

THE CACTUS JOURNAL

Vol. 7

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VOL. 7.

SEPTEMBER, 1938.

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The Cactus Exhibition

THE sixth Cactus Exhibition was held in the Royal Horticultural Society's Old Hall on June 21st and 22nd, 1938. The number of entrants in the Competitive Classes was greater than in previous years, but the actual number of entries had not increased in proportion. Still, it may be regarded as a sufficiently satisfactory show to warrant the holding of a seventh Exhibition in 1939.

The Trade Exhibits, as usual, were arranged round the Hall. W. T. Neale and Co. had a number of large plants as well as smaller cacti and succulents of various types; they showed magnificent clumps of Mammillarias, tall specimens of *Cephalocereus senilis*, the curious monstrose form of *Lophocereus Schottii* and a fine, large plant of *Crassula portulaca*.

Southgate had an interesting collection of plants covering a wide range which, besides cacti, included Aloes, Haworthias, Stapelias and a number of Crassulaceae from Echeverias to Sempervivums.

Musto's group contained some cacti but consisted chiefly of Mesembryanthemums and representatives of the Crassulaceae, many of them quite unusual.

The West End Flower House showed Opuntias in decorative pots and small cacti, whilst Harle had young plants and cristates.

Hayward's greenhouses and frames helped the cactus grower to choose suitable accommodation for his plants; C. E. West showed pots, labels and other useful sundries, whilst the Gloucester Incubator Co. had very useful seed pans to fit into trays by means of which they could easily be watered.

The results of the Competitive Classes were as follows, the number in brackets showing the number of entries in each class:—

Class 1. *Twelve Echinocacti*. 1st, P. V. Collings; 2nd, S. J. Pullen (2).

Class 2. *Twelve Mammillarias*. 1st, Dr. W. R. M. Turtle; 2nd, J. W. Joyce; 3rd, S. J. Pullen (3).

Class 3. *Twelve Cerei*. 1st, S. J. Pullen; 2nd, P. V. Collings (2).

Class 4. *Six Echinocacti*. 1st, A. de Bois; 2nd, G. Turner; 3rd, S. C. Roughton (6).

Class 5. *Six Mammillarias.* 1st, A. de Bois; 2nd, Mrs. Russell; 3rd, G. Turner (9).

Class 6. *Six Cerei.* 1st, A. de Bois; 2nd, H. N. Minchin; 3rd, Miss E. M. Chambers (3).

Class 7. *Twelve Cacti, any genera.* 1st, S. J. Pullen; 2nd, C. L. Thomas; 3rd, R. A. J. Riches (3).

Class 8. *Six Cacti, any genera.* 1st, F. Ducrocq; 2nd, Mrs. J. Gascoigne; 3rd, A. F. Williams (15).

Class 9. *Three Cacti, any genera.* 1st, A. Cuming; 2nd, A. de Bois; 3rd, A. F. Williams (10).

Class 10. *One Specimen Cactus.* 1st, Mrs. Russell; 2nd, F. Ducrocq; 3rd, W. H. White (7).

Class 11. *Mr. Boarder's Seedling.* 1st, Mrs. Vera Higgins; 2nd, K. H. Walden; 3rd, B. Webb (4).

Class 12. *Cacti from Seed.* 1st, A. de Bois; 2nd, R. Reid; 3rd, S. C. Roughton (5).

Class 13. *Cacti from Seed, more than two years old.* 1st, A. Boarder; 2nd, K. H. Walden (2).

Class 14. *Miniature Garden.* 1st, E. C. Edwards; 2nd, Miss V. Lancaster; 3rd, Mrs. Gascoigne (10).

Class 15. *Twelve Succulents.* 1st, Mrs. Vera Higgins; 2nd, Capt. Dunne Cooke; 3rd, C. Clarke (5).

Class 16. *Six Succulents.* 1st, A. F. Williams; 2nd, A. Cuming; 3rd, Capt. Dunne Cooke (9).

Class 17. *Twelve Euphorbias.* 1st, Mrs. Vera Higgins; 2nd, S. J. Pullen (2).

Class 18. *Six Euphorbias.* 1st, Miss Mackenzie; 2nd, A. de Bois (2).

Class 19. *Twelve Mesembryanthemums.* 1st, Capt. Dunne Cooke; 2nd, Mrs. Vera Higgins; 3rd, S. J. Pullen (3).

Class 20. *Six Mesembryanthemums.* 1st, Capt. Dunne Cooke (1).

Class 21. *Twelve Aloes, etc.* 1st, Mrs. Vera Higgins; 2nd, S. J. Pullen (2).

Class 22. *Six Aloes.* 1st, F. Ducrocq; 2nd, Miss E. M. Chambers (2).

Class 23. *Twelve Haworthias.* 1st, C. D. O'Donoghue; 2nd, Mrs. Vera Higgins; 3rd, S. J. Pullen (4).

Class 24. *Six Haworthias.* 1st, A. de Bois; 2nd, F. Ducrocq (2).

Class 25. *Twelve Crassulaceae.* 1st, Mrs. Vera Higgins; 2nd, F. Ducrocq; 3rd, S. J. Pullen (4).

Class 26. *Six Crassulaceae.* 1st, F. Ducrocq; 2nd, Miss Mackenzie; 3rd, Miss B. Hindley (3).

Class 27. *Twelve Stapelias.* 1st, Mrs. Vera Higgins; 2nd, S. J. Pullen (2).

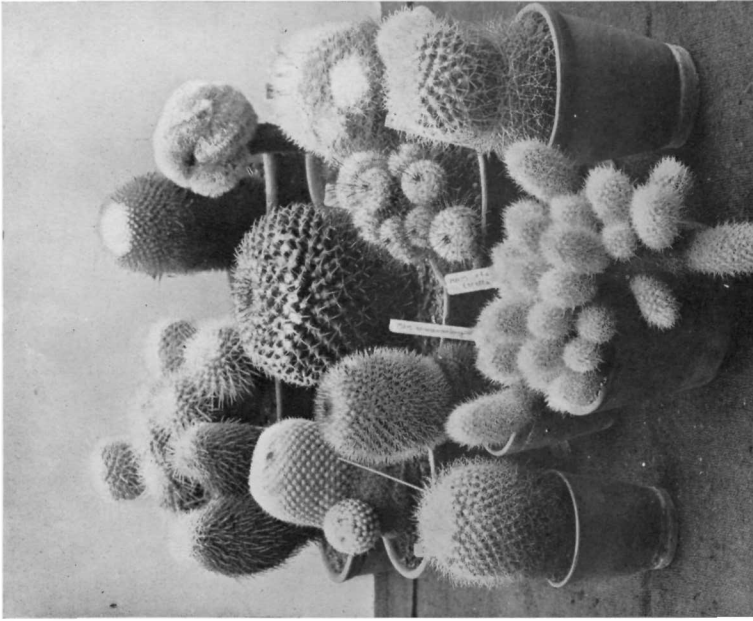
Class 28. *Succulents from Seed.* 1st, L. Barlow-Massicks; 2nd, Mrs. Cutler (2).

Class 29. *Succulents from Seed, more than two years old.* 1st, Mrs. Vera Higgins (1).

The Evelyn Theobald Cup awarded for the highest number of points in Classes 1, 2, 3, 7 and 10 went to Mr. S. J. Pullen, of Horley.

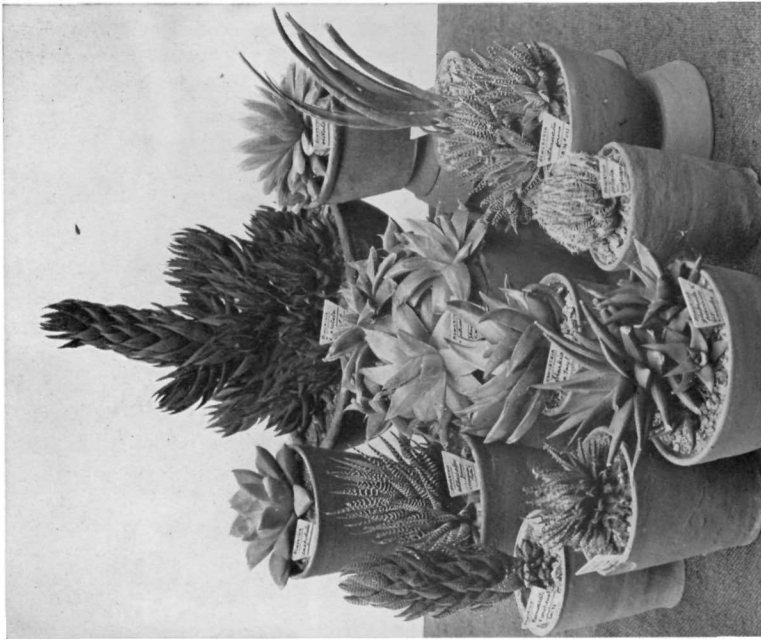
The Lawrence Cup awarded for the highest number of points in Classes 15, 17, 19, 21, 23, 25 and 27 went to Mrs. Vera Higgins, of Croydon.

The King Cup for the highest number of points in Classes 4, 5, 6, 8, 9, 16, 18, 20, 22, 24 and 26 was won by Mr. A. de Bois, of New Eltham.



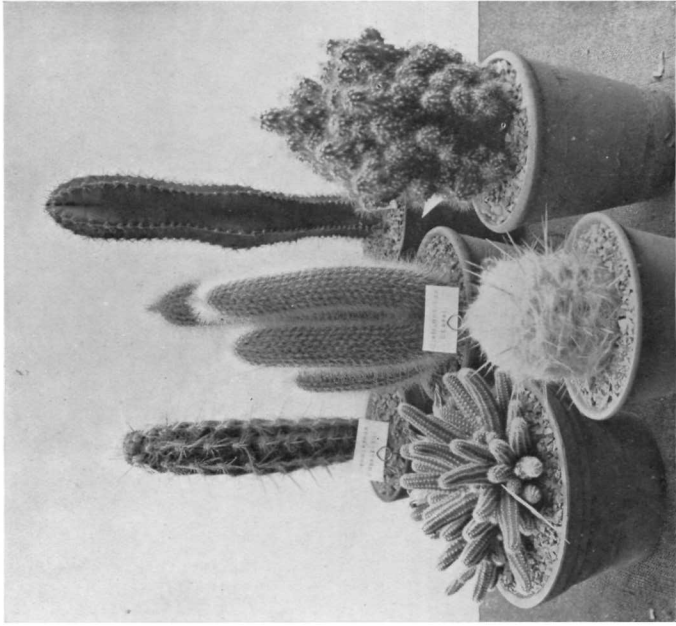
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First Prize Group, Mammillarias.



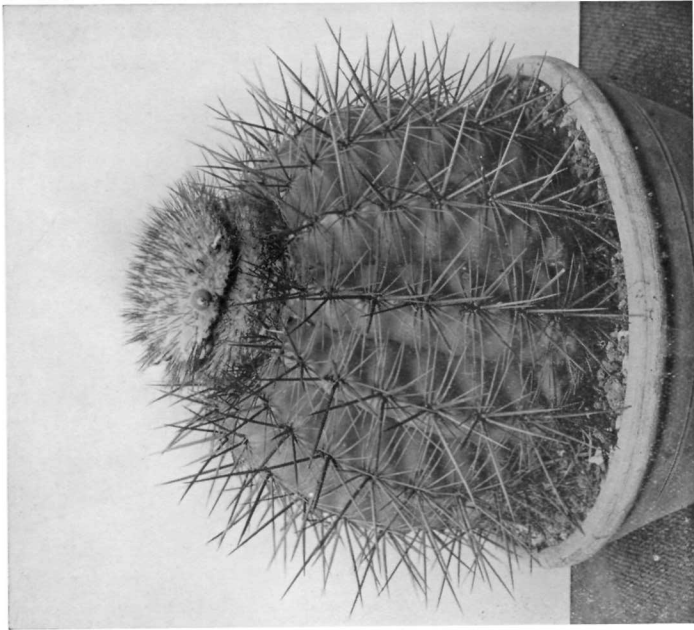
Malby.

First Prize Group, Haworthias.



Malby.

First Prize Group, Cerei.



Malby.

Melocactus sp. from Curacao (*see p. 5*).

An examination of the number of entries will show that the classes requiring the smaller number of plants are evidently preferred and the schedule will be revised with this in view. On the other hand, it takes just twice as many entries of six plants each to make the same show as twelve plants, so that to make a really good exhibition far more exhibitors are required, unless some of the owners of large collections will come forward and put up groups such as characterised the first show the Society ever held; on that occasion there were six groups each filling a space 4 ft. x 3 ft., requiring at least fifty plants. How many people brought up fifty plants to the 1938 Show?

Nevertheless, there were some very good plants shown. Dr. Turtle's *Mammillarias* (see p. 3) were all beautiful specimens, several of the white varieties, *M. geminispina* and *candida*, being particularly lovely. Mr. de Bois' plants all showed great care in their cultivation, as the illustration of his group of six *Cerei* shows (see p. 4). Mr. O'Donoghue is well known as a *Haworthia* enthusiast and the variety of types in this genus is well shown in his group of twelve *Haworthias* (see p. 3).

There were a number of non-competitive exhibits which added considerably to the interest of the Show. Capt. Dunne Cooke grows *Mesembryanthemums* on the roof of a London warehouse, in frames which can be covered with standard Dutch lights when necessary; boxes are made to fit these frames and he brought twenty of these boxes to the Hall; the plants they contained were growing in a most satisfactory manner and many of them were rare and unusual.

Dr. H. T. Marrable put up a large group of *Euphorbias* which well illustrated the wide variation of habit found amongst the succulent members of this genus; the very spiny *E. horrida* was included, *E. stellaspina* where the spines are branched like stars, *E. fasciculata* with very stout spines rather reminiscent of an elephant's up-raised trunk, *E. meloformis*, *E. inermis*, and *E. antisiphilitica* whose inconspicuous flowers are surrounded by five white bracts that look just like the white petals of a true flower.

Mr. John Lancaster showed *Melocacti* (see p. 4) which he had collected at Curacao on his way home from Costa Rica. Several of them had the characteristic "cap" well developed, in fact one fine specimen had four "caps", which is most unusual.

Mr. C. Clarke showed charming little seedling cacti, Mr. F. H. Hughes brought from Birmingham a plant of *Echinocereus procumbens* which opened four magnificent rose-purple blooms; and Mr. K. H. Walden's *Echinopsis* also condescended to open two fine white blossoms.

