have come through the winter in much better condition than last year. The electricity cuts have been fewer and I have been using an oil heater which has kept the greenhouse free from frost. Although I do not try to keep the greenhouse warm in the winter I do like to keep the frost out. Several of the *Mams.* were budded for flower in January. Once I had re-potted the plants they were given a spray with warm water on any bright days as I think that this encourages them to make fresh rootlets. I have dealt fully with the actual re-potting process in earlier Journals and so there is no need for me to repeat this.

If you find that the nozzle of your watering can is too large for the very small pots it is possible to construct a smaller spout which will only allow a gentle flow of water. Get a short length of plastic tubing as sold at aquarists stores, and is about three-eighths of an inch in diameter. This can be bent with the fingers to a swan-neck shape. Next place a rubber cork in the spout of the can. Bore a hole the size of the tube whilst the cork is in position. The tube can then be placed in the cork and it will be found that this enables you to pour out a fine steady stream which is suitable for seedlings and small pots.

In my next notes I shall deal with the pricking out of seedlings.

LISTS RECEIVED

T. N. Blackburn, Woodplumton, nr. Preston; a printed six-paged leaflet giving a good list of species in nearly all the genera of cacti and also several of succulents.

Thiebaut, 30 Place de la Madeleine, Paris, 8e, France; A printed sixteen-paged booklet containing hundreds of packets of seeds, also cacti and succulent plants, with certain interesting accessories.

F. Schwarz, Apartado No. 347, San Luis Potosi, S.L.P., Mexico; Two printed booklets, each of sixteen pages, with hundreds of cacti in one and hundreds of selections of seeds in the other.

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The British Section of the International Organisation for Succulent Plant Study has started operations. It is not an organisation in the proper sense of the word, but a loose association of those more deeply interested in the study of our plants than can be effected by the popular societies. Earlier doubts have been removed as the British Section works entirely on its own, under its own management and rules while still co-operating with others overseas. There is no standard subscription, but everyone interested can assist by a donation, or even a 10/- annual subscription to their "Repertorium Plantarum Succulentarum," which records all new species described during the current year.

The secretary's address is: Mr. J. D. Donald, B.Sc., 3 Braeside Avenue, Brighton, 6.

CULTIVATION OF SUCCULENTS

By W. DENTON, B. E. M.

In the last issue of our Journal, in my succulent notes, I promised to discuss seed sowing as I considered there was still time to obtain satisfactory small plants by those people who were not in the position to give the heat necessary for a start in February. In looking up my remarks last October, I note that I dealt with this subject rather fully, and so I do not wish to weary you with undue repetition. I am afraid there is very little I can add to the general principle then laid down. In talking about individual plants I shall endeavour to explain how I slightly alter the potting compost to suit particular specimens and genera.

John Innes general mixture is what I use and this is added to, and sifted, to suit the various families I am dealing with. Any late sown *Lithops* from last year could now be pricked out in new containers. It is not possible to take out the seedlings as individuals, the best way is to turn out the lot, making sure that the compost is neither too wet, nor dry, but just at the right consistency for you to separate them without damage to the tiny tap roots. This is not as easy as it sounds, and does require great care. One other point I have noted with these, it is a very tedious job pricking out these seedlings and the tendency is to take out the largest and not trouble about the very small ones. This year take the trouble to save a few of these very small chaps; in lots of cases they turn out to be of the most pretty markings and it does make a difference to the general collection when viewed as a whole.

Anyone who has seen a pan of thirty or forty seedlings, say of *Lithops fulleri* or *fossulifera* will know what I mean, some are much nicer than others in the markings. The genus *Titanopsis* is one that I have been interested in for many years and I note it is a very popular plant with members, so a few words about them may be useful. I often wish that my growing conditions were better, surrounded as I am with smoky chimneys and closed-in conditions in the heart of London, I labour with a great disadvantage as this is a plant that very definitely requires clean air and bright conditions.

There are the following species: *T. calcarea*, *setifera*, *fulleri*, *schwantesii*, *primosii*, *luckhoffii*, *triebneri* (*hugo-schlechteri* syn. *astridea*) and one I had sent me years ago called *renoforme* that I have not since heard of. They will stand colder conditions than most plants and certainly require an additional amount of lime in the compost. I have examined many of these, in pre-war years, collected from their native habitats and imported here and have noted that the soil attached is very loamy and sandy and powders up fine when compressed. Therefore, I consider that mortar rubble from an old wall very suitable to add to our base compost. The sand used by builders for this purpose is pit sand and that is not nearly so sharp as we normally use. Three parts John Innes and one part rubble, as above, should be suitable. Ample drainage of lime stone chips should be provided and, when potting, sit the plant on a base of sharp sand. They are summer growers and watering should be commenced about April and carried on with until after flowering when they naturally go to rest. Dry all the winter please for these. The most popular one is *calcarea*, this is by far the easiest one to cultivate and makes a very pretty specimen, especially when you have the true variety and not one of the hybrids so frequently met with. The others are not so easy. They all grow well from seed and make nice plants in one year. I have had them in flower the first year and they nearly always bloom in the second year. It is the winter that beats you with these.

T. hugo-schlechteri is one of the most difficult plants I have ever tried to grow and I have, up to now, never kept one longer than three years. Last year I tried a new method, I potted this in a very deep pot, seven inches by three inches, in the above-mentioned compost and grew plunged in a tray. I kept this in partial shade the whole of last summer and I now have this plant looking fine and entering its fourth year. Perhaps, and I say this with reserve, it may grow under the shade of tall grass or shrubs in its native home. I do not know, but such is my experience with this. I should be glad to know how other people find this plant and expect to be found fault with. I still have plenty to learn about all my members of the succulent families and would welcome any criticism as to my methods of culture.

Special care should be taken with all *Titanopsis* plants, in watering never allow any to settle between the leaves, they rot off very quickly.

Conophytums should, about now, begin to change colour and you will notice they take on a purple hue at the base, this is a sign they are going to rest and that the new growths are on the way and being nourished by the sap of the old ones. Gradually dry off and keep dry for the next few months. About mid-July onwards they will burst open the old leaves, then you can give a little water. Do not be in a hurry to start watering the *Lithops*,

about mid-May should be time enough, in any case watch the plants and when the old growths persist only in the form of dried skins, then start to give a little water.

Re-potting could now be carried out, if necessary, and if you are dealing with old plants, every two or three years should be enough. Seedlings should be given a shift on after the first year. If you have any *Ophthalmophyllums*, these should be kept dry till later in the year, July to August is generally the time these show signs of activity. Very few people seem to go in for these and the plants are not nearly so popular as *Lithops*, although they resemble them closely in appearance. There is a much larger colour range here and I consider they are worth while to try; most of them have beautiful windowed tops. The same potting mixture as for *Lithops* will suit them quite well.

Euphorbias will require a little attention now; watch for signs of growth commencing, then give water. I always think it is as well to let nature tell you when they require moisture; the leafy ones from the Canary Islands will certainly be the first to show signs of young growth. Once you start, regular waterings should be given in fine weather to encourage new shoots to form. *Euphorbia splendens* will, probably, have had attention before this as this is one of the first to respond to a little sunshine and what a nice, colourful plant this is—always looking well among a collection of succulent plants.

By the way, this now has a new name and should be called *Euphorbia milii*, this is according to the botanical experts. Extra care should be taken with those rare plants like *E. obesa*, *bupleurifolia*, *eustacei*, etc., never on any account water these till they are on the move. *E. bupleurifolia* should be given slight shade, this can be arranged by standing by the side of a large specimen. *E. tuberosa* is a most interesting species when resting—nothing at all can be seen above ground. When growing, however, it produces a small bunch of blue-green leaves that, to me, are most attractive. I am only able to make this grow in our winter. Why this should be I do not know as it comes from the Cape Province, the home of many of our summer growers. I think this will always be a rare plant.

Fenestrarias should be given a little water now, especially if the leaves are inclined to shrivel and you want to take a few cuttings. Never cut these plants up only when they are plump and full of sap.

Talking about cuttings, this also applies particularly with *Stapelias*, it is good practice to depend on the young growths, these are much better for flowering than the old stems. Not only that, but you avoid the dreaded black spot that the older stems are subject to. They root quickly in Vermiculite and grow fast with a little bottom heat. A little general watering could take place now most of the succulent plants are on the move, and should be encouraged. *Cotyledon*, *Adromischus*, *Stomatium* and lots of the *Crassulas* are becoming active.

Any re-potting necessary should now be carried out. By the way, do not be tempted to over pot, especially with *Euphorbias*, it is better to give them a size that will fit them comfortably. A small plant in a large pot will not do nearly so well as the one that is shifted on as the size demands.

Watch out for signs of root bug and eliminate by re-potting, this is the best way, soak the roots in a solution of nicotine and meth., dry out by shaking in a little sand. We are not troubled much with the ordinary mealy bug, thank goodness. Greenfly will sometimes attack the young shoots and leaves of *Euphorbia neriifolia* and kindred sorts, but is soon disposed of with a weak nicotine solution or any of the approved insecticides.

So sorry to keep on telling you this, BUT DO GIVE AIR ON ALL FAVOURABLE OCCASIONS.

In accordance with the wish expressed at the Annual General Meeting, the Council will endeavour to make arrangements with Mr. Harle for a further visit to his establishment during May, of which members will be advised later, provided, of course, it is convenient to our very good friend, Mr. Harle.

The Editor of "Amateur Gardening" is desirous of obtaining photographs of small greenhouse collections, to show what can be done in a small space; also photographs of outstanding cactus and succulent plants in flower. Arrangements would be made for photographing in the London and Home Counties areas. Write direct to the Editor, "Amateur Gardening," 2/10 Tavistock Street, London, W.C.2.

THE SCIENTIFIC APPROACH TO SUCCULENTS

By GORDON D. ROWLEY

INSTALMENT SIX

"Of making many books there is no end ;
And much study is a weariness of the flesh."

—Ecclesiastes 12 : xii.

The Literature on Succulents

In my first flush of schoolboy enthusiasm for succulents, the names of Higgins and Jacobsen, Borg and Haselton filled the whole horizon. University days broadened the outlook, and with a list of 100 titles in 1945 I imagined little remained to be read. It was Mr. R. K. Byrd who really opened my eyes to the vastness of succulent literature. With the equivalent of 40 feet of bookshelves packed to overflowing, he still had not exhausted the possibilities. Today, with a select index of over 2,000 titles, I find references continue to come in too fast to handle comfortably.

Consider first the scope of the subject. About two to three per cent. of the world's flowering plants, members of two dozen families—are eligible for inclusion in succulent collections. They live in unexpected places ; their anatomy is extraordinary, their metabolism unique. No conscientious ecologist, morphologist or physiologist can therefore afford to ignore them. Wild or naturalised, succulents occur throughout the world, except towards the poles, and accounts of them are hence ever likely to turn up in local floras, natural history society journals and gardening weeklies. And to all this is added the spotlight of popular favour ; the cactus is the fashionable indoor plant of the austere nineteen-fifties, and nurserymen are not slow to keep the fashion alive. If you need further proof of the amount written on succulents, scan the back issues of "Amateur Gardening" or the 200 odd volumes of the "Gardener's Chronicle," or run your eye through the collective indices of the R.H.S. Journal or Curtis's "Botanical Magazine." I try to keep check of the various society periodicals dealing with Cactées, Kakteen, Cactussen, Kaktéer, Cactaceas and Cacti in a dozen other less familiar languages : goodness knows how many there are beyond the thirty known to me.

Book Collecting

As soon as one graduates beyond the four-book-stage in succulents, one has to face the heart-aches of book-buying in mercenary, dollar-starved England, where this type of specialist hobby provides a playground for the collector maniac who thrives on limited editions and curiosa. I have seen priceless books on succulents hoarded for years as collector's pieces, often with the pages uncut, or in languages the proud owner would never admit he cannot read. How often has one wished that rare books, like *Crassulas*, would multiply *ad lib* by cuttings !

At this point one might reasonably ask : "Why bother with these old books ? Are not the modern ones far better ?" The answer is yes, in many ways—certainly in descriptive detail, presentation and general grasp of the subject. But the older books exhale a charm of their own, particularly when they have hand-coloured illustrations, the product of a long-forgotten age of cheap, skilled labour. Also they are valued for their first descriptions of new plants, which determine future ideas on the interpretation of species.

Types of Book

A bibliography on succulents covers everything from the smallest pamphlet to encyclopaedias ; from gardeners' pocket books to impressive monographs, "some . . . to be tasted, others to be swallowed, and some few to be chewed and digested." There are highlights and shadows ; mysteries, curiosa and jokes. There are the purely "arty" books like "Les Fleurs Plantes Grasses" (Davids and De Montherlant), and the solidly academic : "Notes on Mesembrianthemum Part II" (L. Bolus) with descriptions of 782 new species in Latin. There is the strictly factual title, like "The Genus *Sedum* L.," and the sickly sensational : "Great Scott—the Thrill of Cactus Growing." There is the intentionally humorous "What Kind'a Cactus Izzat ?" a classic by Reg Manning, and the unintentionally humorous, as Haage's first attempt to render his "Kakteen Zimmerkultur" in English. There is Loudon's amazing "Encyclopaedia of Plants," the ultimate in compressed information, and a book like Rouhier's "Le Peyotl," with 372 pages devoted to one plant, *Lophophora williamsii*. There is even one pornographic item ! And I wonder how many beginners have ordered Ethel Mannin's popular novel "Cactus" in the impression that it would help them to name their *Mammillarias* ?

First prize for lavishness must go, I think, to De Candolle's opulent folios of "Plantarum Succulentarum Historia" (1799-?1837), with up to 187 full page colour plates by Redoute, best known of all plant illustrators.

It has a modern counterpart in the gigantic Flora of Argentina now appearing under the editorship of H. R. Descole (1943-7), with the succulents by Castellanos and LeLong. Rarest is a little pamphlet by H. A. Duval, "Plantae Succulentae in Horto Alenconio" (1809), of which only one copy is known to have survived. It was reprinted in this Journal for June, 1939. The worst book ever written on succulents is—alas!—the work of an Englishman. I forbear to give his name, but he was a journalist who compounded his magnum opus by slavishly copying popular handbooks and catalogues, including all the misprints and one entirely fictitious genus "*Globosa*," born from a typographical error in a tradesman's list. Needless to say, his book sold by the thousand.

However, it was also an Englishman to whom we owe the first recognition of succulents as a natural ecological unit* in 1668, and to another the first book devoted exclusively to succulents. Richard Bradley's much-quoted and rarely-seen "History of Succulent Plants" appeared in parts between 1716 and 1727, but there may be even earlier candidates for this honour. Recently a puzzling reference came to my notice, and I quote it here in the hopes that some reader may be able to throw light upon it. In the catalogue of printed books given at the end of "A History of Gardening in England" by the Hon. A. Amherst (London, 1896) one reads on p. 352 the following:

"RICHARD BRADLEY. Paintings of his succulent plants, with written accounts of them. 1706.

—A treatise on Succulent Plants. London, 1710."

Six months of correspondence have revealed nothing regarding their existence at the British Museum, Science Museum, Natural History Museum, Linnean Society, Kew or Cambridge. Where are these mysterious works that Lady Amherst saw 56 years ago? Can any reader help solve the riddle?

For the Fireside—or the Fire?

It is a strangely sobering experience to regard the plethora of writings on succulents on the one hand, and our pitifully muddled and incomplete knowledge of them on the other. How can one reconcile two such extremes? It is easy enough: the amount of reliable research has been so slight and sporadic that authors have had to beg, borrow and steal to present a case at all. The old ideas recur again and again: withered leaves floating endlessly on a stream of complacency. It is not sufficient merely to urge people to experiment and prove for themselves: we must foster a critical approach to reading—an alert, analytical state of mind ever ready to wash the grit from the spinach. "Reading," said Schopenhauer, "is thinking with someone else's head instead of your own," and Pope was aware of the same pitfall when he wrote of "The bookful blockhead, ignorantly read, with loads of learned lumber in his head."

I am not suggesting that it is a bad thing for authors to draw on other books for their information: it is essential for them to do so, providing they are fully alive to the dangers. One of the most pressing needs today is for popular symposia of the type of Berger's admirable German handbooks, digesting and summarising technical papers and monographs for popular consumption: "canned spinach," grit-free and ready for the table.

Illustrations

Line drawings and photographs are a sovereign aid to recognition of succulents; the difference between *Pleiospilos bolusii* and *P. nelii*, obvious from a simple sketch, takes many lines of technical gobbledygook to describe. This century has seen the greatest advance so far in plant illustration: the addition of a third dimension. In the stereoscopic Kodachromes which accompany W. T. Marshall's book "Succulent Plants" we see the first step towards a new and vastly improved aid to plant identification. Its possibilities are enormous.

The lack of cheap publications with coloured plates is a common grouse among cactophiles. Few people seem to appreciate the hazards and hardships facing an author who attempts anything so ambitious. To the existing offices of explorer, collector and botanist he must add writer, business man, publisher and salesman—not to mention ownership of a private fortune to finance the enterprise. Small wonder that good monographs of succulents are so rare. Yet now and then they appear—one so recently as last year. My admiration for G. W. Reynolds' "Aloes of South Africa," the direct successor to the White-Dyer-Sloane heyday of the 1930's, mingled with curiosity regarding its accomplishment. What did it cost to produce a volume with 77 colour photographs? How much profit did the author gain from sales at £3 15s. 0d. a copy? Mr. Reynolds' answer to my queries is so revealing that I quote two paragraphs from it. After giving the publication costs as £11,500, he goes on:

"The general public has little idea as to what is put into a book of the nature of the Aloes book. I personally

(Continued on Page 39)

* J. Wilkins. I hope to reprint his remarkable attempt to classify succulents in a later article.

THE SYSTEMATICS OF CONOPHYTUM N.E. Br.—contd.

By Dr. A. TISCHER

Translated by Mrs. H. Kassai

Sub-genus 2 : *Derenbergia* Schwant.

Semi-shrub, short branched or stemless, cushion forming species, bodies $\pm$ heart shaped, inverted ovate to cylindrical, top with $\pm$ long, free leaf-ends or $\pm$ tapering ovate without free leaf tips ; free leaf tips $\pm$ tapering, keeled or rounded and not keeled : skin smooth, rough or hairy, with or without transparent spots, frequently on both ends of fissure a $\pm$ large transparent dark green zone, keel and edges of fissure often red. Ground colour of bodies yellow green, green in all shades of white-green to dark green or brownish green to grey green. Flower white, rose, red, yellow to salmon or copper.

Series I. *Biloba* N. E. Br.

Bodies cylindrical to heart shaped, with distinctly extended, pointed or blunt leaf ends (lobes). Flower white, pink, red or yellow to salmon or copper, diurnal. Types 24-27, 33-45.

Type species : *C. bilobum* N. E. Br.

Occurrence : Little and Great Namaqualand, Bushmanland.

Sub-series I.

Bodies longer than 2 cm. ; lobes mostly more developed.

C. albescens N. E. Br. (y/26/42), *C. amplum* L. Bol. (y/39), *C. angustum* N. E. Br. syn ; *C. subtenue* L. Bol. (y/40), *C. apiatum* N. E. Br. (y/38), *C. apiculatum* N. E. Br. (y/40), *C. bilobum* N. E. Br. (y/27/37), *C. conradi* L. Bol. (y/41/43), *C. divaricatum* N. E. Br. (y/27/37), *C. elishae* N. E. Br. (y/37/38), *C. exsertum* N. E. Br. (y/27), *C. frutescens* Schwant. (co/37/41), *C. grandiflorum* L. Bol. (y/40/41), *C. incurvum* N. E. Br. (y/41/43), *C. klipbokbergense* L. Bol. (y/39/40), *C. laxipetalum* N. E. Br. (y/37/38), *C. lavisianum* L. Bol. (y/38/42), *C. lekkingense* L. Bol. (y/40), *C. leucanthum* Lav. (w/37/41), *C. leucanthum* var. *multipetalum* L. Bol. (w/37/41), *C. linearilucidum* L. Bol. (y/38/42), *C. markoetterae* Schwant. (y/41/43), *C. meyeri* Schwant. (y/43/45), *C. muscosipapillatum* Lav. (y/39), *C. noisabisense* L. Bol. (y/27/37), *C. nelianum* Schwant. (y/37/38), *C. notabile* N. E. Br. (co/27/27), *C. nutaboense* (L. Bol.) Tisch. (syn. *C. angustum* L. Bol.) (y/27), *C. plenum* N. E. Br. (y/37/41), *C. pole-evansii* N. E. Br. (y/37), *C. regale* Lav. (r/39/40), *C. simplum* N. E. Br. (y/26/27), *C. sitzlerianum* Schwant. (y/37/38), *C. smithersii* L. Bol. (y/26/37), *C. sororium* N. E. Br. (y/37/38), *C. springbokense* N. E. Br. (y/37/38), *C. subacutum* L. Bol. (y/41/43), *C. strictum* L. Bol. (y/26/37), *C. strictum* L. Bol. var. *inaequale* L. Bol. (y/26/37), *C. teguliflorum* Tisch. (co/37/38), (syn. *C. salminicolor* L. Bol.), *C. tumidum* N. E. Br. (y/37/41), *C. vlakmyense* L. Bol. (y/27/42).

Sub-series 2.

Bodies up to 2 cm., leaf ends (lobes) mostly less markedly developed than in case of species belonging to Sub-series I.

C. altum L. Bol. (y/24/25), *C. altum* L. Bol. var. *plenum* L. Bol. (y/24/25), *C. andausanum* N. E. Br. (y/36/38), *C. apertum* Tisch. (y/26/34), *C. andausanum* N. E. Br. var. *immaculatum* L. Bol. (y/37/38), *C. approximatum* Lav. (y/24/25), *C. blandum* L. Bol. (r/27), *C. connatum* L. Bol. (y/33/34), *C. convexum* L. Bol. (y/22/24), *C. corculum* Schwant. (y/24), *C. cordatum* Schick. et Tisch. (y/24/26), *C. corniferum* Schick. et Tisch. (y/25/27), *C. difforme* L. Bol. (y/24/26), *C. dennisii* N. E. Br. (y/38), *C. diversum* N. E. Br. (y/26), *C. ernianum* Loechs et Tisch. (r/36/39), *C. gracile* N. E. Br. (y/37/42), *C. gracilistylum* (L. Bol.) N. E. Br. (r/26/27), *C. karamoepense* L. Bol. (r/25), *C. laetum* L. Bol. (y/24/36), *C. longibracteatum* L. Bol. (y/24), *C. luisae* Schwant. (y/24/25), *C. marginatum* Lav. (r/35), *C. macrostigma* (L. Bol.) Schwant. (syn. *C. cordatum* L. Bol. var. *macrostigma* L. Bol.) (y/24/26), *C. obtusum* N. E. Br. (y/22), *C. parvulum* L. Bol. (y/25), *C. recisum* N. E. Br. (y/43), *C. retusum* N. E. Br. (y/26/27), *C. semivestitum* L. Bol. (r/44), *C. simile* N. E. Br. (y/24/26), *C. taylorianum* (Dtr. et Schwant.) N. E. Br. (r/36/38), *C. tectum* N. E. Br. (y/38/40), *C. triebneri* Schwant. (r/24/36), *C. violaciflorum* Schick. et Tisch. (syn. *C. geometricum* Lav.) (r/36/37).

Series 2 : *Oviger* Tisch.

Bodies compressed or ovate elongated, rounded on top, fissure not or hardly expressed, lobes not at all or hardly outlined. Flowers pink, red or yellow, diurnal. Types 2-3, 7-9.

Type species : *C. ovigerum* Schwant.

Occurrence : Great and Little Namaqualand, Bushmanland.

C. auctum N. E. Br. (y/2/34), *C. latum* L. Bol. (y/24/36), *C. meyeri* N. E. Br. (y/2/24), *C. leipoldtii* N. E. Br. (r/2/3), *C. nanum* Tisch. (y/3/7), *C. ovigerum* Schwant. (y/2/3), *C. polyandrum* Lav. (r/2/23), *C. piriforme* L. Bol. (y/7), *C. puberulum* Lav. (y/2/3/24), *C. ramosum* Lav. (y/2/24), *C. tischeri* Schick. (r/24), *C. velutinum* Schwant. (r/2/24).

Series 3 : *Saxetana* Schwant.

Body spindle shaped (fusiform), inverted ovate to heart shaped, lobes $\pm$ developed, flower small, white, cream, brick-salmon, or wine, nocturnal. Types 33-34, 36-39.

Type species : *C. saxetanum* Schwant.

Occurrence : Little and Great Namaqualand.

C. densipunctum (Tisch.) L. Bol. (w/39/40), *C. elongatum* Tisch. (co/33/34), *C. exiguum* N. E. Br. (y/33/34), *C. graessneri* Tisch. (w/34), *C. halenbergense* (Dtr. et Schwant.) N. E. Br. (v/38), *C. hians* N. E. Br. (w/33/34), *C. hirtum* Schwant. (?/33/34), *C. loeschianum* Tisch. (w/33/34), *C. misellum* N. E. Br. (c/33/34), *C. miserum* N. E. Br. (?/34/36), *C. modestum* N. E. Br. (w/34/36), *C. namibense* N. E. Br. (?/3/34), *C. quaesitum* N. E. Br. (w/34/36), *C. quarziticum* Tisch. (w/39/40), *C. rubricarinatum* Tisch. (co/34), *C. saxetanum* N. E. Br. (w/33/34), *C. vescum* N. E. Br. (w/?/34/37).

Schwantes has classified his sub-genus *Derenbergia* into the following series : *Cordiformia* Bgr., *Viridipunctata* Schwant., *Grazilistyla* Schwant., *Saxetana* Schwant., *Pellucida* Schwant. and *Hirta* Schwant. According to N. E. Brown's suggestion the series *Pellucida* Schwant. has to be included in sub-genus *Fenestrata* N. E. Br. As the flowers of many species belonging to the other groups are well known, the classification suggested by Schwantes cannot be maintained to its full extent. The species *Fenestrata* do not only differ from the species *Derenbergia* by the "windows" being present with nearly all its members, but partly by characteristics of the flowers (f.i. the presence of stamens) and peculiarity of skin (f.i. pigmentation).

There is one group which stands out among the other forms, its species having small flowers which are nocturnal and have a very sweet smell. The type species of this group is, according to Schwantes' suggestion *C. saxetanum* N. E. Br. However, there are a number of other species which have been classified by Schwantes displaying the same typical peculiarities of flowers. The series *Hirta* Schwant. could be incorporated into the series *Saxetana*, as the species *C. hians* N. E. Br. and *C. hirtum* Schwant. display the same characteristics of shape and flower as *C. saxetanum* N. E. Br. The presence of hairy skin does not constitute a basic difference, as we find, within other groups, species both with smooth and hairy skin. The species *C. halenbergense* (Dtr. et Schwant.) N. E. Br. which has been incorporated by Schwantes into the series *Viridipunctata*, should, because of its flowers, together with the still larger *C. densipunctum* (Tisch.) L. Bol. and *C. quarziticum* Tisch. belong to the series *Saxetana*. Species with more or less considerable differences in size of bodies occur in other groups as well, such as *Wettsteinia* Schwant.

A systematic grouping of diurnal species of *Derenbergia* meets with considerable difficulties, as, up to now, no distinguishing characteristics could be traced with any certainty between the flowers of the various groups. Schwantes classifies these species into the series *Cordiformia* Bgr., *Viridipunctata* Schwant. and *Gracilistyla* Schwant. The dots in themselves cannot be regarded as a typical characteristic feature for the members of a group, as we find very often, not only in the same species, but also in the same plant, bodies with and without dots. Schwantes traces further distinguishing features in the more or less strongly marked characteristics of the lobes. But even here we find all the transitory forms from a formation of two long leaf tips—which extend in some cases up to the centre of the body, such as *C. meyeri* Schwant.—to a total missing of "lobes," such as is the case in *C. ovigerum* Schwant. Even the size of bodies is not solely distinctive, as there exist, however, large types where the lobes are entirely missing and small types with long lobes, such as *C. semivestitum* L. Bol. A reasonably satisfactory suggestion might consist in separating those types in which the lobes are rudimentary only or entirely missing, from the other bilobal types. There still remains, however, another group including many species. This solution does not appear to be satisfactory either. On the other hand, a sub-division of the bilobal forms according to the length of lobes cannot be carried out, as all varieties, from rudimentary lobes to well developed ones, are known. The only existing characteristic is the size of the bodies, but even here the distinctions are overlapping. Often old plants have smaller bodies than younger plants, the size of bodies depending to some extent on watering ; bodies often swell considerably due to increased watering. As in most cases, not always however, smaller species have shorter lobes than larger ones, Schwantes' suggestions are justified to a certain extent. The shape of the flower does not allow a satisfactory classification either. The entire group has to be qualified, according to N. E. Brown's suggestions, as *Biloba* N. E. Br. The qualifying name of *Cordiformia* Bgr., used by Schwantes, is not admissible, as this designation applies to a section of the genus *Mesembryanthemum* L. I suggest the qualifying name of *Oviger* for the group lacking lobes.

C. turrigerum N. E. Br. included by Schwantes in his series *Viridipunctata*, should be incorporated into the series *Minuscula* Schwant. This appears also to be supported by the fact that this species occurs outside the proper geographical distribution of the *Derenbergia*. *C. eenkokerense* L. Bol. too, due to its shape and size, should be

(Continued on page 44)

UNCOMMON SUCCULENTS

By G. G. GREEN

Whilst searching through the succulent house for suitable subjects for this article, I lingered as usual, to admire the "Lovelies" of the collection. These include the beautiful *Cotyledons*, *Echeverias*, *Kalanchoes* and other fascinatingly coloured species that are so attractive and which never fail to give one a thrill, no matter how dull the weather.

One of the most beautiful and handsome plants of the "powder" group is *Cotyledon orbiculata* var. *oophylla*. It is wonderfully compact and neat in growth with small, rounded, fat leaves flattened at the tips and covered with a thick coating of white meal. The edges are lined in dark red which brightens at the tips to a lighter colour, giving a delightful contrast.

These leaves are produced on very short branches in close, compact growth, emphasising the sturdy appearance of the plant. It is rather slow growing under ideal conditions, but the initial leaves do not wither or discolour with age and remain as fresh as the new ones for years, which is an unusual trait amongst *Cotyledons*.

The growth should not be accelerated by any artificial means or under the impression that it is good cultivation when plants grow quickly into unnatural sizes or proportions. The whole character of the species will be lost if this tardy growth is not allowed to continue at its own pace. Under such treatment the development of the powder on the stems and leaves will not be sufficient for the needs of the plant in rapid growth, and it will soon suffer from this defect by either dropping its leaves or succumbing to rot or dampness during the winter.

I find that the best way to grow this, and others with a mealy appearance is on a shelf as near to the glass as possible, and away out of reach of the syringe which would soon ruin the beautiful whiteness of the foliage.