Readers of the *Bulletin of Cactus Research*, published by Curt Backeberg, will know that the continued publication of this work can only be assured if sufficient support is forthcoming. Herr Backeberg has already received favourable replies from a number of readers but not sufficient yet to make it certain that the work can be continued. Any reader who has not yet done so is asked to communicate with Herr Backeberg, Im Sorenfelde 15, Volksdorf, Bez. Hamburg, Germany.

“Rare” Cacti—III

By G. Turner

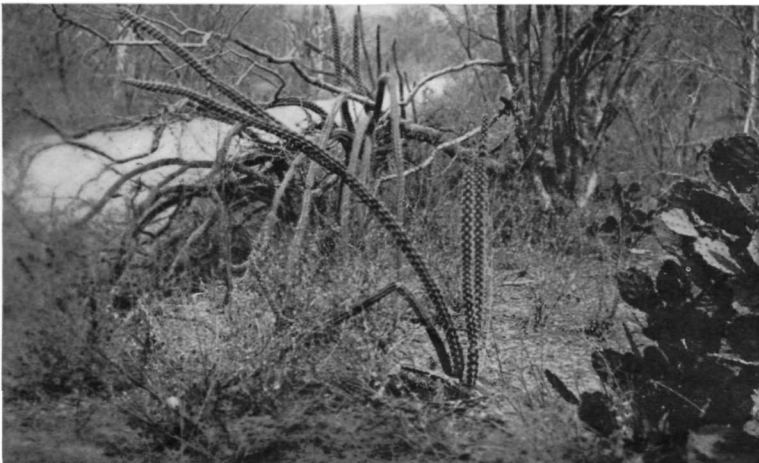
WHEN Drs. Britton and Rose wrote the *Cactaceae* about twenty years ago, *Cereus Deeringii* was plentiful in its native habitat, an island situated off the Florida coast, near Key West. In fact, Britton and Rose illustrate it as a forest tree about 30 ft. high. Since the Great War, the U.S. Admiralty have cleared several of the islands and turned them into naval bases, with the result that *C. Deeringii* is almost extinct.

The approaches to the Keys from the mainland are through almost impenetrable forests which are only possible to enter during the month of November on account of the density of the swamps, and the mosquitos. A friend of mine, an orchid collector, has spent the last two November months collecting in the forests and failed to find a trace of *C. Deeringii*, so anyone with a specimen now-a-days certainly possesses a treasure.

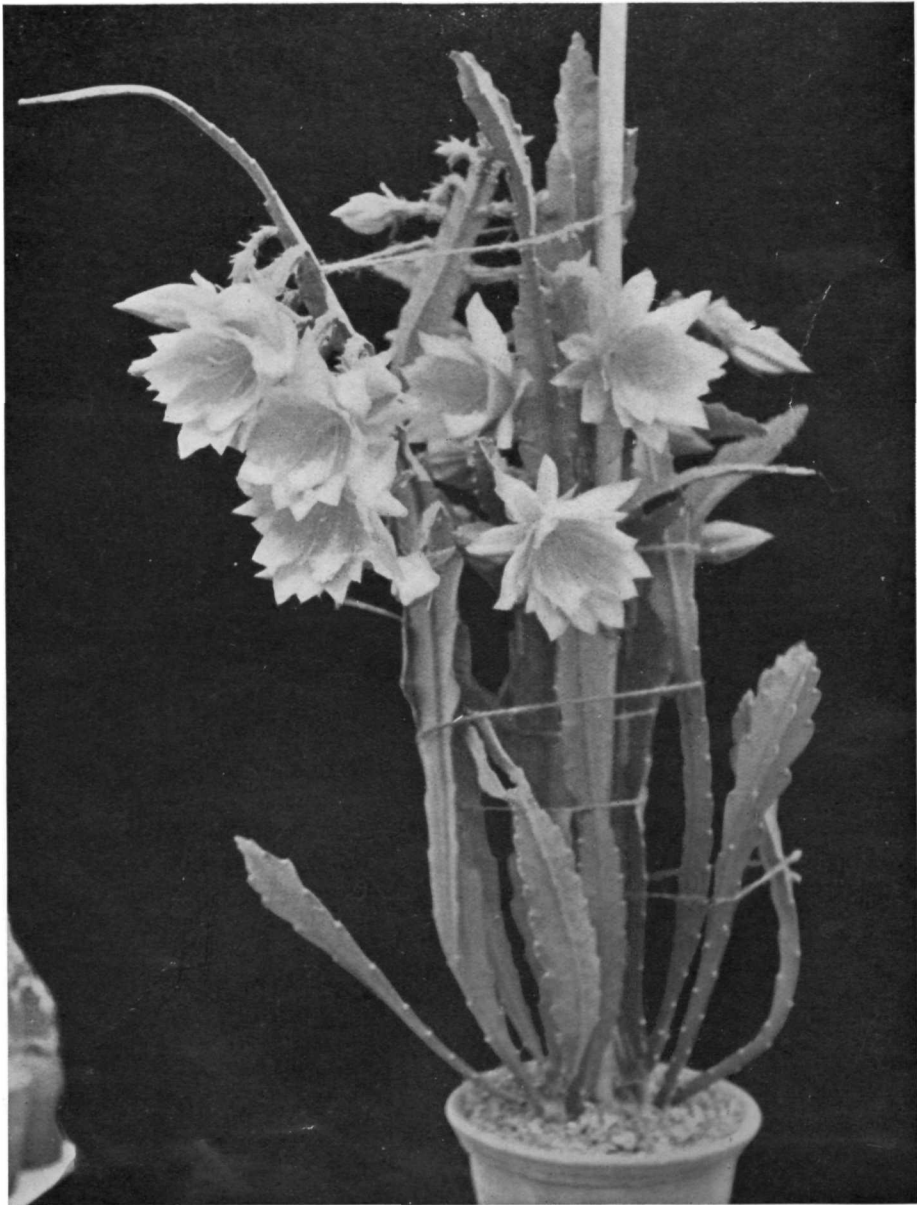
Three more cacti that are somewhat rare as well as beautiful come from the hills and canyons of Alamas, an ancient city in Sonora, now described as “the end of the world”, very seldom visited by white men. The journey out from Nogales, Arizona, where one obtains all necessary permits, is via Guymas, Sonora. A distance of three hundred miles through large forests of *Carnegiea gigantea*, *Pachycereus Pringlei*, *P. pecten-arboriginum*, *Lophocereus Schottii* (a straight-spined variety) and eight foot high *Echinocactus Covillei*, south from Guymas through forests of *Lemaireocereus Thurberi* and *Pachycereus Pringlei* into the dreaded Yacqui and Mayo Valley. In this region there are now military outposts every few miles as a precaution against the Jacqueri tribes. In 1931 they attacked, tortured and murdered every person making the journey.

Alamas is an interesting old city which few whites have seen; all the houses are centuries old. The “Hotel” is 250 years old (see p. 7); there are no glass windows, no plumbing, no sanitary arrangements, no water, no light, but they provide a really good six-course dinner for the equivalent of eleven cents. The approach and surrounding roads are really terrible. In the hills and canyons within walking distance is found the beautiful and rare *Ferocactus alamosensis*. The illustration (p. 7) shows a large specimen with a local “guide” squatting beside it. Another rarity only found here is *Cephalocereus alensis*; the tips of this cereus are heavily endowed with silky white wool; it is certainly one of the most beautiful of the Cerei. Also, a new species of *Echinocereus* described recently by Marshall, *Echinocereus stollenifera*, and *Echinocereus luteus*, a beautiful golden-flowered variety. The first-named is rather a slow grower but the latter commenced growing within a week of potting it and is now in bud. I hope to secure a photograph of the bloom.

Lastly there is the pretty *Rathbunia alamosensis*, the illustration of which (see p. 7) conveys a better description than I can give, apart from the botanical survey of this rarity. It will be observed that these plants are endemic to and named after the old city of Alamas.



*Above: Ferocactus alamosensis.
Centre: Ancient Hotel at Alamas.
Below: Rathbunia alamosensis.*



Phyllocactus which bore 42 flowers, grown by Capt. Dunne Cooke.

Phyllocacti, Epiphyllums & Rhipsalis

By Miss Hetty Mackenzie

(Resumé of a Talk given at the Meeting on June 8th, 1938.)

THESE three types of cactus may be considered together since they resemble each other in that they are found growing in nature on the branches of trees, not rooted in the ground. The lecturer mentioned that she had been specially struck by this when visiting Jamaica recently; even in those villages supposed most nearly to resemble English villages, the trees were covered with cacti.

A hot, dry atmosphere does not suit these plants and they flourish much better in a warm, moist one; but this should not be maintained throughout the year, as a period of rest is essential.

Another way in which Epiphyllums, Phyllocacti and Rhipsalis resemble each other is in their stems, which are green, leafless and often flattened; spines, if present, are not much developed.

Epiphyllums have interesting flowers with the petals arranged in three tiers; in colour they vary from white to purple. They all require leafmould or peat, and good drainage, and may be given a very little fertiliser.

Phyllocacti, too, like leafmould, but if given much fertiliser they tend to "go to leaf"; Miss Mackenzie brought up a specimen bearing seven flowers and said that she had been told it was starved; on the contrary, for a similar plant which had been given poultry manure had grown well and made a better plant but bore only one flower.

Her method of treating Phyllocacti is to stand them out of doors, in the pots, after flowering in a warm place but not in full sun; in August they are brought into the hottest part of the greenhouse to be thoroughly ripened, and then put under the staging where they remain until spring when the buds develop. They are then given a place in the staging once more but are never shaded.

The flowers of Phyllocacti are very beautiful and may be 6-8 inches across, quite small plants bearing an average of 7-8 blooms each. The plants have been so much hybridised that it is now almost impossible to name many of the varieties in cultivation, but the type of flower can be judged from the form of the stem, which is characteristic, though two- or three-edged stems will often occur on the same plant, and a three-angled stem may become flat at a later stage of growth.

Rhipsalis need rather different treatment; their flowers are not so interesting, being quite small and creamy white, though attractive enough when freely produced. Some have flat stems rather like Epiphyllums; in others the stem is cylindrical. They are rather more delicate and need more attention, a warmer atmosphere and never need to be kept quite dry; they appreciate being sprayed night and morning during the growing period; they also do better in light shade rather than full sunshine.

All varieties of these three genera are easy to propagate, any portion cut off rooting quickly in moist sand; the cut end should be allowed to dry for a day or two, as is usual with cuttings of succulent plants.

Euphorbias

By Dr. H. T. Marrable

CONFUSION still exists in the nomenclature of Euphorbias. No reliance can be placed on the names of plants received from dealers, and even the growers in South Africa are not agreed upon the names they write on the labels. However, experts both in the United States and in South Africa are working on the subject and I hope before long that some order will be produced out of the present chaos.

My own experience, for what it is worth, leads me to believe that Euphorbias appreciate a richer compost than the Cacti. A specimen of *E. hottentotta* which had previously grown about 2 inches a year, on being repotted into a richer mixture, made 10 inches of growth in one year—a strong healthy growth; and other species have benefited considerably without losing their characteristic appearance. The compost I use consists of equal parts of a good fat loam, bacterised peat and coarse sand, with a little mortar rubble added. Pots on the large size should be used as root growth in this compost is rapid, and, when I have allowed two years to go by without repotting, I have had to break the pot in order to release the plant.

Watering should be done with care and judgment. I find that the family is slow in adjusting itself to the reversed seasons, and the result is that growth ends later and starts earlier than is the case with Cacti.

Much depends on the temperature of the house. If the temperature is allowed to fall below 45 degrees F. in winter, it is better to withhold water from the succulent species.

The leafy and shrubby plants, such as *E. bulbalina*, *E. splendens*, should be given a little water through the winter. During the summer months water freely with soft water from which the chill has been taken.

While some of the Euphorbias, including the two mentioned above, and *E. bupleurifolia* come readily from seed, it is little use attempting to grow such species as *E. caput-medusae*, *E. caput-gorgonis* and *E. inermis* from seed. The caput or head will not develop as it should and the resulting growth will be attenuated and uncharacteristic.

In many collections will be found a plant labelled *E. viperina*; it looks like a bunch of vipers; there is no such plant, it is simply one of the three plants which I have mentioned above, gone wrong. It is difficult in our climate to keep even an imported "caput" plant from getting drawn, and seedlings are hopeless.

Cuttings taken from Euphorbias are more difficult to strike than is the case with Cacti. Great care must be taken to check the flow of latex, and this can best be done by dipping the cut end immediately in powdered charcoal or sulphur. Otherwise the treatment is the same as with Cacti. Equal parts of sand and powdered peat make a good medium for the cuttings, which should be taken during June, July and August, unless bottom heat is available.

The only pests I have encountered have been scale on imported plants, and red spider. Neither of these is difficult to deal with if taken in time. Mealy bug, which is met so frequently in Cactus collections, never, so far as my experience goes, attacks Euphorbias.

Home-grafted Plants

By Thomas Sharp

THE following list of grafted cacti, with one exception all of my own grafting, was prompted by lack of success on "own roots" of the species named. The one exception is *Cereus peruvianus monstrosus* of which I have a plant growing on its own roots. The cause of so many non-successes I attribute to absence, or rather loss, of about half the normal sunshine due to the aspect of my houses. A goodly number of Euphorbias thrive in the limited sunlight and the following Madagascan plants thrive with increased shade and less humidity, viz:—*Euphorbia lophogona*, *E. xylophyloides*, *E. macroglypha* and *E. Hislopii*, and *Allamanda procera*, recently possessed, promises to succeed in like conditions.

Pilocereus Palmeri, grafted 8th June, 1933, on *Pilocereus strictus Fouachianus*; scion a seedling 1 inch long, $\frac{1}{8}$ th inch thick. Union was speedy; the first growth 1 inch long, second $2\frac{1}{2}$ inches long, and the third 6 inches long, almost destitute of wool. No growth has been made since, but there is some evidence of activity now.

Cereus peruvianus monstrosus, grafted in 1936 on *Cereus validus*; result, 2 inches of growth.

Opuntia cylindrica grafted about five years ago on *Opuntia vulgaris*; result, three stems; after three years the stock rotted; the new growths were dried and stood on a mixture of broken pot and sand where they quickly rooted, two of the stems being now 6 feet long and the third, 18 inches.