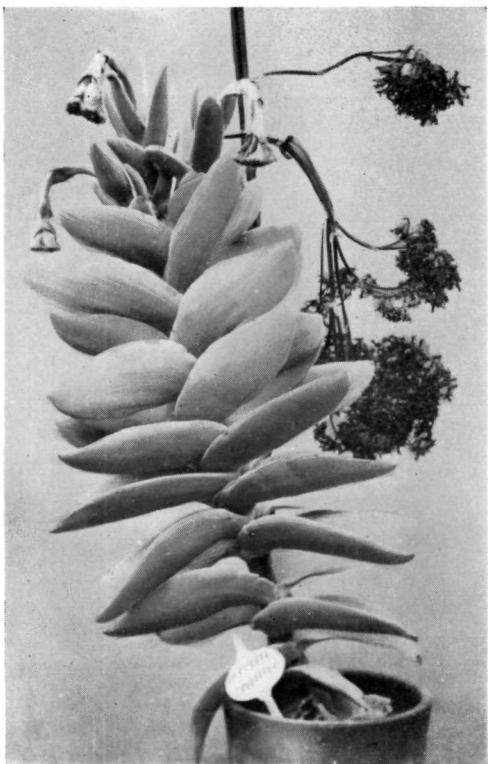
Watering should be carefully carried out as splashing the stems will soon dirty them or wash off the powder, and may cause rot at the neck during the winter months. A tray of sand in which these species can stand, and which can be watered so that the plants receive moisture from the base, has proved to be the best method.

The nearness to the glass prevents leggy growth and the light encourages the appearance of the beautiful colouring in the stems and leaves. The vivid orange-scarlet bell shaped flowers, fairly large and pendant are produced in late summer, about the end of August with me, and the combination of colour at this period is most pleasing. The usual soil compost, not very rich, will suffice for this species.

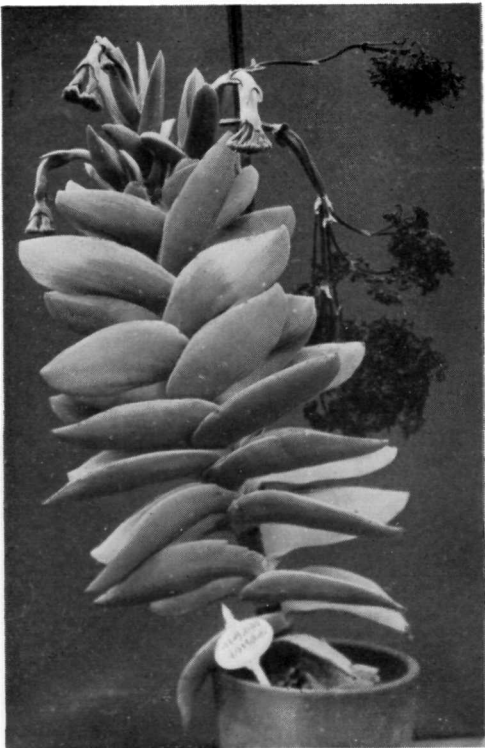
Grown under the same conditions is *Pachyphytum oviferum*, the "Sugared Almond" plant, with swollen, round leaves closely arranged in a rosette on the short stems. These and the leaves are covered with a white powder which is smoother and less dense than in the previous species, giving it a pearly appearance. It is amazing how much white powder is produced on these mealy plants and how beautiful is the sight of an unspoiled specimen of such highly "protected" succulents. *Echeveria farinosa*, with its many narrow tapering leaves, will generate so much that it piles up at the bases of the leaves to shower upon the soil surface at the lightest touch.

The more sunshine these species get, the more beautiful they look with their dressing of white, and perfect specimens can be obtained during the season if watering is carried out by wetting the sand in the tray only, say twice a week. With age, the plant stems may grow elongated clustered with the dried remains of the leaves, and though this adds to its appearance in my view, the beheading of the plants fairly low down the stems will encourage groups of new rosettes to grow within a few weeks. The severed tops may be re-rooted in sandy peat, after removing the old leaf skins, and potted up as specimens when needed. The pale yellow flowers do not contrast very vividly as in most other mealy species, especially when compared with *P. oviferum* with its scarlet flowers curving along the stems under the white, waxy bracts, but they are nevertheless very pleasing.

The *Cotyledons orbiculata* and *undulata*, most immaculate of this fine group, will throw up their fine umbels of scarlet flowers very freely under the same treatment. The latter is, of course, a most desirable species with its crinkled, wavy edges on the pure white leaves, and form bushy plants when grown on the shelf. During the warm summer months, the pots may be plunged in ashes in the cold frame, being protected from rain by raising the lights on bricks so that ample ventilation is always present. Fresh air is important if the plants are not to be drawn out of all proportion to their natural growth. Many of the beautiful felted or hairy species should be grown in a similar manner in order to bring out the delightful colouring and to strengthen the growth which would become soft and coarse with too little sunshine. Plants such as the lovely *Kalanchoe tomentosa* and *Echeverias leucotricha* and *pulvinata*, will develop the most attractive reddish brown markings on the stems and leaf edges when placed in full sun with ample fresh air and sufficient water for their needs.



Crassula falcata Dr. E. Elkan



Crassula falcata Dr. E. Elkan



Euphorbia xylophylloides Br. ex Lem. J. A. Janse



Conophytum elishae Dr. A. Tischer



Two specimens of *Echinocereus knippelianus*

Mrs. P. D. Bruce



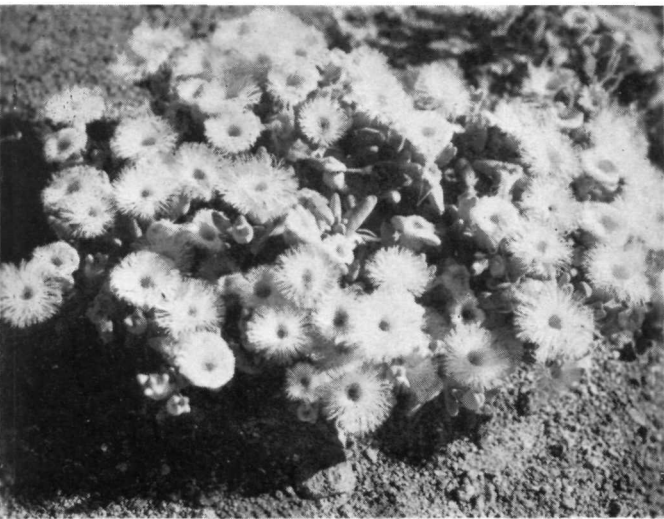
Echinocereus pentalophus

W. Beeson

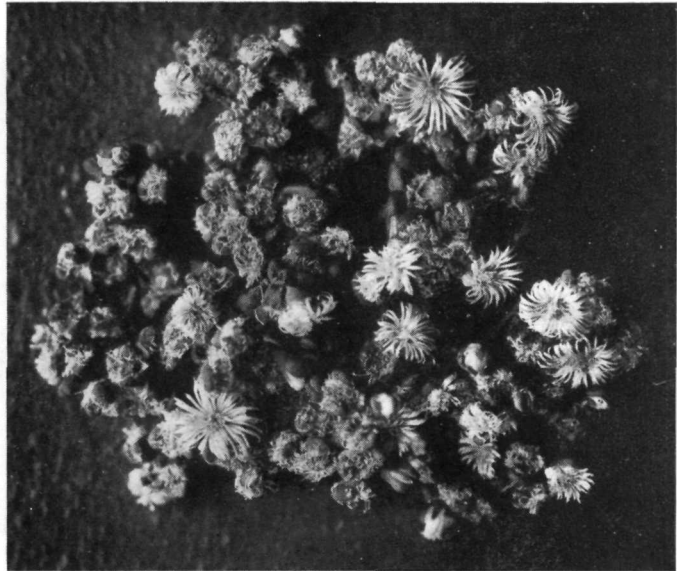


Frithia pulchra

W. Beeson



Halenbergia hypertrophica



Synaptophyllum juttiae

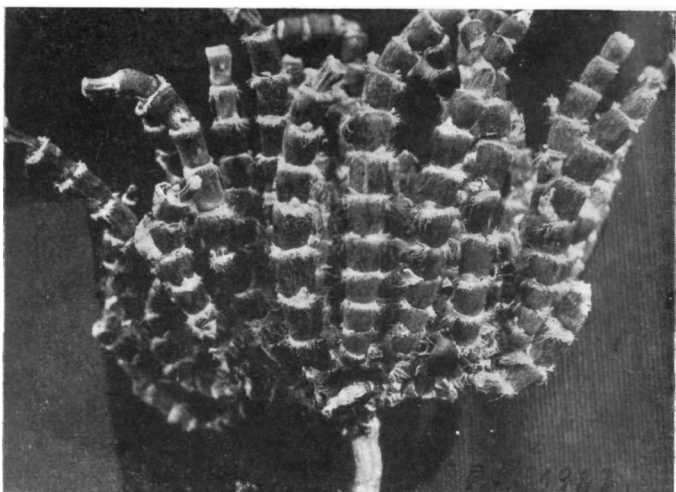


celetium anatomicum



Phyllobolus resurgens

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



Brownanthus schenkii



Dactylopsiis digitata



Ruschia levynsiae



Carruanthus caninus

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

The "Panda plant," as *K. tomentosa* is sometimes called, can have few equals for sheer beauty of form and colouring. The dark reddish brown stems and leaf tints contrast wonderfully with the silvery green of the foliage, bright and shiny with the minute silver hairs that glisten in the light. Usually considered to be rather difficult to grow well, I believe the conditions described will be found to be ideal for the successful cultivation of short sturdy and bushy plants. It usually takes some time to develop into a specimen, but large and soft, ungainly plants can easily be grown through shade and over watering, or in too rich a soil mixture. Such specimens would be quite useless however, and not at all as nature intended. In their natural homes, Madagascar, S. Arabia and Africa, these plants never grow tall, but form dense bushes of short thick growth. *K. Beharensis*, with its brown felted, triangular leaves, does grow tall however, and rarely flowers when young, but stem cuttings are quick to root and bushy plants formed when new growth shoots from the stem at the base.

Echeveria leucotricha and *E. pulvinata* are similarly marked to *K. tomentosa* in that the stems are reddish brown and the leaves edged and tipped with the same colour, which brightens almost to a vivid scarlet in *E. leucotricha*. The shining plush leaves and stems are also covered with the minute silvery hairs, and given a suitable supply of water from beneath, should be grown on the shelf. When flower stems are formed the large buds with touches of crimson peeping through the green give a very striking appearance which further develops as the buds open to show the bright red petals. The whole business of flowering, from the production of the stems to the final withering of the flowers takes up a period of several months during Autumn, Winter and Spring, giving one this delightful exhibition through days that are dull and dreary, and as a herald to Spring. The two species are very similar in growth and colouring, *E. pulvinata* having broader and shorter leaves, and both will thrive in a coarse mixture of the usual compost.

Crassula tecta is not one of the usual run of succulents though it is one of the prettiest of the *Crassulaceae*. The leaves are long and broad with the upper surface slightly hollow and rounded underneath. They are covered with minute, grey silky hairs growing thickly on the hard skin of the leaves and stems. The heads of white flowers form on long stems, two or three at a time, and the effect is of quiet elegance and grace with a beauty no less than that of the more brilliant and showy species already described.

Some years ago I wrote of the scent that exudes from the flowers of the small *C. orbicularis*, and another *Crassula*, *rosularis*, with the same power of filling a greenhouse with its perfume, not unlike that of *Euphorbia viperina* which flowers at the same time. From the ease with which it grows, I should imagine that it must be fairly common, though I have my doubts. Yet what satisfaction is thus obtained from a few plants, unsurpassed in beauty of form, colour of foliage and the added attraction of a gentle elusive perfume from a lowly *Crassula*!

These are the rewards and recompense for good growing and patience, with the knowledge that the plants are as near what they should be as makes no difference. One of the major delights in the cultivation of succulents is in this control of the growth and development of individual plants, for it is only too easy to let them get completely out of hand and develop into monstrosities bearing little or no resemblance to nature. This has been repeatedly stressed in the previous articles for nothing could be more discouraging for the small greenhouse owner than to have all the space occupied by a mass of, seemingly, tropical undergrowth, resulting in the complete ejection of the lot in favour of dwarfer growing plants and perhaps, with not a half of the beauty.

THE SCIENTIFIC APPROACH TO SUCCULENTS—continued from page 31

have not only not received one penny from sales, but I have put well over £2,000 of my own hard-earned money into the job to see it through. The only reward is the joy of doing the job, as giving of our best transcends any financial or material considerations. There are also many joys and compensations and blessings, among which one must include a number of very good friends made in the course of investigations. It is what you can put into the world that counts most, and it really is more blessed to give than to receive. I have no complaints at being sadly out of pocket: I count as blessings the joys of being out in the field, peace of mind, health, strength and happiness—spiritual qualities which the contents of the Bank of England can never purchase. So one has not to look far to realise that we have far more to be grateful for than to grumble about."

On reading this letter one can feel grateful that there are still such men alive to enrich our bookshelves, and appreciate all the more the best of the books already available.

(To be continued).

THE CRAZIEST THING THAT GROWS—*contd.*

By NEIL M. CLARK

(Reprinted from the "Saturday Evening Post" of April 7th, 1951, by special permission of The Curtis Publishing Co., of Philadelphia, U.S.A.)

One rabid collector, dizzy from the hope of finding the variety known as old-man cactus growing wild, struck out across a sun-fazzled, roadless desert in a stripped-down car, with only his dog for company. The first thing that happened was that his dog ran a bobcat up a saguaro tree forty feet high. Saguaro is the giant cactus of the Arizona desert. Its trunk is wax-slippery and covered with spines three inches long and half an inch apart. The collector took a picture of the bobcat perched up there, for he knew that without proof, nobody would believe that anything without wings could get up there. Next, the collector tried to cross a deep arroyo. He got his car down, but couldn't get it up, and he had to travel on the bottom for twenty miles in dread of a flash flood. Finally, after getting out of the arroyo, he ran low on gas, and for hours, under desert stars nursed the dwindling supply over trailless space, praying that the last gallon would get him somewhere. Stopping at midnight to sleep, he was awakened at dawn by a car whizzing past. He was right beside the pavement and had paralleled it for hours in the dark. Cactus nuts don't call that crazy!

Mr. Cactus in person is Howard E. Gates, of Corona, California, a collector of some pretty fancy cactus goods that a lot of fans would go to jail for, an explorer of new cactus fields, a discoverer of new varieties, one of the founders and former president of the California Cactus Growers Association, and twice president of the Cactus and Succulent Society of America. Gates' shirt-tail seldom stays in, and his hair is rarely cut or combed. Behind his spectacles, in his blue-gray eyes, there is always an "old gardener" twinkle. He will go anywhere, alone if necessary—or would when a little younger than his present sixty-plus years—to find a new kind of cactus or to see an old one under new conditions. The peninsula of Lower California is the region he particularly haunts. That's a cactus collectors' paradise and as lonely as any place on earth. He knows it from north to south and east to west probably as well as any living person. Once in the middle of a trip he wrote exultingly to a fellow cactomaniac: "At last I've seen the creeping devil on the shores of Magdalena Bay. I've gathered the *Casa de rata*; been struck by the jumping cholla of Comodu; rode by towering cardons till I could see spines in my sleep. I've been axle-deep in mud; cut off tree limbs to fill chuckholes; drank water out of ruts; broke a drive shaft; waited three days for somebody to come by, then walked fifty-seven miles in thirty-one hours on a gallon of water . . . The trip has been wonderful!"

Gates has discovered at least twenty new species of cactus. Every specimen of a certain variety now widely distributed in collections in this country, is believed to have originated from a dozen or so cuttings that he brought back from one plant—the only one he was able to reach after a long mountain climb 1,100 miles south of the border. Natives down there have two names for Gates. Publicly they call him *El rey de los chollas*, "King of the chollas"—cholla is a particularly vicious kind of cactus. Privately he is called *El hombre loco*, "The crazy guy."

Gates is engaged in the cactus business, mainly so he can keep on collecting and exploring for cactus. The two principal centres of the cactus business are California and Texas. Gates says there are about 30 cactus firms in business in California. His own cactus gardens, as well as the precious private plants that neither love nor money can get away from him, are located at the foot of rolling hills near Corona. A large part of the acreage is planted to cactus of many kinds, set in rows like cabbages. These are the plants from which seeds and cuttings are taken. Those for sale are grown under glass, lath or other protection.

Cactus growing is one of those fabulous enterprises that you can get rich at overnight—if your pencil is sharp! Neither seed-grown plants nor cuttings take up much room or need a lot of time to mature to market size. They are grown in flats, usually eighteen inches square, that hold 225 or more plants. A flat may sell wholesale for eight dollars. It is ready in six to eighteen months from the time it is started. From this it is easy to count the unhatched chickens. An acre easily accommodates 10,000 flats at a time, perhaps 20,000 a year. At eight dollars per flat, the take is 160,000 dollars per acre. Isn't it? If you want to hear how a horse laughs, show those figures to any cactus grower.

Griefs of the business are what he'll load you down with. Damping-off, failures to germinate, stuff like that. Seeds, for instance, are something to have bad dreams about. There are no regular cactus-seed companies in this country. Growers get most of their seeds by collecting them as they mature on their own plants, a few at a time. Mexicans send in some, but irregularly and in small quantities, and they fetch their weight in gold—about 1.25 a gram, which adds up to more than thirty-five dollars an ounce, with gold worth thirty-five dollars. I saw

a little package of old-man-cactus seed, half a pound or so, that a Los Angeles grower had just happily received. He estimated that it contained 185,000 seeds ; the bill was 166.50. Another grower was glad to offer 2,500 dollars in United States money for seven pounds of cactus seed in Mexico.

Gates estimates that fifty to seventy-five of the hundreds of cactus varieties, are profitable in commercial production. Retail outlets are heterogeneous. Florists sell cactus. So do dime and department stores. Also novelty stores. A food company offered free cactus with box tops, and the Texas grower who filled the order sent out 90,000 plants in three weeks. Gates has an Ohio customer who buys about 1,000,000 plants a year ; his trucks go to places as far off as Milwaukee, Albany and Memphis, selling to retail stores as they go.

A considerable part of the business is dish-garden trade. One strong appeal of cactus is that many kinds, even from the driest deserts will do well in steam-heated apartments with little care. "Cactus," declares Doctor Berry, "will stand more neglect than any other plant. Mine are happy when I go away for two or three weeks ; they know they won't be fussed over." Life seems to refuse to leave some cactus plants. G. H. Tegelberg, an Inglewood grower and lately president of the California Cactus Growers Association, dug up a big old barrel cactus and laid it on a bench in his greenhouse. It received no care. He put it in the ground five years later, and it took root and grew. Probably the easiest way to ruin a cactus is to baby it.

Any plant so determined to live, it seems, ought to be very useful to man. The known practical uses of cactus, however, are not many. Cactus spines have been packaged and sold for phonograph needles ; they have been ground up as *Jackpuler*, or itching powder, a German atrocity that will make anybody the life of the party if he puts it down his friends' necks or in their bedsheets. A kind of candy is made from barrel cactus, which is delicious—if you like it. Flour of sorts is made from ground saguaro seeds by Southwestern Indians, and jams, jellies and an intoxicating beverage known as *tiswin* are made from saguaro fruits. Recent experiments with an oil extracted from *Opuntia* fruits indicate that a wonderful face cream may come along any day now, guaranteed to banish anybody's wrinkles.

Possibly research may uncover unsuspected medical virtues in cactus. Some varieties are known to contain alkaloids that do funny things to the vision, particularly peyote, the early Indians' substitute for TV. This is variously known as dry whisky, mescal button or sacred mushroom, and is supposed to be eaten at some native religious festivals. An Oklahoma Indian who left the reservation and drove 700 miles to collect some along the lower Rio Grande, told an inquirer why he wanted it. He said, "One bite, see things pretty ; two bites, look inside the pearly gates ; three bites, love everybody !"

Cactus woods of some kinds are hard and take a good polish, and can be worked into interesting novelties. A farmer near Phoenix, upon retiring, occupied his idleness by gathering cholla and saguaro skeletons and making them into ash trays, pipe racks and lamps. It earned him eating money and provided dust catchers all over the country.

The most ambitious project for making cactus an economic plant had to do with developing it as forage for livestock. Cattle will eat prickly pear or cholla if they have to, spines or no. Some ranchers like to have some as emergency feed. It will do well where other plants won't, and some thoughtful people really believed there were millions in it. Luther Burbank, the plant wizard, developed a spineless variety, and promoters went to town with it, selling many an acre of sandy desert at fancy prices to people who thought their fortunes were already as good as banked. The bubble burst when United States Department of Agriculture investigations showed that where cactus could be grown amply for forage, more nutritious plants could be grown equally well.

Cactus has some value as human food. The apples of certain *Opuntias*, called "tunas," are widely eaten in Mexico. Italians learned to like them, too, when cactus was introduced to their country. There are several tuna ranches in California. The fruit is wrapped and shipped east under refrigeration in boxes containing sixty apples apiece ; these are sold from pushcarts and fruit stands. Latin-American restaurants along the Rio Grande serve fried cactus in the spring. Many Mexican stores sell canned cactus. The secret of most cactus recipes seems to be to put in so many other things that you can't taste the cactus.

Odd tales have grown up. Sorcerers of Peru thought cactus spines could kill people in witchcraft ; they stuck them in clay figures of people they wanted to put a curse on. A scientific magazine sponsored the story that the creeping-devil cactus, which looks like a gigantic caterpillar on the prowl, always turns toward the sea ; it doesn't. One popular cactus is said to know the calendar—it is supposed to bloom on the same night all over the world. A certain cholla called the jumping cholla is thought to throw its spines ; it doesn't, but the spines are mighty loose and nervous. One odd belief is that road runners, those strange desert birds, build a cactus fence around snakes they want to kill ; they don't.

(Continued on page 42)

THE IMPORTANCE OF THE RIGHT BACKGROUND

By Dr. E. ELKAN

I am speaking of photography—not of education.

There is, among my plants, a specimen of *Crassula falcata*, that has given me a lot of trouble. It was pretty obvious, early on in 1950, that the plant was going to flower, but contrary to all one usually observes in flower stalks, the buds did not want to grow towards the light as they usually do, they grew away from it and the flower stalk looked like the crook of a walking stick. This plant needs more light, thought I, and installed it on the rockery. There it was hot and sunny and this made absolutely no impression on the plant. The buds remained in their downwards pointing position almost to the moment when they opened in September. The red flowers opened in relays and only then, by an awkward turn, did the stalks straighten themselves out a little. This plant needs a larger pot, thought I, and conscientiously I re-potted it early in '51. Flower stalks have again appeared and at the time of writing (Sept. 2nd) they look exactly like last year's, all the buds pointing downwards. Once these flowers open they remain alive for several weeks; the flower stalk then dries up but, being an extension of the plant, it does not fall off. Having decided to let the plant develop naturally, I left last year's stalk where it was and then tried to get everything together on a photograph. A suitable background had to be found to give the necessary contrast. Should it be bright or dark? To this day I am undecided and I leave the choice to the reader. Against a dark background the plant, which is silvery grey, stands out well but the old flower stalk disappears. Against a bright background (aluminium-painted balloon fabric) the old stalk stands out beautifully but the plant looks flat. Still, the main features can be seen on both pictures and only one question remains: how could such a big clumsy affair stand upright in natural surroundings? I still think there must be something radically wrong with this plant and advice from any quarter would be highly appreciated.

THE CRAZIEST THING THAT GROWS—continued from page 41

Cactus can go for years without drinking, but when it drinks, it really drinks. On the driest Arizona deserts, where the only visible water is in the mirages that aren't there, and where the giant saguaro cactus lives and likes it, there often are thousands of gallons of water above ground on every acre, hoarded in the trunks of the giants and other cacti. Some of them drink so much so fast in wet weather that they burst. The fable has grown that bisnaga, the barrel cactus, is a "fountain of the desert," which if tapped can save the lives of those dying of thirst. What's inside a bisnaga, however, can be reached only with the help of a machete or an axe, and it's a toss up whether it's better to drink it or die.

In adapting itself to rugged conditions, cactus has taken on many forms. There are about 150 known groups or genera, and some 2,000 varieties, or species. There are some 350 varieties of *Opuntias* and about 235 varieties of *Mammillarias*. Some fully-grown cacti weigh ten tons; others never get bigger than a baby's fist. Some have spines shaped like fishhooks, others like knitting needles, others like spear points ten inches long. Common names indicate the fantastic shapes: Lobster-claw; Cuban baby; biscuit; mother-in-law seat; owl's eye; goat's horn; boxing glove; beaver tail; popcorn; rattlesnake and many more. Some varieties live to be 200 years old. Some endure temperatures up to 140 degrees and winter temperatures 20 degrees below freezing. Some thrive at 11,000 feet, others below sea level. Some are desert plants. Others live in tropical jungles. Some variety of cactus grows naturally in every state of the United States except Maine, Vermont and New Hampshire. Seeds of some varieties are known to be viable for at least fifteen years and lie without sprouting for that long, or longer. Some varieties spread when broken pieces cling to clothing or animal fur and are carried long distances, forming new roots in the new location.

In size, color and fragrance, hardly a flower on earth matches some cactus blooms. A single blossom of a night-blooming *Cereus* can perfume an entire patio under the stars. Flowers sometimes measure fifteen inches across. This also is a survival factor, for man himself, cactomaniac or not, cannot let such beauty die.

The one thing everyone knows about cactus, if he knows anything, is not to sit on it. Ancient Aztecs punished common criminals by tying them tight to cactus bushes. A Harvard professor's wife won an easy divorce when she testified that her husband threw a pot of cactus at her as she was bending over. A woman who coveted some darling little bunny-ears cactus plants that she saw while walking through a greenhouse hid a couple in her brassiere to save the bother of paying for them; she learned promptly how many ways cactus spines have of going places. And a Texas cowboy, climbing out of the prickly-pear bush his pony unloaded him in, said succinctly, "Feathers is softer."

ON EUPHORBIA XYLOPHYILLOIDES Br. ex Lem. AND EUPHORBIA ENTEROPHORA Dr. D. Cast

By J. A. JANSE, Hillegom (Holland)

Euphorbia xylophyloides Brongn. ex Lem., in *Illustr. hort.*, VI, 72 (1857); id. in *Decand. Prodr. Syst. R. Veg.* XV-2, 176 (1862); id. in *Berger, Sukk. Euph.* 24 (1907); in *Goebel, Pflanzenbiol. Schild.*, 59, fig. 27 (1889); id. in *Denis, Euphorb. Iles Austr. Afr.*, 226 (1922); id. in *Jacobsen, Succ. Pl. c. fig. 76 sub 3* (1946). *Euphorbia enterophora* Drake del Castillo, *Notes sur quelques plantes de la region Sud et Sud-ouest de Madagascar*, in *Bull. Mus.*, 307 (1899); id. in *Denis, Euph. Iles austr. Afr.*, 223 (1922); id. in *Cat. Plantes de Madagascar, Euphorbiaceae*, 13 (1935).

A visit to Paris in early 1948 enabled me to study the extensive material of the Paris Herbarium. Looking through the *Euphorbias* of Madagascar I was especially struck by the morphological resemblance of *Euph. enterophora* Drake d. C. with the often cultivated *Euphorbia xylophyloides* Br. ex Lem.

Euphorbia xylophyloides was first described by Charles Lemaire in 1857 after a cultivated specimen in the Jardin des Plantes at Paris. Lemaire, at that time editor of the "L'illustration horticole," visited Paris and quoted some interesting specimens cultivated in that famous collection. His, apparently preliminary, notes are unfortunately short and incomplete and later authors have been confused by them.*

His description runs as follows: (translated from the French)

"— *xylophyloides* (Ad. Brongniart ?). At last, there exists long since (184 ?) in the gardens another species of succulent *Euphorbia*, known by this name, which is very appropriate and hitherto omitted by systematic writers. It is also very curious by its upright and erect habit, its numerous branchlets which are oblong, very narrow, almost linear, somewhat fleshy, flat-compressed and with small distant notches at the margins, bearing each a very small ovate leaf. It is said to be also from Madagascar; it is unarmed, as the foregoing† and it belongs consequently neither to the one or the other of our sections. . . ."

A somewhat more detailed description was given by Boissier l.c. It runs as follows:

"699 *E. xylophyloides* (Ad. Brongn. in hort. Paris, Ch. Lemaire, III. hort. 1857, 72) a shrub, erect, stiffly branched, woody terete mainstem, green long branches, alternate and distichously branched; branches and branchlets flat-compressed, at the margin with distant notches and obsolete-denticulate margins, small oblong, soon deciduous leaflets at the younger branchlets. Shrub with a trunk one inch thick or somewhat thicker, with milky juice. Branches 1-1½" long, complanate, 3-5 lines broad, convex sides and acute margins. Branchlets stiff, curved inwards, narrower and more obtuse. Areoles 6-10 lines apart, hardly prominent. Leaflets scale-like, hardly one line long. Involucres unknown."

Boissier placed it in his list of "Imperfectly known species" and even doubted to refer it to *Euphorbia*, having not seen the involucres. Denis (l.c.) says of it: "Perhaps after specimens existing at the Museum, Brongniart has described it in a very incomplete way." In my opinion there is no description by Brongniart at all, but the specimen cultivated in Paris was provisionally labelled (by Brongniart ?) "*Euph. xylophyloides*" to be described at a later date. Lemaire writes between brackets "Ad. Brong. ?" and from his article it is evident that he was describing living specimens cultivated in the greenhouses of the Jardin des Plantes. *Euphorbia xylophyloides* is frequently mentioned by various writers on succulent plants, such as Berger (1907) and Jacobsen (1946).

On the other hand, *E. enterophora* Dr. d. C. has never been a subject of authors on succulents, though its description is completely known as well as its distribution. It is a common plant in various parts of Madagascar, being mentioned from Fiharenana Valley (S.W. Region), Andrahomana (E. Region), gneiss rocks Mnt. Ambihoponana at 270 feet above sea level; xerophytic meadows between Ionoivo and Sahambana; Mnt. Senorika (coll. Perrier de la Bathie, No. 11717!) (C. Region); Amboanio (Decary!) W. Region. Denis gives of it the following description: "A much branched tree with fleshy joints, flattened, 8-10 cms. long and 1-2 cms. broad, oblong or obovate with minute leafscars in marginal notches. Leaves ovate, a few mm. long and soon deciduous. Cyathia terminal, not numerous, somewhat reddish, almost sessile, unisexual, glabrous. Bracts (under the cyathium) short and scale-like, glands 4-5, elliptic, concave-elliptic or peltate, undulate at the margins. Ovary with angled back of the carpels. Styles as long as the ovary and bifid at the tips. Capsule ovoid, 7 mm. long, with broad

* His *crispata* has been renamed *E. Lemaireana* by Boissier (1862); his *rhysaloides*—Tirucalli L.

† *E. rhysaloides* Lem.

grooves, obtusely angled along the back, somewhat fleshy outside on a thick and short pedicel. Seeds obtusely 4-angled, 3 x 4 mm. with a fleshy caruncle, half-moon shaped. Vernacular name : Betinay.

A glance at the two descriptions given above will convince the reader that the two plants meant by them must be of a similar habit, yet we have to bear in mind that it is extremely difficult to sketch in a few words the distinguishing characters of two allied species. N. E. Brown once said (Flora Capensis, V-2, p. 224) : "... as there are many cases where it is perfectly obvious to the eye that two or more plants placed side by side are quite distinct, yet the characters available for a key are so few that it becomes exceedingly difficult to express what the eye instantly perceives in words that will enable one to discriminate the species when seen separately." This is true also in a reverse order ! But a glance at the actual specimens and a more detailed examination afterwards haven't procured me any definite distinguishing character. Lemaire hasn't given any description of the involucre, so we remain in doubt whether *E. xylophyloides* show any distinguishing characters in these parts. Specimens in cultivation frequently flower and their cyathia are similar to those of *E. enterophora*, except for the reddish shade mentioned by Denis, the specimens in cultivation being entirely green. This, however, may depend on cultural conditions and may not represent a definite and constant character. As there doesn't exist a type-specimen of *E. xylophyloides* the question may be posed whether cultivated specimens under that name represent virtually *E. enterophora*, a suggestion that in my opinion must be answered in the affirmative for all the specimens that I have had under my eyes and that perhaps may be the case for quite another number of specimens. In this respect I would mention a specimen collected by H. Perrier de la Bathie at Mt. Senorika in 1911 (No. 11717) which bears a.o. a herbarium-label "*E. xylophyloides*" but according to Leandri (in litt.) undoubtedly belongs to *E. enterophora* Dr. d. C.

Denis in his excellent treatise of the Madagascarene species of *Euphorbia* has much valued Gaucher's observation, according to which the stomata of *E. xylophyloides* have a horizontal fissure whereas a vertical one is observed in *E. enterophora*.

From his key it appears that only one other species from Madagascar has a horizontal fissure, viz. *E. leucodendron*, a species widely differing in habit. Two specimens cultivated as *E. xylophyloides* and dissected by me showed vertical fissures of the stomata. One specimen was sent to me by Mr. Herre of Stellenbosch, the other one is a cutting from a large plant, grown by Mr. Stern of San Remo (Italy).

Gaucher made his observation more than 50 years ago, so it will be extremely difficult to trace the origin of his specimen. But even if he actually saw an *E. xylophyloides* with such stomata, his observation can hardly serve as a general distinguishing character until it may be observed in other specimens. So far, we believe, that *E. xylophyloides* and *E. enterophora* are the same species and the specific epithet *xylophyloides* Brong. ex Lem. will have priority, in the same time reducing *enterophora* Dr. d. C. to synonymy.

The Exchange Secretary informs us that he has received some more seed for free distribution. Members are urgently reminded that a stamped addressed envelope must be sent with applications. Applications with stamped addressed envelope should be sent to the Exchange Secretary, Mr. A. Boarder, Marsworth, Meadway, Ruislip, Middlesex.

THE SYSTEMATICS OF CONOPHYTUM N. E. Br.—Continued from page 33

incorporated into the series *Minuscula* Schwant. Not without some deliberation have I added *C. leipoldtii* N. E. Br. to the series *Oviger*. This species, with its entirely spherical bodies, occurs invariably outside the geographical distribution of *Derenbergia* (Cedar Mountains, near Clanwilliam). This species, being diurnal, however, cannot be classified as a member of the series *Barbata* Schwant. which belongs to the sub-genus *Euconophytum* Schwant. the latter being nocturnal plants. Due to its long hairs and the lack of other markings, it does not seem to belong to the series *Minuscula* Schwant. either, which stretches even more southwards. So, until further investigation might justify a different classification, only the thesis remains that *C. leipoldtii* N. E. Br. is an advanced southern outpost of the series *Oviger* Tisch. which seems closely related to the hairy species, such as *C. velutinum* Schwant. or *C. tischeri* Schick. The flower of *C. vescum* N. E. Br. not being known to us yet, I cannot classify this species definitely, but, according to the size and appearance of its bodies, may be closely related to the smaller forms of the series *Saxetana* Schwant.

(To be continued)

ANNUAL GENERAL MEETING

Held at the Royal Horticultural Society's New Hall on the 12th February, 1952.

Mr. A. J. Edwards in the chair.

The Minutes of the last Annual General Meeting were read and confirmed.

The report of the Council and the accounts were adopted unanimously.

The Hon. Editor reported that as he had received no adverse comments he assumed all was in order. Costs were still increasing. A good number of contributions had been received and were in hand for the 1952 Journals. He stated that he hoped to maintain a standard in keeping with the Society and useful to all members. After expressions by members that the Journal compared favourably with other publications a vote of thanks and appreciation was accorded Mr. Shurly.

The Hon. Librarian outlined the type of books available to members and reported a continued demand for books. Postage had caused increased costs. He thanked members for their co-operation in the care of the books and the offers of and provision of packing material. The meeting accorded the Librarian a vote of thanks.

The Exchange Secretary enumerated his duties. He did not handle plants for exchange, but put members in touch with each other. He had distributed over 1,000 packets of seed during the year, this took many hours in sorting, cleaning, packeting and distributing. He emphasised that he could not spare time to give cultural notes individually to members who write for seed. These matters were considered when preparing his cultural notes so that all members would have the benefit. When sending for seed please enclose a stamped self-addressed envelope. He thanked those members who had forwarded seed for distribution. The meeting thanked Mr. Boarder for his work during the year and coupled Mr. Shurly with such thanks for the amount of seed he had obtained for distribution.

The Branches continued to show progress, arranged shows and competitions in their own areas. Berks and Bucks branch had arranged to hold a show in conjunction with the Windsor Show on July 11th and 12th, to be held in Windsor Park, an event which should not be missed.

The Earl of Mansfield was unanimously elected President.

Mr. Kenneth Harle and Captain H. J. Dunne Cooke as Vice Presidents. (Dr. R. L. Geyer is Hon. Vice President).

Mr. K. H. Walden—Hon. Secretary. Mr. W. Denton, Assistant Secretary.

Mr. E. W. Young—Hon. Treasurer in place of Miss D. M. Poore who resigned. Messrs. W. Denton, E. Shurly and Miss Fergusson Kelly, the three retiring members of the Council, were available for re-election and Mr. L. J. Reynolds was also nominated. On a ballot being taken Mr. Shurly, Mr. Denton and Mr. Reynolds were duly elected. The Chairman thanked Miss Fergusson Kelly for her work on the Council during the past years.

Hon. Auditors: Mr. S. Naylor and Mr. A. E. Cole (provided he agreed) as he was not present at the meeting.

Mr. J. H. C. Cheale offered to accept appointment as Hon. Meetings Secretary, to assist the Editor with reports of the Society's meetings, to which the meeting agreed.

Mr. Shurly reported that Major Dorrien Smith, though not able to take an active part in the affairs of the Society, would always welcome visitors from the Society to Tresco, Scilly Isles, at any time they were nearby. They would find such a visit well worth while. Many plants other than Cacti and succulents grew there more successfully than in any other part of the country.

The Council were requested to make arrangements for a visit to Mr. Kenneth Harle's Nursery early in the summer. Also to arrange for a 21st Anniversary Dinner to be held.

The Hon. Treasurer made a request for a special effort by everyone to obtain a new member.

The meeting accorded Miss D. M. Poore a hearty vote of thanks for her work as Hon. Treasurer during the past three years, a thankless task which had been literally thrust upon her, but which she had enthusiastically carried out.

After the presentation of the Cups and Awards gained during the year the meeting closed with a hearty vote of thanks to Mr. Edwards for the able manner in which he had conducted his duty as Chairman at the meetings during the year.

THE CACTUS AND SUCCULENT SOCIETY OF GREAT BRITAIN

Income and Expenditure Account for the year ended 31st December, 1951

INCOME			EXPENDITURE		
1951	£	s. d.	1951	£	s. d.
Jan. 1st.					
Balance brought forward ...	...	...	Journal. Printing	...	523 0 2
Subscriptions, 1951 ...	207	18 7	Postages	...	15 15 0
ditto 1952 (in advance) ...	51	16 6	Sales	...	538 15 2
Profit on visit to Mr. Harle ...	259	15 1	Advertisements	...	298 13 9
			Overseas Subscriptions	...	45 7 0
			Hire of photos	...	18 17 3
				...	1 1 0
				363	19 0
			Shows. Expenses	...	174 16 2
			Engraving	...	38 8 4
			Insurance of Cups	...	6 6 6
				...	1 2 6
			Entrance Fees	...	39 17 4
				...	4 13 6
				...	35 3 10
			Library	...	7 14 2
			Purchase of Books	...	5 0 0
			Postages	...	12 14 2
			General Expenses	...	
			Hire of Hall	...	11 12 6
			Stationery	...	7 14 2
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			Translation	...	1 10 0
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			Bank Charges	...	1 3 4
			R.H.S. Affiliation Fee	...	2 2 0
			Donation	...	44 12 8
				...	3 0
			Balance	...	44 9 8
				...	137 0 11
				...	£404 4 9
				...	£404 4 9

(Signed) D. M. POORE, Hon. Treasurer.

(Signed) S. BORDER,
G. RIDDICKHon.
Auditors.

REVIEWS

Mr. Bertrand and Mr. Guillaumin's very important book, "Cacti," first printed in French, has now been published in English. While giving some scientific information, it mainly deals with cultivation. There are 33 illustrations, some very finely coloured. It can be recommended to all, the beginner especially, and can be obtained from any bookseller, or the publishers, Crosby Lockwood and Son Ltd., 39 Thurloe Street, London, S.W. 7, price 16/-.

Two very interesting books from South Africa are Miss Karsten's "The Old Company's Garden at the Cape and its Superintendents," and Miss M. M. Kidd's "Wild Flowers of the Cape Peninsula." The former, obtainable from Maskew Miller Ltd., Cape Town, price 21/-, is an historical record, but the early days of the "Old Company" and its garden are of special interest to us. It enthrallingly tells of the establishment of the garden for the succour of ocean travelling crews and its development to the present day. Succulents are included. Miss Kidd's book can be obtained from the Oxford University Press, price 63/-, contains nearly one hundred coloured plates, accompanied by explanatory notes, of plants indigenous to the Cape, many of them of particular interest to us.

Have you obtained your copy of Reynold's wonderful Aloe Book? No more comprehensive book has ever been published, or in such a magnificent style, on any genus with which we are interested. It is a monumental monograph on Aloes and can be obtained from The Aloes of South Africa Book Fund, P.O. Box 2097, Johannesburg, South Africa, price £3 15s. 0d.

Further instalments of Neale's Photographic Plates have appeared. This publication makes a bold bid to be one of the major works on our subject. The photographs are accurately named and are particularly fine.

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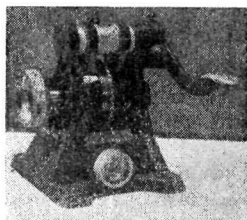
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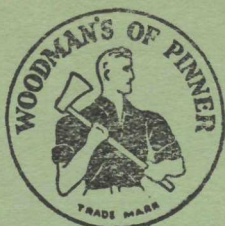
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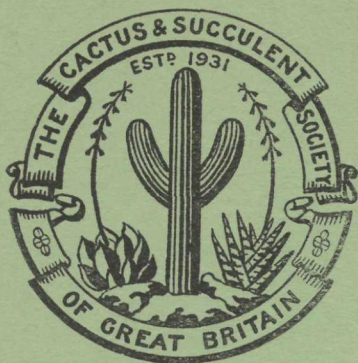
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SOCIETY NEWS

1952

August 26th 6 p.m.
September 23rd 6 p.m.
October 21st 6 p.m.

Captain H. J. Dunne Cooke : Stemless Mesembryanthemums.
Autumn Show and Discussion.
W. Denton : Euphorbias.

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THE
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JOURNAL
OF GREAT BRITAIN

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Vol. 14

JULY, 1952

No. 3

EDITORIAL

My wife and I had, recently, the opportunity of re-visiting Holland in order to meet old Dutch friends who were in the services in this country during the war. I also had some export business to attend to. We could not let the opportunity pass by of fulfilling another ambition to meet our succulent friends in Holland and to again make the acquaintance of our very good friends, Mr. A. J. A. Uitewaal and Mr. J. A. Janse, also to make the first acquaintance of Mr. Buining, the chairman of Succulenta, as well as many others.

Nobody could have extended a heartier welcome to us than our fellow cactophiles in Holland, and we wish to record our grateful thanks to so many, among whom were Mr. Uitewaal and his very charming daughter, Mr. and Mrs. Buining, Mr. Janse and Mrs. Grullemans van Berghem.

The Amsterdam Branch called a special meeting to greet us, and you should have read the notice calling the meeting; we blushed as my halting, forty-year-old Dutch made out its meaning! It was a great compliment to us in this country and, if I may be immodest for once, to ourselves. Mr. Buining gave a lecture on *Lobivias* and *Rebutias*. He must have known about Mr. Boarder's fine lecture! They had a completely full house at the meeting. However, I felt completely embarrassed when Mr. Mol, the chairman, after extending to us a hearty welcome, called on me to reply in Hollands! Struggling to get together my forgotten Dutch, I made a halting reply in their native language and extended to them the greetings of all of us in England. Their response showed their appreciation and friendship for us, and they charged us to convey their greetings to our Society and its members.

And to close the proceedings, Mrs. Grullemans van Berghem, on behalf of the Succulenta Society, invested the wife and myself with their Society's badges, creating us honorary members!

We had the opportunity of viewing Mr. Uitewaal's notable collection of *Haworthias* and many other plants. It certainly is a remarkable collection. We visited Mr. Janse's collection which includes many rare *Euphorbias* and envied him his fine library of books on succulents. We spent some hours with Mr. Buining who has some remarkably fine specimens, including quite a number of white plants and, jokingly, he informed my wife he kept them washed with Persil—they certainly were clean and white.

We did not go to Holland to visit any of the growers but, being at The Hague, we found ourselves within twenty minutes' walk from Mr. Jansen, one of the largest Dutch growers, so we were able to visit his fine collection of plants.

CACTUS CULTURAL NOTES

By A. BOARDER

In the last two Journals I have been describing my methods of seed-raising. In this issue I shall deal with the pricking out of the seedlings. It is quite impossible to give any exact date or age when this should be done. So much will depend on the type of seedlings being dealt with and the rate of growth. I am writing these notes on May 6th, and have already had to prick out some of my seedlings, the seed of which was sown in February, this year. Such types as *Cereus* and *Opuntia* are as a rule fairly quick growing and will require a move before some types like the *Mammillarias*. Be guided by the size of the plants and whether they are crowded or not. Again the soil may look sour when it is advisable to prick out from this pan as soon as possible. Although seedlings may be left in the pan for six months or more, I am sure that, if they are transplanted carefully into fresh mixture, they will grow at a faster rate once they get settled. I do not like to move anything until I am able easily to handle the seedlings. If any pan is attacked by the damping off disease it is well to move any healthy seedlings at once.

The seed should have been sown in the John Innes seed compost as recommended previously, and the soil for pricking the seedlings into should be the same mixture with the addition, to each bushel, of one-and-a-half ounces of hoof and horn grist and three-quarters of an ounce of sulphate of potash. See that the mixture is well stirred up and that any large pieces are at the bottom of the receptacle before pricking out. The soil should be damp, but not wet enough to soil the hands whilst being used. I now use concrete boxes exclusively and find that they are ideal for my purpose. They are 14 x 7 x 3 inches outside measurements. I make them in a mould and whilst the ends are about half-an-inch thick the sides are only about a quarter-inch thick at the top. The sides of the boxes taper slightly, being thicker at the base for extra strength. These boxes will never rot, warp, crack or harbour diseases. They are everlasting and do not weight five pounds each. Although this may seem heavy, when compared with wooden ones, in practice I find that this is far outweighed by the many advantages and, after all, you do not need to be handling them often. As to drainage, this can easily be made when the concrete has set for about twelve hours, when holes can be bored in the base. I use no drainage holes at all, but I am not suggesting that anyone inexperienced should try to do this. I grow many plants successfully in these boxes but, of course, the watering is the main point where some may go wrong. As long as this is not overdone it is quite safe, and after all I do know that what water I give does remain in the box and not run straight out of the bottom.

Firm the soil in the boxes and see that it is pushed well down into the corners. If only a few seedlings are being dealt with, it is possible to use half pots such as I use for seed sowing. The seedlings can then be planted round the sides of the pot and perhaps one in the centre. When moving the seedlings it is necessary to take great care that no damage is caused to the root system. On most cacti seedlings the junction of the root with the plant is so thin and delicate that it can be broken very easily. If this happens it is probable that the plant will die. If a small portion of the soil can be lifted with the seedling it will be safer, but in some cases where the plants are very crowded this is quite impossible. I have just moved a number of seedlings from a four-inch half pot which had been divided into four compartments to allow for four different species of seeds to be sown. The plants were so packed together that the soil was completely hidden. In such cases it is better to gently raise the whole mass in the quarter pot at once, lay them down carefully and gently disentangle each one, working from the outside of the bunch. Make a hole in the pricking out soil large enough to take the roots without trouble. It is unwise to bend the roots up especially if they are tap-rooted. Gently firm the soil around the seedlings and give each one about an inch each way. After the box is finished, spray well with tepid water to settle the soil around the roots and place in slight shade. As I have mentioned before these small seedlings must not be exposed to the strong sunlight until the food-bag or cotyledon has been absorbed. The seedlings may be kept in a rather close atmosphere for a time, but do not water too much at first. About a week should elapse before they need watering again, but this time will depend on the temperature of the house and the weather. After about a week give air as often as you can and the seedlings will soon grow. If the compost is used as recommended the soil should be safe from pests, but, if made up by the user, it must be sterilised by watering with either Cheshunt Compound, Chinisol or permanganate of potash.

Once the seedlings show signs of fresh growth they must be watered as often as they dry out. With this treatment it is possible that by the autumn many of them will be large enough to pot up into two-inch pots. Any pot smaller than this is of little use. The two-inch pots can be purchased in sizes of two-inch, two-and-a-half and three inches in depth. I prefer the latter for most Cacti, but the shallower ones are very good for small rooting types such as *Rebutias*. However, the deeper pots take up no more space in the greenhouse and do hold much more soil.

When you have taken all the seedlings from the seed pan do not throw the soil away, but, by treating it as if it had just been sown, it is possible that several more plants will appear in a few days. With those pans which are not yet forward enough to transplant you must give plenty of air at all times. The seedlings can soon damp off if too wet and once the weather is right for growth the pans can be well watered so that all the soil is damp and can then be left to dry right out before re-watering. This is a safe method, but if the pans are always in a sopping wet condition there will soon be trouble.

I am often asked if it retards plants to re-pot them when they are budded. I do not find that it makes any difference. All my plants have been re-potted again this season and some were in bud when done. Scores of others have since flowered. One example I can quote is *Echinocereus berlandieri*, re-potted in March and now has nineteen well developed flower buds almost showing the colour. As these flowers will all be four inches across, purple with a white centre, it is easy to imagine what a show the plant will make. The *Echinocereus* are among the finest types for spectacular blooms. I have a seedling of *E. fendleri* which flowered last year again in bud, as is also *E. scheeri*, a pink beauty. Another which has pleased me very much is a three-year-old seedling of *E. pectinatus* var. *longiseta*. This has three flower buds well developed and should look fine. This particular plant was one I picked out from the others in the batch as being the most forward, and this does prove my contention, so oft repeated, that you have to grow a plant well before you can expect it to flower well. Another instance of this is the case of an *Echinopsis multiplex*. I have just had a thrill at seeing buds on one of mine. You may be inclined to sneer at this and say why get excited at flowering an *Echinopsis*? Quite true, but this one happens to be something special as it is only a two-year seedling. There are two buds well developed and two more possible. The seedling in question is $3\frac{1}{2}$ inches wide and 3 inches high. It was re-potted in February last year having been first potted in October the previous year. In August last year it was potted on and in March this year I used it for a demonstration of potting which I gave at a local society. That it is flowering now proves what I have always said, "that you have to grow a plant to flower it"; and the semi-starvation methods so long recommended for producing flowers are not only old fashioned but ridiculous when one considers that Cacti are, after all, just another type of plant which requires nourishment like all the other growing things.

I wish you could see my plants now. Yesterday there were 124 different *Mammillarias* in bloom in my greenhouse without counting the many one-year seedlings flowering in the boxes. I could write a whole article on the colour alone, as what with the beautiful shades of colour of the *Mam.*, spines, their fruits and now the many flowers ranging through most shades of carmine, magenta, pink, red, cream and yellow, the whole mass looks spectacular. One plant which I have referred to before is *M. bocasana*, quite a common one but this one was enough yesterday to cause Mr. J. Brown of Southall, to remark, "Oh, no, it's not possible." The plant will have well over seven hundred flowers. It is now $8\frac{1}{2}$ inches wide and is $7\frac{1}{4}$ inches high. There are about 66 heads and each one has over 12 flowers or buds. The centre head has over 30 flowers and buds. This plant has been grown in the last four years from a seedling the size of a walnut. The *Echinocereus* seedling mentioned with three buds is 3 inches high and $3\frac{1}{2}$ inches wide. I had another great Cacti grower yesterday to see the plants and he said that he had never in his life seen so much colour in a group of *Mams.* I was rather pleased at this as it was none other than Percy Collings who has pulled my leg over my plants for many years and was the originator of the suggestion that I blow my plants up with a bicycle pump.

I have often given names of *Mammillarias* which I have had in flower the year after sowing the seed. To this list I can now add *M. zeilmanniana*, over 12 flowers; *M. pennispinosa*, five flowers out at once; *M. rettigiana*; *M. denudata*; *M. lesaunieri* and *M. dumetorum*. The following are two-year seedling *Mams.*, flowering for the first time: *M. discolor*, *M. formosa*, *M. sonorensis*, *M. sonorensis* var. *hiltoni*, *M. lenta*, *M. collinsii*, *M. bravoae*, *M. pseudoklissingiana*, *M. brauneana*, *M. caput-medusae*, *M. martinezii*, *M. perbella lanata*, *M. woodsii* and *M. zuccariniiflora*.

The *Rebutias* are flowering well; *R. violaciflora* making a brave show with many flowers and vieing in shade with *Aporocactus flagelliformis* which has over twenty flowers out. This plant produced two fruits last season and I have pricked out several seedlings from this plant already. They look very spindly at present, but after all quite typical of the parent plant.

From now on the plants must have plenty of fresh air. There is no need to shade adult plants as long as plenty of ventilation is given. If you have to leave the greenhouse for a long period it is advisable to leave the windows open, even day and night rather than to have the house overheat in a sudden spell of bright sunshine.

All the plants should have been re-potted by now and should be making new growth. Look for this growth at the top of the plant in the growing centre. Remember that if the plant is making fairly rapid growth it must be supplied with more water than one with little signs of growth. Besides much moisture being lost by evaporation the plant itself requires quite a fair amount if growing well.

(Continued on Page 63)

CULTIVATION OF SUCCULENTS

By W. DENTON, B.E.M.

The fine spell of weather at Easter time gave most of our plants a fine start. The majority of them will now require regular watering on all favourable occasions.

I have one or two specimens of *Cotyledons*, *reticulata* and *wallichii*—that are kept dry in our summer, but I find these are not popular with many people. As I have said before, *Conophytums* should not be watered till the new growths are showing and the old stems persist only in the form of dried skins. Generally with me, the end of the month is time enough. In any case, it depends on the weather to a large extent and, as these notes are written well in advance of the publication of the Journal, it is impossible for me to give exact times.

Lithops will, by now, all be in full growth and any re-potting necessary should have been carried out when they become active, generally about mid-May. Anyone who has grown a quantity of *Lithops* from seed may have noticed that there is sometimes an odd one shows up with three leaves after the seedling stage. I have always discarded these as I considered it was not worth while to trouble about abnormal specimens. To my surprise, one I happened to have kept, divided this year to three complete growths, giving me a three-headed plant, so I find it is worth while to save these. This particular variety was *Lithops herrei*. I hope that some others will do the same in the future as I shall carefully save all these as time goes on. The ideal size for these plants is five or six heads, after this they become somewhat difficult to keep in good health, the centres seem to get smaller and eventually die out.

Now is the time to give some plants a treat by transferring them to the garden for a little open air treatment. Lots of *Euphorbias* will benefit by this, in fact, all varieties will appreciate all the air you can give them. Plants in frames could have the lights off.

That reminds me, I have had several enquiries lately about the difficulty of flowering *Epiphyllums*. I wonder if these plants will return to favour. In my young days they were ever so popular, and I notice in one of my old catalogues from De Laet, of Contich, in Belgium, he listed in 1931 over a hundred florist varieties, all named and of all colours. We used to call them *Phyllocacti* then. These plants require different treatment from the majority of cacti and succulents. A much richer soil. The John Innes potting compost, without the addition of extra sand, should suit these and I would even add to this a little hop manure after the drainage. To flower these successfully, it is necessary to thoroughly ripen the new growths and where better than in the open air. Plant them out in the open garden in the pots, rims just level with the surrounding soil. Take care to put a piece of tile or a handful of ashes under the pots to prevent worms entering. No watering is necessary beyond what nature provides in the way of rain. Good drainage is necessary for these and all plants greatly benefit from a potting soil that will not become stagnant. You will notice, as the summer proceeds, that the green leaves have a tendency to turn red at the edges; this is a good sign and is the promise to come of future flowers next spring.

While numbers of our plants are in the open air, it is a fine opportunity to give the greenhouse a paint up, inside and out, if you have not done so for a few years. I am afraid a good many of us are guilty of neglect in this respect. I have found out, to my regret, that I have lost a number of plants this year through a few drips from the sash bars inside the house. A good flat white lead paint is ideal for inside, any thinning necessary do with paraffin as this will keep down many undesirable insects. White is generally considered the right colour for greenhouses inside and out. I paint mine green outside as I find, in my dirty surroundings, this wears better than white and keeps respectable longer.

Fenestrarias are now in full growth and require regular waterings in hot weather; these are very popular plants and worthy of a little extra care. They are very deep rooting subjects and should be provided with deep pots and a very sandy soil. If you happen to have a small garden bed in the greenhouse, this is the ideal place to plant one straight in. Under these conditions they flower more freely than under pot culture. My own plant of *rhopalophylla*, the white one, I found to have rooted to a depth of seven inches. As this produced five flowers and several buds that did not open, I can only conclude that this treatment suits them admirably. The only other one in this genus is *aurantiaca*, a yellow flowered variety.

A very beautiful plant that should be in all collections is *Frithia pulchra*, this is another window plant, a very free flowering one, violet in colour. Similar treatment to *Fenestrarias* suits these. In talking to Mr. Collings a little while back he told me he had lost his plant of this and concluded that some dead flowers left on the plant had become damp and caused rot to set in. I am inclined to think he is correct here and it is very necessary to remove any dead flowers or stems, using every care to cause no damage. There is no doubt that a cool root run that a

plant gets when planted out, helps to increase the flowering possibilities. A flower pot standing on the staging in full sun must get very hot, to the detriment of the very fine roots near the edges.

There is another little plant I am fond of—*Neohenricia sibbettii*. This is like a tiny *Titanopsis* and most attractive. Most members have seen this and I have been able to distribute a few pieces. Fortunately, it is a very easy subject to manage and spreads very quickly with reasonable treatment. It is a summer grower and produces its tiny cream coloured flowers late afternoons. It is very similar to the *Stomatiums* in shape of flowers and times of opening.

Talking about *Stomatiums*, these are fairly easy to manage and there are a few outstanding varieties. *agninum* is the largest stem plant I have, but have never succeeded in flowering it. *conradi* and *loganii* are among the smaller ones. *bryantii* and *geoffreyi* are nice, worth-while plants. They all flower freely and make nice specimens. The cultivation of these is simple, but do not be too generous with the water pot in summer, they will take it freely and make large lush plants, but lose the appearance one expects to see with desert plants in their native habitat.

It is quite easy to root cuttings of these provided you cut near new growth, the old wood is very difficult to manage and if you root it at all, it will take a long time. In looking over the house this afternoon, at the time of writing this article (May 7th), a nice sunny day, I note that *Gibbaeum comptonii* is pushing its pink bud through with the new growth, having shown no sign of the old growth dying away; evidently too much water has reached this plant in winter. *G. album* and *dispar* I hope will follow later. *Argeta petrensis* is also in flower at this date. These are plants, together with the *Cheiridopsis*, that will always have to be treated as individuals, each one requiring different treatment from one another and will always remain rather sticky subjects.

The genus *Haworthia* is one that does not seem to be so popular with cactus fans as they used to be. I had a few before the war that I was mildly interested in, including that gem *H. bolusii*. This I found to be a difficult plant to manage, the outer leaves used to frequently die away and my plant was always a small one. In recent years I have added quite a number to my collection and have kept to the smaller varieties, room being somewhat restricted. The *bolusii* mentioned above is one I should very much like to add to my collection for further trial, but I find it hopeless to obtain at present. Most of the plants come from the Little Karroo and the south eastern districts of Cape Province and offer a range of conditions of culture that should suit everyone, some requiring full sun, others slight shade. You will find, if you decide to grow a few, that they seem to grow on you and give you so much pleasure that you will want to keep adding to your collection. Again, for those unfortunate people who have a greenhouse that is slightly shaded, you are able to grow these very successfully. What a subject for specialist material for the study of a life time—I should think almost an impossible task. I remember Mr. Farden's articles in our old Journals with reference to the variety *attenuata*, the number of the slight differences in this alone would make a long list and give you plenty of fun if you had the time and material to work on. I, myself, have five different kinds of the variety *planifolia* and I am sure they are all lovely plants. Most of them offset freely and, in time, make large clumps. A few, like *margaritifera*, always remain as single plants and I am afraid some of the very best fall into this category. *viscosa* and *tessellata* are two that require full sun. *attenuata*, *cymbidiformis* and *planifolia* and kindred sorts manage with partial shade. Those transparent varieties that seem to have teeth on the edges, like *bolusii* and *arachnoides*, require shady conditions. A few gems among my own plants, kindly given me by friends, are *atrovirens*, *hilliana*, *venosa*, *cooperi*, *eilyae*, *jonesae*, *herrei*, *dielsiana*, *correcta*, *zanteriana*. These are mostly of the small type. Two recently added are real beauties, *hurlingii* and *gracilidelineata*.

I have not had a great deal of experience with the culture of these plants as I consider you require many years to thoroughly understand all their requirements. All the same, my plants seem to be healthy and growing well, so I offer you my method. They are all plunged in trays of sandy soil. The pots are kept mostly to three- and four-inch sizes. Some are in John Innes mixture without additions, others in good loam with about a third added of good sharp Bedford sand. Both these mixtures seem equally good and I find no difference in the rate of growth, or appearance of the plants. At the base of each one I have introduced a layer of sand, as in my early days I had one or two rot off in winter and I concluded that they do not like any damp hanging about the base. I also found out that you can very easily over water them in summer. They will take what you like to give them when in full growth and become nice fat plants, but in winter you will be in for a bad time and, if not careful, you will lose a few. I provide about one inch of lime stone chippings as drainage. I find this is a very important point, with all specimens a waterlogged soil in the pots is fatal. Many of you may not agree with me, but I do not water overhead as I consider any excessive moisture left between the leaves will, in time, cause rot to set in. No doubt it is a good method, if you have the time to blow or soak off any excess, but it is so easy to miss one and the damage is done before you realise it.