Opuntia senilis grafted on *O. vulgaris* made huge growth absolutely bare of wool, but fairly furnished with yellow spines. This plant was broken up, some pieces given away, others destroyed, but one medium growth was rooted.

Opuntia clavaroides was grafted in 1936 on the abnormal specimen of *O. senilis* mentioned above; result, poor union and growth, viz:—two clavaroid and one cylindrical; one of the clavaroids made one cylindrical, the other made two growths one of which bifurcated into four cylindricals; the other of the two growths was cylindrical. No growth has been made since.

Opuntia clavaroides grafted on *O. robusta* in 1937 has made no growth.

Opuntia ursina grafted on *O. ficus-indica* in 1937 made $5\frac{1}{2}$ inches of cylindrical growth. This season a further cylindrical growth was made, which is still advancing.

Opuntia basilaris grafted on *O. vulgaris* in 1931; union was prompt but the scion died to an inch in length; from this proceeded three good growths from basal buds, which I take to be normal; the following year four growths were made, all from the apices, two of which were good and two stunted (of these two, see below).

Opuntia subulata grafted on *O. ficus-indica* in 1937; prompt union and 7 inches growth; it was just starting again last July, 1938.

Cereus formosus monstrosus grafted on *C. peruvianus* in June 1920; it has made 26 inches growth with signs of slowing up.

Opuntia acracantha on *O. cantabridgensis* in 1931; growth good with increased length of spines on growths of the last three years.

Cereus Donkelaarii grafted on *C. stenogonus* in 1936 has made no growth.

Opuntia microdasys grafted on *O. robusta* in 1936 made no growth in 1936 but three in 1937.

Opuntia microdasys grafted on *O. ficus-indica* in 1936 made satisfactory growth.

Opuntia microdasys albispinus on *O. ficus-indica* in 1936 made satisfactory growth and in 1937 and 1938 also.

Cereus formosus monstrosus grafted on *C. macrogonus* in 1935 made good growth.

Opuntia basilaris (stunted growth mentioned above) on *Opuntia sp.* in 1938; there is no result so far.

Opuntia basilaris on *O. microdasys* (? var.) in 1938 with no result.

Opuntia basilaris on a cutting of *O. ficus-indica* in 1938 with no result; the scion is an old stump, probably eighteen to twenty years old.

Echinopsis aurea grafted on *C. stenogonus* in 1938 with no result.

Cereus Donkelaarii on *C. peruvianus* in 1938 with no result.

The following are trade grafted plants :—

Aztekium on *Cereus sp.*, very healthy.

Pilocereus euphorbioides on *C. sp.*, healthy.

Pilocereus Guntheri on *C. sp.*, healthy.

Mammillaria Hahniana cristata on *C. sp.*, healthy.

Echinocactus Monvillei on *C. sp.*, said to have been grafted by the late Mr. Justus Corderoy fifty or more years ago; for its age it is a pygmy.

Opuntia papyracantha on *O. sp.*, 1938 growth ordinary.

Opuntia papyracantha on *O. robusta* in 1933, first two growths very large, subsequent growths normal size, very healthy.

VISITORS.

When travelling about the country some members like to take the opportunity of seeing other collections, but may not care to call unless they know a visit would be welcome. It is suggested that the names of those members who would welcome visitors should be marked in the List of Members issued annually in March. If anyone would care to have their name so marked, the Hon. Secretary would be glad to be notified.

Ceropegias

By Vera Higgins

ONE or two Ceropegias are fairly well known and even people who are not familiar with the name will often recognise the trailing *Ceropegia Woodii* with its little marbled leaves as a not uncommon plant in greenhouses. *Ceropegia stapeliiformis*, *C. dichotoma* and *C. Sandersonii* are found occasionally in collections of succulent plants but not many of the others are in cultivation outside botanical collections. Nevertheless this genus is very interesting, particularly on account of the unusual structure and varied form of the flowers.

There are over one hundred species of Ceropegia found in the tropics of the Old World and in South Africa. As a rule the plants either climb or hang, some twine round other shrubs, some merely sprawl over their neighbours. The roots may be fleshy, or tuberous, and in many cases a definite corm is formed.

The stem also varies; in *Ceropegia Woodii*, for instance, it is very thin and weak, whilst in *C. dichotoma* from the Canary Isles it is erect and succulent; the South African *C. stapeliiformis* is so-named from the likeness of the fleshy stem to a Stapelia, but it grows to considerable lengths, straggling up through the surrounding bushes and is even capable of twining.

In the succulent types leaves are hardly developed, or soon fall; in other species, even if the stem is comparatively slender, the leaves may be succulent. This is the case in *Ceropegia Woodii* and, in cultivation, the degree of succulence depends on the situation in which it is grown; in a moist atmosphere the leaves will be comparatively thin and green, but grown in a drier position the little leaves, in pairs at long intervals along the stems, become much thicker, the silver patterning becomes more marked and the back and edge of the leaf are red. But many members of the genus are not succulent plants at all, though anyone who has become interested in the curious flowers may perhaps be forgiven if they are led away to collect any species they may come on.

Ceropegia belongs to the family Asclepiadaceae, to which also belong the Stapelias. In essence the form of the flower is very similar. The parts are in fives but the most distinctive feature is that the pollen, instead of being loose and dusty, is collected into five sticky masses or pollinia. This is connected with the elaborate mechanism for pollination found throughout the Asclepiads. These pollen masses are hidden beneath the style which spreads out like a split umbrella above them; there is also a curious and characteristic structure inside the corolla and surrounding the stamens known as the corona. The pollinia must be removed by insect agency and conveyed to the stigmas of the same, or more usually, another flower; a fly which gets into the flower and crosses the style is liable to get a foot caught in one of the slits; in struggling to free itself, there is a good chance that it will touch a pollen mass which will adhere to the foot and be removed by the insect when it flies away. In Stapelias the flowers are usually open and the insect has easy access; the curious colouring and unpleasant smell is designed to attract flies, and it is extraordinary how quickly blow-flies will find Stapelias flowering in a greenhouse.

But with Ceropegias the flowers are tubular and the insect must descend a considerable length of tube, in some cases, before it can effect pollination: see Fig. 1, 7, which shows a cross-section through the base of a flower with the corona at the

bottom. In many cases these tubes are lined with hairs so that an insect can enter easily but cannot escape so readily; in fact *Ceropegia* flowers examined in their native habitat in South Africa have been found to contain quite a number of small fruit-flies. It seems unlikely that this elaborate mechanism should merely result in self-fertilisation, and probably, as the flower dies, the hairs collapse so that the insects can escape, but their struggles in the meantime will have resulted in the release of some of the pollinia to be carried by the escaping fly to another flower.

As a general rule, *Ceropegia* flowers have no unpleasant scent, though one, *Ceropegia cimiciodora*, as its name indicates (it means "smelling of bugs") has a very disagreeable smell. But the corolla, instead of being flat, as in *Stapelias*, is tubular and variously expanded at the mouth, and is much larger in proportion to the essential organs inside it. The colouring is seldom brilliant but the markings and zonings in shades of green and purple make them attractive.

All *Ceropegias* have long tubes, usually swelling a little at the base, and it is the distant end of the corolla that assumes curious shapes, by means of which the plants have been classified into three main groups.

I. *Lysanthe*. In this group, the corolla is divided into five pointed lobes, which are free at the top as in *C. stapeliiformis*, see Fig. 1, 6.

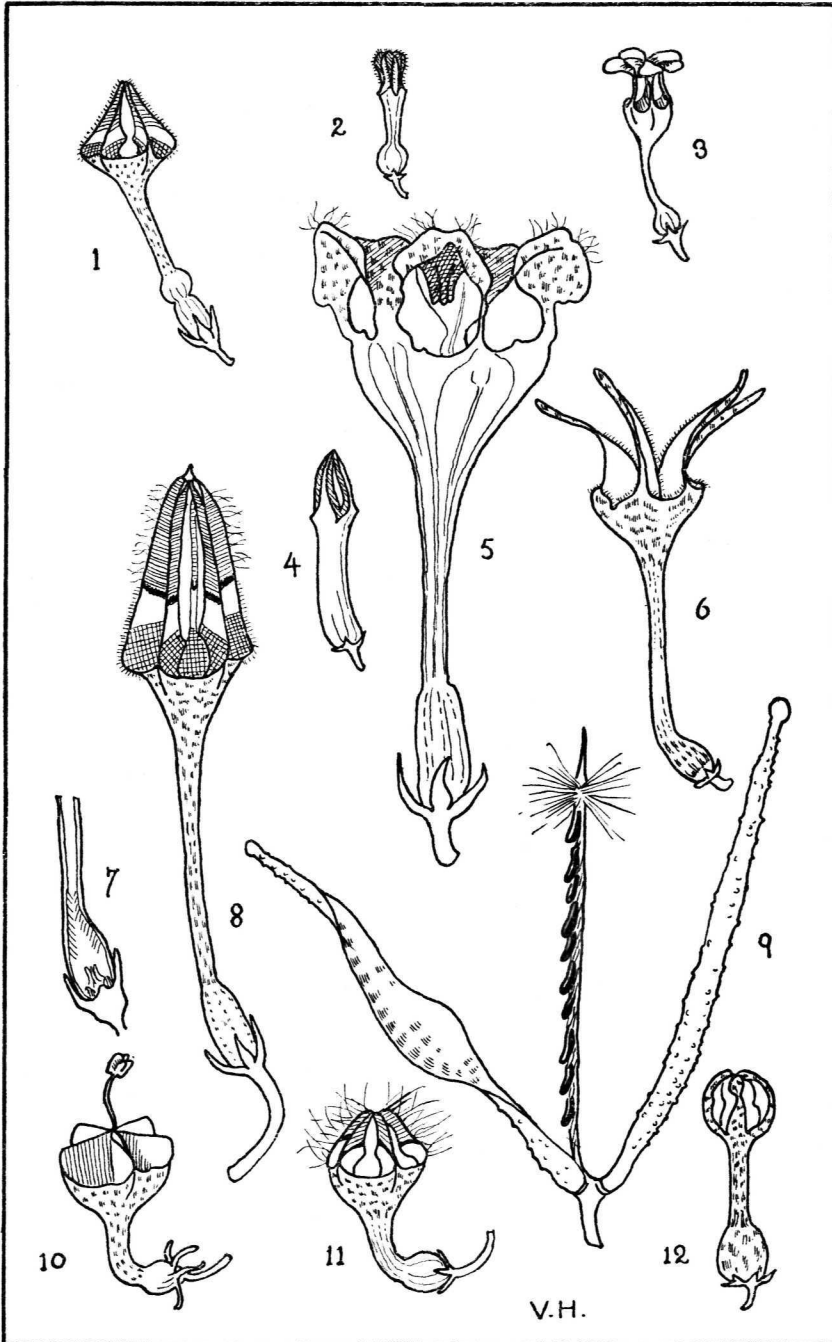
II. *Phananthe*. Here the five lobes of the corolla never separate but remain attached to each other leaving five openings between their joined tips and the funnel mouth of the tube below. The majority of the species belong to this section; examples are *C. Woodii* (Fig. 1, 2), *C. dichotoma* (Fig. 1, 4), and *C. radicans* (Fig. 1, 8).

III. *Ombroskepe*. In the third group, the lobes not only remain joined but are expanded to form a lid over the tube so that the flower looks somewhat like a parachute, as in *C. Sandersonii* (Fig. 1, 5) and *C. Rendallii* (Fig. 1, 3).

The fruit of a *Ceropegia* (Fig. 1, 9) closely resembles that of a *Stapelia* in that it consists of two long horns which ultimately split longitudinally to release the seeds, each with a tuft of long silky hairs attached, by means of which they can be carried a considerable distance by the wind. As a rule the *Stapelia* fruit does not begin to develop until nearly a year after flowering, so that people are often puzzled to find two long horns projecting from a plant which they know has not flowered recently. With *Ceropegias* it appears to be more usual for the fruit to develop and ripen soon after the flower dies.

Ceropegias are easy to grow, requiring a well-drained soil but not too poor. The species with corms and tubers should be given a resting period during the winter but do not need to be kept completely dry. The flowers are produced over a considerable period, beginning in May and going on well into the autumn, in fact one plant of *C. Sandersonii* flowered continuously for about nine months.

The illustration shows some of the types of flower found in this genus. The largest (5) is *C. Sandersonii*, which is patterned in apple green on a cream ground, the central boss below the umbrella being dark purple. *C. radicans* (8) also has large flowers, the lobes being zoned in green, cream and purple. *C. stapeliiformis* (6) is pale inside but the outside is mottled in purple. One of the most charming is *C. Rendallii* (3) which has a curious "umbrella" resembling little green clover leaves, whilst the tube is white, tinged with purple towards the base. The flowers of *C. dichotoma* (4) are comparatively uninteresting, being dull yellow in colour and the flower of almost uniform width throughout. *C. simulans* (11) is patterned in maroon



Types of Ceropogia flowers.

and has long hairs on the free edges of the corolla. *C. Thorncroftii* (12) is bright purple and green on a white ground and though the flowers are not large, they are usually produced in bunches of several together. *C. plicatilis* (1) is of the usual *Phananche* type but has a "lobster pot" at the base; there is a double expansion at the bottom of the tube, with a ring of hairs inside, projecting from the join between the two bulges. The little flowers of *C. Woodii* (2) are dark purple with hairs fringing the dark corolla lobes. One of the most curious of all is *C. Haygarthii* (10); the flower looks rather like the gills of a mushroom, and is of similar colouring, and surmounted by a slender stalk terminating in a curious little expansion; possibly this moves in the wind and helps to make the flower conspicuous.

Of the species shown, *CC. dichotoma*, *Sandersonii*, *radicans* and *stapeliiiformis* have succulent stems, the leaves of *C. Woodii* are succulent, but the aerial growths of the other species show little succulence though most have swollen underground stems or corms.

It will be gathered that the writer is a *Ceropegia* enthusiast; not many of these plants are in commerce and the collection, which now includes over thirty species, has been got together with the help of friends in various parts of the world. If any reader of these notes knows of any unusual *Ceropegias* available, the writer would be very to hear of them, and to make suitable return.

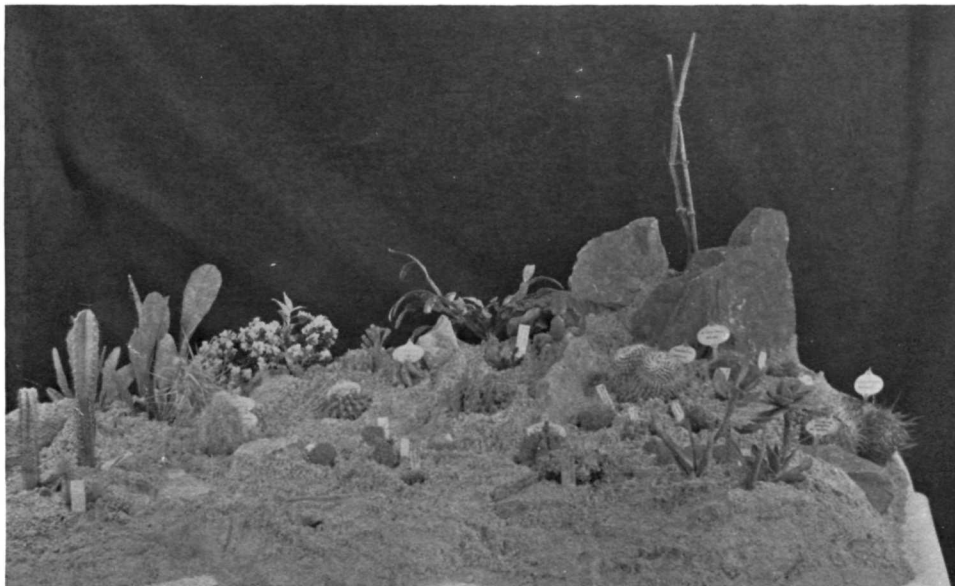
Flowering Opuntias

THERE can hardly have been a collection of cacti that has not, at some time or another, contained an *Opuntia*. But when space becomes limited they are often the first to go. The reason is that when they grow freely, they quickly make large, unmanageable plants and, if kept small, they seldom flower; in fact there is a general impression that *Opuntias* only flower when very large plants—despite pictures in catalogues which seem to prove the contrary.

Mr. G. D. Hewitt, however, has succeeded in getting good flowers on quite small plants, as the illustrations on p. 17 show. *Opuntia Engelmannii* is about 18 inches high and the flowers are clear pale yellow, about 4 inches in diameter, whilst *O. Rafinesquiana* is only 10 inches high, being more prostrate in growth; its flowers, however, are much larger, 5½ inches across, and of a deep rich yellow, with a golden blotch at the base of the petals.

Both these plants were cuttings rooted from single pads in August 1934; the soil used was one-half broken brick and lime rubble, and one-half ordinary, light, sandy garden loam, with a small quantity of charcoal chips in the drainage. The plants have been kept quite dry in winter, but are plunged in their pots out of doors for as long as possible during the summer, when they are left to look after themselves.

More and more growers are realising how much succulent plants approve of open-air treatment, even if they are not actually planted out, but still left in their pots. If this treatment also results in freer production of flowers, it should be tried whenever it is possible.



Desert Group arranged by Mr. C. L. Thomas (*see p. 24*).

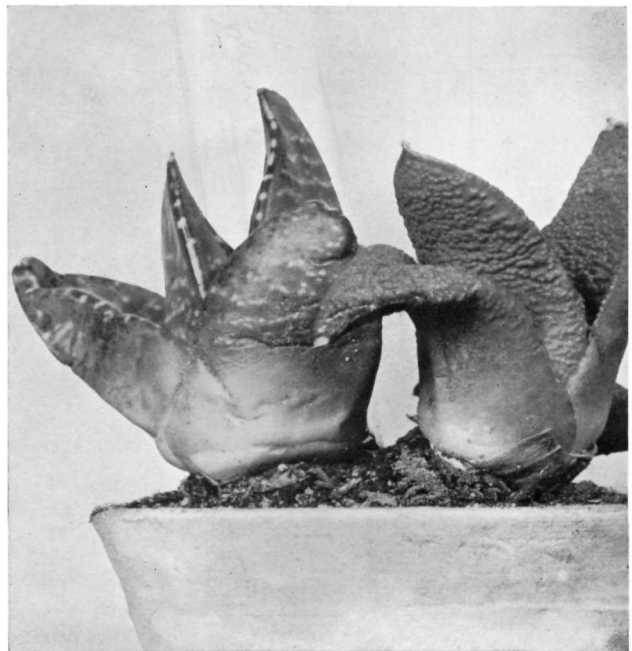


Opuntia Rafinesquiana.



Adromischus antidorcatum v.l
(The name on the label
incorrectly spelt.)

Gasteria Staynerii v.P.



Adromischus Antidorcatum v.P.

By Dr. Karl von Poellnitz

(Oberlödla bei Altenburg, Thüringen, Germany.)

THE Latin description of this new species will be published in Fedde's Repertorium.—A dwarf undershrub up to about 4 cm. high without flowers, branched. The older stems and branches rough, the younger ones with papillae. Leaves spirally arranged, 2-3½ cm. long, $\frac{1}{4}$ - $\frac{1}{3}$ as broad, about as thick as broad or somewhat less thick, ovate lanceolate or narrow-oblong, gradually narrowed into a short petiole towards the base, nearly terete, but a little flattened on the upper side, this side with a narrow furrow, which is less distinct in older leaves and in cultivated plants and which is broadened towards the leaf tip, obtusish or acutish, a little recurved at the tip, dirty green and mostly with brownish-red to brownish flecks, with a waxy covering (cultivated plants often without this covering), younger leaves with colourless or light rose-coloured papillae and more or less erect, older leaves widely spreading or spreading recurved, with less distinct almost greenish or brownish papillae or only roughened, somewhat shrunken at resting time, but not or not distinctly black-brown.—Flowers unknown. (The type flowered with me in 1937, but I lost the description of the flower.)—Little Namaqualand : 30 miles south of Springbok, November 1936, leg. W. Triebner 1324 (=Stellenbosch 1324=Stellenbosch 6431).—The name of this new species is derived from the Latin “antidorcas”, which means “springbok”.

Gasteria Staynerii v.P., Spec. Nov.

By Dr. Karl von Poellnitz

(Oberlödla bei Altenburg, Thüringen, Germany.)

ACAULIS vel brevissime caulescens, perparva, valde proliferans, mox caespitosa. Folia in plantis junioribus pauca, disticha, circ. ovato-oblonga usque ad paene linguiformia, apice late rotundata vel subdeltoideo-rotundata, breviter mucronata, subtus non carinata, opace viridia, utrinque tuberculis creberrimis, concoloribus instructa. Folia in plantis adultis spiraliter seriata, pauca, laevia, supra concava, subtus convexa et inaequaliter carinata, utrinque maculata, ovata, acuminata, acuta, mucronata. Flores adhuc ignoti.

Acaulescent or nearly acaulescent, very proliferous from the base, soon caespitose. Leaves of younger plants few, erect-spreading or spreading towards the tip, about ovate-oblong to nearly linguiform, with a broadly-rounded or somewhat deltoid-rounded tip, mucronate, dark green, not shining, face concave towards the base, somewhat convex or flat-convex towards the tip, back convex and not keeled, both sides smooth at the base, otherwise tuberculed; these tubercules dark green, very numerous, distinct, solitary or somewhat confluent, a little shining on the face, but

scarcely shining on the back; margins with the same tubercles, but mostly smooth at the tip. Leaves of the adult plant few, spirally arranged in a rosette of about 5-7 cm. across, 5 cm. long, $2\frac{1}{2}$ cm. broad towards the base, erect-spreading, concave at the face, convex and unequilaterally keeled at the back, about ovate, acuminate, acute, mucronate, dark green, smooth, scarcely somewhat shining, with whitish or greenish-white flecks; margins and keels with whitish, mostly solitary, inconspicuously prominent, roundish or oblongish tubercles or flecks, but the leaf tip smooth; flecks not numerous, scattered and scarcely arranged somewhat regularly, about 1 mm. across, mostly roundish on the face, on the back of the same size, more numerous, often arranged in regular cross rows which are close together, and more often somewhat confluent.

South Africa: Korsten Hill, Port Elizabeth, among short grass, rarely flowering, F. J. Stayner 12, type.—This new species which is most interesting on account of its leaves—leaves of the younger plants distichous and tubercled, those of adult plants spirally arranged and smooth—is named in honour of its discoverer, who is a keen and successful collector of succulent plants in South Africa.—The new species is doubtless near *Gasteria decipiens* Haw., but the leaves of younger plants are distichous.—*Gasteria parvifolia* Bak. is not well described; but I think that Baker as well as Berger would have mentioned if its leaves on younger plants had been distichous and tubercled.—Type plants given to the Botanic Gardens of Dahlem, Kiel and Kew.

Succulents at Missouri Botanical Garden

THE Missouri Botanical Garden is well known for the interesting plants grown there and reported on from time to time in the monthly *Bulletin* issued by the gardens.

In 1930 the number of succulent plants there was about 154 named varieties, but when Mr. Ladislaus Cutak was put in charge, he worked hard to increase this number and has been so successful that the latest list gives over 1,100 species. This must be the finest collection under glass in America.

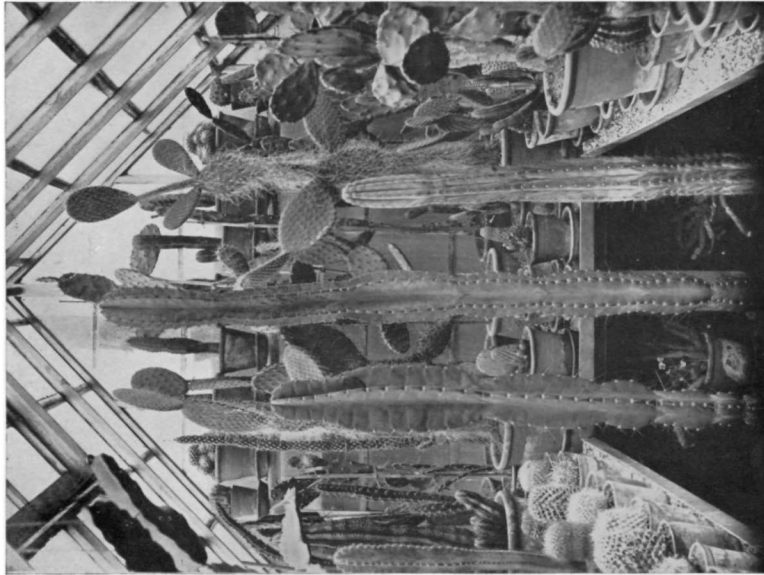
The Cactaceae is well represented, seventy-two of Britton and Rose's genera being included. There are a large number of Asclepiads, Euphorbias, Agaves, Aloes, Haworthias, Crassulaceae and Mesembryanthemums. A Guide to this interesting collection, with a list of the species included, and some excellent illustrations, has been compiled by Mr. Cutak and may be obtained from the Librarian, Missouri Botanical Garden, St. Louis, Mo. U.S.A., price 25 cents.



AT CHELTENHAM FLORAL FETE.

Above : Exhibit by Mr. A. S. Treasure, awarded a Silver Medal.

Below : Exhibit by Mr. G. L. Coventon, awarded a Large Gold Medal and the *Gardener's Chronicle* Silver-Gilt Medal for the best Amateur Exhibit in the Show.



Plants in the collection of Mr. A. W. Russell, Birmingham.

Silver Trophy for Cacti and Succulents

In connection with the Fortnightly Meeting on September 13th and 14th, the Royal Horticultural Society offer a Silver Trophy, provided from Mrs. Sherman Hoyt's Prize Fund, for the best group of cacti and/or succulents staged by an amateur; the space to be occupied is at the discretion of the exhibitor.

It is hoped that as many members as possible will put up groups; the autumn date makes it possible to show plants, especially Mesembryanthemums, in better condition than they would be at the time of the Cactus Exhibition in June and members who specialise in those plants which develop late in the year should take this opportunity of showing them.

An entry form and full particulars can be obtained from the Secretary, Royal Horticultural Society, Vincent Square, London, S.W.1.

A LETTER

Mr. A. W. Russell has sent photographs of his collection, two of which are shown on page 22, and he says:—"As our Society consists of so many workers who would like to know what the other members are doing, and as we cannot visit all the other collections, I thought that you would like to see what I have been able to do as my 'hobby'. I am enclosing photographs showing part of my collection after nine years' work, and if you can include them in the *Journal* they may be a bit of encouragement to those just starting."

The illustrations show that Mr. Russell has a number of fine plants and that these cover a wide range; two other photographs, which could not be included for lack of space, show that Aloes, Phyllocacti and Euphorbias also form part of this collection which certainly should be an inspiration to beginners.

Members may like to know that back numbers of the *Journal* can be obtained (price 1/6 per copy) with the exception of Vol. I (all parts) which is out of print. As there is a demand for Vol. I, the Society is prepared to buy back unwanted copies of this volume, especially numbers I and IV.

Editorial

AS was mentioned in the last number of the *Cactus Journal*, the Society will itself be responsible for the publication in future.

The opportunity has been taken of altering the style. The cover has been made stiffer so that there should be less risk of damage in transit, but the size is being kept the same as before so that members who bind their copies will have no difficulty. As the shiny surface of the paper made it unpleasant to read in certain lights, this has been replaced by a duller surface and special pages will be inset to take the illustrations. The arrangement of the type in two columns has been abandoned as this is inconvenient when setting out botanical keys, etc.

As regards the contents, no alteration is contemplated except that more illustrations will be given when possible; it is hoped to keep the articles as varied as possible and the Editor will welcome comments and suggestions and, still more, contributions of articles and photographs on any subject of interest to growers of succulent plants.

The *Journal* reaches all the members and forms the chief link between them; the more it is used to pass on information between members, the better it will be for the Society.

The Exhibition is also an important part of the Society's activities and must rely chiefly on the enthusiasm of members to make it a success. We are very glad to hear that members are putting up exhibits at local shows with marked success, as can be seen from the photographs on p. 21. The desert group shown on p. 17 was arranged at one of the Flower Shows held by the Ministry of Labour Horticultural Society, where it attracted considerable attention. All such exhibits help to make people familiar with succulent plants and the more frequently they can be arranged in various parts of the country the better.

Meetings

The following Meetings have been arranged and will be held at the Royal Horticultural Society's New Hall, Greycoat Street, Westminster, at 6 p.m. :—

September 13th.