To conclude, grow them all hard, by that I mean all the air possible and good light, and do be careful with the watering can in summer. In winter no water at all; start to reduce about early September in gradual stages. I feel sure that these plants will give you all much pleasure and are not difficult if you give them reasonable care.

THE SCIENTIFIC APPROACH TO SUCCULENTS

By GORDON D. ROWLEY

INSTALMENT SEVEN

More about Books

In the last essay we scanned superficially the literature on succulent plants, classifying the different types of book as monographs, floras, popular handbooks, periodicals and scientific papers. To the critical eye any one of these can be analysed into elements which are original and elements which are derivative, and the latter class further assessed as intelligent summarising or blind plagiarism. We noted also the rival claims of the book collector and the student; claims which are often diametrically opposed—an advantage where copies are in short supply. The connoisseur admires an uncut or deckle edge; to the student it is anathema, a dust-trap and a hindrance to quick reference. Most publishers nowadays have the good sense to guillotine edges properly before sending out their books. Again, the bibliomaniac worships first editions, especially authors' presentation copies, and insists that they be complete, even to the blank pages at the ends. The student prefers a cheap working copy, and values each edition on its own merits. This often means reference to several copies of the same book. Thus, in the famous *Gardeners' Dictionary* of Philip Miller the first edition (1731) is valued as the earliest record of the writer's views on hybridisation and related subjects; the seventh (1759) for showing the advent in England of binomial nomenclature; the eighth (1768) for the uniform adoption of the Linnaean system, and the last, the ninth (1804) for being the most complete and all-embracing. Of these, Edition 8 is the "authorised version," being the last that the author lived to prepare.

In paying homage to the great masters of literature, let us not forget the often nameless hero to whom falls the dull but vital task of checking the proofs and compiling the index. By the fullness and thoroughness of its index a reference work stands or falls. Who nowadays can afford the time to thumb right through a book in order to dig out a few facts buried in the text? One of the most authoritative and praiseworthy books of its kind, Hutchinson's "*A Botanist in Southern Africa*," remains a locked chest until someone gives us the key to its 686 fact-filled pages.

Excerpts and Bleeding Hunks

It will be apparent to most readers that books devoted exclusively to succulents are few and far between: a small nugget set in a very large rock matrix. Much less rare are those books in which succulents form just a part—a single chapter, or a few pages scattered here and there. It is these small items that are our concern here, for they present many problems to addicts of so specialised a hobby.

Because it is so difficult to prepare and publish a complete monograph, students who are neither geniuses nor millionaires prefer to publish piecemeal, sending short papers to the various weekly, monthly and quarterly journals. So popular has this outlet become that there are now journals by the thousand, some covering wide fields of scientific activity, some very narrow. Even with the time and means to browse in the larger libraries one cannot keep abreast of them all, although reference to "*Biological Abstracts*" and "*Bibliography of Agriculture*" helps a great deal. Yet to one who takes his *Mammillarias* seriously it is important to locate and see, or if possible obtain, these shorter publications which often present the needles free from the encumbering haystack. If a particularly attractive article is spotted in a periodical, it is worth while to write to the author requesting a copy. All reputable journals run off 25 to 50 copies for the author's own use, and these reprints can usually be had for the asking if one shows a serious enough interest in the subject. Failing that, one can write to the publishers and offer to buy that part of the journal in which the article appeared. Sometimes, too, one can buy from the publishers loose pages in batches of 16 covering the succulent sections in a complete book. In this way I obtained the whole of the invaluable succulent excerpts from the 7-volume "*Flora Capensis*" for less than one-sixth of the cost of the book complete.

The most frequently consulted part of my library is the top row of file boxes filled with just these pithy extracts. A pot of glue, adhesive tape and manilla board covers are all that are needed to make each serviceable for quick reference. A word of warning, however—curb the passion to break up existing books unless you are absolutely certain that the rest of the volume is valueless to yourself and anyone else. Like a good doctor, please consider the fate of your patient before you remove the appendix!

Some people like to have collections of small items bound together. On the whole this is a bad practice, except in the case of a uniform run of the complete works of one author. Otherwise there is the perpetual urge to add to the sandwich, or take out something that shouldn't be there.

Scrap Albums

I suppose to most people the mention of a "scrapbook" recalls memories of those ornate trifles in which Victorian ladies pasted fern leaves or family group pictures in sepia. The systematic scrapbook is an altogether different affair, and none the poorer in scientific merit for the lack of a more impressive name. It is built to a plan, aesthetic considerations being second in importance to the more lasting, if prosaic, needs of ready reference. The first step is the choice of a suitable album, preferably of the loose-leaf type, and because initial mistakes cannot be rectified later, it pays to invest in a really robust and spacious album at the start. Second, the system of mounting must be decided. Two principal methods commend themselves. The first, and better, is to sort all items under group headings and mount them collectively on loose-leaf sheets. Descriptions and pictures of plants are mounted according to genera, additional sheets being devoted to Cultivation, Pest Control, Hardy Succulents, Window Gardens, and so on. Finally the sheets are serialised alphabetically, or in folders with name tags stuck along the margins. The system is self-indexing. To refer to *Echinopsis* one turns direct to letter E, finding there, perhaps, cross-references also to "Cultivation: Cacti" and "Table Bowls." The second method is to stick items in more or less as they come, and compile an index at the end of the volume. This has the advantage that a loose-leaf binder is not needed; indeed, for extreme economy one can paste over the text of an existing book as a last resort. There are no gaps or half-filled pages, and the scope is greater for artistic groupings. But the key to the contents is everything. It is so disconcerting having to rummage for that photograph of Messrs. Suckett and See's Prize-winning Exhibit at the Gritpool Horticultural Show, 1923, when it is sandwiched between "*Pachypodium novi in Horto Rowleyense*" (Instalment 27) and a racy write-up on "How my Aunt Muriel Grew a Rat's Tail" (continued from p. 67, with illustrations in Caudachrome).

Sources of Material

How can one get sufficient material to make the scrapbook habit worthwhile? There are the larger booksellers: one can always take "pot-luck" by rummaging in the gardening and biological shelves, and writing for catalogues. A book is all the more appreciated when one has spent an hour hunting for it, and how many doughnuts one has to bite before finding one with jam in it! A clearance of the attic may well reveal piles of old gardening magazines. Seed lists and florists' catalogues often feature succulents, as do some of the popular illustrated weekly magazines. It is surprising how well the press clippings come in once one gets the search really organised. Even the daily papers occasionally burst out with some arresting, if improbable, tale of "Cactus as a Source of Uranium," or "Parted Lovers united by Cactus," illustrated, for no obvious reason, by a youthful bathing beauty clasping an inverted *Aloe* labelled "*Cereus sennillis*."

A well-organised scrapbook becomes in the course of a few years a miniature reference library: a useful standby for queries on any angle of this many-faceted subject. It provides an outlet for the creative urge, and an answer to all who complain that books are too expensive—let them make their own! More important, a scrapbook is a safe repository for all those small items turning up in unexpected places, and lost forever if nothing is done to draw attention to and preserve them. Their value may not be obvious now, but the asides of today are tomorrow's pointers to prevailing fashions and prejudices. But please be sure that the date and source of each excerpt is retained, or you will make more riddles than you solve. The same applies to book excerpts, which should always include the title page and, if a journal, the volume and part numbers. Another point concerns the names under which plants are described. It is tempting to cut off the "*Cereus sennillis*" of the above hypothetical quotation and substitute "*Aloe sp.*", but wiser to retain the original name and lightly pencil the alteration in the margin. A little study of the vagaries of nomenclature will soon show why!

Where to find Books

The Society and Branch Libraries are doing an excellent job in making the popular books on succulents available to members: all praise to the hard-working librarians who attempt to satisfy often overwhelming demands. For the more out-of-the-way books one must contact the larger public and private libraries, and it is here that the need is felt for some system of locating special items. Some central organisation like the I.O.S. might well take the lead, preparing a card index of book titles stating where they are to be found, and under what circumstances they can be consulted. In this way the link joining serious enthusiasts throughout the country can be made stronger still.

Mrs. Cutler, one of our oldest members, has been kind enough to supply the missing copy, No. 2 of volume 7, of our own Journal which now completes the library set. Mr. Eatwell has also been good enough to donate copies of Mr. Roan's "Cactus and Succulent Plants," and Mrs. Higgins' "The Cactus Growers' Guide" to the Library.

THE SYSTEMATICS OF CONOPHYTUM N.E. Br.—contd.

By Dr. A. TJSCHER

Translated by Mrs. G. Peters

Sub-genus 3 : *Euconophytum* Schwant.

Species of compact, or loosened bolster growth, body spherical, cylindrical, spindle shaped, pear shape or else skittle to heart shaped. Outer skin smooth, rough or hairy, unmarked, or else marked with spots or lines, which are sometimes elevated. The flowers are white, cream, pink, red to carmine red, copper coloured, wine red or yellow to orange. Some open in the day time and some at night. Type 1 to 24.

Series 1. *Ficiformia* Schwant.

Body pear shaped, or, through lobe formations, heart shaped, blue green, sides often reddish, on top marked with large translucent dark green to reddish spots which partly merge into one another. Flowers are large, pink or white in colour, opening at night. Types 20 to 24.

Type species : *C. ficiforme* (Haw.) N. E. Br.

Occurrence : District Ceres, Worcester, Robertson.

C. altile (N. E. Br.) N. E. Br. (rs 22/24), *C. bicarinatum* L. Bol (rs 23/24), *C. ficiforme* (Haw.) N. E. Br. (rs 20/24) (syn : *C. placidum* N. E. Br.) N. E. Br. ? *C. pallidum* (N. E. Br.) N. E. Br. ? *C. odoratum* (N. E. Br.) N. E. Br. (rs 22/24) (syn. *C. altile* (N. E. Br.) N. E. Br. ?), *C. pallidum* (N. E. Br.) N. E. Br. (rs 21/23), *C. placidum* (N. E. Br.) N. E. Br. (w-rs 21/23).

Series 2. *Carruicola* Schwant.

Body mostly inverted skittle shaped and flat on top, in some instances nearly half globular or a little spindle shaped. Flower white, straw colour to cream, wine red ; opening at night. Types 2 to 6, 8 to 10, 13 to 16, 19 and 20, 23 to 26, 33.

Type species : *C. truncatellum* (Haw.) N. E. Br.

Occurrence : Districts Van Rhynsdorp, Clanwilliam, Calvinia, Piquetberg, Ceres, Laingsburg, Worcester (?), Montague, Robertson, Ladismith, Swellendam, Oudtshoorn, Prince Albert, Willowmore, Uniondale, Beaufort West (?).

Sub-series 1. *Truncatella* Schwant.

Body reversed skittle shape, flat on top, a little sunken or else half globular rounded, some species (marked bilob) green to grey green, sides often reddish tinted, with large separate or row formation of spots, which are sometimes elevated. Flowers open at night and are white, straw to cream and pale wine red coloured. Types 2 and 3, 8 to 10, 13 and 14, 16, 19, 24 to 26.

Type species : *C. truncatellum* (Haw.) N. E. Br.

Occurrence : Districts Van Rhynsdorp, Clanwilliam, Ceres, Calvinia, Montague, Laingsburg, Ladismith, Prince Albert, Oudtshoorn, Willowmore, Uniondale, Beaufort West (?).

C. archeri Lav. (v 9/13), *C. brevitybium* Lav. (w-rs 9), *C. calitzdorpense* L. Bol. (w-rs 13), *C. catervum* N. E. Br. (w 13), *C. cerasianum* L. Bol. (c 13), *C. cibdelum* N. E. Br. (c 13/14), *C. clarum* N. E. Br. (c 13/14), *C. dispar* N. E. Br. (c 16), *C. fimbriatum* (Sond.) N. E. Br. (w 13/14), *C. framesii* Lav. (c 24/26), *C. meleagris* L. Bol. (c 9/14), *C. lucipunctum* N. E. Br. (c 16/24), *C. morganii* Lav. (w 14/24), *C. muirii* N. E. Br. (w 13/14), *C. multipunctatum* Tisch. (w 14/16), *C. peersii* Lav. (c 13), *C. permaculatum* Tisch. (w 2/3), *C. pisinum* N. E. Br. (w ? 8/9), *C. novellum* N. E. Br. (c 13), *C. purpusii* (Schwant.) N. E. Br. (c 13/14), (syn. *C. rennei* Lav. ? *C. spirale* N. E. Br. ?), *C. rennei* Lav. (c 13/14), *C. spirale* N. E. Br. (c 13/14), *C. subglobosum* Tisch. (c 14), *C. translucens* N. E. Br. (c 13), *C. truncatellum* (Haw.) N. E. Br. (c 13/14), (syn : *C. cibdelum* N. E. Br. ?), *C. truncatum* (Thunb.) N. E. Br. (c 13/14), *C. viridicatum* (N. E. Br.) N. E. Br. (c 13), *C. viridicatum* (N. E. Br.) N. E. Br. var *punctatum* N. E. Br. (c 13), *C. uvaeforme* (Haw.) N. E. Br. (c 8/14) (syn : *C. vanrhynsdorpense* Schwant., *C. julii* Schwant.), *C. wagneriorum* Schwant. (w 9), *C. wiggettae* N. E. Br. (c 13).

Sub-series 2. *Piluliformia* Tisch.

Body very small, inverted skittle shape to nearly spherical or elliptical, green to blue green, at the top with small dark green to brown green spots, or marked with short lines. Flower very small, white, cream, copper coloured or red. Types 2 to 4, 9, 13 and 14, 19, 33.

Type species : *C. piluliforme* (N. E. Br.) N. E. Br.

Occurrence : Districts Malmesbury, Robertson, Montague, Ladismith, Swellendam.

C. advenum N. E. Br. (co ? 13), *C. aggregatum* N. E. Br. (co 13/14), *C. brevitybium* Lav. (r 9/14), *C. edwardii*,

Schwant. (w? 4/33), *C. comptonii* N. E. Br. (co 13/19), *C. joubertii* Lav. (c 9/14), *C. leightoniae* L. Bol. (rs 9/14), *C. piluliforme* (N. E. Br.) N. E. Br. (co 9/14), (syn : *C. etaylorianum* Schwant.), *C. rubrum* L. Bol. (r 3/4).

Sub-series 3. *Picta* Schwant.

Small bodies inverted skittle shape, at the top with spots or line markings, which in some cases are elevated, grey to bluey green, sides mostly reddish to intensive carmine red coloured, spots and lines also most intensive brown to carmine red coloured. Flower is white to cream coloured, opening at night. Types : 8 to 10, 13 and 14, 16, 33.

Type species : *C. leviculum* (N. E. Br.) N. E. Br.

Occurrence : Districts Van Rhynsdorp, Calvinia, Clanwilliam, Ceres, Worcester, Robertson, Montague, Laingsburg, Ladismith.

C. albifissum Tisch. (c 13), *C. assimile* N. E. Br. (c 9/14), *C. batesii* N. E. Br. (c 9/13), *C. decoratum* N. E. Br. (w-c 16), *C. fossulatum* Tisch. (c? 20), *C. labyrinthum* (N. E. Br.) N. E. Br. (c 13), *C. lambertense* Schick. et Tisch. (w-c 16), *C. leviculum* (N. E. Br.) N. E. Br. (c 13), *C. literatum* N. E. Br. (w 13), *C. minimum* (Haw.) N. E. Br. (c? 16/19), *C. notatum* N. E. Br. (w-c 10/16), *C. obmetale* N. E. Br. (w 13), *C. occultum* L. Bol. (c 13/14), *C. pardivisum* Tisch. (w 14), *C. paucillum* (N. E. Br.) N. E. Br. (w-c 13), *C. petraeum* N. E. Br. (c 13), *C. perpusillum* (Haw.) N. E. Br. (w-c 13), *C. pictum* (N. E. Br.) N. E. Br. (w-c 13), *C. polulum* N. E. Br. (w 13), *C. praecinctum* N. E. Br. (w-c 13), *C. pusillum* (N. E. Br.) N. E. Br. (w-c 9/13), *C. radiatum* Tisch. (w 3), *C. scitulum* (N. E. Br.) N. E. Br. (w 10/13), *C. signatum* (N. E. Br.) N. E. Br. (c-y 9/13), *C. vagum* N. E. Br. (w 9/14).

Sub-series 4. *Tuberculata* Schwant.

Small bodies inverted skittle shape, mostly larger and broader than the types of sub-tribe *Picta*, grey green to sea green in colour, sides mostly deep dark carmine ; at the top with either separate or intermingling, larger, mostly elevated spots ; flowers white to cream coloured or pale pink, opening at night (nocturnal). Types 9, 10, 13 to 16, 19 and 20, 24.

Type species : *C. obconellum* (Haw.) N. E. Br.

Occurrence : Districts Calvinia, Van Rhynsdorp, Ceres, Clanwilliam, Worcester, Piquetberg.

C. declinatum L. Bol. (w 20), *C. divergens* L. Bol. (w 20), *C. germanum* N. E. Br. (w 10/20), *C. longifissum* Tisch. (w 15), *C. multicolor* Tisch. (c 19/20), *C. mundum* N. E. Br. (w-c 16/20), *C. obconellum* (Haw.) Schwant. (w 10/16), (syn : *C. nevillei* (N. E. Br.) N. E. Br.; *C. klaverense* N. E. Br.), *C. obcordellum* (Haw.) N. E. Br. (w 16/24), *C. parvipetalum* N. E. Br. (w 10/19), *C. parviflorum* N. E. Br. (w 20), *C. picturatum* N. E. Br. (r 10/13), *C. praeparvum* N. E. Br. (w 9/14), *C. spectabile* Lav. (rs-r 10), *C. ursprungianum* Tisch. (w 9).

Series 3. *Wettsteinia* Schwant.

Body broad, inverted skittle shaped, top flat and slightly saddle shaped, sunken, or arched to nearly spherical, dark green, grey to blue green, at the top and partly also extending on the sides, with small or largish spot markings, in some types, the spots are altogether absent. Flowers mostly large, with long floral stems, red, pink, white or yellow ; opening in the day time. Types 1 to 3, 7 to 20.

Type species : *C. wettsteinii* (Bgr.) N. E. Br.

Occurrence : Districts Great and Little Namaqualand, Van Rhynsdorp, Bushmanland.

C. braunsii Schwant. (r 10), *C. circumpunctatum* Schick. et Tisch. (r 10), *C. doorensis* N. E. Br. (r 2/9), *C. flavum* N. E. Br. (y 10) (syn : *C. concinnum* Schwant.), *C. fraternum* N. E. Br. (r 17), (syn : *C. fraternum* N. E. Br. var. *leptanthum* L. Bol. (r 17 *C. marlothii* N. E. Br.), *C. globosum* N. E. Br. (r-rs 1/2), *C. gratum* N. E. Br. (r 7), *C. iucundum* (N. E. Br.) N. E. Br. (r 7/14), *C. inornatum* N. E. Br. (r* 8/9), *C. kubusanum* N. E. Br. (r 9/16), *C. longistylum* N. E. Br. (r 10), *C. longipetalum* L. Bol. (y 10/11), *C. luteum* N. E. Br. (y 10), *C. luteolum* L. Bol. (y 8/13), *C. minutum* (Haw.) N. E. Br. (r-rs 10/17), *C. minutum* (Haw.) N. E. Br. var. *laxum* L. Bol. (r-rs 10/17), *C. novicium* N. E. Br. (y 10/13), *C. obovatum* Lav. (rs 1/2), *C. obovatum* Lav. var. *obtusum* L. Bol. (y 1/2), *C. ornatum* Lav. (y 9/10), *C. pearsonii* N. E. Br. (r 10/12), *C. pearsonii* N. E. Br. var. *minor* N. E. Br. (r 10/12), *C. percrassum* Schick. et Tisch. (y 10/16), *C. praecox* N. E. Br. (w 18/20), *C. rarum* N. E. Br. (r 10), *C. ricardianum* Loesch et Tisch. (w 11/12), *C. robustum* Tisch. (r 9/10), *C. rubristylosum* Tisch. (y 13/14), *C. ruschii* Schwant. (r 11), *C. schlechteri* Schwant. (w 20), *C. sellatum* Tisch. (r 18), *C. tetracarpum* Lav. (y 7/8), *C. tinctum* Lav. (y 10/11), *C. tubatum* Tisch. (r 19), *C. wettsteinii* (Bgr.) N. E. Br. (r 12), *C. wettsteinii* (Bgr.) N. E. Br. var. *oculatum* L. Bol. (r-rs 10/11) (syn : *C. ruschii* Schwant. ?).

Series 4. *Minuscula* Schwant.

Bodies small, inverted skittle shape or egg shape, cylindrical to spindle shape, top sides flat, arched or sometimes rounded bilob, translucent light green to olive green, or dark green to brownish green, sides partly brownish, reddish or carmine red, with spot or line markings, which are mainly elevated. Flowers comparatively large, with long

(Continued on Page 63)

UNUSUAL SUCCULENTS

By G. G. GREEN

It is a curious fact that, amongst the *Echeverias*, the most brilliant flower colours are to be found on the hairy species, and apart from those mentioned some time ago, *E. setosa*, now in full bloom, is both hairy and colourful. The orange red flowers are borne in profusion during May, as many as ten or more stems from a single plant being quite common, and the flowers last for several weeks. A low growing and compact species it is ideally suitable for edging or pan culture and clusters of the hairy, green rosettes are a sight to see during this period. Culture is extraordinarily easy as almost any kind of soil will suit, so long as it is of a porous nature, and nothing could give a brighter splash of colour in the window where it will grow comfortably. There are other varieties of this species, also most interesting, especially the cristate form which, however, rarely flowers.

In the last issue I did not mention the flowers of the *Kalanchoe* group, and the sight of the beautiful pink blooms of *K. eriophylla*, at present in flower, brought this to mind. This lovely species is less common even than *K. tomentosa*, and a little more difficult to cultivate, but it is a treasure when grown successfully. The white silvery leaves are narrow and longer than those of the "Panda" plant, with lighter brown markings turning almost rust red at the tips. It has a tendency to sprawl if not grown in full light, or if too rapid growth through shading and over watering has occurred, but strong bushy plants can be acquired during the course of a season or two if the treatment described previously for the hairy species is carried out.

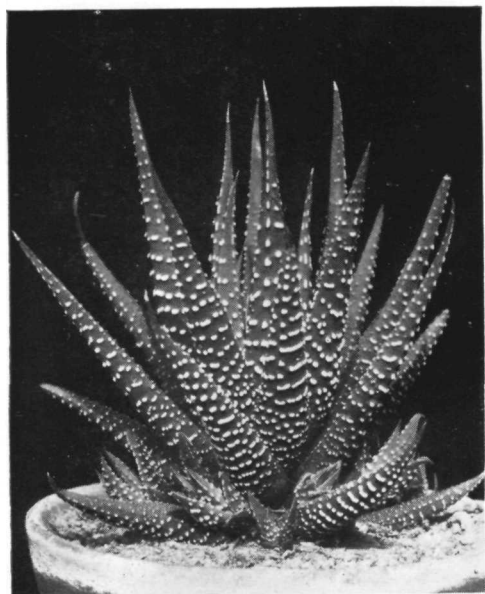
Patience is the watchword for good cultivation, and it has its own reward in the later development of a healthy plant, very beautiful in appearance, with the large lilac-pink flowers on their long hairy stems. A sandy compost, containing leaf mould and fine gravel, suits this species well and, if the watering is carefully attended to, should encourage the strong growth necessary to the species.

Before leaving this remarkable genus, I would like to include a word or two about *K. kewensis*, a species that seems to get scarcer every year. There is no great demand for it, however, among succulent collectors, and growers have reluctantly been forced to keep down stocks on account of this and the much needed room. I believe that this lack of interest is purely the result of failure to cultivate the species, plus the fact that it is a hard subject to grow with any success. Unlike any of its relations in appearance, *K. kewensis* has peculiar leaf forms which vary slightly on the same plant. They are produced from a smooth hairless stem, bronze in colour, in a somewhat irregular fashion. There may be a pair of long, narrow pointed leaves, greenish brown in colour, and the next pair divided into three or four long narrow points, almost like fingers stretching out from the stalks. These leaves are thick and tough, rounded along the edges and smooth, giving a most interesting appearance to the plants. The flowers are rose pink in colour, produced in large numbers from the centre of growth, lasting for a considerable time. It is a slow growing species, easily raised from seed, and needs a substantial soil compost containing leaf mould and coarse sand. The growing point should be taken out when young to encourage side shoots and have uncramped conditions for the roots. Though slow growing the plants always have an attractive appearance, and need little attention in the way of cultivation other than regular waterings in the summer and very little in the winter. Good light will bring out a coppery tone to the foliage, and care should be taken to see that the roots are not dried out during the hot weeks of summer. It is a species well worth growing, apart from the satisfaction obtained when flowers are eventually produced on a healthy specimen.

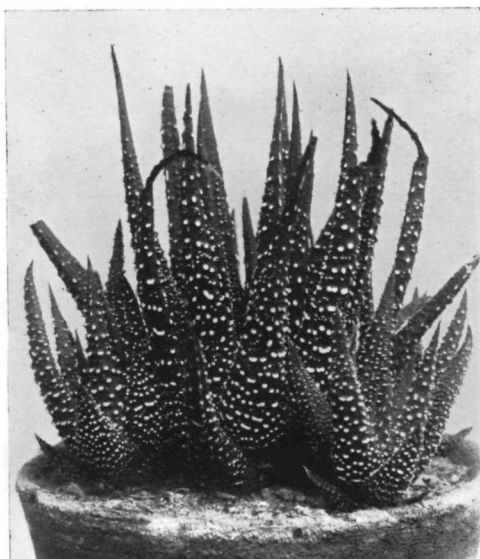
The flowers on *Senecio medleywoodii* have now produced the feathery seed pods, soon to float about in the breeze unless a careful watch is made on them, but other equally fascinating species of the genus are just coming into bloom.

S. vestita, with its flattened silvery leaves and very compact growth, has formed large buds on long silvery stems and the bright yellow petals will be fully opened within the next day or so. This is the culminating point of a year's patient growth with the plants nearly twice the size of last year. This species only grows slowly, but is elegantly formed and regally disdainful of all efforts to increase the rate of growth, preferring to keep its lovely appearance almost unchanged for long periods. The leaves very rarely shrivel or fall off, persisting for several years without blemish. The creamy white wool at the growing points is an attractive feature of the growth and as long as this occurs the plants are healthy. There is a strong root system to this species which enjoys a more unrestricted freedom than most succulents. Consequently, a fairly large pot will be appreciated if the soil is good, coarse and nourishing, and contains a liberal quantity of crushed brick and mortar, or limestone gravel. Plenty of water is needed in spring and summer, with only sufficient to keep the roots moist in winter.

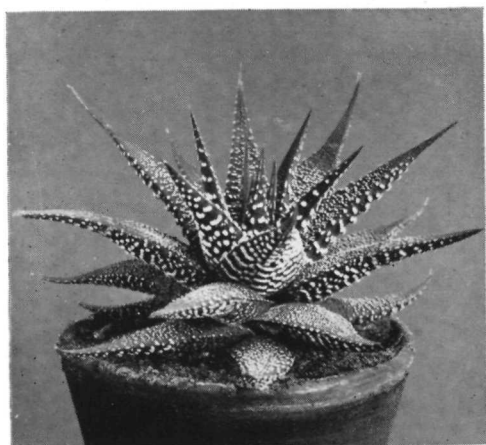
S. scaposus is also about to flower though the stems and buds are not so large as those of the preceding species. Of much shorter growth, this species is equally fascinating and needs the same treatment for good results. The



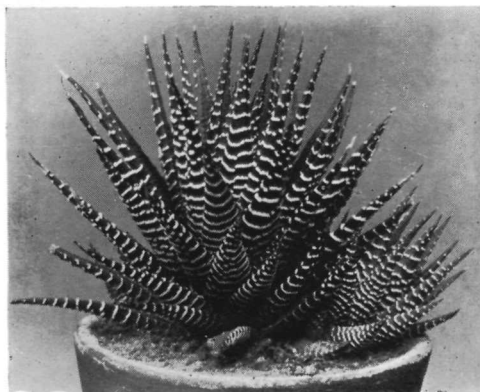
Haworthia attenuata typica



Haworthia attenuata var. britteniana

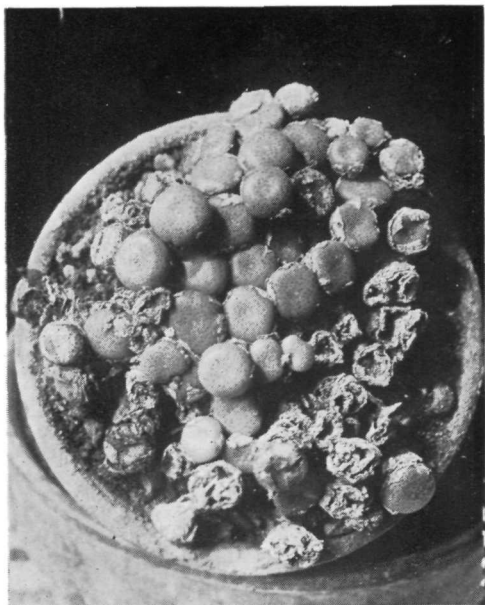


Haworthia attenuata var. clariperla



Haworthia attenuata var. fasciata

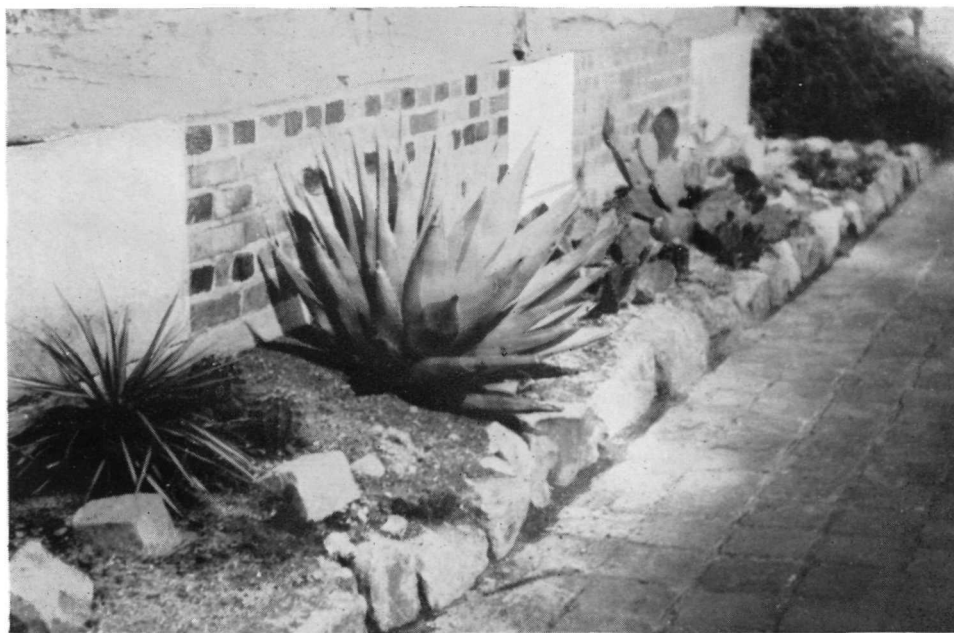
Four photographs by A. J. A. Uitewaal

*Conophytum ricardianum*

Dr. A. Tischer

*Opuntia tomentosa*

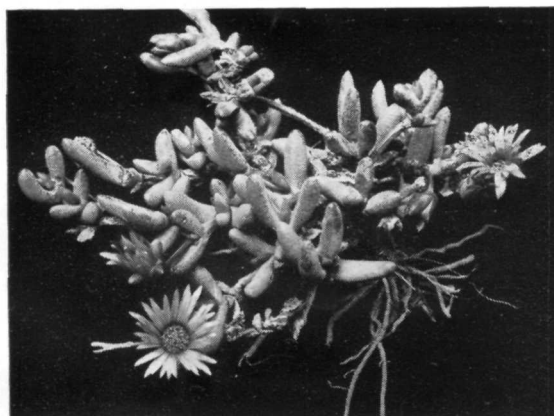
H. Hall

*Succulents outdoors in Normandy*

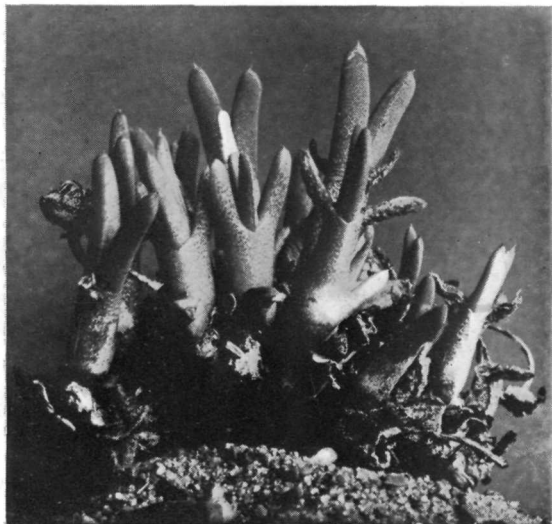
Capt. J. Delacour



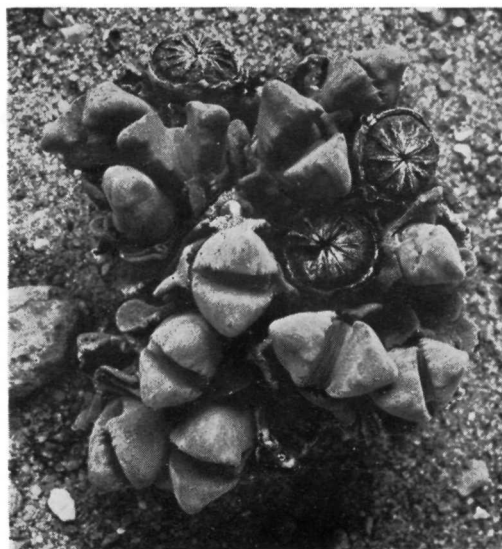
Hereroa granulata



Cephalophyllum ebracteatum



Cheiridopsis marlothii



Odontophorus sp.

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



Vanheeredia roodiae



Oscularia deltoides



Lampranthus sp.



Ebracteola montis moltkei

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

longer, narrower leaves are silver and shining with the same white wool at the growing points, and remain almost as long on the plant as *S. vestita*. It does, however, resent too much water if the weather is not fine and warm, and care should be taken to see that none gets among the leaves to cause rot which would soon demolish the plant. These are two plants that should be placed with the other beautiful hairy species.

Another splash of brilliant colour has been provided by the purple blooms of those *Mesembryanthemums*, *Trichodiadema bulbosum* and *Aptenia cordifolia variegata*.

The first is a small bush with erect stems crowded with the small hair-tipped leaves. Flowers are produced very freely indeed at the tips of the stems which grow from tuberous or swollen root stocks, and last for lengthy periods. The plants should be trimmed in March into compact forms so that the appearance is not marred by overgrown stems bending under the weight of the leaves. They like plenty of water from April and throughout the summer, with very little in winter, enough being stored in the roots to last through the winter.

The other species, *Aptenia cordifolia* is a pretty trailing or prostrate plant with yellow and green variegated heart-shaped leaves and bright purple rose flowers during May and June. Culture is easy if watering is not too heavy during early spring, and plants ripen better when bedded out in the garden during summer.

Sedum Palmeri is also a pretty plant when in bloom in early spring. The feathery yellow flowers are much larger than in the usual *Sedums* and are borne in a full cluster on the upright stems. It is very unlike a *Sedum* in growth and appearance, with the broad light green leaves, and needs more water than other species. It makes a good foil for the darker green of *Monanthes muralis* that quaint little shrub with the "pin cushion" flowers in bloom now.

A *Crassula* that used to be found in almost every florist's shop at this time of year, because of its pretty pink flowers, is *C. sarcocaulis*. This half hardy shrub was often bedded out in parks during the summer months and a brave sight it was, too, but like many other good plants, seems to have almost disappeared nowadays. It is very easy to grow from cuttings and forms small shrubs with minute oval leaves and slender branches. The flowers are light pink in close clusters on the ends of the branches, borne very profusely during spring and summer. In the cold greenhouse or on the window sill, it will thrive in an ordinary compost of loam, leaf mould and sand, and needs water regularly.

CACTUS CULTURAL NOTES (Continued from Page 51)

I hope that members who had seeds from the distribution have been successful at raising them. The distribution has kept me very busy, too busy for the time of the year. I noticed a slight under-statement in the April Journal, when in the report of the Annual Meeting it was stated that I had dealt with over a thousand packets in the year. This should have been for one distribution only. Each following one has meant as much work. Added to this is the task of trying to answer all the queries which are still being sent with the applications and it will not leave much to the imagination to realise how my time is occupied.

This is still a good time to take cuttings. It is amazing the difference the sun can make where cuttings are concerned. I have had off-sets in Vermiculite for some time without roots forming, but a few days' sunshine has caused the cuttings to produce roots in a day or two. You will often find that it is unwise to insert the cuttings deep into the rooting medium; they generally do better if they just rest on the surface. Tall ones can be supported with a small stick. Whilst the plants are still flowering it is advisable to pollinate with a fine brush, as many types will not produce fruits and seeds unless this is done. If you do not require the seeds for sowing the fruits will give added colour to your collection. Some *Mams.* appear to be self sterile and will not form berries unless they are pollinated from another plant of the same species.

THE SYSTEMATICS OF CONOPHYTUM N.E. Br. (Continued from Page 57)

floral stem, white, red or yellow; opens in the day time. Types 3 to 6, 8 to 10, 13 and 14, 16, 19 and 20, 28 and 29.

Type species: *C. minusculum* (N. E. Br.) N. E. Br.

Occurrence: Districts Little Namaqualand, Bushmanland, Kenhart, Van Rhynsdorp, Clanwilliam, Paarl, Malmesbury, Fiquetberg.

C. auriflorum Tisch. (y 3/8), *C. brownii* Tisch. (rs 9), *C. ectypum* N. E. Br. (rs 13/16) (syn: *C. limbatum* N. E. Br.?), *C. eenkokerense* L. Bol. (rs 28), *C. edwardsiae* Lav. (r 29), *C. fulleri* L. Bol. (r 10), *C. herrei* Schwant. (r 3/4), *C. limbatum* N. E. Br. (r 13) (syn: *C. chloratum* Tisch.), *C. luehmannii* Lav. (r 28), *C. minusculum* (N. E. Br.) N. E. Br. (r 3/4), *C. obscurum* N. E. Br. (r 10/13), *C. reticulatum* L. Bol. (r 9/13), *C. reticulatum* L. Bol. var. *roseum* L. Bol. (rs 9/13), *C. roodiae* N. E. Br. (w 28), *C. primosii* Lav. (w 28), *C. tantillum* N. E. Br. (r 19/20), *C. tischleri* Schwant. (y 13), *C. turrikerum* (N. E. Br.) N. E. Br. (r 28), *C. virens* L. Bol. (r 10/13), *C. wiesemannianum* Schwant. (r? 10/13).

AEONIUM SIMSII

By WILLIAM T. STEARN

The contemporary renown of Dr. John Sims (1749—1831) rested on his knowledge and skill as a medical man. He was physician to the London Charity for Delivering Poor Married Women in their Homes as well as to the Royal Ear Dispensary and enjoyed an evidently well earned reputation, which led to his being summoned, alas, too late, for the Princess Charlotte's tragic confinement. He was also a keen botanist. When his friend, William Curtis, the founder of the Botanical Magazine, died in 1799, Sims took over the editorship and kept the magazine going until 1826, being thus responsible for volumes 14 to 53; he then retired and William Jackson Hooker became editor. It is Sims's long association with the Botanical Magazine rather than his medical activities, at the time so much more important, that has kept his name alive.

Among the many new plants, figured in the Botanical Magazine during Sims's editorship, is a dwarf Canarian house leek, introduced from the Canary Islands by Christian Smith in 1815, and described and illustrated by Sims in The Bot. Mag. t. 1978 (April, 1818) as *Sempervivum ciliatum*. This name had, however, already been used by Willdenow in 1809 for another species. Sweet, whose Hortus Suburbanus Londinensis was then in the printer's hands, noted this double employ of the name *Sempervivum ciliatum*; it was too late for him to enumerate Sims's plant in the main body of his work, so he included it in the addenda, renaming it *Sempervivum simsii*. Sweet's entry is as follows:—"Sempervivum. 19 Simsii, ciliatum. Canaries, 1815, 9.4. G. Bot. Mag. 1978. ciliatum B.M. not of W. en." It gives a clear reference to Sims's description and figure in Bot. Mag. t. 1978, published under the invalid name of *Sempervivum ciliatum* and indicates Willdenow's prior use of the same name for another plant. This reference to an earlier validly published description made it unnecessary for Sweet to describe the plant anew. Praeger in his Account of the *Sempervivum* Group 193 (1932), thus erred in dismissing the name *S. simsii* Sweet as a "name without description." In 1820 the same plant was named *S. caespitosum* C. Smith, but this name is ante-dated by *S. simsii*. Nowadays the species is placed in the genus *Aeonium*, among the species of which, to quote Praeger, it may be "at once known by its close tufted habit and dense rosettes of strap-shaped leaves edged with long cilia. It is one of the small group of species which bear conspicuous parallel glands on the back of the leaves."

Its correct name is accordingly:—

Aeonium simsii (Sweet) Stearn in Gard. Chron. III. 130: 169 (1951).

Syn.: *Sempervivum ciliatum* C. Smith ex Sims in Bot. Mag. 45: t. 1978 (1818); non Willdenow (1809). *S. simsii* Sweet, Hortus Suburb. Lond. 230 (1818). *S. caespitosum* C. Smith ex Otto in Nees ab Esenbeck, Horae Physicae Berol. 38 (1820); Loddiges, Bot. Cab. 16; t. 1515 (1829); Burchard, Beitr. Ökol. Biol. Kanarenpflanzen (in Bibliotheca Bot. 98) 141, t. 38 (1929). *S. ciliare* Haworth, Revis. Pl. Succ. 64 (1821). *Aeonium caespitosum* (C. Smith) Webb & Berthelot, Hist. Nat. Iles Canaries, Phytog. I: 191 (1840); Praeger, *Sempervivum* 193, fig 84 (1932).

The Autumn Show of the Society will be held in the R.H.S. New Hall on the 23rd and 24th September. It will comprise sixteen classes: three *Echinocactanae*; three *Coryphanthanae* (including *Mammillarias*); three *Cereeanae*; three *Echinocereeanae*; three cacti; one specimen succulent (excluding cacti); three *Faucarias* and/or *Stomatium*; three stemless *Mesembryanthemums*; three *Haworthias*, *Gasterias* and/or *Aloes*; three *Euphorbias*; three *Crassulas*; three *Echeverias* and/or *Cotyledons*; three succulents other than cacti; succulents other than cacti, raised from seed by the exhibitor, sown on or after 1st January, 1950 (giving date of sowing) space allotted 3 ft. by 1 ft.; three *Stapeliads*; group of cacti and/or succulents to cover table space 5 ft. by 3 ft. for the Amateur Gardening Bronze Medal and Award of Merit. Entries should be sent to the Hon. Secretary, Mr. K. H. Walden, 152 Ardgowan Road, Catford, London, S.E.6, not later than 13th September.

On March 12th, a well attended meeting, at which were a number of guests from other societies, heard the Howard E. Gates' lecture on Cactus Collecting in Lower California, read by Mr. Shurly. Coloured Kodachrome slides were shown that also illustrated some of the local architecture and were of considerable general interest. The lecture included some historical details about the buildings. Mr. Bishop, chairman of the London Cactus Club, made a short speech of thanks at the close of the meeting.

REPORTS OF MEETINGS

May 13th, 1952. A. Boarder : *Rebutias*, *Parodias*, *Lobivias*.

A number of *Rebutias*, *Lobivias* and *Parodias* were brought as a table show for the talk by Mr. Boarder, the main points of which follow.

Rebutias and *Lobivias* are members of the *Echinocereaceae*, *Parodias* of the *Echinocactaceae*. It is often difficult to identify cacti from their appearance unless flowers or seed pods are carried, although the shape of the plant is sometimes a guide, as with *R. violaciflora*, the head of which is flat. *R. senilis* bears wide flowers, while *R. aylosteria* and *fielbrigii*, which belong to the *Digitorebutia* group, have hairy buds common to these finger shaped plants. *Rebutias* are easy to grow from seed and, if given plenty of sun, will flower and set seed freely, but because of packed close offshoots they may be difficult to gather. Flowers spring from low down on the sides of the plants.

Lobivia haageana forms the connecting link between *Rebutias* and *Lobivias*. Offshoots of the latter do not rot readily and the shape of the parent is spoiled by removing them. *Lobivias* (the name is an anagram of Bolivia, their native habitat) are closely related to *Rebutias*, but *L. famatimensis* is reminiscent of *Echinopsis*, with cup shaped flowers. Flowers develop over a longer period and stay open longer than *Rebutias*, perhaps because of non-pollination.

Pseudolobivia kratochvilliana, which flowers at two years, carries its cream sweet scented blooms on long tubes and provides the link between *Lobivias* and *Echinopsis*. The ridges of *Lobivias* are broken, not continuous as in *Echinopsis* and the plants are stronger than *Rebutias*, though not so free flowering, e.g., *L. pentlandii* is not easy to flower, but the colour of the flowers is finer, the petals are larger and the period of blooming longer.

Parodias, however, flower from the newer central growth for a long period, but are not easily grown. Spines are sometimes hooked as in *P. catamasensis*. They are particularly liable to failure from over watering, which, perhaps, accounts for the popularity of the grafted plant with this genus. Seeds ripen the year after flowering.

General points include a fondness of sunlight, particularly for good flowering—a plant in a room should be regularly turned to the light. They are very susceptible to rot from over watering. A good soaking when the plant is really dry is better than continual smaller additions, as underneath the bulge of the plant may be quite moist even though the soil looks dry. At nightfall a light spray is beneficial, as this simulates the dews of nature. Over potting should be avoided. A good porous soil is recommended, say two parts loam, one of peat, one of sharp sand, with fertilisers such as superphosphate of lime, hoof and horn grist, etc., but if your soil gives good results—let well alone. Vermiculite will encourage root growth provided food is in the soil, but grafting tends to produce an unnaturally vigorous growth.

Germination is facilitated, particularly with the dust-like seeds of *Parodia*, if small stones are scattered over the seeds, leaving gaps for observing the degree of moisture. Spraying should be done carefully, too, or the seed may be blown away. Germinate at 70–80°, with some air, in darkness; giving light, in moderation, for six months, and more air as soon as any seeds grow on. *Parodias* usually take up to three weeks for germination. Temperature should be slightly reduced when growth begins.

Flowers fertilise cleistogamously sometimes, but usually hand pollination is needed and cross-pollination in some cases. With *Digitorebutias* shoots and flowers sometimes alternate annually. Seed pods should not be removed from show plants.

When sowing seed it is a good plan to divide the pot with divisions and number each for identification purposes. Dampness collecting on the glass should be wiped off daily. Water stores should be covered to prevent the formation of algae, as this tends to drag seedlings from the soil. If the seedlings get too much sun and turn red, they should be put in partial shade for about six months until they show signs of renewed growth. Once the spines have formed, they can be dried out, if necessary to curb moss or algae growths. For the latter of which, a weekly spray with dilute permanganate of potash (beetroot colour when *all* is dissolved) is useful.

Mr. Boarder dealt with numerous questions put to him after the close of his lecture. The meeting closed after Mrs. Pryke Howard had been unanimously supported by all present in passing a vote of thanks to Mr. Boarder. General praise was given by the lecturer and others on the fine show of plants of the genera on which the lecture was given. The show was the finest we have had for a very long time.

A full house attended another Covent Garden Meeting on April 8th, and many members brought specimens for exchange. After a preliminary survey of the plants, a brisk trade was carried on by barter for upwards of an hour, during which time general exchanges of information were made on the cure for ills and the best kind of treatment to be given to obtain healthy plants.

HAWORTHIA ATTENUATA AND ITS VARIETIES

By A. J. A. UITEWAAL

H. attenuata Haw. is one of the many variable species, like many within the genus, of which scarcely two plants from different localities seem to be exactly the same. Is it a matter for wonder?

This species was first described by Haworth in Trans. Linn. Soc. 1804, but had been in cultivation long before that time as Boerhaave had already mentioned it in his 1717 catalogue of plants in the garden at Leiden, Holland. Today, this species, or at least one of its forms, is more frequently seen in collections than any other, but not always known by name though it may be fairly easy to recognise by the tubercles on the back of the leaves being larger than the minute ones on the face, moreover, always having a raised row of tubercles in the middle of the leaves. The plant Haworth described had recurved, long tapering, subulate leaves with chalky white tubercles on both sides, of which those on the back of the leaves being larger than those on the face; the fruit being oblong-triangular.

In Philos. Mag. 1828, Haworth described *H. clariperla*, which later, particularly by Baker, has been regarded as a variety of *H. attenuata*; comparison of Haworth's original descriptions of these two species, there is indeed scarcely any difference of importance, *clariperla* only having very distinct tubercles. From an observation added to the diagnosis of the latter, it can, however, be taken that *clariperla* must have been a smaller plant with shorter, less tapering leaves than *attenuata*, the tubercles being more beautiful and more distinctly arranged in cross bands.

Baker, in Flora Capensis 1896, mentions a plant as *H. argyrostigma* Hort as existing in English gardens under this name. This plant was regarded by Berger to be a variety of *H. attenuata*, differing from it by the tubercles being somewhat smaller, less regularly arranged and rather scattered.

Dr. K. v. Poellnitz, in Kakt. u. a. Sukk. 1937, added a third variety, viz., var. *britteniana*, a variety he had first described as a separate species. Fairly often (not always as stated by v. Poellnitz) will be found some minute tubercles between the larger ones on the back of the leaves of many forms of *H. attenuata*. Var. *britteniana* has rather a lot of these minute tubercles, which form little groups and also often short transverse rows.

So far it would seem to be fairly simple to distinguish the species and its three varieties and one would perhaps think it must be fairly easy to indicate them in one's collection without difficulty. So it might seem, but there are, however, so many different and transitional forms, in leaf shape, in size and arrangement of tubercles, moreover, also in colour, that it is often scarcely possible to say, with absolute safety, which of all these forms was the one described by the author. It is often so with the genus *Haworthia* and this is understandable in a genus with so many polymorphic species, that one is only sure of possessing exactly this or that species or variety described if one has a co-type or an offset of the plant in question, or if one is in the position to compare with good herbarium material, or living type plants. Perhaps with the exception of var. *britteniana* type, material was sent by v. Poellnitz to the Bot. Gard. at Berlin-Dahlem; no type material of the species and varieties mentioned up to now have been saved.

Because I possess an offset of a plant of the var. *britteniana* (locality Oudtshoorn) sent to Europe by Miss Britten, I may suppose to possess a typical plant. This variety was already represented in my collection by other specimens, one of them under the number "Stellenbosch 108"; it seems to vary somewhat in the length of the leaves. It is fairly easy to recognise from the other forms by the combination of the following characteristics: a. its habit, the tapering leaves $\pm$ incurved or upright, seldom recurving as far as has been noted; b. the colour of the leaves, being of a dark, somewhat olivaceous green; c. the fairly numerous minute tubercles between the larger ones on the back of the leaves, the larger ones being mostly scattered, sometimes arranged in $\pm$ clear, often curved transverse rows; d. the larger tubercles, especially often somewhat depressed at their tips.

Of *H. attenuata* and its var. *clariperla* there are good figures in the monograph of Salm Dyck. The transverse rows of the sometimes confluent tubercles as drawn in Salm's figure of the type are too much idealised; generally the arrangement is more irregular. What, however, has always struck me most is the comparatively great difference between the plants figured; such a remarkable plant as shown in Salm's figure of var. *clariperla* was represented in my collection, though about twice the size than as described. In 1950, in the Zurich collection, I found, however, the same plant, of which the measurement of the leaves completely agreed with Salm's description (shown on the photo); the plant was correctly named *H. attenuata* var. *clariperla*. Compared with the typical species, the recurved leaves of the var. *clariperla* are shorter (ca. 5 c.m.), somewhat wider (ca. 2 c.m.) and less long tapering, the tubercles on the back of the leaves are larger in proportion, not so crowded, pure white, often arranged in distinct transverse rows, $\pm$ confluent and so forming shorter or longer cross bands; the larger tubercles are somewhat depressed. The leaves, being of a rather dark green colour (like those of var. *britteniana* from which it differs, among others, by a quite different habit and arrangement of tubercles), the pure white tubercles are

strikingly beautiful, so its name has good reason. One question, however, remains : were the plants described by Haworth and by Salm exactly the same ?

The number of described forms of *H. attenuata* increased considerably when R. S. Farden, in this Journal (Vol. 8, nr. 2, 1939) described fourteen new varieties and forms, of which, however, ten are illegitimate as they are not accompanied by Latin diagnosis ; the legitimate ones are : var. *o'donoghueana*, var. *linearis*, var. *deltoidea* and var. *minissima*. Farden himself stated that it was not easy to define these varieties because all varieties and forms were irregular in the disposition of the tubercles ; it, therefore, being necessary to avoid defining the leaves by extremes and only to select those which might be called the most general.

Besides the fact that several plants described might have been garden forms, his sub-division, based especially on arrangement and size of the tubercles, very unstable characteristics, is a too artificial one and, therefore, not quite unjustly, criticised. If every morphological difference was given a taxonomical category, nearly every plant in the vegetable kingdom would have a name. Mr. Reynolds, in the preface of his splendid work "The Aloes of South Africa" rightly wrote "that the beginner instinctively notes differences between plants, but, as his field experience increases, he will learn to seek resemblances which bring them together into specified groups." We think, even without field experience, the serious student, in the course of time, comes to approximately the same conclusion ; the longer he studies the genus *Haworthia*, the more he will be inclined to group rather than sub-divide. We can, however, understand that one sometimes feels the need to describe an outstanding form in such a polymorphic population. I possess a form of *H. attenuata* of which the tubercles on the margins of the leaves are often confluent, thus forming a distinct, white, interrupted margin along the leaves ; I received this plant from a collector in America and it seems to be somewhat rare.

We will not go here in detail of the several species Farden described. In 1947 I saw Farden's plants in Kew Gardens ; it is to be hoped that this material will be well kept and photographs made of them and published, at least of those varieties legitimately published and mentioned above. Farden did well to transfer *H. fasciata* var. *caespitosa* to the *attenuata* group by naming it *H. attenuata* var. *caespitosa*, to which group it surely belongs. This plant is one of the most beloved forms within the group, commonly known and generally distributed by the incorrect name of *H. fasciata*. A characteristic of the *attenuata* group, Farden properly mentioned, is the raised, lengthwise row of tubercles in the middle of the face of the leaves, although some related species also have the same characteristic.

I will now try to give a sketch of *H. attenuata*, including its forms. A stemless, or nearly stemless rosette, freely sprouting. Leaves lanceolate-deltoid to deltoid, mostly gradually tapering from base to tip, sometimes sub-ovate at base, somewhat incurved to recurved or spreading, often falcated in the upper part, about 3.8 c.m. long and 8—20 m.m. wide (seldom larger) ; face flat convex to somewhat convex, with a more or less raised row of tubercles in the middle of the leaf, never smooth ; back convex to very convex, with a $\pm$ distinct keel, sometimes no keel is to be seen (especially in forms with confluent tubercles in crossbands). Tubercled on both sides of the leaves ; tubercles on face mostly minute (less than ca. $\frac{1}{2}$ m.m.), sometimes medium sized (ca. $\frac{1}{2}$ m.m.), mostly all of about the same size, scattered (except the lengthwise row in the middle), sometimes arranged in indistinct lengthwise rows, mostly apart, seldom some confluent, white, whitish, greenish, or sometimes concolorous, rarely somewhat differing in colour ; tubercles on the back of the leaves always larger, sometimes scarcely, generally $\frac{1}{2}$ —1 m.m. diameter, sometimes somewhat larger, in some forms with fairly numerous minute tubercles between the larger ones, sometimes almost scattered, often arranged in $\pm$ regular transverse rows, often apart or some confluent and so forming shorter or longer transverse bands, sometimes confluent in $\pm$ complete cross bands, seldom $\pm$ confluent on margins and so forming a $\pm$ interrupted marginal line, white, whitish or greenish, rarely somewhat differing in colour.

As can be seen from the above, the arrangement of the tubercles can be quite different and is seldom quite the same on the various leaves of the same plant. Also in the colour of the tubercles there is much variation, often they have a pearl like hue, they may be pure chalky white, but seldom nearly concolorous. A plant with concolorous tubercles on the face and nearly concolorous tubercles on the back of the leaves is Stellenbosch 56 (loc ?) ; further only the tubercles on the face may be $\pm$ concolorous, whilst those on the back of the leaves are pure white ; never, however, the reverse.

To end this record we will compare *H. attenuata* with some other species of the section *Margaritiferae*. *H. margaritifera* has stouter leaves with generally larger tubercles, which on both sides (the face, however, is sometimes smooth) are of the same or nearly the same size ; the peduncle is stout, the flowers are rather whitish and their segments somewhat longer, the fruit oblong-triangular. Typical plants of *H. radula* have very minute tubercles of the same size on both sides of the leaves ; this species may also be fairly variable. Plants agreeing with Salm's

(Continued on Page 69)

AN OUTDOOR CACTUS GARDEN IN NORMANDY

By Capt. J. DELACOUR

Normandy, and particularly Clères, between Rouen and Dieppe, does not sound like an ideal location for desert plants. Perhaps the greatest horticultural success, however, that has been achieved there has been the establishment of a good many species of cacti and of other succulents cultivated out of doors during the last sixteen years. Although my principal interest is in birds and animals, of which large numbers are kept at Clères, gardening comes a very close second, and in the course of the years I have gathered together many species of trees, shrubs, ferns, herbaceous, alpine and water plants; there were also several houses for stove plants and orchids, which have been war casualties.

The climate of Clères could hardly have been less suitable for the purpose. It is situated in a narrow valley surrounded with wooded hills; a chalk stream flows through the grounds, expanding into a small lake. The soil is rich and deep, but heavy, limy and very cold; vegetation is about two weeks late compared to nearby Rouen (15 miles) and to London. Summer heat is practically unknown, and night temperatures of 42° are frequent in July and August. Winters are fairly severe, rather colder than in the south of England; exceptional frost of 5° F. i.e., 27 degrees F. below freezing point occurred in 1940, 1941 and 1942, although it is unusual for the thermometer to drop below 12° F. Air humidity is always high.

There are at Clères narrow terraces running in front of the old Manor House, which are much elevated above the surrounding grounds (20 to 25 feet); they have been established on the vaults and rubble of the old medieval castle. There are two levels; the lower terrace is 15 feet wide between the stone balustrade and a tall, three-storey building; it has a central paved path, with a bed three feet wide of rock plants and ferns on the outside, and a six-foot wide one along the building. At both ends of the terrace are two circular platforms, formed by ruined towers, with pools for water plants, tubs and vases. The upper terrace is only 10 feet wide; the bed along the wall is narrow (2 feet) and about 60 feet long.

The terraces face south and catch a good deal of sun, although the irregular buildings of the Manor House, as well as the mass of the nearby chateau, project their shade on parts of them early in the morning, and after five p.m. during the summer. The high roofs of the XV^e century Manor overhang the bed of the upper terrace to such a point that only stormy rains driven by strong southwesterly winds ever reach it.

For many years I tried to grow in those beds various small shrubs and plants from dry countries, with indifferent success in most cases. The artificial soil resting on the vaults was not deep enough for many of them.

During several visits to California and Arizona in the thirties, I became much interested in cacti and succulents, as I noticed many wild species growing at high altitudes in cold places. I decided to experiment with them on the terrace at Clères, and I brought over a few. At the same time, I obtained from various sources in Europe other species known to be hardy. About ten different *Opuntia*, as many *Echinocactus* and *Echinocereus*, and two *Agave* were first tried in 1934. They did well, being watered liberally from May to October, but not at all the rest of the year; snow and driving rain, however, reached them at times during the cold season and caused some to rot. The following year, some protection was devised for half the bed; moveable panels made of two boards separated by two-inch space filled with sawdust, 20 inches high, were set up five inches in front of the row of large sandstones which form the border of the raised bed; glass frames leaning on the wall at a height of three feet provide a shelter from water and hard frost; they can be lifted; they are kept open during the day when it is not freezing, but they exclude water entirely; in very cold weather the glass is protected by layers of burlap or straw matting. The important point is to keep the plants absolutely dry from October till May. Boards and frames are removed and taken away during the summer, and no trace of them can then be seen.

This protection proved very useful. When at the end of April the boards and frames had been removed, all the plants were alive, if somewhat shrivelled; within a week or two they looked perfect. It was so encouraging that I procured immediately many semi-hardy or even so-called tender species, and the whole bed was planted out. Kew and Paris authorities consulted showed no confidence in my undertaking, but during the summer all the plants grew luxuriantly and a number flowered well. Before the autumn, more frames were made for the whole length of the bed, and it was arranged to allow a height of five feet inside for taller plants.

It was a complete success; a few delicate species did not stand the winter, but the great majority survived, and the summer show was excellent in 1938. As usual, the only trouble later on was the lack of room as specimens grew up; we transferred the larger *Opuntia* and a few others to the broader, if a little less sheltered bed of the lower terrace, which is protected in a similar way during the winter. The plants grow much better and flower more freely under such conditions than they do in pots that are taken indoors at the cold season. I should add here that some of the very hardy species were left unsheltered in small beds.

In all beds we placed rich loam, one to two feet deep, and mixed with coarse sand. Later on, it was found that muddy sand from the bottom of the stream suited the cacti to perfection. The water runs freely through the light soil. When I left Clères in May, 1940, the plants were in excellent shape, some of the taller *Opuntia*, *Cereus*, *Aloe* and *Crassula* reaching a height of five to six feet; most species had flowered abundantly in 1939.