Mr. B. S. Williams will give an account of the results obtained with his system of manuring; a discussion will follow.

October 11th.

There will be a discussion on Gadgets; members are asked to bring or to describe any gadgets they may find useful.

November 29th.

There will be a discussion on "Watering", to be opened by Mr. J. Southgate.

Page Twenty-four

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Vol. 7

December, 1938

No. 2

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THE CACTUS JOURNAL

VOL. 7.

DECEMBER, 1938.

No. 2.

Growing Succulents from Seeds

By S. G. Fiedler

IN 1936 I became a Member of the Botanical Society of South Africa and received as such a number of seed packets under the free distribution arrangement of the Society. The seeds were chiefly succulents from the Karoo Garden at Whitehill and here again 80 per cent. were stemless Mesembryanthemum.

Seed raising has always fascinated me and I have sown many kinds of rare seeds in the ordinary way described in garden handbooks, generally with poor results, until I was taught step by step how to prepare the soil and how to sow the seeds. If, therefore, the following is a rather detailed description, it is because I have found that even a small deviation had a marked effect on the result.

PREPARATION OF THE SOIL

For this I use :—

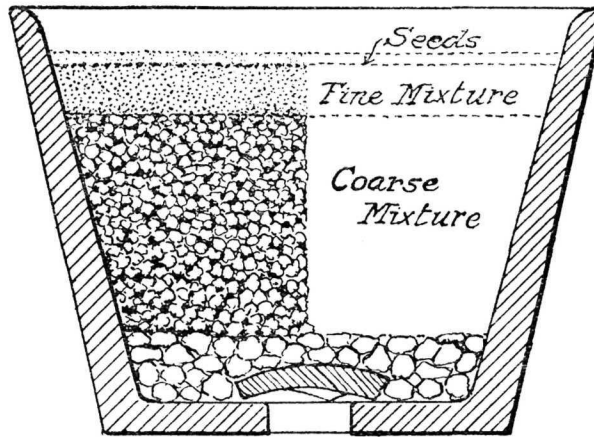
1. A good fibrous loam obtained from old, well-rotted, grass turves, which have been stacked for 2 years grass downwards. When rather dry, it is rubbed through a quarter-inch sieve (4 meshes to 1 inch), the lumps not passing through being thrown away.
2. Sharp clean sand.
3. Ground red bricks or broken pots. Here in England this material can either be bought from the nursery sundriesmen, or be prepared at home on a very useful crock grinder, but before I bought this grinder, I have used a hammer to crush the crocks well, although it is rather laborious when a quantity is required, for it must be broken quite fine—from dust to $1/16$ in. in diameter.
4. Sorbex Peat—this is a very valuable material. It is a peat derived from Sphagnum moss, perfectly free from weed seeds and beautifully clean to work with. In the dry state it can be rubbed with the hands to a fine homogeneous mass, and it absorbs and retains moisture for a long time. It is used extensively for packing

bulbs in, and small quantities may be obtained in this way, but I believe it can be bought almost anywhere nowadays. It is really worth the trouble to secure Sorbex for mixing in the compost.

Take 2 parts Loam.
 1 part Sand.
 1 ,, Ground Bricks or Crocks.
 1 ,, Sorbex well rubbed out, moistened and thoroughly mixed.

SEED SOWING

For this I use 3 in. or 4 in. pans according to the quantity of seeds I have, as these must not be sown too close, a household sieve (rather fine, 12 meshes to the inch), and a flat disc about $2\frac{1}{2}$ in. in diameter—a round tin such as those in which



throat pastilles or the like are packed is very useful, but it should be quite flat without embossed letters, for even the slight unevenness these would make in the soil causes the seeds to roll down and lie too close together in the furrows).

I place a number of pans on the bench, cover the drainhole with a crock, and put a $\frac{1}{2}$ in. layer of coarse draining consisting of $\frac{1}{4}$ in. shingle or broken bricks or crocks, charcoal or mortar rubble of similar size. Then fill the pot to within $\frac{1}{2}$ in. of the rim with the prepared soil, make it reasonably firm by dabbing it with the finger tips, and make the surface smooth with the tin box lid. Then take some soil mixture in the household sieve and shake over the pan until filled to within $\frac{1}{4}$ in. from the rim, make smooth and firm again with the tin box, and place the pan in a basin with water, leaving it there until the soil is thoroughly moistened. The coarser matter which did not pass through the sieve is put in the next pan on top of the drainage, and the level made up with prepared soil to $\frac{1}{2}$ in. from the rim, firmed, a $\frac{1}{4}$ in. layer of fine mixture put on top, firmed, moistened in the basin and so on until all your pans are prepared.

When thoroughly moistened, the pan is placed on the ground to allow superfluous water to drain away.

The seeds are now sown on the smooth surface of the soil and slightly covered

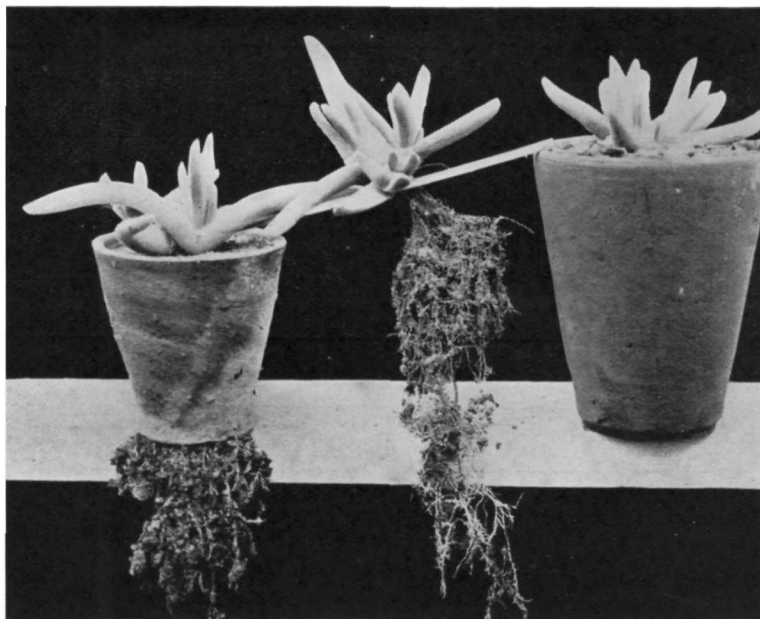


FIG. 1.
Cheiridopsis Comptonii. Sown 1937, potted September, 1938.

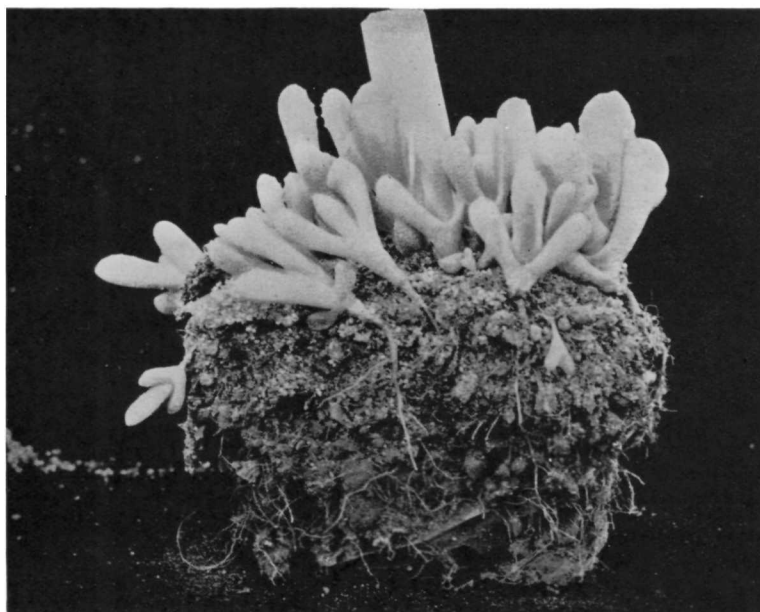


FIG. 2.
Stomatium rooting through ball of soil, sown February 18th,
photographed August 12th.

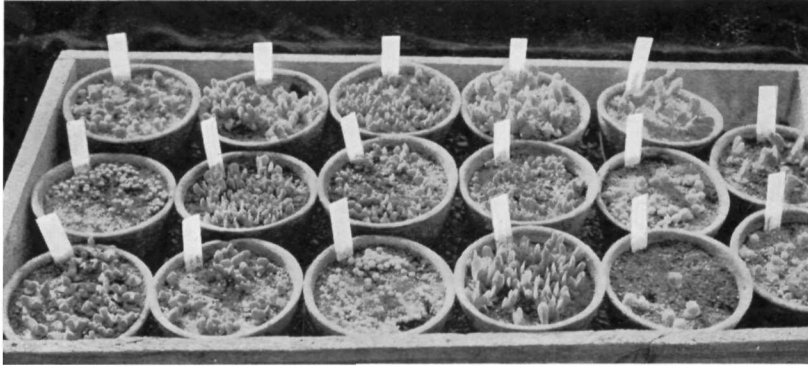


FIG. 3.
Seed pans, sown February 17th, 1937, photographed May 20th, 1937.

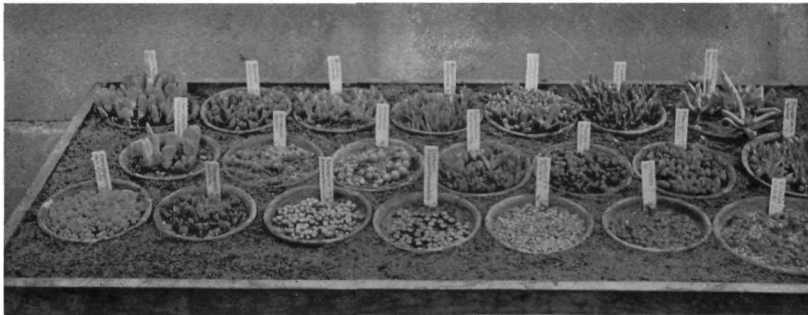


FIG. 4.
Seed pans, sown February 18th, 1937, photographed July 27th, 1937.

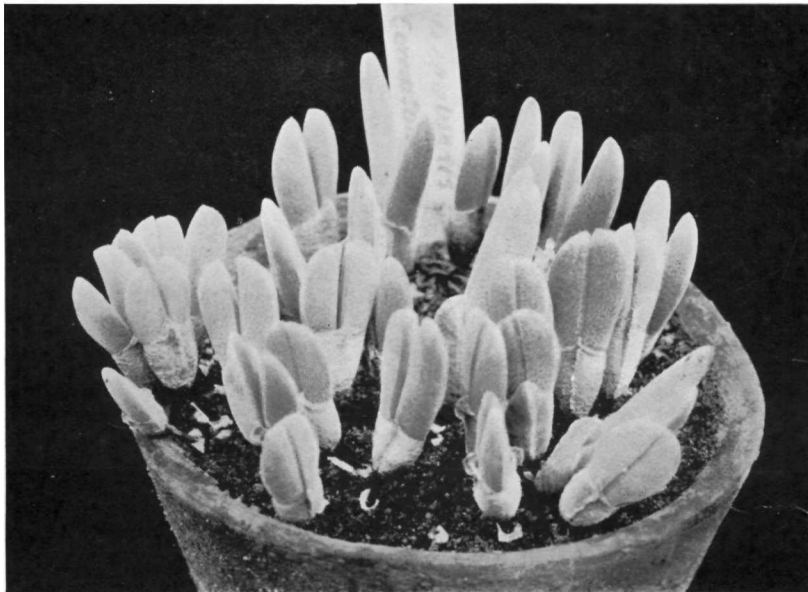


FIG. 5.
Cheiridopsis Comptonii, sown February 18th, 1937, photographed
August 12th, 1937.

by gently shaking the sieve over the pan. Do not hold it high over the pan, otherwise the force of the falling material may displace the fine seeds. Very small seeds should only have a slight covering, larger seeds, such as *Gasterias* and *Haworthias*, a layer approximately double the diameter of the seed. Large seeds should be planted individually and covered up to $\frac{1}{4}$ in. Do not firm the covering soil.

The pans are now placed in a box approximately 6 in. deep, with a 1 in. layer of $\frac{1}{4}$ in. shingle on the bottom, and covered with glass panes, which are turned morning and evening and any condensed moisture thereon wiped off. If there is a lot of moisture, tip the glass and let it run back on the shingle, but be careful not to pour it on to the seed pans.

The temperature in the box was kept at 60 degrees and no further watering of the seed pans was found necessary until nearly one month after. By then all the *Mesembryanthemum* seeds had germinated, germination generally beginning 5 days after sowing, and in another week most of the seedlings were up. When the first true leaves started to appear, the pans were moved to another box and plunged in a moist mixture of half sand and half Sorbex, and placed in a light position in the greenhouse.

Unfortunately I was away nearly two months in June and July, where the seedlings remained in the greenhouse well ventilated to give them a lot of fresh air, but kept rather dry. When I returned they had grown into fair-sized plants, as shown in the accompanying photographs, and badly needed pricking out into single pots.

This was done, and the pots plunged in an open frame outdoors, where in the warm and rather dry summer we enjoyed in the south of England in 1937, they established themselves very well, and grew to good sizes, even two *Stomatium Fulleri* bloomed five months after sowing.

In some cases where I received a large quantity of seeds, I later sowed a batch in a different soil mixture, the same as I used some years ago, consisting of a mixture of 2 parts loam, 1 part sand, 1 part sifted mortar rubble and 1 part leaf-mould.

In this, germination was not nearly so high, there was also a certain amount of damping-off which did not take place in the new mixture. The old mixture was also more difficult to keep at the right degree of dampness.

In some cases I placed the earth crumbs from the loam left on the sieve, in the bottom of the pan as drainage instead of shingles. While the seedlings were growing, there was no noticeable difference, but when pricking out I found the tips of the roots of the seedlings had grown into the earth lumps from which they could not be freed without damage, whereas the plants grown in pans with shingle drainage could be separated with root tips intact and were established in their pots much quicker than the former.

If pans are not available, I should use 4 in. pots and make a 2 in. drainage of $\frac{1}{4}$ in. gravel, with a small addition of Sorbex to prevent the extra thickness of gravel becoming quite dry. On the other hand there must not be so much Sorbex that it stops the drainage.