I returned from America in the summer of 1946; there was little left of the collection; the head gardener reported that the cacti and succulents had been wonderful until 1943 when a particularly troublesome body of occupying troops had burned the boards and frames in the heart of the winter. By the next spring only a few species had survived, which I saw in 1946: three different forms of *Opuntia* hyb. (*tortispina*?), procured from Correvo in 1920, one of which has pink flowers; *Opuntia echinocarpa*; *Opuntia whipplei*; *Agave parryi*, including a large specimen which is now ready to flower and was planted twenty years ago, one *Agave victoriae-reginae* and several *Agave mexicana* of a small, hardy form.

In the spring of 1947, most of the upper bed had been re-planted with cacti brought from America, or obtained on the Riviera. The collection has been improved every year since, and the terraces are looking today much as they did twelve years ago.

The following species are prospering now under the conditions I have described; it is interesting to record that practically all of them had stood without damage the very severe winters of 1940—41, 1941—42, and 1946—47 with no other shelter than boards and frames. There is little doubt that many more species could be grown successfully in the same way.

Cacti

Opuntia: *leptocaulis*, *kleinii*, *vivipara*, *acanthocarpa*, *echinocarpa*, *bigelowi*, *cholla*, *imbricata*, *tunicata*, *fulgida*, *alcahes*, *prolifera*, *vestita*, *salmiana*, *cylindrica*, *miqueli*, *corrugata*, *grahami*, *aurantiaca*, *pentlandii*, *schickendantzii*, *basilaris*, *microdasys*, (and *m. alba*), *rufida*, *tortispina*, *sulphurea*, *rafinesquei*, *soehrensii*, *setispina*, *santa-rita*, *phaeacantha*, *bergeriana*, *vulgaris*, *scheeri*, *dilleni*, *tomentosa*, *figus-indica*, *leucotricha*, *robusta*, *fragilis*, *polyacantha*, *rodanthea*, *rutula*, *strobiliformis*; *Nopalea cocconellifera*: *Cereus*: *peruvianus*, *aethiops* (*coerulens*), *sinilis*, *pringlei*, *dumortieri*, *eruca*, *thelegonus*, *bridgesii*, *macrogonus*, *spachianus*, *lamprochlorus*, *candicans*, *schickendantzii*, *tortuosus*, *martinii*, *jusbertainii*, *areolatus*, *celsianus*, *strausii*, *flagelliformis*, *spinulosus*, *rostratus*; *Chamaecereus silvestrii*; *Echinocereus*—*mojavensis*, *paucispinus*, *blanckii*, *pentalophus*, *cinerescens*, *fitchii*, *engelmannii*, *stramineus*, *ehrenbergii*, *melanocentris*; *Rebutia*: *minuscula*, *pseudominuscula*, *fielbrigii*, *diminuta*; *Echinopsis*: *pentlandii*, *multiplex*, *eyriesii*, *turbinata*, *calochlora*, *rhodotricha*, *valida*, *aurea*, *violacea*; *Echinocactus*: *acanthodes*, *johnsonii*, *echidne*, *ingens*, *grusoni*, *ottonis*, *bicolor*, *mammulosus*, *leninghansii*, *longihammatus*, *pampeanus*; *Gymnocalycium*: *damsii*, *schickendantzii*; *Astrophytum*: *myriostigma*; *ornatum*; *Ancistrocactus scheeri*; *Escobaria tuberculosa*; *Mammillaria*: *bocasana*, *echinaria*, *bicolor*, *compressa*, *erythrosperma*, *kunzeana*, *rhodantha*, *setispina*, *longispina*, *polimensis*; *Epiphyllum* hybrids.

Other Succulents

Agave: *parryi*, *mexicana* form?, *macroacantha*, *franzoseni*, *filifera*, *victoria-reginae*, *ferdinandi-regis*; *Aloe*; *Haworthia*; *Gasteria*; *Crassula*; *Rochea*; *Cotyledon*; *Echeveria*; *Sedum*, etc. (various species).

I should like to call attention to the truly magnificent collection of Cacti and Succulents that M. Julien Marnier-Lapostolle has gathered together at Villa des Cedres, St. Jean Cap-Ferrat, between Nice and Monaco, which I had the pleasure of visiting last spring. It is the most complete and best cultivated one that I have ever seen, even in California. M. Marnier also possesses large series of sub-tropical trees, vines and shrubs, as well as of orchids, bromeliads and store plants. Every summer Victorias flower in his ponds in the open, and he has transformed a small wood into a tropical jungle such as cannot be seen elsewhere in Europe.

HAWORTHIA ATTENUATA AND ITS VARIETIES (Continued from Page 67)

figure are rather distinct, differ, however, from plants as published under the same name by Berger (after an unpublished plate of Salm Dyck) and which we think to be nearer to *H. rugosa*. This species and *H. subulata* have much larger rosettes and much longer (10—12 c.m.) and stouter leaves. Salm Dyck saw them in Vienna and first described them (youth forms) as varieties of *H. radula*. These plants were grown from seeds. *H. subattenuata*, described by Salm (also from a plant found in Vienna), we would scarcely hesitate to consider a form of *H. attenuata*; on the face of the leaves the tubercles are restricted to a raised row of greenish tubercles, downwards in the middle of the leaves, tubercles on the back of the leaves are rather large, somewhat arranged in transverse rows.

A WEEK-END IN WINDHOEK

By H. HALL

Windhoek, the capital of S. West Africa, is pleasantly situated amongst attractive looking hills and is about 6,000 feet above sea level. As most readers know, plant collecting is my hobby, and this explains why I was so far from the Cape. For nearly four years I had waited for an opportunity to visit S.W.A., famous for its succulent flora as well as the Namib Desert and Skeleton Coast, and at last my wish was fulfilled by being invited to join the "Bernard Carp Expedition" to the Kaokoveld, a region in the far north of S.W. Africa, and very little known. After more than six weeks of adventure away from civilisation, we returned to Windhoek early in July this year, where the trucks had to be serviced after their gruelling time in the hinterland as well as to prepare them for their long run to Cape Town, nearly 1,000 miles further south, mostly over execrable roads.

Naturally I had intended to visit the well-known "S.W.A. Succulent Nurseries" from the moment I knew we should pass through Windhoek and, though unforeseen circumstances prevented me from visiting Mr. Triebner on the outward journey northward, I made quite sure to do so on my return. The enforced delay in the garage permitted me to look up several other acquaintances, including a certain Mr. Hockey who had generously supplied me with some valuable maps of the country we had to pass through. Mr. Triebner's place is situated in a suburb known as Klein Windhoek, and is at a higher altitude than Windhoek itself and where, he said, "occasional frosts wipe out some of my best plants." It was early one Sunday morning, July 15th, the warm winter sun blazing down from a cloudless sky. I might add, at this point, that the winters are quite dry in this part of the country and clear skies are the order of the day. As a matter of fact, the whole time I was in S.W.A. we never saw a cloud in the sky. Mr. Triebner appeared, after a call from his good wife, tall, grizzled of countenance, and spent about three hours showing me some of his treasures. His garden is part of a rocky slope, full of choice succulents, of great diversity—naturally, however, largely S. W. African and including many of the rarest species known. There were species of *Hoodia*, *Trichocaulon*, *Adenium*, *Pachypodium*, *Lithops* and *Euphorbias*, practically all growing outdoors. There was a fine collection of *Aloe* species, many in flower, including the species known as *Aloe ausana*, growing alongside its relation *Aloe variegata*. Seeing the two together, the former with much longer leaves, it was difficult to agree that they are forms of the same thing.

His collection contains many plants which have no name and look so very different from any known species. Reluctantly I turned away to continue the rest of my programme.

In one school garden in the town I was pleased to see *Kalanchoe marmorata* in full flower (Mr. Grant will remember that I once wrote that I had only seen it in flower on the Riviera), its long white-tubed flowers being quite unique. In many other gardens I noted beds and borders of *Bryophyllum tubiflorum* with their orange scarlet heads massed together, evidently well-suited to this dry winter weather. My perambulations through the sunlit streets and suburbs revealed many small gardens with fine plants of *Opuntia subulata* and *O. cylindrica*, vigorous bushes about three feet high, tree *Euphorbias* and tree-like *Cereus peruvianus*, *Agave* and *Furcraea*, *Yuccas* and local *Aloes*.

The hills surrounding Windhoek are dotted with countless thousands of *Aloe rubrolutea*, sharing the dry yellow grass (winter stage) with thorn bush. This *Aloe* is normally unbranched, reaches an approximate height of eight feet. On our way north they were all in flower, on our return ripening their seeds. One morning I took a native boy along to try to find a few young specimens for Kirstenbosch but, among the said thousands, youngsters are very hard to find. As with many other plant forms, though seed is scattered annually by the million, very few ever survive. Those we found were invariably well hidden in a thorny bush or a tuft of grass. Here and there an occasional specimen of *Aloe hereroensis* was seen, a beautiful species with glaucous leaves dotted with curious H-shaped spots. In this, the dry season, the leaves were strongly incurved, thus protecting the growing point from sun and wind. The leaves of the young *Aloe rubrolutea* were vertical and even compressed inwards near the tips for the same reason and thus made handling and packing considerably easier than when extended and brittle in the growing season, or as they mostly remain, in cultivation in gardens. Very plentiful around the town was *Kleinia longiflora*, forming thin-stemmed bushes three to five feet high. Passing through a man-made cutting through a small hill on our way back with the *Aloes*, I spotted a plant of *Stapelia schinzii* which was clinging to a meagre bit of soil some twelve feet above the road. It was now in full sun and highly coloured but, in all probability, grew in shade until the pick and shovel gangs arrived! I left it there for two reasons; firstly because I had already collected this species elsewhere, and secondly, because it would have been difficult to climb the smooth face of the cutting with passing traffic below.

The town appears to be expanding as rapidly as any other in the world and, of course, the thorn-bush and *Aloe*-

covered slopes are being encroached upon more and more ; it was therefore with mixed feelings that I observed the *Aloes*, *Kleinias*, etc., getting chopped out to make way for the fences, the foundations, and so forth. On our return with the *Aloes* I noticed huge specimens of various *Opuntia* species, resembling *O. ficus-indica*, *dillenii* and *tomentosa* on some waste ground. They were obviously escapes from gardens or had been thrown away in the past. One plant of *O. tomentosa* was so laden with small dull-red fruits that I stopped to take a photograph of it and enclose it for the sake of the record. It was an old favourite of mine in Manchester (where it flourished, but never flowered) and here it was twelve feet high, rather limp with drought and yellowish green in colour, a few feet from the road. So off with my rucksack to get at my camera, my "boy" glad of the chance to get rid of his sack load of young *Aloes* ! It chanced that a deep drain was being dug along the opposite side of the road and a group of about forty native navvies all downed tools to witness such an unusual diversion, some crazy person taking a picture of what they probably regarded as ordinary bush.

In the Government Gardens there are some very fine succulents in cultivation, species of giant *Cissus juttae*, *bainesii*, *kramerianus*, *Euphorbia virosa*, shrubby *Mesems.*, etc. There were several very fine specimens of the rare *Pelargonium spinosum*, about four feet tall, reminding me that I once found one specimen in Namaqualand in 1950, in very arid surroundings. The genus *Pelargonium* contains some very lovely species from the dry regions of southern Africa and few are in cultivation.

Then, the trucks being declared fit for the road we hurried south and home.

REVIEW. We have just received a copy of Mr. Uitewaal's new book "Cactussen en Vetplanten." It is a 116-paged book, written in Dutch, especially for beginners. It has over a hundred illustrations and very fully deals with all those subjects that interest the beginner. A member who can read Dutch will find the book extremely helpful.

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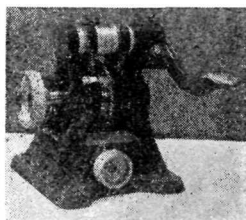
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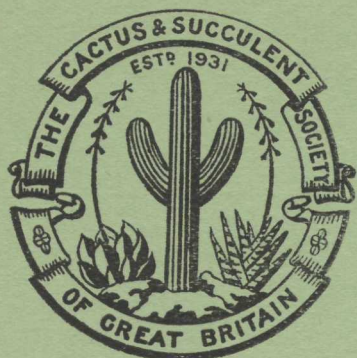
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SOCIETY NEWS

1952

November 18th 6 p.m.

December 2nd 6 p.m.

1953

January

Epidiascope : Photographs of cacti and succulents.

S. Pullen and K. H. Walden : Propagation by cuttings.

No meeting.

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EDITORIAL

With the present Journal another year ends. A year that has been very eventful in the history of our society and of our plants.

With this number is concluded the letterpress of the Professor Schwantes' inset. 1953 will provide the remainder necessary to complete the book. It is now due to Professor Schwantes to express our grateful thanks for the very generous gift of his manuscript, for which he asks nothing and, in fact, gathered more trouble than was first expected as the original manuscript was much smaller, but, at the editor's personal request, he added numerous genera which, while they are uncommon in this country, were needed to complete the review of the whole of the Family.

Another outstanding event has been the completion, with this issue, of Dr. Tischer's articles on *Conophyta*. These articles contain much information of value to the ordinary collector and have been of even greater value to more scientific circles. Dr. Tischer has, like Professor Schwantes, been generous in presenting the articles to the society and we wish to express our grateful thanks and appreciation to him.

Now for a personal note. This issue completes six and a half years of my editorship of the Journal. Members are not vocal in their appreciation or criticism, but, on occasion, it has been made clear to me that the only complaint is that the Journal does not appear often enough, nor is it big enough! With that I can rest content, but tribute must be paid to others who have given their services free and with enthusiasm. I refer, firstly, to Mr. Boarder who has so generously supported the Journal by his quarterly articles from the first number after the war, July 1946. Only one issue later, Mr. G. G. Green commenced to contribute his well known articles. 1952 saw Mr. Boarder confining his articles to cacti and Mr. Denton commencing his articles on succulents. What a galaxy of talent has appeared in the pages of the Journal during these six and a half years! It is dangerous for me to mention names as I am sure to overlook somebody unintentionally, but I cannot fail to mention such stalwarts as Howard Gates, Gordon Rowley, H. Hall, Mr. Uitewaal and how many others? And then there are the translators, Mr. Engler, Mrs. Kassai and Mrs. Peters. I can only say 'thank you' to each of you—you have helped to make my task easier and have provided more than your share towards presenting what I do consider to be a notable contribution to the knowledge of our plants.

CACTUS CULTURAL NOTES

By A. BOARDER

Another growing season is passing away and it is now possible to take stock of our failures and successes. The year has been a very good one on the whole for the growing of our cacti. In my own greenhouse the amount of flowers has surpassed anything I have had previously. The production of seed pods also appears to have been excellent judging by the range of colours to be seen. This seed formation does not seem to run along any recognised lines as some plants always form seeds after flowering whereas others never appear to do so. I have an *Echinopsis aurea* from which I was anxious to get some seeds. It had about eight flowers at different times and although I tried pollination I have been quite unsuccessful at getting any seed pods to form. This has also happened with my plant of *Acanthocalycium violacea*. My various *Lobivias* have flowered better than ever this year but up to the present do not seem to have produced a single seed. The *Rebutias* seeded fairly well, but these are not always easy to gather. I find that the best way is to hold a spoon under the seed pod with the plant tipped to one side so that the seeds can be pushed into the spoon. I think that the *Mammillarias* have produced many thousands of seeds and some of the pods are very large and showy. A plant of a type of *M. bocasana* had a much larger flower than the normal type and the fruits were almost 2 inches long. This I am referring to as *M. bocasana splendens*, it is indeed a splendid plant. Most of the seeds of the *Mams.* can be gathered quite easily but that is not the case with *M. longiflora*. This plant has large flowers with a long tube about 1½ to 2 inches long and, after fertilisation, which must be from another plant, the seed pods form. These are greenish in colour with a slightly red tip. The dried flower persists on the end of the fruit, and when the pod is ripe, by pulling at the dead flower, some of the pod comes away with a few seeds. The rest of the seeds, generally the majority, are left behind and it is then that the difficulty appears. The plant has rather large well developed tubercles and the flowers form between them. As the plant grows during the season, the earlier tubercles become more compressed and the seed pods are almost hidden. To get the remaining seeds out from the crevice one has almost to dig them out with a pointed stick. How these seeds ever come to be sown under natural conditions is a mystery to me, as the growing plant seems to trap them in completely. Fortunately, few of the *Mams.* are as awkward as this one and they can generally be depended on to send out their seed pods sufficiently far enough to be gathered with ease.

In the July issue of the Journal I mentioned the *Echinocereus berlandieri* which had many buds. This plant has produced 11 seed pods filled with seeds, some hundreds in each pod. My other *Echinocereus* also gave me many seeds. The *Echinopsis* seedling which flowered in 2 years from seed also had 2 seed pods and this plant was not the only 2 year *Echinopsis* seedling to flower as another species had two flowers. This one, however, did not produce seed pods. Whilst on the subject of seeds it may be well to relate the experience I have had with plants of *Astrophytum myriostigma*. I have three flowering plants and I cross fertilised them when in bloom. The seed pods formed so quickly and the seeds so easily ripened that I have now several seedlings ready for pricking out, in the middle of August, which are the result of this year's flowers. Not all Cacti seeds ripen as quickly, but I find that when they do it is advisable to sow the seeds at once as a good germination usually occurs from this fresh seed. It has been rather a fight with the ants to save most of the seeds. I had a fine pod of a *Gymnocalycium* absolutely denuded of seeds by the ants before I realised that the pod was ripe. With most of the *Echinopsis* and *Echinocereus* the pods burst when they are ripe, but have no fear that the seeds will at once fall out as they are enclosed in a whitish sticky substance and until this has been well dried in the sun there is not much fear of the seeds falling out.

I hope that your seedlings have made good progress this year. I have had record growth and have already some potted up into 2 inch pots. These include not only the fairly quick growing *Cereus* but also *Mams.*, etc. Some *Mams.* are from a half to an inch in diameter and this only six months after sowing the seeds. I have proved fairly conclusively that, if seedlings are pricked out after four months or so, they grow at a much faster rate. A *Titanopsis setifera* was in flower within six months of the seed being sown, but then many of the other succulents can be grown as easily as cabbages.

It has been interesting to note through the year the different opinions of visitors to my greenhouse as to why my plants grow and flower well. All kinds of reasons are put forward as if all this has come about by accident. In fact, this is not so at all. It is mainly through experience gained over a period of 47 years of Cacti growing. When my present greenhouse was built I intended it to be mainly a *Mammillaria* house, as these are my favourite plants. It was therefore designed with the idea of giving these plants what I considered to be the best conditions possible in this country. The reasons put forward by visitors have been :—low roof, giving plants that nearness to the glass which they seem to prefer ; the fact that I keep the plants on gravel over solid soil instead of standing them on wooden shelves, and the fact that I can get plenty of air in the house. Well, all these points have a bearing on the

growth of the plants and this system was arrived at deliberately. Some people make a study of the nomenclature of Cacti, I have made a study of growing them. Who gets the most satisfaction I will leave you to guess. My house was planned on the sunken or forcing house type. Some call it a cucumber type, as it has no glass sides at all. There is a brick base from which the roof rises direct at an angle of 45 degrees. There is a path down the centre of concrete and this is surrounded by a brick wall about two foot six high. Between the outer and inner walls there is packed earth topped by about an inch of gravel. The top of the gravel is about six inches from the top of the outer wall which allows me to stand a fairly large plant close to the glass. The house is 20 feet long and 9 feet wide. It runs from north to south and the door is on the south end. At this end are two windows, one each side of the door which open outwards so that one can be opened against the wind if necessary, or both in hot weather. At the north end is a large window, 3 feet by 2, which opens out from the bottom whilst in the roof are four windows, two each side, staggered so that they are not opposite to one another, these are 3 feet by 2. It can be seen from this that I can give the plants plenty of fresh air and, in fact, if the weather is very hot the door can be left open as well. This house gives me a good start, but that is not all of the story. The fact that all my plants are re-potted each year at least once and that I use what I consider to be a splendid potting mixture, add another important phase to the story. Then what I consider to be the most important point of all is the study of the water can. No matter how good everything else may be, success will not come until you are able to know exactly when and when not to water a plant. I am sorry I cannot tell you when this is, you can only find this out by experience. Without sufficient water the plants will not grow but over-do it and they die. When you have mastered the art of watering you are well on the road to success.

The most simple rule to follow is to water a plant when the soil is quite dry and do not water again until it has dried out again. Some soils pack down tightly fairly quickly. There is no need to worry if this happens, just hoe the surface with a flat pointed stick, not too deeply and the plant will benefit. Some people get very worried if they see a little moss form on the top of the soil in a pot. I have not found that this harms a plant. I have had a moss form around seedlings without them coming to any harm. Should a pot become covered by moss on the soil a good dry out should be given when the moss can be scraped away.

As it will be Autumn when these notes appear in print I must advise all to gradually withhold the water from the adult plants. I do not mean that you should cease watering altogether but reduce it as much as possible, always taking into consideration the weather and the type of house in which the plants are kept. The growers without a greenhouse who keep their plants in a living room are often wrong in providing too arid conditions throughout the winter months. It must be remembered that it is generally much warmer and drier in such a room than it is in the average greenhouse. Few if any Cacti need to be kept so dry all the time that there is never the suspicion of moisture in the soil for months on end. As a rule the colder and damper the conditions then the less use must be made of the water can. Even in my greenhouse I rarely go for long at a time without giving a little water to some of the plants. If any plant, such as an *Opuntia*, shows signs of withering it should have a slight watering. As for the current year's seedlings I consider that it is well to be able to keep these, if not growing, then well alive and plump. If they are allowed to dry out to such an extent that the tiny fibrous roots are killed it will retard the growth of the plant in the spring. Now as to temperatures in the winter. I never mind if the temperature of my greenhouse goes down nearly to freezing point. It often goes below this, but not to my pleasure. I am definitely against keeping the plants in a stove atmosphere all the winter. I think that the colder they are kept within reason the better they are likely to flower in the following year. If there is a warmer part of the greenhouse this is the place for the seedlings as they can then be kept well alive if not actually growing.

List of seeds available, October, 1952.

Mr. Boarder reports that he has the following seed for distribution.

Echinopsis aurea, *E. campylacantha*, *E. violacea*, *Echinocactus grusonii*, *Trichocereus thelagonus*, *spachianus*, *gladiatus*, *Astrophytum ornatum*, *Cephalocereus chrysacanthus*, *Monvillea rhodoleucantha*, *Cotyledon papillaris*, *Notocactus pampeanus*, *Agave victoria reginae*, A. spec., Grand Canyon, A. spec. Arizona, *A. kerchovei*, *Aloe striatula*, *A. supralaevis*, *A. mycrostigma*, *Lobivia backebergii*, *Beschorneria yuccoides*, *Furcraea roezlii*, *Aptenia cordifolia*, *Stapelia variegata*, *S. rufa* v. *attenuata*, S. mixed., *Dyckia altissima*, *D. rariflora*, *D. montividiensis*, *D. remontia*, *D. sulphurea*, *Cereus peruvianus*, *Puya spathacea*, *P. alpestris*, *Ferocactus wislizenis*, *Faucaria lupina*, *F. duncani*, *Pleiospilos optatus*, *P. bolusii*, *Agave rigida*, *Carnegiea gigantea*, *Harrisia bonplandii*, *Anacampteros rufescens*, Mixed Cactus seed. *Bergeranthus multiceps*.

Some are in limited quantities and will be sent out strictly as applied for, first come first served. It is possible to send ten sorts in an ordinary envelope and this number will be the maximum amount supplied. If no kinds are named, Mr. Boarder will send out at his own discretion. Mr. Boarder cannot enter into correspondence in regard to cultivation, etc. Members desiring some of these seeds should send stamped addressed envelope to Mr. A. Boarder, Marsworth, Meadway, Ruislip, Middlesex.

CULTIVATION OF SUCCULENTS

By W. DENTON, B.E.M.

At this season of the year most of our plants are resting or about to go to rest. This does not mean that all watering should suddenly cease. You must take notice of the condition of the plants and carry out the operation gradually. For instance, *Euphorbia bupleurifolia*, with the green leaves growing from the top. This will tell you when to ease the water. You will notice one of the leaves turning yellow and another will fall off, then is the time to slack off with the water pot. Make it a gradual process and allow the plants to go to rest naturally. Lots of succulents should be treated this way and it is a safe rule with all leafy *Euphorbias*. A good many plants will still be growing well into October, so please do not check too suddenly.

A few of the thin stemmed varieties of *Euphorbia*, like *mili*, will require just a little water occasionally in winter to prevent undue shrivelling. Some *Cotyledons* should also have this treatment, but do pick a fine day so that any excessive moisture will be cleared off by nightfall.

I find this year that numbers of our members have placed many plants out of doors for the summer and they are all full of praise with the way the plants have responded. I feel sure that this method will pay good dividends in the appearance and health of the plants. I noticed at the June Show a very fine specimen plant of *Crassula sarco-caulis* that was very thin on the flowering branches and the flowers were very pale in colour. A few months outdoors in the open air I feel sure would turn this plant into a real gem.

A plant I noticed in a member's garden was *Kalanchoe aleurodes*; under glass this is a greenish leaved plant covered with white meal, but the rain had washed this off. The sun finished the job by turning the leaves a beautiful red and, to me, it was most attractive and I am sure the plant was very healthy in spite of the fact that the rain had disposed of nature's covering.

I have been very disappointed with my *Lithops*; this year very few flowers have rewarded me for my care and I am rather at a loss to explain the reason. One would have thought that the fine sunny period early in the year would have been a big help, but, in my case, it was not so. Generally speaking, I think about the middle of May, when the plants become active, should be the correct time to re-pot two or three year old plants. I did not intend to re-pot many this year and left the job. The end of June I noticed that nearly all the plants were infested with root bug, so I had to re-pot them all. This time I have introduced a few crystals of paradichlorobenzene among the drainage to act as a deterrent and hope for a decided improvement. I am inclined to think this late potting has had a bad effect on my flowering possibilities. I find, in talking to friends, that they too have not had the flowers usually produced by these plants. So perhaps it is something we do not understand that is the cause. Nature sometimes works that way.

However, I have been rewarded with a satisfactory year with the *Conophytums*; these little chaps always do well and I consider them the most easy of any to cultivate. Small pots only are necessary, they are very shallow rooting so that depth is not required. There are several hundreds of sorts in all shades of colour and they make a fine subject for specialisation for anyone who cares to study them. It is unfortunate that they hybridise so freely, numbers of plants are in the possession of people that certainly are not true to name. As I have said before, these are now growing and should have ceased flowering. Just a little water now and then throughout the winter on favourable occasions. This should go on till about next March when they go to rest and remain in their skins till the growing season returns. The plants themselves will tell you as the new green growth will show up through the old stems when they are ready again for a little water. When *Conophytums* are in full growth you should carefully remove the completely dead skins with a pair of blunt tweezers to avoid any water or moisture lodging at the base of the new growths as this is liable to cause decay. No force should be used on this job; if they do not come away easily leave them alone for a time. This will also give you the chance to check up on your labels and renew any that are not clear and distinct.

Plants on the exhibition table could be provided with tee shaped labels so that visitors are able to read the names easily. For ordinary use in the greenhouse, the upright type I consider most useful. Use a thick brand of celluloid as this will not warp easily and print the names on with plastic ink which will give you a very long life. The material is available from sundriesmen in large pieces and can be cut up to suit your requirements. If you wish them to last for a good many years, a thin coat of clear varnish will be a refinement that will pay you in the long run.

I noticed one group of plants in our June Show where the pots had been washed over with a little red ochre. What a difference this made to the appearance of the collection, it could do no harm as this is not like paint that would stop the porosity of the pots. These little refinements make a difference and in a class that is very close gain points with the judges and add considerably to the appearance from the visitors' point of view.

There are various schools of thought with reference to the top dressing for stemless *Mesembryanthemums*; some say that the introduction of Cornish sand prevents one from inspecting the top soil with reference to the watering, but I still feel it is well worth it especially when exhibiting, it does add to the appearance and the plants grow naturally among stones. After all, it can be removed when the plants return to the greenhouse. It has one advantage with me, it does help to keep the plants clean, avoiding any unnecessary splashing when watering.

After all, colour is what matters, especially with *Lithops*. Green sappy plants make no appeal to me and are most difficult to bring through our winters. Grow hard is my motto, full sun and all the air possible and if the plants are on the small side what matters if colour and markings are clear and distinct.

The last year or so I have been interested in the genus *Adromischus* of which I have a few nice plants, including *cristatus*, *hemisphaericus*, *marianae*, *clavifolius*, *maculatus*, *rhombifolius* and a few varieties without names. You see very few of these about, but they are well worth while with their nicely marked leaves and fairly easy culture, rooting as they do with ease from the leaves. The plants were not doing so well as I should have liked last year, so I decided I would try a slight alteration in soil, etc. Some of them are now growing in six inch pans in a mixture of loam and sand only and I find they are very much better in appearance and are healthy and growing well, so perhaps my John Innes mixture is not so suitable for these plants. Those interested in succulent plants would do well to pay a little more attention to these most interesting plants.

I am writing these notes at the beginning of September and I note that my *Ophthalmophyllums* are just starting to grow, having a fair number of this year's and last year's seedlings I have been tempted to start a little watering in late July to see if they would respond a little earlier in the year. My efforts met with no reward, however, they still remain dormant, proving that nature will have its way and they will only grow with me at any rate in late Autumn. I still hope for a few flowers, however, and whatever happens I value these plants, all gems of the succulent world.

I do consider how fortunate we are to have the benefit of the fine articles now appearing in the Journal by Dr. Schwantes, they are most helpful and instructive and how very pleasing when this world authority describes a plant that is rare and difficult and you know you have been lucky enough to have this plant in your collection for many years and that it is one that flowers regularly.

At this date, September 3rd, *Herreanthus meyeri* is about to flower, it has five nice buds and is a very worth while plant. I had this before the war and it never failed to flower.

Another interesting plant, three years from seed, is *Dinteranthus puberulus* with three flowers.

Everybody should grow *Pleiospilos hilmari*, a real beauty and the smallest of the genus, never fails to flower and comes easy from seed.

Others in flower with me now are *Lithops kunjasensis*, *salicola*, *fulleri*, *lesliei*, *karasmontana* and several other *Pleiospilos* varieties.

By the way, see that the heating arrangements are in good order, you may want them any day now.

Our Chairman, Mr. A. J. Edwards, has been kind enough to donate a very handsome polished shield, called the Junior Challenge Shield, to be competed for by the junior members up to eighteen years of age. Details will be sent with schedules for 1953 shows.

At a Horticultural Show at Ilford during the August Bank Holiday, one of our members, Mr. E. W. Sansom, gained the Kew Cup for Cacti and other succulents, also three first prizes in other competitions.

A SUCCULENT MÉLANGE

From the Fuau Herbarium, Australia.