This was my experience in 1937. Really I had extraordinary luck and thought things quite simple, so when I sowed the new batch of seeds received this Spring I had much food for thought through the erratic behaviour of the seeds, and in the hope that my observations may be of interest to my fellow members of the Society I will give an account of what I have done and the results. As said, I joined the

Botanical Society of South Africa in the Autumn of 1936 and received therefrom two portions of seeds early in 1937. The first was sown 17th February, and the second 3rd April. This year I received my seeds rather late. As the first lot sown 23rd April gave poor germination, I sowed the remainder on 13th July and this has given more satisfactory results. The trouble with the third lot was that a thick layer of moss grew on the soil which seemed to prevent the seeds from germinating, as I think I shall prove in the following.

I will put my observations under separate headings and give my conclusions to each.

SOIL MIXTURE

In 1937 I used loam from turf cut in the lower end of my garden, the sod was cut very thin, only 1 in., and rotted down to a fine, sandy, fibrous loam, perfectly clean from weed. In 1938 I used loam from the top of the garden where the soil is very clayey. When dry, it was quite nice to work, but I have no doubt that it contained spores of moss which gave much trouble.

So! avoid clayey substance in the mixture and use only good, fibrous loam.

WATERING

I find that most succulent seeds require much moisture while germinating. I place my seed pans in a box with a 1 in. deep zinc tray in the bottom, and in 1938, a hinged lid with glass. The tray is always kept wet; sometimes I flood it to a $\frac{1}{4}$ in. depth to allow the pans to get really soaked, leaving the lid open for surplus water to evaporate.

In 1937 I was away six weeks, from 1st June to 17th July. I am afraid the gardener who looked after the frame at that period allowed it to get too dry, but as most seeds at that time had germinated and grown to fair-sized plants it did not do any harm.

In 1938 I was absent from the 14th June to 4th July. Again the pans were allowed to dry out a couple of times, with the fatal result that the moss which had formed dried to a hard crust, and there was nothing else to do but prick out the few seedlings that came up before the moss formed, throw the contents of the pan out, and make the second sowing on the 13th July. This I looked after myself, and again moss began to grow within ten days of sowing, and things tended to turn out very much like the first sowing. A few more seeds germinated before the moss, but there is more to say of this sowing later.

Conclusion: Seed pans should be kept quite wet and under no circumstances allowed to dry until most or all seeds have germinated.

Seedlings, on the other hand, can stand much dryness, but will stop growing until watered again.

POSITION OF SEED FRAME

With regard to this, I believe I have had rather interesting experience. In 1937, my greenhouse, a $\frac{3}{4}$ -span, lay in a north-south direction; it was heated by a rather inefficient boiler which just kept the frost out. Immediately behind the boiler, in the north-east corner of the house, I had built a pit over the pipes, in which the seed frame and pans were placed. The sun never reached it until after midday.

In the beginning I shaded the frame with a sheet of brown paper, but as the seeds all germinated very quickly and grew fast, they tended to be drawn, and the paper was discarded.

During the later Summer, after the seedlings had been pricked out and plunged in a mixture of Sorbex and sand in an open bed, the greenhouse was taken down and re-erected together with another house, this time in an east-west direction, the new section being heated with a very efficient boiler. The seed frame was placed on the north side of the gangway facing south, and had the full blast of the sun all day. This had a great effect on the temperature in the frame where I always keep a thermometer. Stoking had finished for the year when the first sowing was made. During the Summer the temperature often rose to between 100 and 110 degrees, and I think this both encouraged the growth of moss when the pans were wet and formed the crust when the pans dried out in June.

Although germination at the second sowing was better, it was far from good, and about the end of September I decided to move the seed frame to the east end of the house where a hedge outside threw a little shade. The lid of the frame now faced west, and the pans were in the shade till about 11 o'clock, and of course at this time of the year the light is not so strong either. I carefully scraped away as much moss as possible without disturbing the seeds below. Immediately germination started in all pans, even in three where no germination had so far taken place. A *Glottiphyllum*, a *Faucaria*, and a *Stomatium*. I was somewhat surprised, but maybe without reason.

Conclusion: Although I would not shade the frame with brown paper, it should certainly be in half-shade.

TEMPERATURE

The first two sowings (1937) placed in the pit in the old house were kept at a steady temperature around 55 to 65 degrees, with the boiler alight; the third sowing (1938) was subjected to very great variation in temperature, the fourth also, but from the time the frame was moved I have had a safety fire at night and the temperature has been very constant, between 60 and 70 degrees, at which strong germination has taken place.

Conclusion: Temperature should be as constant as possible between 60 and 65 degrees.

TIME OF SOWING

Candidly, I do not think it matters much what time of the year you sow. My experience is that seedlings do not go to rest the first twelve months, but grow rapidly as long as they are kept moist. As most *Mesembryanthemums* rest during our summer, I certainly like to sow these as early as possible, end of February or early March. The seedlings will be ready for pricking out in June, and can be plunged in an open, sunny pit outdoors, and kept growing all Summer. By the end of September I brought mine in to the alpine house. The staging was covered with sheets of zinc, the pots put on an inch layer of Sorbex and sand, and watered once a week in the pot and on the sorbex and sand, but not sprayed overhead, and thus kept growing without a stop until the middle of May.

Of course, the alpine house is not heated, but when it looked like frost I put a portable paraffin stove in the house. That, however, was not sufficient on one very

cold night, and it was certainly a sad sight the following morning. I expected to lose half my plants, a lot of *Pleiospilos simulans* in particular were quite black and frozen solid. I hurriedly covered all plants with sheets of newspaper to prevent the sun thawing them quickly, and this did the trick, not a single plant was lost.

During the Summer I have given a little water once a fortnight, and chiefly on the stage, especially the very succulent Rimarias and Gibbaeum, if they looked shrivelled. I should mention that having no frame with glass cover, large enough to enable me to exclude rain, all plants were left in their Winter quarters in the alpine house.

Early September, the 1937 plants began to grow again, and many are blooming or have bloomed by now, for instance: *Bergeranthus scapigera*, *Dracophyllus Delaetianus*, *Ebracteola Derenbergiana*, *Nananthus Jamesii* and *rubrolineatus*, *Rhinephyllum Comptonii*, *Rhombophyllum rhomboideum*, *Titanopsis Schwantesii* (18 plants out of 25), *Stomatium deforme*, *Fullerii* and *mustellinum*, and *Faucaria hyb.* (21 of 25 blooming early October, some with fine, large flowers).

Other plants have grown very satisfactorily in these eighteen months, several *Cheridopsis* have 9 to 11 heads. Lithops are up to $\frac{3}{4}$ in. diameter.

PRICKING OUT

This is a big job with such large quantities as I have had, but as the seedling continues growing the first twelve months, it can be done at any time. The compost I use for the plants is made up of :

- 2 parts old leaf-mould.
- 1 part old potting compost.
- 1 „ mortar rubble, crushed rather fine.
- 1 „ loam.
- 1 „ old cow dung, which I boil to kill possible stem-eel.
- 6 parts sharp river sand.

This will prove a good porous mixture. The drainage hole I cover with a crock and a $\frac{1}{2}$ in. layer of $\frac{1}{4}$ shingle to help sharp drainage.

I have had rather interesting experience with the growth of the 1937 seedlings. Of each different sort, I pricked out from 6 to 10 seedlings in a 6 in. pan, 4 in. deep, others in pots 2 in. wide and 2 in. or $3\frac{1}{4}$ in. deep. Of the latter I ordered 500 specially made at a local pottery at the same price as the 2 in. deep stock pots. Practically in every case the seedlings in the pans grew fastest the first nine months, making good-sized plants, undoubtedly on account of the bigger space in the pan and because the soil did not dry out as quickly as in the small pots. Later, however, the plants in the deep pots gained on them and have flowered better than those in the pan, where generally only one or two bloomed. Practically all plants in the shallow pots are the smallest, and often much smaller. The reason I discovered about the end of September. To get pots for this year's seedlings, I began potting last year's plants on. The drainage hole in the specially made deep pots was quite unintentionally rather large and difficult to cover with the crock. The long taproot had grown through the drainage hole out in the Sorbex and sand on the stage, and spread far under the pot. I always stop watering some days before re-potting—that makes it easier to shake the old soil from the roots without damaging them. When lifting the pot, a

large clump of Sorbex clung to the roots, but being dry, it was easy to brush off, and the taproot could be pulled through the drainage hole without breaking.

The photograph (Fig. 1, p. 27) shows three plants of *Cheridopsis Comptonii*. To the left, a plant in its old pot, centre, a plant cleaned for re-potting, to the right, one in its new pot, a specially deep one, 3 in. diameter and $4\frac{1}{2}$ in. deep. In every case of plants flowering in the pans, their taproots had found a way through the drainage hole out in the Sorbex. This confirms what I have felt for a long time, that we are inclined to grow our succulents in much too small and shallow pots. I have had similar experience with *Stapelias*, *Euphorbias*, *Gasterias* and *Sempervivums*. There is a belief that these plants flower better when potbound, but my observation is just the reverse, after having grown a number of *Stapelias* in an open bed this Summer.

Having seen the vigorous root growth in the mixture of sand and Sorbex on which the pot stood, I am putting 1 more part each of old leaf-mould and potting compost in the mixture used when re-potting.

Finally I will say a few words about mortality. Either I have been singularly lucky or the stemless *Mesembryanthemums* are far easier than their reputation indicates, anyway in the infant stage. Of 84 different species of nearly all the sub-generas I have raised, only three have proved, shall I say, tricky. They are *Lithops Fulleri* and *Titanopsis astridea*, which definitely do not like to be watered overhead; and *Juttadinteria deserticola*, which resents transplanting, all my seedlings died promptly.

For rooting difficult cuttings: A pan of water is covered by a sheet of perforated metal, through the holes of which narrow strips of blotting paper are passed; the strips dip into the water below and project about 1 in. through the metal sheet so that they can be turned down on it; a sheet of blotting-paper is then laid over the sheet and this will be kept continually and evenly moist, causing a moist atmosphere if a bell glass is suspended just above. Cuttings are potted in very small pieces of crock or brick, their pot being put into a second and slightly larger one, so that too much water does not reach them; stood under the bell jar, on the blotting-paper, they will receive enough water to induce rooting. (*Gadget described at the Meeting on October 11th.*)

An annotated Index to Salm-Dyck's "Monographia Generum Aloes et Mesembryanthemi"

By William T. Stearn

(Lindley Library, Royal Horticultural Society, Westminster.)

JOSEPH Maria Franz Anton Hubert Ignaz zu **Salm-Reifferscheid-Dyck**, Reichs- und Altgraf, later Fürst, of Dyck, an enthusiastic cultivator and student of succulent plants, usually and more conveniently known as the Prince Salm-Dyck,¹ was born at Schloss Dyck, near Düsseldorf, in the Rhineland, north Germany, in 1773, and died at Nice, in 1861. He lost his father, the reigning Altgraf Franz Wilhelm, at the age of three. His mother saw to his education, first under private tutors, then at the Jesuit College in Cologne, and at the age of eighteen he felt himself sufficiently versed in worldly matters to marry a young Countess, Marie Therese von Hatzfeld; he divorced her in 1801. When the French revolutionary armies overran the Rhineland in the seventeen-nineties, Salm-Dyck offered no resistance. He lost his sovereign powers but, by treating hospitably Generals Jean Baptiste Kléber and Jean Baptiste Jules Bernadotte, later King Charles XIV. of Sweden, he contrived to retain his possessions undisturbed.

This friendship with the French determined his future life. He made frequent visits to Paris. There he met the French authoress, Constance Marie de Théis (1767-1845)—she had divorced her husband in 1799, and Salm-Dyck married her in 1803—and such distinguished botanists as Desfontaines, Antoine Laurent de Jussieu, Thouin and Thuillier, and that great botanical artist, Pierre Joseph Redouté. Some years before, Redouté had made paintings of succulent plants difficult to preserve in herbaria; he prevailed upon a young Swiss student, Augustin P. de Candolle, to write descriptions to accompany them. Under the title *Plantarum succulentarum Historia ou Histoire naturelle des Plantes grasses*, they were published

¹ The house of **Salm** took its name from its ancient stronghold, now in ruins, of Chateau-salm at Vielsalm in the valley of the river Salm, fifteen miles south of Spa, Belgium (prov. Luxembourg), and may be traced back to an eleventh-century Count Gisilbert of Luxembourg, whose son Hermann (d. 1088), a King of Germany from 1081 to 1088, was Count of Lower (Nieder) Salm in the Ardennes and Upper (Ober) Salm in the Vosges. Hermann's two grandsons divided the family territory, Heinrich founding the line of Obersalm (from which the branches of Salm-Salm, Salm-Neuburg, Salm-Kyrburg and Salm-Horstmar are derived), and Friedrich the line of Niedersalm or Altsalm. The direct line of Niedersalm ended with the death of Count Heinrich VII. in 1416; his possessions passed to Johann, Seigneur (Herr) of Ryfferscheid (or Reifferscheid, a stronghold about thirty miles north-east of Vielsalm) and of Dyck. The Counts (Grafen) of **Salm-Reifferscheidt** thus created gave rise to the Princes (Fürsten) of **Salm-Reifferscheidt-Raitz** (title granted in 1790), **Salm-Reifferscheidt-Krautheim** (title granted in 1804), and **Salm-Reifferscheid-Dyck** (title granted in 1816 to Joseph and his brother Francis by King Friedrich Wilhelm III. of Prussia); on the extinction of the last branch in 1888, Schloss Dyck passed to the branch of Krautheim, which then assumed the title of Salm-Reifferscheidt-Krautheim und Dyck. In botany the house is commemorated by the generic names *Salmia*, *Reifferscheidia* and *Dyckia*.

The biography of Salm-Dyck given here is based on *Wochenschr. Ver. Beförd. Gartenbau* 4, 145-148 (1861), *Bonplandia* 9, 331-334 (1861), *Allgemeine Deutsche Biographie* 30, 254-257 (1890), the family history on Fahne, *Gesch. Graf. Salm-Reifferscheid* (1866) *Allgemeine Deutsche Biographie* 30, 254 (1890), Ruvigny, *Titled Nobility of Europe*, 1275 (1914), *Almanach de Gotha*, 175, 298 (1938).



FIG. 6.

PORTRAIT OF SALM-DYCK.