It seems to me that attention should be drawn to the unfortunate mistake that has arisen in relation to *Cereus Beneckeii*. Ehrenbg, which Backeberg has included into his new classification as *Hertrichocereus Beneckeii* (Ehrenbg.) Backg. He says "This genus is distinguished by its nearly creeping habit, its diurnal flowers (see Schlange, 1933 : 435)"

Schlange does say that the flower is diurnal, but goes on to say "Flower opens from early morning hours until 12—1 o'clock in early December for one day only", without defining what she means by "early morning hours." She has very evidently jumped to the conclusion that the flower opened that morning, whereas in reality the flower opened the evening before and remained open until late the following day, a phenomenon frequently observed in the cereoid species.

I have an almost mature plant in cultivation here, the main stems ca. 1.5 m. high, and this year bearing about 80 buds, some of which didn't mature because of a rather early snap of winter weather that dropped the temperature down into the thirties. It is quite regularly nocturnal flowering, the outer perianth segments loosening during the afternoon and the flowers opening in the last rays of the setting sun, usually not more than three opening on each stem on the one evening, though this would be a variable factor. The accompanying photo was taken in the last of the evening light with the help of one flood-lamp, and shows one flower already fully reflexed and one half opened. You will note that the buds appear to lean outwards but actually that appearance is caused mainly by the stems of the plant growing away from the light, a quite remarkable character of this particular plant.

Schlange is not the only author to be deceived by the flowers of the Ghost Cereus: Bravo also says (in the *Anales*) that the flowers are diurnal. Evidently they both wandered abroad in the morning, full of botanical enthusiasm, instead of staying around long enough to really see when the plant flowered. Two authorities considered the species nocturnal-flowering: its author, Ehrenberg, and Britton and Rose, who were possibly advised by Professor Reiche, when he sent them living material in 1921. So much for its "diurnal" flowers, and its inclusion in the subgenus *Heliopachycerei*, in which it loomed as an uncomfortable ingredient in any case, if one has any regard for the meaning of "pachy." It will have to be put down somewhere else. I don't want you to interpret this as an attack on Backeberg—there are quite enough people teaching their grandmother how to suck eggs at present, without me joining in the chorus—but this is a point that should be noted.

Well, to go from Mexico to Arizona, one of our interesting little side-lines here is the resuscitation and repair of some of the battered old hulks of *Ferocactus wislizenii* that remain from the old days of imports, when these plants were sold fresh from their native deserts, full of colour and spines. For the last ten to twenty years they have just sat and defied the elements to kill them, and as old collections are put on the market, they return to circulation hoary with the grit of neglect, practically dead, certainly without growth these many years, and, not infrequently, infected with rootnematode. The problem is to grow them instead of keeping them as curios and the method, which at first appears unconventional, is to reduce them to a cutting. After removing whatever root-stubs remain we go to work with a carpenter's brace and one inch bit, boring into the cortex for two or three inches until the end of the woody tissue is reached. The hole is then enlarged until all of the corky tissue is cleared away, generally resulting in a space big enough to put a fist into! The plant is then put into the hottest position available with a generous shovelful of raw sheep-manure under it. It may take a year, sometimes considerably less, for the new roots to appear. At first they are threadlike but they soon thicken up, and so the plant starts on the long road back. It still has to be watched to see that slaters don't get into the considerable space that still remains at the base of the new roots, but this, too, gradually fills out until the root system looks as though it has never been the subject of an operation.

Quite a number of plants have been treated in this manner, amongst them a *E. horizonthalonius*, that now has an enormous root system, fine spines and flowers freely, and three plants of *Escobaria dasyacanthus* that, having been carefully nursed for several seasons, now reward us with a smother of blooms and provide the seed we so sadly need. Except, that is, when the pair of glasshouse mice (who like to gather as much winter food as they can) rob me of the fine red berries.

These little fellows will attack anything that's edible in the seed line. At first I was greatly mystified by tiny

heaps of *Frailea* seeds under a bush of *A. clavarioides*, until careful watching solved the problem. A tiny twitching noise—suspicion on four legs—a flash of grey light, and no more.

You wanted to know more about the *Haageocerei*, and suggested that they might not be getting enough air, and possibly needed shading. Well now, I doubt if they would need shading, since they grew to perfection in the dry and hot climate of northern Victoria where temperatures are in excess of 110°F throughout most of the summer, and so far as air is concerned, the main glasshouse is open on two sides which, together with glass louvres on the other sides, ensures an ample flow of air at all times.

My experience here has been that they are quite unsuited to our Winter, tolerating neither the frosts, the relatively heavy rainfall, nor the overcast of cloud that is almost continuous throughout the six months of inclement weather that we call winter and spring. They do very well under glass, neither liking nor needing repotting oftener than every two or three years, slow growing, but highly coloured in their white, yellow, brown and purplish-red spination, and, since they are now quite substantial bushes, I plan to move them, this coming season, into what will be semi-open garden, being only roofed over for protection from rain and frosts. This will necessitate the erection of another 360 sq. ft. of glass to the 250 sq. ft. that I have already made this year, so you can see why my hand is continuously in my pocket! I plan to alternate bushes of *Haageocereus* with half-grown plants of *Oreocereus* (now about 3-4 feet high—including what is probably the finest range of *O. Celsianus* in Victoria) in a forty foot bed, with a border of seedling *Ferocacti* of varying species. This will necessitate moving the present planting of *Agaves* and *Yuccas* to another location. Unlike the cacti, they regard our climate with approval and need no attention whatever from year to year, so, of course, our growers almost entirely neglect to include them in their plantings, which is a pity, for what could be more attractive than the dull reddish-purple of *Y. Desmetiana* or the yellows of the variegated form of *Y. filamentosa*, to mention but two of the plants.

Over the last week it has rained continuously—2½ inches—so I am again looking forward to losing a yard or so of *Machaerocereus eruca*. The year before last a plant of about nine feet in all rotted off, and last year a yard or two also succumbed to the persistent rain, so perhaps next year I will have to start again. Aren't cactophiles persistent?

We have received details of the *Rebutia* Study Group that has been commenced by the I.O.S. They issue a guide to the study of *Rebutias* and the papers are extensive and comprehensive. These papers are intended only for serious students of the genera covered generally by *Rebutias*. If members feel they can help the Study Group will they write direct to the secretary of the I.O.S., J. D. Donald, 3 Braeside Avenue, Brighton 6.

On August 26th, 1952 was held the Cacti and Succulent Competition for the Sherman Hoyt Trophy at the Old Hall, R. H. S. Mrs Pryke Howard was successful in gaining the award with a very colourful, well grown collection of plants, predominantly of *Echeveria* and *Stapelia* types, but there were some nice plants, particularly an eight inch high *Oreocereus celsianus*, *Rhipsalis cereuscula saglionis* and *Kleinia pendula* in flower. The plants were not rare, but the art of display was well illustrated. There were four other competitors, Mrs Stillwell, Mr. P. V. Collings, Mr. S. G. Fiedler and Mrs Shurly. Among the plants were some notable specimens and, of course, Mr. Collings well known plants which need no further description; others were *Fenestraria aurantiaca*, *Opuntia strobiliformis*, *Leuchtenbergia principis*, *Henricia sibbettii*, *Testudinaria elephantipes*, *Mammillaria plumosa*, *Cissus juttae*, *Oophytum oviforme*, *Euphorbia multiceps*, *Ariocarpus kotschubeyanus cristata*, Zonal *Pelargonium eurulaceum*, *Opuntia clavarioides*, a couple of *Machaerocereus eruca* and an eight inch high *Euphorbia obesa*.

The dates of the meetings in 1953 are as follows :—February 3rd, Annual General Meeting; March 17th; April 14th; May 12th; June 23rd, Show; July 28th; August 25th; September 22nd, Show; October 20th; November 17th; December 1st. No meeting in January. The desire has been expressed for having the meetings commence at 7.30 p.m. This matter will be discussed at the next General Meeting for the opinion of the members.

There will be a dinner to celebrate the 21st anniversary of the founding of our Society on Thursday, November 27th. Details are not yet settled, but will be sent by post to members in good time. Please book this date.

THE SYSTEMATICS OF CONOPHYTUM N.E. Br.—contd.

By Dr. A. TISCHER.

Translated by Mrs. G. Peters.

Series 5. Cataphracta Schwant.

Body inverted skittle shape to spherical with very firm, pale bluey green to whitish-chalky green outer skin, unmarked or with some pronounced spots. Flowers yellow, nocturnal, fragrant scented. Types 1-3, 8-11, 13.

Type species : *C. calculus* (Bgr.) N.E.Br.

Occurrence : Districts Great and Little Namaqualand, Kenhart, Bushmanland, Van Rhynsdorp.

C. breve N. E. Br. (y/13), *C. calculus* (Bgr.) N. E. Br. (y/1), *C. calculus* (Bgr.) N. E. Br. var. *protrusum* L. Bol. (y/1), *C. globuliforme* Schick et Tisch. (y/2-3), *C. forresteri* L. Bol. (y/13), (syn ; *C. victoris* Lav.), *C. johannis-winkleri* (Dtr. et Schwant.) N. E. Br. (y/10), *C. minutiflorum* (Schwant.) N. E. Br. (y/10-11), *C. pageae* N. E. Br. (y/13), *C. pumilum* N. E. Br. (y/10-13), *C. pygmaeum* Schick et Tisch. (y/1-2), *C. schickianum* Tisch. (y/13), *C. subtilis* N. E. Br. (y ?/9-10), *C. subrisum* (N. E. Br.) N. E. Br. (y/13), (syn ; *C. poellnitzianum* Schwant ; *C. villettii* L. Bol.), *C. udabibense* Loesch et Tisch. (y/10), *C. tabulare* Loesch et Tisch. (y/11), *C. vanzylii* Lav. (y/11).

Series 6. Barbata Schwant.

Bodies without markings, spherical to inverted skittle shaped, outer skin hairy, yellowy to brownish green. Flower yellow to ochre coloured, or reddish. Nocturnal. Types 1-2, 11.

Type species : *C. stephanii* Schwant.

Occurrence : Districts Little Namaqualand, Van Rhynsdorp.

C. bolusiae Schwant. (y ?/11), *C. fibulaeforme* (Haw.) N. E. Br. (y ?/11) (syn ; *C. bolusiae* Schwant. ?), *C. depressum* Lav. (y-co/1), *C. publicalyx* Lav. (r/2-3), *C. stephanii* Schwant. (y-co/1) (syn ; *C. helmuthii* Lav.).

Series 7. Costata Schwant.

Bodies inverted skittle shaped, dark olive green, with series of ribbed lines around the slit and radiating from the cleft. Flower small, yellow, nocturnal. Type 16.

Type species : *C. angelicae* (Dtr. et Schwant.) N. E. Br.

Occurrence : Great Namaqualand.

Only known species up to the present : *C. angelicae* (Dtr. et Schwant.) N. E. Br. (y-co/16).

The systematics suggested by Schwantes within the Sub-tribe *Euconophytum* Schwant. I recognise as justified from my own observations. I have, however, taken a number of species from the Tribe *Carruicola* Schwant. and collated them in a special Sub-tribe *Piluliformia* Tisch., because of their mostly tiny, hardly noticeable marked bodies and because of their tiny, mostly copper coloured flowers as in the Sub-tribe *Picta*. The species of this Sub-tribe are only found in the areas where *Picta* are found, viz., in the Districts of Malmesbury, Robertson, Montague, Ladismith and Swellendam. The Tribe *Verrucosa* Schwant. has no standing. *C. fulleri* L. Bol. belongs to the Tribe *Minuscula* Schwant. because of their geographical distribution. It is day blooming, while *C. praeparvum* N. E. Br. belongs to the Sub-tribe *Tuberculata* Schwant. and to the Tribe *Carruicola*, which also have some species with somewhat elevated lines or spots. This type blooms at night.

Some species in the systematics of Schwantes will have to be re-arranged. *C. longifissum* Tisch. belongs to the Sub-tribe *Tuberculata* Schwant., also *C. declinatum* L. Bol. and *C. spectabile* Lav., *C. obscurum* N. E. Br., which were mentioned by Schwantes as in the Tribe *Wettsteinia* Schwant. and near related species like *C. virens* L. Bol. and *C. tischleri* Schwant. and, consequently, must be included in the Tribe *Minuscula* Schwant. *C. permaculatum* Tisch., that was also included by Schwantes in the *Wettsteinia*, belongs to the Sub-tribe *Truncatella* Schwant. *C. longipetalum* L. Bol. is a day bloomer and with near species like *C. percrassum* Schick et Tisch., *C. ornatum* Lav. and *C. tinctum* Lav. must be included in the Tribe *Wettsteinia* Schwant. Schwantes considered these species as belonging to the Tribe *Cataphracta* Schwant. *C. fraternum* N. E. Br. var. *leptanthum* L. Bol. evidently belongs to the Tribe *Wettsteinia* Schwant. and is probably identical with *C. marlothii* N. E. Br. It is a day bloomer, as is obvious from the long floral stem. The habitat in the original description is evidently erroneous as, up to now, no day bloomer of the

Conophyta has been found in this district. *C. comptonii* is a night bloomer and is nearest related to the dwarf *Conophyta* in the Sub-tribe *Piluliformia* Tisch., which mostly also show slightly elevated lines and spots and mostly have copper coloured flowers.

Sub-genus 4. *Berrisfordia* (L. Bol.) Tisch.

Body inverted skittle shaped, grey green, at the top flat to slightly rounded, with short, pointed, blunt, thorny humps, slit sharply cut in. Blooms late in the day, large, rose coloured. Type 38.

Type species : *C. khamiesbergense* (L. Bol.) Schwant.

Occurrence : Little Namaqualand.

Up to now the only known species : *C. khamiesbergense* (L. Bol.) Schwant.

From the conception of Schwantes, the point in question is that this species is claimed to be a genuine *Conophytum*. After the description of the flower by L. Bolus one has to suppose that this conception is correct. The habit of this species varies considerably from all other *Conophytum* known up to now. Characteristic are the pointed hump like elevations. The peculiarity of the habits justifies *C. khamiesbergense* to be recognised as a representative of a special Sub-tribe, for which the previous naming by L. Bolus under the designation *Berrisfordia* had to be chosen.

Through concentrated study it was possible for me to systematically arrange, for the first time, all the aforementioned species of *Conophytum*. The study of many flowers has enabled me to settle many doubtful questions. I am thoroughly aware, that, even now, much uneasiness exists as regards the systematic position of many species. Nevertheless, the proposed arrangement permitted an insight into the species relationships of by far the greatest proportion of the described species. This is one of the hypothesis for the further study of the specific standing of many of the described species. The extraordinary variability of many species leads, undoubtedly, to some species being described under various names. A few instances of this kind have been explained earlier in these articles. It will be necessary to complete many more studies in order to clear up questions of this kind. Especially will it be necessary to have as much plant material as possible, together with reliable information as to their native habits. The geographic methods introduced by Schwantes, therefore, substantially contribute to an understanding of the latitudes of variations of *Conophytum* species.

Mr. Boarder feels that the second and third paragraphs of the report of his lecture reported on page 65 of the July Journal have not been accurately given. He wishes that they should be replaced by the following :—

Rebutias and *Lobivias* are genera of the sub-tribe *Echinocereaceanae*, whilst *Parodias* belong to the *Echinocactanae*. It is proposed to further divide the *Rebutias* and with over 124 different Genera of Cacti already, it seems rather confusing to make more. However one has to admit that there are more than one distinct type of *Rebutia*. *Rebutia fiebrigii* has been placed in the proposed genus *Aylostera*, and this plant is of a much stronger growth than the well known *R. minuscula*, and the flowers are borne higher up on the plant. Another genus, the *Digitorebutia* will take in such plants as *R. steinmannii*, which is almost finger shaped and has large flowers with hairy tubes. Many of these plants are very difficult to name unless they are in flower and then sometimes not until they form fruits. *R. violaci-flora* is a rather flat-topped plant and *R. senilis* has large dark red flowers. Most of the *Rebutias* produce their flowers from fairly low down on the plant. The *Rebutias* can be easily raised from seed and can usually be flowered in their second year. Most produce off-sets which may be taken off and rooted although some types are not easy to strike.

The name *Lobivia* is an anagram of Bolivia and these plants are very handsome when in flower. The flowers are mostly larger and more cup-shaped than *Rebutias* and appear to form a connecting link between some types of *Rebutia* and *Echinopsis*. Whilst the flowers on *Rebutias* are soon over, the *Lobivias* will continue to form fresh flowers over a considerable period. Mr. Boarder does not find them quite as free-flowering as the *Rebutias*.

COLOUR IN AUTUMN

By G. G. GREEN

I hope I may be forgiven for writing again about the *Mesembryanthemums*, but the present time, September, is when these beautiful plants are at their best. The popularity of the stemless species is increasing tremendously, and may be due to the knowledge obtained through this Journal regarding their cultivation, or the fact that there are no more beautiful plants in the whole family of succulents.

It says much for the common sense of the average collector that these plants are gradually absorbing so much attention, for with such a wealth of contradictory information as to the successful cultivation of the species that has been written over the last year or so, it is amazing that this interest has not been stifled before it could gain a foothold. Throughout the present year, since early April, I have talked to hundreds of collectors and have been both dismayed and amused at the many different methods of growing *Mesembryanthemums* that have been described to me. From dry shelves high up under the eaves of the glass house where no water, except for a sip or two in August, is given them, to deep pits or frames having "hot-bed" conditions (whatever they may be), the poor things have, apparently, survived and even dared to flower in one or two isolated cases,

The *Lithops* seem to have caused the most difficulty, as the period of waiting until the old bodies have shrivelled before watering varies to a great extent between April and July, or even August.

A little thought, and of course, reference to back numbers of this Journal, would simplify things a great deal in this respect, and enable these plants, under correct treatment, to develop properly and flower during August and September regularly.

The winter rest, which is essential from the end of November to April, should not be prolonged any further than is necessary, nor be too suddenly ended. This means that during the latter half of April, the new bodies should be growing and the old ones splitting and beginning the process of drying out, gradually and steadily.

The sudden bursting or splitting of the old bodies is a sign of too much moisture, and the non-appearance of any sign of growth, an indication of too little.

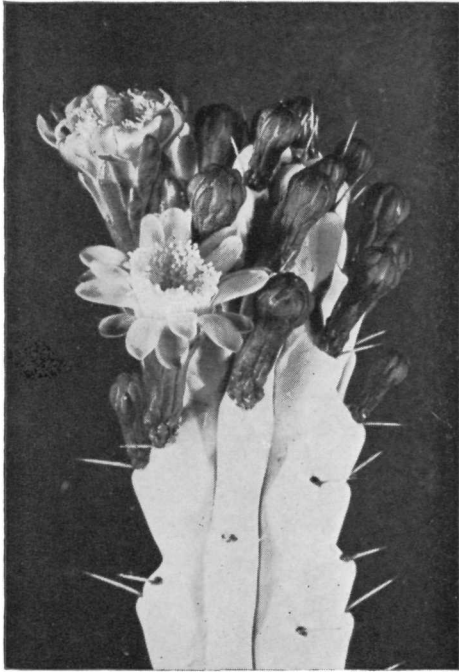
Most people allow their plants to dry out thoroughly during winter and then do the wrong thing in spring. They either do not give any water until the old bodies have shrivelled, or give too much at first so that the bodies split or burst, or even rot. A long rest such as this necessitates gentle persuasion in order that the plants may be encouraged to begin their natural functions, and this means that the root tips should have enough, and only sufficient, moisture to help the new growth to begin.

Too much water in the beginning is dangerous, for the root-tips or roots, after months of dryness, will generally be dead, and so cannot absorb moisture at all until new rootlets have grown, and until these new rootlets have grown, the plant itself cannot develop. New root tips, or roots, will not grow without moisture to encourage them, so the practice of waiting until the old bodies have entirely shrivelled before watering at all is never very successful after such a long winter's rest. Generally it is August before the process is complete under these conditions, and the ensuing new bodies are small and under developed, whilst flowers are non-existent. Under good cultivation the old bodies should have disappeared by mid June or July at the latest and the new ones should be growing into sturdier and larger plants to flower in late August or September.

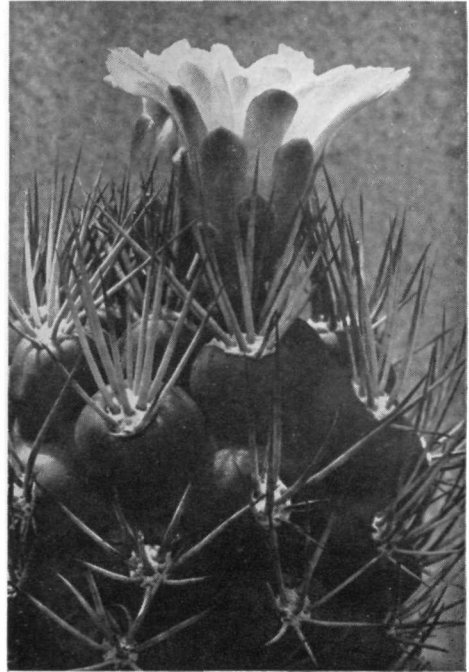
The many thousands of two-year plants that I am growing under conditions described before, are nearly all showing buds, or are already in flower, and have received light waterings until June, since the end of April, and periodical drenchings afterwards.

Although they have had their winter's rest, the gravel stagings have been kept damp since February, so that the root tips have not been allowed to die off, nor encouraged to promote precipitate growth out of season.

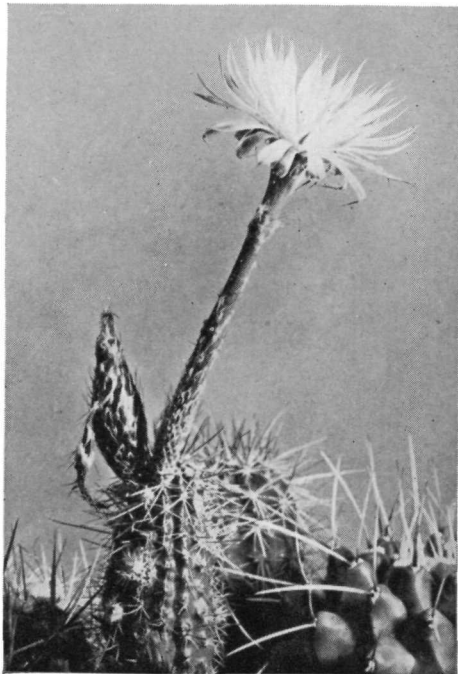
By the end of April the new bodies were visible under the shrinking older ones, bursting through these in early June. They then received their first heavy waterings which were contained at regular intervals, taking into account weather conditions, until the present time, when the pure white, scented, and shaded yellow flowers are beautiful



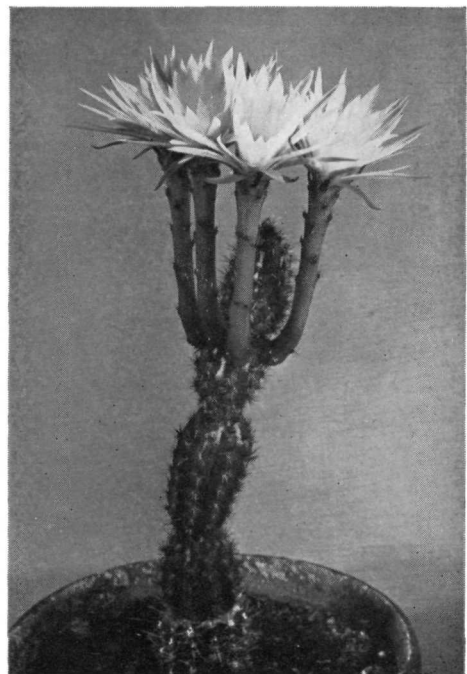
Cereus beneckeii



Weingartia fidaiana

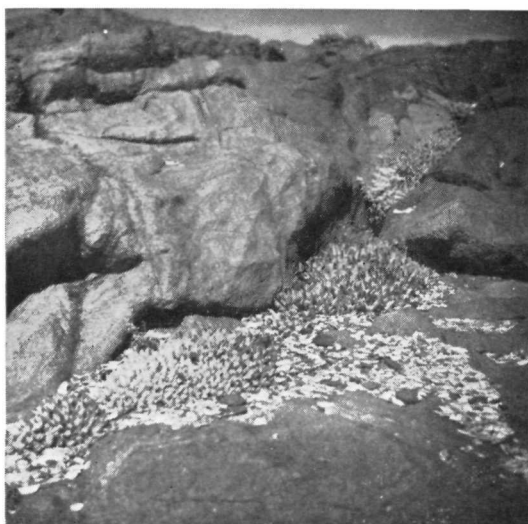


Setiechinopsis mirabilis

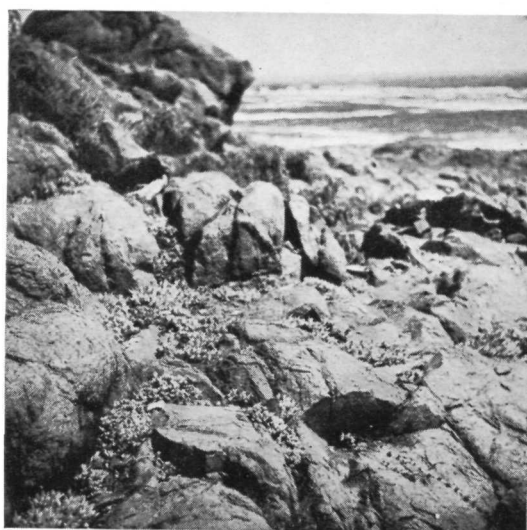


Euarthrocereus microsphaericus.

Four photographs by Fuaux Herbarium.

*Cheiridopsis purpurascens*

H. Hall

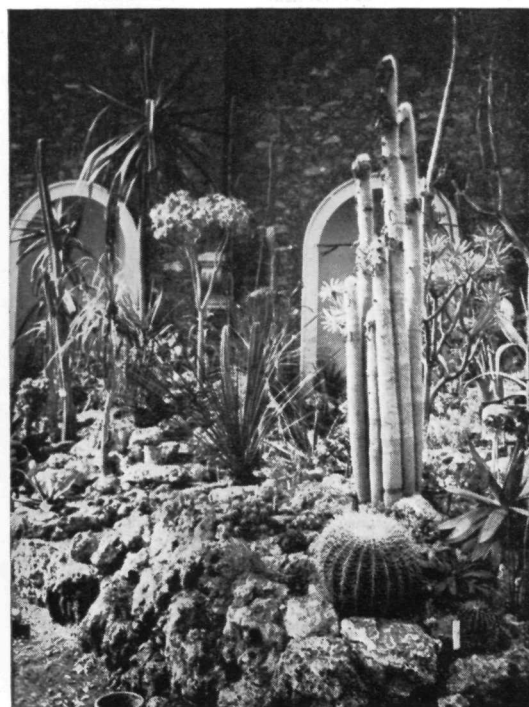
*Cheiridopsis purpurascens*

H. Hall



Collection of Cacti ; Jardin des Plantes, Paris.

Dr. E. Elkan



Collection of Cacti ; Jardin des Plantes, Paris.

Dr. E. Elkan



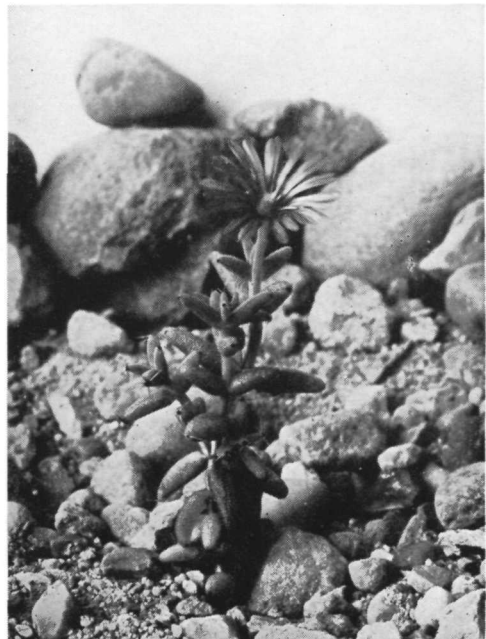
Echinus geminatus



Delosperma brunnthaleri



Drosanthemum sp.



Trichodiadema intonsum

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



Psammophora sp.



Psammophora sp.



Nelia schlechteri



Argyroderma ovale

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

to see. Double and multi-headed specimens are particularly attractive when in flower, especially when planted in half pots or deep pans.

The white, pink, lilac and purple flowers of the *Ophthalmophyllums* are also blooming now, and will continue until well into late September, giving added brilliance to those of the *Lithops*. These plants, though having much softer bodies than those of the *Lithops*, are often more hardy, even though the text books declare that low temperatures are fatal to them. The growing season in this country is usually from July or August to January, so that though they need water during this period, care must be taken to see that they do not suffer from dampness and cold together. A place as near the glass as possible with protection in the shape of brown paper on cold nights in winter, and watering only from the bottom, will be best. So long as strong healthy growth is obtained by giving the plants liberal water and fresh air in August and September, the plants should not suffer in winter. I have noticed that plants in frames where the lights have been raised fully each dry day since May, and those on shelves near the glass with moisture obtained from sand at the base, have grown bigger and flowered more profusely than others standing on the usual staging, indicating the need for light and air. The species *dinteri*, rosy purple flowers; *schlechteri*, pale lilac, and *triebneri*, pure white, are three of the best.

It is truly remarkable how pretty the *Conophytums* are when in flower, and specially the smaller growing ones such as *julii*, *pallidum*, or *truncatellum* which often seem too small to produce the large purple, yellow and violet flowers. Even single heads, rooted from cuttings the previous year, burst into flower during September, and a charming sight is rows of these single plants in seed pans, all bearing a brilliantly coloured flower when the bodies themselves are hardly discernable in the fine gravel.

Very easy to grow, *Conophytums* soon make large clumps of tightly packed bodies which are better divided into smaller groups than left as one big one. Often the new growths get squeezed out or fail to develop satisfactory stems through being so crowded and it is an easy task to cut them into smaller groups, each having a portion of stem or root attached and planted into a sandy compost in May. It is a good plan to give a little water in early spring when new bodies are about to form, easing off in May to allow the outer skin to shrivel entirely, and start normal watering about July. At this time the new bodies will be thrusting through the dry skins and should be encouraged to do so by watering, applied at regular intervals so that they can grow big enough to store moisture for the long rest.

Of all the *Pleiospilos*, the one that attracts me most is the smallest, *P. himari*, with its shining reddish-green body and the rich golden flower. This species will flower when only one year old from seed and can be set among the *Lithops* or *Conophytums*, requiring much the same treatment. Being so small, the flower often covers the entire plant, and the contrast of the gold with the reddish green stem is most charming.

Other species in flower this month and equally brilliant and interesting are the *Faucarias*, *Frithia*, *Rhombo-phyllums*, *Trichodiademas*, *Glottiphyllums* and *Bergeranthus*, to name a few, and how bright they all are! With colours ranging from white, pink and yellow to purple and carmine, the large flowers are indeed a beautiful sight, well worth any trouble one may take to help the plants produce them.

Will members interested in floral clocks, with special reference to cacti and succulents, correspond with Gisela Merkel, Nordbahnhofstrasse 181, (146) Stuttgart-N, Germany.

The Howard E. Gates lecture on "Cacti in Baja, California," illustrated with one hundred coloured Kodachrome slides, is being read by Mr. E. Shurly on Wednesday, December 10th next, at 8 p.m. in the Lambourne Room, Ilford Town Hall. All members are cordially invited.

Mr. Herre reports that "in the flesh of *Testudinaria* they have found now a certain percentage of cortisone and they want to start a factory for it. But what will happen with our plant which is so slow growing? Happily it is protected, so they will not be able to extinct it immediately!"

CHEIRIDOPSIS PURPURASCENS, N.E. Br.

By H. HALL

In the recently published "Mesembryanthemaceae," by Jacobsen, Volk and Herre, which lists all the known species of "Mesem" the genus *Cheiridopsis* contains about 100 species. Generally speaking, they are all dwarf, compact leaf-succulents with very showy flowers from magenta, orange-red, pink, yellow to white. The species vary in size from the very dwarf *C. Meyeri* (tufts about two inches across and less than one inch tall) to the massive rosettes of *C. candidissima* up to a foot across and weighing several pounds. They inhabit the more arid regions of S. Africa and are largely confined to the western districts, Namaqualand, etc. All are sun lovers but though most of them can be cultivated under glass with moderate care the genus is notoriously reluctant to produce flowers. As the flowers are exceptionally showy this fact is quite a tragedy. I have seen flowers of *C. Pillansii* in the Karoo Garden, Worcester, which measured nearly four inches across, with shades varying from deep orange to creamy white.

The species which occurs closest to Cape Town is *C. purpurascens* and comes to within about 60 miles of "The Tavern of the Seas." It was one of the first species to be collected and grown in Europe and was, incidentally, the first member of the genus I met with in the wild state, about one week after arriving in the Union. At this tiny, almost uninhabited, fishing village, the massive granite outcrops that formed the shore were well populated by large clumps of low, mat-like plants in very shallow layers of grit and mussel-shell pounded to fragments by the waves, and periodically hurled up over the cliffs. Often completely grown together, a low-growing *Ruschia granitica*, looking remarkably like the *Cheiridopsis*, shared the same situation. The *Ruschia*, of course, has smaller, magenta flowers and trails eventually and in cultivation alters considerably; and so does the *Cheiridopsis*, unfortunately. Fully exposed to the prevailing sea winds and frequently drenched with salt spray in stormy weather, the *Cheiridopsis* was so utterly unlike the cultivated specimens I previously knew that I did not recognise it at all. The plants were a rich orange-red, beautifully sun-tanned, and as the rich yellow flowers opened that same afternoon they formed a charming sight.

Several hollows on the granite still contained traces of salt water and others contained thin layers of salt glittering in the bright sunlight, where the water had dried up. About ten yards away the wide Atlantic rollers were pounding against the cliffs and between the *Cheiridopsis* and the sea grew another "Mesem," *Drosanthemum candens*, whilst still further down, yet another, the green, soft-leaved *Disphyma crassifolia* with white flowers. The enclosed photographs depict *C. purpurascens* in natural surroundings at Yserfontein, Cape Province.

The Associated Lead Manufacturers Limited request us to point out, anent the suggested use of good flat white lead paint thinned with paraffin mentioned on page 52 of the July Journal, that the thinnings should be best quality white spirit, or pure American turpentine and that flat paint tends to increase the rate of slow erosion; they suggest Undercoating and Oil Gloss Finish Genuine English White Lead paint.

Members who would like to acquire volumes one and two of the Journal should write to Mr. G. Erskine, Blandford Press Ltd., 16 West Central Street, London, W.C.2. He has for disposal volumes one and two bound in one volume and a few separate copies of parts of volumes two and three. This is an unusual opportunity as volume one is exceedingly scarce and is fetching £5.

A JOURNEY TO FRANCE

By Dr. E. ELKAN

We cannot all travel to Mexico. With our £25 travel allowance we should get stuck in mid-ocean. But we can just manage to cross the Channel and to spend a few days in France. This I have done this summer and, on returning, I feel that I should let readers hear what I have seen in the way of succulents, though I would much rather tell them about the principal reasons for my journey, which was a visit to the famous cave of Lascaux. *Homo magdaleniensis*, however, who executed the famous paintings which adorn that cave, concentrated entirely on beasts and he probably never saw a cactus. His distant descendants, who now inhabit the valleys of the Vézère and the Dordogne, however, see quite a lot of them. The hotels adorn their fronts with large barrels full of flowering *Epiphyllums* and there is hardly a house without some *Opuntias*, an *Aporocactus* or a row of *Echinopsis* outside. Not that their owners know their names, or know much about how to treat them. I have a suspicion that they keep them mainly because they can stand the heat—which is considerable—and flower without giving any trouble year after year. One of the bigger *Echinopsis* in the Rue du Moyen Age (so-called because it cannot have changed much since the Middle Ages) in Les Eyzies has twenty four well advanced buds. I admit I felt a little silly thinking of the two or three I can ever achieve at home.

Returning from the very sunny South to the not less sunny streets of Paris, we had the extremely good fortune of the help and patronage of the Secretary of the French organisation for succulents, Mr. E. Veau. The majority of the Parisians do not live, as we do in London, in small houses with at least a postage stamp piece of garden. They live in flats and their cacti have to live in flats too. To overcome this difficulty, Mr. Veau has converted a balcony high above the Rue Lecourbe into a hothouse and I am sure his results up there are as good as those we achieve on terra firma. His accounts, too, of the progress of the French organisation "Cactus" were very reassuring. There was, he said, no shortage of funds. What they needed was more photographs worth publishing. Well, I hope we can help them with these.

The cactus collection in the large hothouse of the Jardin des Plantes (a mixture of Zoo and Botanical Gardens) was closed to the public. This was perhaps just as well because the St. John's Ambulance—or whatever their French equivalent may be—would have had to carry away strings of sunstroke victims from that place had the public been admitted. Mr. Veau, however, who seems to be on friendly terms with every one of the gardeners and who was entirely unaffected by the heat, got us safely around the barriers and introduced us to Mr. Rose in charge of the cacti who, with an assistant, was busy re-arranging the collection. We stayed just long enough to make a photograph or two and to see a few beautiful specimens imported from the Mediterranean coast. The public, when admitted, will be able to see good specimens of all the more popular cacti and succulents well arranged around an artificial stony hill with little paths in between. But if the temperature inside this hothouse is what one has to endure on a collecting trip in Mexico or Arizona, I must ask to be counted out for that profession. Even the adjoining "Grande Serre," representing rain, forest and jungle, very life-like, was quite enough for me.

Cacti are being sold to the Parisians in stalls along the quays of the Seine in the direction of the Gare d'Austerlitz, together with goldfish, tortoises, silkworms, pots and pans and white mice. The specimens are most of the more popular hundred and the spelling of the names is not always what we are used to. One recognises the cactus, however—if not the name. The stalls are extremely picturesque and crowded with shoppers. The tortoises, I am afraid, are having an extremely bad time.

I had, unfortunately, no time to meet other members of our French sister organisation.

The French are lucky in so far as in the southern half of their country, cacti can easily be grown out of doors without any artificial help and, if one really wants to see what the French can do, one should go to the Côte d'Azur, to Monaco and to Cap Ferrat where the great M. Marnier-Lapostolle has what is perhaps the most complete collection anywhere. But how that kind of journey can be made on £25, I still have to find out.

BOOK REVIEWS

"LEAF AND AREOLE DEVELOPMENT IN CORYPHANTHA"

By N. H. BOKE

Considering their extraordinary appearance and unique mode of life, the Cacti have been the subject of surprisingly little anatomical investigation. The classical researches of Schleiden in 1845 have been followed by much debating and theorising, but only sporadic attempts to attack the problems scientifically. In recent years Buxbaum and others are making good this neglect. Some of the most valuable work has come from Dr. Norman H. Boke of Oklahoma University, whose fourth contribution⁴ has just been published. All his papers are outstanding for the fine photographs of microscopic preparations of cactus tissues, which, because of their softness compared to the tough skin and spines present special difficulties for sectioning.

Dr. Boke first examined *Trichocereus spachianus*,¹ where he found the growing tip to be a massive dome of cells 1 mm. across—the largest meristem then known for any flowering plant. *Opuntia cylindrica* was similar, but rather less than half that size; *Echinocereus reichenbachii*³ and *Coryphantha vivipara*⁴ came somewhere between these two. The complex tissues of the apex could be resolved into several zones covered by a single-layered tunica or dermatogen. A central group of mother cells, the "initial zone," is flanked by smaller, more deeply staining cells with a central rib meristem lying below, and surrounded by cells dividing mainly parallel to the shoot axis. The general structure is reminiscent of the primitive Cycadales.

It may startle some to read of leaves in *Trichocereus*, *Lemaireocereus* and *Coryphantha*, and of stipules in *Opuntia*, but both appear in the illustrations. The former in *Coryphantha* are scales up to 1 mm. long with a single vascular strand and sometimes with stomata; the latter are metamorphosed into hair-like glochids about 1 cm. long. *Echinocereus* also has leaves, but they are mere pimples 0.1 mm. high.

What is the nature of the cactus areole? Many ideas, based often on slender evidence, have been advanced, but Dr. Boke is in a position to review them and judge with authority². For *Opuntia cylindrica* he writes:—"... The results of this investigation support the contention that the areole is best regarded as an axillary bud, growing on a persistent leaf base, and that its appendages should be regarded as the morphological equivalents of leaves. From this it also follows that spines and glochids can be homologized with bud scales."

His latest publication⁴ confirms the Cacti on anatomical grounds as members of the Centrospermae, and shows *Coryphantha* as standing closer to *Echinocactus* than to *Mammillaria*. A series of diagrams suggests how the curious furrowed tubercle of *Coryphantha* might have arisen from the normal type *Cereus* areole by differential elongation of the base of podarium—an elongation in which the two ends of the areole become pulled apart and linked only by a sunken row of hairs. There is still one growing point only, not several, and the interpretation of Ganong (1894) is thus upheld. The author makes a small slip in stating that Britton and Rose assigned *Mammillaria* to *Neomammillaria* "because its tubercles have no furrows"; they altered the name for purely taxonomic reasons. Nor did Buxbaum transfer *Coryphantha vivipara* to *Escobaria* on the sole evidence of its tubercle anatomy.

Everyone whose interest in Cacti goes more than "skin-deep" should make a point of seeing these papers, which are clearly presented and admirably illustrated. I hope the author may be encouraged to take up more of the many problems raised by Cacti, such as the nature of the tubercles in *Leuchtenbergia* and *Ariocarpus*, the inflorescences of *Neoraimondia*, and the branch systems of *Rhipsalis* (*R. paradoxa*, etc.).

¹. BOKE, N. H. "Zonation in the Shoot Apices of *Trichocereus spachianus* and *Opuntia cylindrica*" in Amer. J. Bot. 28. viii. 656-664 (1941).

². "Histogenesis of the Leaf and Areole in *Opuntia cylindrica*" in l.c. 31. vi. 299-316 (1944).

³. "Histogenesis of the Vegetative Shoot in *Echinocereus*" in l.c. 38. i. 23-38 (1951).

⁴. "Leaf and Areole Development in *Coryphantha*" in l.c. 39. ii. 134-145 (1952).

G. D. R.

Mr. Boke's comment on the above review:—"Your review of my papers has been most generous. I have only a single criticism. You stated that 'His latest publication confirms the Cacti on anatomical grounds as members of the Centrospermae.' While my present work leads me to believe that this is highly probable, I still believe that we do not know enough to make the statement 'confirms' justifiable. I prefer the word 'supports' to 'confirms.' I am not a taxonomist. As you have pointed out in your review, I slip up now and then. Your criticism is therefore entirely justified. I am doing my best to alleviate the situation by consulting with Dr. Reid Moran of Cornell. I shall continue to investigate the family from a morphological point of view and to report and illustrate situations to the best of my ability. It may be of interest to know that as a Guggenheim Fellow for 1953, I am to go

to Cuba to collect cactus materials there. I am particularly interested in *Pereskia*, *Rhipsalis* and *Cactus*. Some of the genera which you have mentioned as needing investigation occur in Mexico, which is close enough to Oklahoma so that I shall be eventually able to collect there even without the aid of a fellowship grant."

(Ed.).

THE ROYAL HORTICULTURAL SOCIETY DICTIONARY OF GARDENING

George Nicholson's great gardening dictionary of 1884-7, with its two supplements (1888, 1900), bound in 4 handy or 11 cumbersome volumes, has been a standby to gardeners since the day of its publication. Succulent lovers were generously treated, especially in the first supplement where W. Watson illustrated his accounts of cacti with the famous engravings also used in early editions of his "Cactus Culture."

The news of a modern revision of Nicholson's encyclopedia is welcome; doubly so as the succulents are in the safe hands of Mrs. Vera Higgins. Mrs. Higgins not only reviews the different genera, but provides the line drawings for the cacti. The illustrations for the other succulents are by another hand and technically not quite so good. Mrs. Higgins tells me that most of her contributions were done about 1942, and because of the delays in publication and difficulty of altering proofs some modern work had to be omitted. Nevertheless, a difficult task has been ably handled, for the treatment of a specialist subject in a general encyclopedia poses many problems. Enthusiasts for Mushrooms and Orchids, Alpines and Filmy Ferns compete for space, and would extend the size of the work indefinitely if allowed. The compromise here effected in the succulents is well balanced: thus, 110 names are listed under "*Mesembryanthemum*" with their modern equivalents, while 11 of the most popular segregate genera are treated separately. No keys to species are given, but without a fuller understanding of variation within the species, workable keys cannot be made.

The writing throughout is simple and clear, requiring no technical knowledge to understand it. Especially praiseworthy are Mrs. Higgins' introductions to each family and genus of succulent. As a sample of the numbers of species described, there are 23 entries under *Agave*, 33 under *Aloe*, 61 under *Cotyledon* and 54 under *Crassula*. A good plate comparing the spine processes of Cacti and *Euphorbias* has come to grief in the captions: the letters C and E should be transposed.

* Four vols., 4to., 1951, Oxford. Ed. F. J. Chittenden. Price £10 10s.

A fifth volume on selections of plants is promised.

G. D. R.

"THE STAPELIEAE OF SOUTHERN AFRICA"

By C. A. LUCKHOFF

This long awaited book has been received since the last issue of the Journal. It is a book of 283 pages, dealing with 196 species of *Stapeliads*. The text is in English and Afrikaans. There are short descriptions of twenty genera, with keys of the genera and keys of species. The short foreword indicates that White & Sloane's "*Stapelieae*" is accepted as the standard work of reference.

There are twenty-three floral drawings, five coloured plates and 255 photographs.

To those who like a book for the pictures contained in its pages, this book is a treasure ground with its plethora of illustrations, but, unfortunately, the greater proportion of the photographs have been greatly enlarged and, in consequence, any flaws in the smaller, original photographs have been accentuated.

The greatest defect of the book is the lack of descriptive material in regard to the species themselves. The uninitiated find that keys are extremely complicated and that, without some descriptive matter, they feel defeated.

It is stated that *Stapeliads* are often unidentifiable till the flowers appear and these illustrations seem to be based on this point, but I wonder whether there is not sufficient divergence in the form of the stems that, if they were given more attention, would enable much more identification than is now considered possible.

This seems a hard review, but it is not meant to be. The book is valuable for many aspects and I have only felt it my duty to point out its shortcomings in the hope that any book that appears in the future on *Stapeliads* will look into the possibilities of my suggestions.

The most intriguing fact with the book is the sole and very unusual decoration on the front cover—I have never met with the publisher's initials in such a position! The book costs £5 and is published by A. A. Balkema of Cape Town and Amsterdam.

E.S.

SUMMER SHOW

This took place on the 24th and 25th June at the Royal Horticultural Society's New Hall, Westminster.

There was not quite as big an entry as usual, but it was very noticeable that the quality of the exhibits had greatly increased and were a tribute to the enthusiasm of our members. The judges, Mr. A. Boarder and Mr. W. Denton confessed to a difficult task in placing the awards. Most classes contained some really magnificent specimens, well cultivated and nicely presented for the show. Much comment was heard from onlookers. It is a striking fact that whenever cacti are shown the public are intensely interested and the stand invariably holds quite a large audience.

- Class 1. Three *Echinocactanae*. 1, R. J. Rickett ; 2, H. J. Aylott ; 3, A. J. Edwards ; V.H.C., R. H. West ; H.C., Mrs. Pryke Howard.
- Class 2. Three *Coryphanthanae*. 1, A. J. Edwards ; 2, R. H. West ; 3, R. Barrett.
- Class 3. Three *Cereanae*. 1, P. V. Collings ; 2, Mrs. Pryke Howard ; 3, R. H. West.
- Class 4. Three *Echinocereanae*. 1, R. H. West ; 2, H. J. Aylott.
- Class 5. Three Cacti, any genera. 1, R. H. West ; 2, Mrs. J. A. Wells ; 3, P. V. Collings ; V.H.C., R. J. Rickett.
- Class 6. One Specimen Cactus. 1, P. V. Collings ; 2, Captain H. J. Dunne Cooke ; 3, S. L. Greaves.
- Class 7. Cacti raised from seed by the Exhibitor (sown on or after 1st January, 1948). 1, Mrs. J. A. Wells ; 2, R. H. West ; 3, Miss D. M. Poore.
- Class 8. Cacti raised from seed by the Exhibitor, more than 3 years old. 1, R. H. West.
- Class 9. Miniature Garden of Cactus Plants. 1, Mrs. E. B. Pryke Howard ; 2, Mrs. M. Stillwell ; 3, S. L. Greaves ; V.H.C., Mrs. J. A. Wells.
- Class 10. Three *Mesembryanthemums*. 1, Mrs. M. Stillwell ; 2, P. V. Collings ; 3, A. J. Edwards ; V.H.C., Mrs. E. B. Pryke Howard.
- Class 11. Three *Haworthias*, *Gasterias* and/or *Aloes*. 1, P. V. Collings ; 2, Mrs. M. Stillwell.
- Class 12. Three *Euphorbias*. 1, A. J. Edwards ; 2, S. J. Pullen ; 3, Mrs. D. F. Shurly.
- Class 13. Three Succulents other than Cacti. 1, Mrs. J. A. Wells ; 2, Mrs. M. Stillwell ; 3, Mrs. Pryke Howard.
- Class 14. Six Succulents and/or Cacti. 1, P. V. Collings ; 2, Mrs. Pryke Howard ; 3, H. J. Aylott.
- Class 15. Twelve Succulent Plants other than Cacti. 1, Mrs. E. B. Pryke Howard ; 2, Mrs. M. Stillwell.
- Class 16. Group of Cacti and/or Succulents to cover table space 4ft. x 3ft. 1, Mrs. M. Stillwell ; 2, R. H. West ; 3, H. J. Aylott.
- Class 17. Group of new and unusual plants. 1, Captain H. J. Dunne Cooke.

Mr. A. Boarder, commenting on the Show at the evening meeting, impressed on the members present the need for showing plants clearly labelled, and pots, as well as plants, nice and clean. There were some cases where this could have been improved and such lapses lost marks in awards. He spoke at some length on the individual classes and gave many hints which should be of help at future competitions.

Mr. W. Denton, the other of the judges, confirmed that he and Mr. Boarder were in complete agreement in their findings and that it had been a pleasure to them to work together.

The Miniature Gardening Cup was won by Mrs. E. B. Pryke Howard. The "Amateur Gardening" Silver Bronze Medal was awarded to Captain H. J. Dunne Cooke for a beautiful group of new and unusual plants (Group 17) containing mainly stemless *Mesembryanthemums*. The "Amateur Gardening" Diploma was awarded to Mrs. M. Stillwell for a fine display in Group 16.

AUTUMN SHOW

Entries were rather smaller than usual at the Autumn Show, R.H.S. New Hall, September 23rd and 24th, 1952. The quality, however, was much higher than ever and the exhibits created even more attention on the part of the public, the show steward and his assistants were continually occupied dealing with enquiries.

- Class 1. Three *Echinocactaceae*. 1, Dr. W. R. M. Turtle ; 2, P. V. Collings.
 Class 2. Three *Coryphanthaceae*. 1, Dr. W. R. M. Turtle ; 2, P. V. Collings ; 3, R. H. West.
 Class 3. Three *Cereaceae*. 1, Dr. W. R. M. Turtle ; 2, P. V. Collings ; 3, Mrs. E. B. Pryke Howard.
 Class 4. Three *Echinocereaceae*. 1, Dr. W. R. M. Turtle ; 2, R. H. West.
 Class 5. Three Cacti. 1, R. H. West ; 2, P. V. Collings ; 3, Mrs. E. B. Pryke Howard.
 Class 6. One Specimen Succulent. 1, Capt. H. J. Dunne Cooke ; 2, Mrs. D. Shurly ; 3, Mrs. J. A. Luty Wells.
 Class 7. Three *Faucarias* and/or *Stomatiums*. 1, Mrs. E. B. Pryke Howard ; 2, Mrs. D. Shurly.
 Class 8. Three Stemless *Mesembryanthemums*. 1, P. V. Collings ; 2, A. J. Edwards ; 3, Mrs. D. Shurly.
 Class 9. Three *Haworthias*, *Gasterias* and/or *Aloes*. 1, S. J. Pullen ; 2, P. V. Collings.
 Class 10. Three *Euphorbias*. 1, A. J. Edwards ; 2, Mrs. D. Shurly ; 3, S. J. Pullen.
 Class 11. Three *Crassulas*. 1, Mrs. J. A. Luty Wells ; 2, A. J. Edwards ; 3, Mrs. E. B. Pryke Howard.
 Class 12. Three *Echeverias* and/or *Cotyledons*. 1, Mrs. E. B. Pryke Howard.
 Class 13. Three Succulents other than Cacti. 1, Mrs. J. A. Luty Wells ; 2, A. J. Edwards ; 3, S. J. Pullen.
 Class 14. Succulents other than Cacti raised from seed by the Exhibitor, sown on or after 1st January, 1951.
 1, Mrs. J. A. Luty Wells ; 2, R. H. West.
 Class 15. Three *Stapeliads*. Mrs. E. B. Pryke Howard ; 2, P. V. Collings.
 Class 16. Group of Cacti and/or Succulents. 1, Mrs. M. Stillwell ; 2, Mrs. E. Pryke Howard.
 Class 17. Group of new and unusual plants. 1, T. P. Matthews ; 2, Capt. H. J. Dunne Cooke.
 Amateur Gardening Bronze Medal. T. P. Matthews, for interesting group of *Lithops*. (Class 17).
 Amateur Gardening Diploma to Capt. H. J. Dunne Cooke for Group of new and unusual plants. (Class 17).

Cups will be awarded as follows :

- Evelyn Theobald Cup for highest points gained at two Shows for Succulent plants : Mrs. E. B. Pryke Howard.
 Sir Wm. Lawrence Cup for highest points gained at two Shows for Cacti : R. H. West.
 P. V. Collings Cup for *Euphorbias* awarded to A. J. Edwards.
 R. S. Farden Memorial Bowl for highest points gained at two Shows for Group of Cacti and/or Succulents (Class 16):
 Mrs. M. Stillwell.
 S. J. Pullen Cup for Miniature Garden: Mrs. E. B. Pryke Howard.

The most remarkable feature of the Show was the very fine exhibits by Dr. W. R. M. Turtle, a member for many years and particularly active before the war, but this was his first exhibit since the war. All the plants were of extra large size, but their most remarkable characteristic was the quality of the plants, well grown with spines and other features in full natural colour. They attracted a great deal of attention by members and the general public, and the wish was expressed that more members with such excellent plants would exhibit their plants, as such exhibits do a fine job of work, creating interest in the Society and in our subject. Mr. Matthews' well-displayed group of *Lithops* also created a great deal of interest.

At the evening meeting after the Show, Mr. Boarder, for himself and on behalf of his co-judge, Mr. W. Denton, commented generally on the exhibits and followed by a short talk on the winter care of Cacti.

Judges : Mr. A. Boarder and Mr. W. Denton. Show Secretary : Mr. K. H. Walden, and Assistant Show Secretary : Mr. W. Denton. The meeting passed a hearty vote of thanks to the judges, Mr. Walden, Mr. Denton and other members who made the Show possible.

Number Two, 1951, of the *Repertorium Plantarum Succulentarum*, published by the British Section of the International Organisation for Succulent Plant Study has been received as we go to press. Those who saw the first issue realise that possession of the publication keeps all interested up to date as to new plants, and where they were originally published. It is invaluable for everybody interested in Cacti and Succulents. Details of the publication can be obtained from Mr. H. M. Roan, Tree Tops, Church Lane, Adels, Leeds, 6.

REPORTS OF MEETINGS

July 22nd, 1952 ; E. Shurly ; *Mammillarias*.

It is not intended to give a scientific lecture. At the same time, *Mammillarias* are an extremely large genus, comprising well over three hundred species and require somewhat special treatment.

The genus is extremely popular. The reasons for its popularity are obvious ; they are smaller growing than many other cacti and numbers can be contained in a small greenhouse. They flower, for the larger part, quite easily and are notable because of either their size, such as *M. longiflora* (now put in another genus—*Krainzia*), or their quantity—Mr. Boarder has frequently commented on the hundreds of blooms he has had on *M. bocasana*.

It might be interesting to know how they can be split up into sections. All *Mammillarias* with hooked central spines can easily be separated from the others. Another section can be made out of straight centrals, viz., according to milky or watery sap (all the hooked species with one exception, *M. uncinata*, have watery sap). Those with milky sap all have brown seeds, but those with watery sap can be split again into brown and black seeds. Of course, it is not everybody who knows the colour of the seed, but literature, particularly Dr. Craig's "Mammillaria Handbook," will provide this information in the majority of cases.

As to cultivation, much has already been said on various occasions, but we are coming to the point of view that the soil of the ordinary collector tends to clog too much and that more sand and other soil openers should be used. Sand must be sharp, we find river grit is ideal. If the soil binds too easily, time produces a hard ball of soil round the roots which becomes impervious to water and to air and the plants starve in a world of abundance. Roots must have room to develop and unless they are able to range around for their food the plant above soil stops growing.

For some years, I have pressed the need for more air to get to our plants and I am glad to see that this point is being taken notice of more and more. The average collectors' greenhouse is a stuffy, enclosed space in which it is a marvel that anything can grow. More and more windows, open right through the summer and as frequently in winter as possible.

If you sectionalise your *Mammillarias* several facts will be forced on your notice. You will find that soft and hard textures are features of most of the sections, in fact, there are two such distinct sections among hooked spined plants. Another interesting fact is that while one species will flower on all the newer areoles, giving, as in *M. bocasana*, hundreds of flowers, other species, like most of the milky types, only give one or two flowers to each spiral, so that there is but a single ring around the head of the plant.

The "sign manual" of a cactus is that it has "areoles," those areas from which flowers and spines come. With the *Coryphanthanae*, which includes *Mammillarias*, the plants differ from the rest of the *Cactaceae*. Other cacti have areoles in one site, but in *Coryphanthanae* the areole is split and stretches from the axils where the flowers appear to the tips of the tubercles which bear the spines.

There are several kinds of roots among *Mammillarias*, but they can be divided into two main sections, those that act simply as means of transport of nutriment and others that also act as storehouses of food. They are indicated by fibrous roots as transporters and bulbous, tap roots as storers. There are, of course, many variations between the two types.

It is well known that I do not like grafted plants. I appreciate that many plants do better on grafts, but I feel that we should prosecute our enquiries as to how we can cultivate these plants on their roots rather than adopt the lazy collector's habit of just grafting plants. While plants are grafted the tendency is bound to be to take the easier course and neglect the search for correct methods of cultivation, or rather adaptation of our conditions to the necessities of the plant.

August 26th, 1952 ; Captain H. J. Dunne Cooke : Stemless *Mesembryanthemums*

What are stemless *Mesembryanthemums* ? Must all be without stems ? Many *Conophytums* have long stems,

Lithops have little stem and will live almost underground.

I am only voicing my own opinions, but botanists do make things difficult by frequently changing genera. It is, however, important that they should be correctly spelt and pronounced, otherwise the errors get passed on.

Captain Dunne Cooke then proceeded to go through the various genera. It is impossible to give the whole of the material, but the following highlights will provide a good indication of what the lecturer passed on to us. Of course, in passing, some genera were referred to out of alphabetical order.

Agnirictus agninus was first *Mesembryanthemum agninum*, later *Stomatium agninum*. It is not free flowering in a pot.

Some *Ruschias* are delightful, but some grow to many feet high in their own country.

Argyroderma comprise a considerable number of species which fall into three groups. They are delightful and will flower freely with the minimum of water.

Bergeranthus scapiger is a free bloomer ; there has been much argument about the size of the flower, I have known them up to two inches in diameter. They are better for hard growing.

Carpobrotus do not flower until they cover about half an acre !! But they help to keep the sand down !

Cheiridopsis are interesting to grow, but difficult to flower. A peculiarity of *Cheiridopsis meyeri* and *peculiaris* is that they go completely to rest.

Conophyta interest everybody. Only water when the old leaves have completely dried up. *C. altum* is the last to dry off and *C. frutescens* is the first to flower. *C. odoratum* has sweetly scented flowers. *C. picturatum* seen under a magnifying glass is very beautiful. Night flowering.

Cylindrophyllum have very large lemon coloured flowers.

Delospermas are shrubby, or herbaceous. From one capsule you can get plants with different coloured flowers. Grow *D. sutherlandii*.

Faucaria tigrina, if true to type, must have purple leaves, but it gets greener if shaded. According to Salm Dyck, *F. felina* is the largest of the *Faucarias*.

Fenestrarias are splendid plants, but will not grow in London. *F. aurantiaca* has a brilliant orange flower. Others white to pink.

Gibbaeum. *G. album* is rather distinct. Those that used to be *Rimaria* can grow as big as peas or as large as a golf ball.

Glottiphyllums are not usually grown correctly ; they should not be grown large. *G. erectum* becomes a huge plant.

Juttadinteria are semi-cylindrical in shape and some have teeth on the leaves.

Some *Hereroas* are known as " stag horns " because of their peculiar overlapping growth at the tips of the leaves.

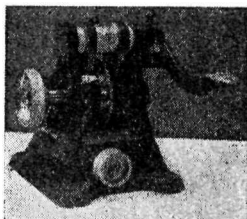
Obviously we must adhere to some method of naming *Lithops* and I prefer to abide by the nomenclature in Professor Nel's book "*Lithops*." (This remark was with reference to *Lithops* of which Captain Dunne Cooke has given us an article which will appear in 1953.)

Muiria hortenseae grows completely away from type in cultivation ; they arrive as tight little clumps. In South Africa they literally blow about and, when rains come, root themselves.

Nananthus malherbei has tuberous roots and is representative of the genus.

In conclusion, do not bother with the difficult *Mitrophyllums*, *Monilarias*, etc., but try to grow on *Ophthalmophyllum* (or *Conophytum*), one or more members of *Pleiospilos*, a *Psammophora*, *Rabiea*, *Rhinephyllum*, *Schwantesia*, *Stomatium*, *Titanopsis* and a *Vanheeridia*.

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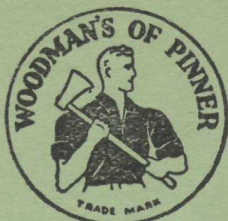
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