Reproduced from E. Nelmes and W. Cuthbertson, *Curtis's Botanical Magazine Dedications, 1827-1927: Portraits and Biographical Notes*, 66 (1932), by courtesy of the Secretary of the Royal Horticultural Society.

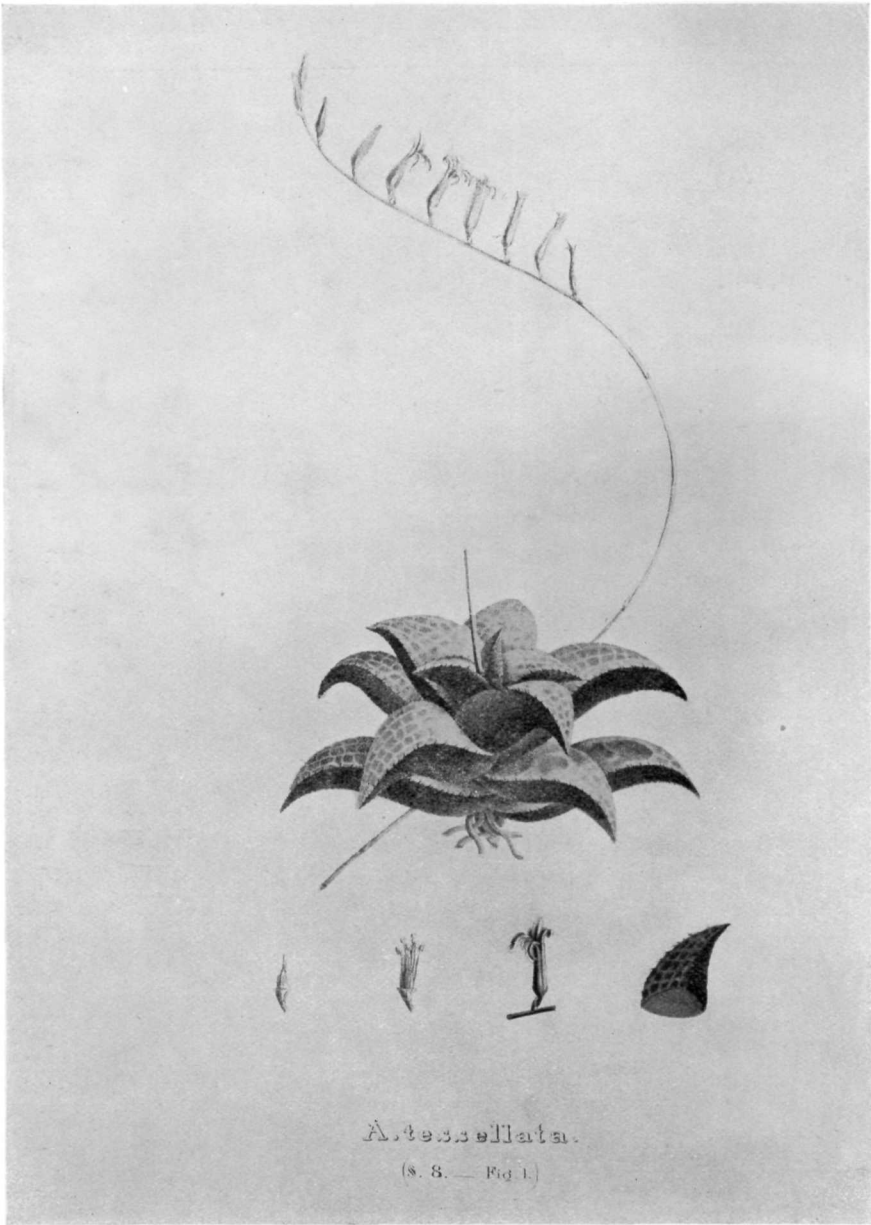


FIG. 7.
One of the Plates from Salm-Dyck's Monograph.
(Reduced to half-scale.)

in parts between 1798 and 1829.² These plates probably did more than anything else to interest Salm-Dyck in succulent plants. From Thuiller he had acquired a good knowledge of botany. He had a natural talent for drawing and painting, and lessons from Redouté made him an expert in the delineation of succulents. At Schloss Dyck he built glasshouses and gathered plants so successfully that his collection of cacti, aloes and mesembryanthemums soon became the finest in Europe. By 1835, according to James Forbes, the Duke of Bedford's gardener, who in that year made a tour through Germany, Belgium and part of France, the Prince's glasshouses needed rebuilding, but they contained many rare species. Forbes's *Journal* testifies that even then a zeal for the cultivation of cacti and other succulents was widespread in Germany.

The Prince was no mere collector. He studied his plants carefully, and his activity bore fruit in many publications :- *Catalogue raisonné des Espèces *** d'Aloes* (1817), *Observationes botanicae* (1820-1822), *Index Plantarum succulentarum in Horto Dyckensi* (1822 and 1829), *Hortus Dyckensis* (1834), *Cactae in Horto Dyckensi cultae Anno 1841* (1841), *Anno 1844* (1845), *Anno 1849* (1850), and articles in periodicals. His most important work is the *Monographia Generum Aloes et Mesembryanthemi, auctore Josepho Principe de Salm-Reifferscheid-Dyck* (Düsseldorf, 1836-1842; Bonn, 1849-1863), a collection of lithographed and partly hand-coloured plates accompanied by Latin descriptions. This beautiful work was issued in seven parts (fascicles). Each part contained a list of contents (Conspectus Fasciculi), but these lists, together with the original wrappers, appear to have been discarded by the binders of most copies. Hence the contents and dates of issue of the parts have hitherto been uncertain. Thanks to the Reginald Cory bequest, the Lindley Library of the Royal Horticultural Society possesses a copy complete with the seven lists and the plates grouped as issued. These establish the contents of the parts. Their dates of issue have been ascertained by searching contemporary journals for notices and reviews, and are tabulated below.

Salm-Dyck published only six parts, to which he contributed both text and plates. After his death in 1861, seventeen unpublished plates of Aloë were found. There was no text to go with them and the publishers accordingly issued them in 1863 without any. They provided title-pages for the work as a whole, but left it without an index. Hence the present paper.

Salm-Dyck divided both Aloë and Mesembryanthemum into numerous sections distinguished by numbers. The *Monographia* is not paged continuously. Instead, each sheet of text carries at the top the sectional number of the plant figured and described, followed by the number of the plate within that section. This unusual system of numbering was adopted in order that the text and plates of plants of the same section might be brought together and their chronological order abandoned on the completion of the work. The accuracy of Salm-Dyck's naming has been much questioned in recent years, but not the excellence of his draughtsmanship. His beautiful illustrations can never become out of date, but many of the names used by him have now been superseded. The genus Aloë, as he accepted it, is

² De Candolle's *Plantarum succulentarum Historia* seems to have been published as follows: Part 1, pls. 1-6, in Dec. 1798 or Jan. 1799; parts 2-4, pls. 7-24 in 1799; parts 5-9, pls. 25-54, in 1800; part 10, pls. 55-60, in Dec. 1800 or Jan. 1801; parts 11-14, pls. 61-84, in 1801; part 15, pls. 85-90, in 1801 or 1802; parts 16-18, pls. 91-108, in 1802; parts 19-24, pls. 109-138, in 1803; parts 25-28, pls. 139-159, in 1804 or 1805; parts 29-31 [pls. 160-182] in 1829.

now split into five genera, Mesembryanthemum into many more. Unfortunately this adoption of new names makes the plates and information published under the old names difficult to find. Luckily Salm-Dyck's plates were cited by Alwin Berger in his revision of *Liliaceae-Aloineae* (1908),³ and by N. E. Brown in his many critical notes on Mesembryanthemum published in *The Gardeners' Chronicle* (1921-1932) and elsewhere. The opinions of Berger and Brown as to the correct names of the plants figured have accordingly been entered below, in the right hand column of the index. When Brown died on November 26th, 1934, there were still many groups about which he had published little or nothing. The correct specific names for these remaining species, as indeed for some of those Brown commented upon, are somewhat doubtful. Hence it seemed best not to try and supply them here, but merely to indicate the modern segregate genus to which the plant figured is now referred. Even this was no easy task. However, the kind co-operation and industry of Mr. A. A. Bullock, of Kew, and Herr H. J. H. Jacobsen, of Kiel, has made possible the inclusion of provisional generic and specific names for these; I trust that other specialists will appreciate their effort to make Salm-Dyck's illustrations once again as useful as they are beautiful.

DATES OF PUBLICATION OF PARTS

Salm-Dyck seems to have been engaged upon the preparation of his work by 1819. In 1833 he issued a prospectus which is noted in Loudon's *Gardener's Magazine* **9**, 460 (1833) and in Otto and Dietrich's *Allgemeine Gartenzeitung* **1**, 71 (1833). Publication did not, however, begin until 1836. Reviews and notices in contemporary periodicals establish the issue of parts (fascicles) as follows:—

Fasc. **1**, published **1836** (in January) at Düsseldorf; listed in *Allg. Gartenz.* **4**, 30 (23rd January, 1836), J. C. Hinrichs, *Verz. Büch. Jan.-Juni 1836*, 194, *Flora Lit.* **6**, 33 (April, 1836), *Linnaea* **10**, Lit. 185 (1836); contents, 24 plates of Aloë, 36 plates of Mesembryanthemum, with Conspecti of Aloë and Mesembryanthemum.

Fasc. **2**, published **1837** (probably June) at Düsseldorf; listed in J. C. Hinrichs, *Verz. Büch. Jan.-Juni 1837*, 210, *Allg. Gartenz.* **5**, 232 (22nd July, 1837), *Linnaea* **11**, Lit. 221 (1837), Wikström, *Jahresb. Fort. Bot. in 1837*, 38 (1841); contents, 22 plates of Aloë, 36 plates of Mesembryanthemum.

Fasc. **3**, published **1840** (between July and October) at Düsseldorf; listed in J. C. Hinrichs, *Verz. Büch. Juli-Dec., 1840*, 210; *Proc. Hort. Soc., London*, No. 12, p. 191 (for 20th October, 1840); *Linnaea* **14**, Lit. 217 (1840), Wikström, *Jahresb. Fort. Bot., 1839-42*, 57 (1846); contents, 21 plates of Aloë, 36 plates of Mesembryanthemum.

Fasc. **4**, published **1842** (probably March) at Düsseldorf; listed in *Comptes-Rendus Acad., Paris*, **14**, 458 (for 21st March, 1842), *Allg. Gartenz.* **10**, 112 (2nd April, 1842), J. C. Hinrichs, *Verz. Büch. Jan.-Juni, 1842*, 207, Wikström, *Jahresb. Fort. Bot., 1839-42*, 57 (1846); contents, 20 plates of Aloë, 36 plates of Mesembryanthemum.

Fasc. **5**, published **1849** (probably May or June) at Bonn; listed in J. C. Hinrichs, *Verz. Büch. Jan.-Juni, 1849*, 190, *Bot. Zeitung*, **7**, 470 (29th June, 1849), *Journ. Hort. Soc., London*, **5**, vi. (for 2nd October, 1849); contents, 19 plates of Aloë, 35 plates of Mesembryanthemum.

³ "Liliaceae-Asphodeloideae-Aloineae" in Engler, *Das Pflanzenreich, IV.*, 38, III, II. (otherwise Heft 33); Leipzig, 1908.

Fasc. 6, published 1854 (probably June) at Bonn; listed in J. C. Hinrichs, *Verz. Büch. Jan.-Juni, 1854*. 204, *Bot. Zeitung*, 12. 562 (11th August, 1854), *Comptes-Rendus Acad., Paris*, 39. 701 (for 2nd October, 1854); contents, 14 plates of Aloë, 36 plates of Mesembryanthemum.

Fasc. 7, published 1863 (probably August) at Bonn; listed in J. C. Hinrichs, *Verz. Büch. Juli-Dec., 1863*. 248; publisher's preface dated "Julio anni MDCCCLXIII."; contents, 17 plates of Aloë, with general title-page and preface, but no descriptive letterpress.

The contents of fasc. 1-6 are listed by C. Mueller under Aloës in Walpers, *Annales Bot. Syst.* 6. 130-133 (1861) and under Mesembryanthemum in op. cit. 5. 16-22 (1858).

INDEX TO PLATES OF ALOË WITH THEIR DATES OF PUBLICATION

The plants grouped by Salm-Dyck in 29 sections (§) under Aloë are now placed in 5 genera as follows:—

§ 1-2 of Salm-Dyck	=	genus Aprica Willdenow.
§ 3-13	=	" Haworthia Duval.
§ 14	=	" Chamaealoe Berger (Bowicia Haworth, non Harvey).
§ 15-28	=	" Aloë Linné.
§ 29	=	" Gasteria Duval.

Abbreviations used below:—

A.—Aloë; Ait.—W. Aiton; D.C.—A.P. de Candolle; G.—Gasteria; H.—Haworthia; Haw.—A. H. Haworth; Jacq.—N. J. von Jacquin; Jacq. f.—J. F. von Jacquin, son of N. J. Jacquin; L.—C. von Linné; Lam.—J. B. P. A. de M. de Lamarck; Mill.—P. Miller; Poelln.—K. von Poellnitz; Roem. & Sch.—J. J. Roemer & J. H. Schultes; Salm—Joseph M. F. A. H. L. zu Salm-Reifferscheid-Dyck; Thunb.—C. P. Thunberg; trans. nov.—new transfer of epithet; var.—variety; Willd.—C. L. Willdenow.

Name adopted by
Salm-Dyck
(1836-1863)

§ Fig.	(Fasc. Fig.)	Date	Name adopted by Berger (1908)
18. 1	(4. 6)	1842	<i>A. abyssinica</i> Lam.
29. 11	(6. 12)	1854	<i>G. acinacifolia</i> (Jacq. f.) Haw.
27. 2	(7. 11)	1863	<i>A. africana</i> Miller
5. 1	(6. 2)	1854	<i>H. albicans</i> (Haw.) Haw. = <i>H. marginata</i> (Lam.) Stearn ⁴
11. 3	(1. 20)	1836	<i>H. altilinea</i> Haw.
11. 3β	(4. 4)	1842	<i>H. denticulata</i> Haw.

⁴ *Haworthia marginata* (Lam.) Stearn, trans. nov. *Aloë Africana humilis folio in summitate triangulari et rigidissimo, marginibus albicantibus* Commelin, *Praeludia Botanica*, 81, fig. 30 (1703), *Horti Med. Amstelæd*, Pl. 48 (1706). *Aloë marginata* Lamarck, *Encycl.* 1. 89 (1783) *Aloë albicans* Haworth in *Trans. Linn. Soc.* 7, 8 (1804); Ker-Gawler in *Bot. Mag.* 35, t. 1452 (1812); Salm-Dyck, *Mon.* §5, fig. 1 (1854). *Haworthia albicans* (Haw.) Haworth, *Synopsis Pl. Succul.* 91 (1812); Berger in Engler, *Pflanzenreich*, IV. 38. III. II. (Heft 33), 94 (1908).

FIGURES:—Commelin, *Praeludia*, fig. 30; *Bot. Mag.* t. 1452; Salm-Dyck, *Mon.* § 5, f. 1.; Berger, loc. cit. fig. 29.

Name adopted by Salm-Dyck (1836-1863)				Name adopted by Berger (1908)			
	§ Fig.	(Fasc. Fig.)	Date				
angulata	29.29	(5.16)	1849	<i>G. angulata</i> (Willd.) Haw.			
angustifolia	29.30	(5.17)	1849	<i>G. angustifolia</i> (Ait.) Haw.			
arachnoides	12. 2	(3.12)	1840	<i>H. arachnoides</i> (Ait.) Haw.			
arborescens	26. 3	(5. 6)	1849	<i>A. arborescens</i> var. <i>natalensis</i> (Wood & Evans) Berger			
aspera	2. 2	(3. 1)	1840	<i>Apicra aspera</i> (Haw.) Willd.			
asperiuscula	3. 2	(3. 3)	1840	<i>H. asperiuscula</i> Haw.			
asperula	9. 2	(1.19)	1836	<i>H. asperula</i> Haw.			
atrovirens	10. 2	(3.10)	1840	<i>H. atrovirens</i> (D.C.) Haw. = <i>H. herbacea</i> (Mill.) Stearn ⁵			
attenuata	6.12	(2.13)	1837	<i>H. attenuata</i> (Haw.) Haw.			
clariperla	6.12 β	(1.11)	1836	<i>H. attenuata</i> var. <i>clariperla</i> (Salm) Baker			
Bayfieldii	29.14	(4.11)	1842	<i>G. Bayfieldii</i> (Salm) Baker			
bicolor	29. 5	(7.15)	1863	<i>G. bicolor</i> Haw.			
Bowiea	14. 1	(1.24)	1836	<i>Chamaealoe africana</i> (Haw.) Berger			
Bowieana	29.3	(5. 9)	1849	<i>G. picta</i> Haw.			
brachyphylla	29.8	(3.21)	1840	<i>G. brevifolia</i> Haw.			
brevifolia	16. 1	(7. 2)	1863	<i>A. brevifolia</i> Haw.			
caesia	17. 3	(7. 5)	1863	<i>A. caesia</i> Salm			
candicans	29.13	(6.13)	1854	<i>G. candicans</i> Haw.			
carinata	29.20	(6.14)	1854	<i>G. carinata</i> (Mill.) Haw.			
chloracantha	13. 1	(1.22)	1836	<i>H. chloracantha</i> Haw.			
ciliaris	25. 1	(2.22)	1837	<i>A. ciliaris</i> Haw.			
coarctata	6.17	(1.13)	1836	<i>H. coarctata</i> Haw.			
Commelini	24. 5	(7. 8)	1863	<i>A. mitriformis</i> var. <i>Commelini</i> (Willd.) Baker			
concinna	3. 4	(4. 1)	1842	<i>H. viscosa</i> var. <i>concinna</i> (Haw.) Baker			
congesta	2. 1	(6. 1)	1854	<i>Apicra congesta</i> (Salm) Baker			
consobrina	18. 3	(7. 6)	1863	<i>A. consobrina</i> Salm			
conspurcata	29.31	(5.18)	1849	<i>G. conspurcata</i> (Salm) Haw.			
cordifolia	3. 1	(3. 2)	1840	<i>H. cordifolia</i> Haw.			
cymbaefolia	11. 1	(3.11)	1840	<i>H. cymbiformis</i> (Haw.) Haw.			
decipiens	29.16	(4.13)	1842	<i>G. decipiens</i> Haw.			
depressa	16. 3	(6. 4)	1854	<i>A. brevifolia</i> var. <i>depressa</i> (Haw.) Baker			
dictyodes	29. 4	(7.14)	1863	<i>G. retata</i> Haw.			
distans	24. 1	(6. 8)	1854	<i>A. distans</i> Haw.			
echinata	15. 2	(2.19)	1837	<i>A. humilis</i> var. <i>echinata</i> (Willd.) Baker			
Ecklonis	21. 2	(5. 5)	1849	<i>A. Ecklonis</i> Salm			
elongata	29.15	(4.12)	1842	<i>G. trigona</i> Haw.			
ensifolia	29.12	(7.16)	1863	<i>G. acinacifolia</i> var. <i>ensifolia</i> (Haw.) Baker			

⁵ *Haworthia herbacea* (Mill.) Stearn, trans. nov.

Aloë; *Africana*; *minima*; *atroviridis*; *spinis herbaceis numerosis ornata* Boerhaave, Index Alter Pl. Horto Acad. Lugd. Bat. 2 131 cum icona (1727). *Aloë herbacea* Miller, Gard. Dict., ed. 8, art. Aloe, no. 18 (1768). *Aloë arachnoides* β *pumila* Aiton, Hortus Kew. 1. 468 (1789); Ker-Gawler in Bot. Mag. 33. t. 1361 (1811). *Aloë atrovirens* De Candolle, Pl. Succul. Hist. 1. 51 (1800); Salm-Dyck, Mon. § 10, fig. 2 (1840). *Haworthia atrovirens* (DC.) Haworth, Revis. Pl. Succul. 57 (1821); Berger in Engler, Pflanzenreich, IV. 38. III. II. (Heft. 33) 110 (1908); Poellnitz in Fedde, Rep. Sp. Nov. 44. 222 (1938).

FIGURES:—Boerhaave, Index Alter, 131; Bot. Mag. t. 1361; De Candolle, Pl. Succul. Hist. t. 51; Salm-Dyck, Mon. §10, f. 2.

Name adopted by Salm-Dyck (1836-1863)				Name adopted by Berger (1908)			
	§ Fig.	(Fasc. Fig.)	Date				
erecta	6. 7	(4. 2)	1842	<i>H. margaritifera</i> var. <i>erecta</i>			(Haw.) Baker
excavata	29.22	(5.15)	1849	<i>G. excavata</i> (Willd.) Haw.			
fasciata	6.15	(2.14)	1837	<i>H. fasciata</i> (Willd.) Haw.			
major	6.15 β	(2.15)	1837	<i>H. fasciata</i> var. <i>major</i> (Salm) Berger			
ferox	27. 5	(4.10)	1842	? <i>A. supralaevis</i> Haw.			
flavispina	24. 2	(7. 7)	1863	<i>A. mitriformis</i> var. <i>albispina</i>			(Haw.) Berger
foliolosa	2. 4	(1. 2)	1836	<i>Apicra foliolosa</i> (Haw.) Willd.			
glabra	29.19	(5.13)	1849	<i>G. glabra</i> Haw.			
glabrata	6.13	(3. 7)	1840	<i>H. glabrata</i> (Salm) Baker			
concolor	6.13 γ	(5. 2)	1849	<i>H. glabrata</i> var. <i>concolor</i> (Salm) Berger			
perviridis	6.13 β	(5. 1)	1849	<i>H. glabrata</i> var. <i>perviridis</i>			(Salm) Berger
glauca	17. 2	(7. 4)	1863	<i>A. glauca</i> Miller			
granata	6. 6	(2.10)	1837	<i>H. margaritifera</i> var. <i>granata</i>			(Willd.) Baker
minor	6. 6 β	(1.10)	1836	<i>H. margaritifera</i> subvar. <i>minor</i>			(Salm) Berger
grandidentata	23. 4	(6. 7)	1854	<i>A. grandidentata</i> Salm			
guttata	29. 9	(5.11)	1849	<i>G. subnigricans</i> var. <i>glabrior</i> Haw.			
				= <i>G. pseudo-nigricans</i> var. <i>denticulata</i>			(Salm) Stearn ⁶
humilis	15. 1	(2.18)	1837	<i>A. humilis</i> (L.) Haw. var. <i>typica</i> Berger			= var. <i>Candollei</i> Baker.
hybrida	4. 4	(2. 7)	1837	<i>H. hybrida</i> (Salm) Haw.			
imbricata	1. 1	(2. 1)	1837	<i>Apicra spiralis</i> (L.) Baker			
incurva	15. 3	(2.20)	1837	<i>A. humilis</i> var. <i>incurva</i> Haw.			
intermedia	29.24	(4.16)	1842	<i>G. verrucosa</i> var. <i>intermedia</i> (Haw.)			Baker
laetevirens	10. 3	(4. 3)	1842	<i>H. laetevirens</i> Haw.			
latifolia	23. 3	(6. 6)	1854	<i>A. latifolia</i> (Haw.) Haw.			
lineata	17. 1	(7. 3)	1863	<i>A. lineata</i> (Ait.) Haw.			
Lingua	29.33	(5.19)	1849	<i>G. lingua</i> (Thunb.) Berger			= <i>G. disticha</i> (L.) Haw. sec. Poelln.
longiaristata	15. 7	(2.21)	1837	<i>A. aristata</i> Haw.			
maculata	29. 1	(3.18)	1840	<i>G. maculata</i> (Thunb.) Haw.			
margaritifera	6. 5	(3. 4)	1840	<i>H. margaritifera</i> (Mill.) Haw.			
micracantha	21. 1	(3.16)	1840	<i>A. micracantha</i> Haw.			
microstigma	26. 4	(6.11)	1854	<i>A. microstigma</i> Salm			
mirabilis	9. 1	(1.18)	1836	<i>H. mirabilis</i> (Haw.) Haw.			
mitraeformis	24.4	(6.10)	1854	<i>A. mitriformis</i> var. <i>xanthacantha</i>			(Willd.) Baker

⁶ *Gasteria pseudo-nigricans* (Salm) Haworth.

Aloë pseudo-nigricans Salm-Dyck, Cat. rais. d'Aloës, 17, 50 (1817). *Gasteria pseudo-nigricans* (Salm) Haworth, Revis. Pl. succul. 47 (1821) *Gasteria subnigricans* Haworth in Philosoph. Mag., new ser. 2, 351 (1827); Berger in Engler, Pflanzenreich IV. 38. III. II. (Heft 33) 139 (1908). *Aloë subnigricans* Sprengel, Caroli Linnæi Syst. Veg. 16ta, 2 71 (1825); Salm-Dyck, Mon. § 29. 10 (1849).

G. pseudo-nigricans var. *denticulata* (Salm) Stearn, trans. nov.

Aloë nigricans β *denticulata* Salm-Dyck, Cat. rais. d'Aloës, 17 (1817) *Gasteria subnigricans* β *glabrior* Haworth, loc. cit., 352 (1827); Berger, loc. cit. 139 (1908). *Aloë guttata* Salm-Dyck, Hortus Dyck. 332 (1834), Mon § 29. 9 (1849).

Name adopted by Salm-Dyck (1836-1863)				Name adopted by Berger (1908)			
	§ Fig.	(Fasc. Fig.)	Date				
mollis	29.38	(4.20)	1842	<i>G. mollis</i>	Haw.		
nigricans	29. 7	(3.20)	1840	<i>G. nigricans</i>	(Haw.) Haw.		
nitida	29.17	(4.14)	1842	<i>G. nitida</i>	(Salm) Haw. var. <i>grandipunctata</i>	(Salm) Haw.	
nobilis	24. 7	(7. 9)	1863	<i>A. nobilis</i>	Haw.		
obtusifolia	29.37	(4.19)	1842	<i>G. obtusifolia</i>	(Salm) Haw.		
papillosa	6. 4	(2. 9)	1837	<i>H. papillosa</i>	(Salm) Haw.		
parva	8. 2	(1.17)	1836	<i>H. tessellata</i>	var. <i>parva</i> (Roem. & Sch.) Baker		
pentagona	1. 4	(2. 4)	1837	<i>Apicra pentagona</i>	(Haw.) Willd.		
picta	23. 2	(6. 5)	1854	<i>A. obscura</i>	Miller.		
planifolia	11. 2	(5. 3)	1849	<i>H. planifolia</i>	Haw.		
plicatilis	28. 1	(5. 8)	1849	<i>A. plicatilis</i>	(L.) Miller		
pulchra	29. 2	(3.19)	1840	<i>G. pulchra</i>	(Ait.) Haw.		
purpurascens	22.2	(4. 8)	1842	<i>A. purpurascens</i>	(Ait.) Haw.		
Radula	6. 8	(3. 5)	1840	<i>H. radula</i>	(Jacq.) Haw.		
recurva	7. 3	(1.15)	1836	<i>H. recurva</i>	(Haw.) Haw.		
Reinwardti	6.16	(1.12)	1836	<i>H. Reinwardtii</i>	Haw.		
reticulata	10. 1	(3. 9)	1840	<i>H. reticulata</i>	(Ker) Haw.		
retusa	9. 3	(2.16)	1837	<i>H. retusa</i>	(L.) Haw.		
rigida	4. 3	(1. 8)	1836	<i>H. rigida</i>	(D.C.) Haw.		
<i>expansa</i>	4. 3 ^β	(1. 9)	1836	<i>H. rigida</i>	var. <i>expansa</i>	(Salm) Baker	
rugosa	6. 9	(2.11)	1837	<i>H. rugosa</i>	(Salm) Baker		
Salm-Dyckiana	27. 1	(5. 7)	1849	<i>A. Salm-Dyckiana</i>	Schultes = <i>A. principis</i>	(Haw.) Stearn ⁷	
scaberrima	29.26	(4.18)	1842	<i>G. verrucosa</i>	var. <i>scaberrima</i> (Haw.) Baker = <i>G. verrucosa</i>	var. <i>asperrima</i>	(Salm) Poelln.
scabra	7. 1	(1.14)	1836	<i>H. scabra</i>	Haw.		
semiglabrata	6. 2	(2. 8)	1837	<i>H. semiglabrata</i>	Haw.		
serrulata	20. 1	(3.14)	1840	<i>A. serrulata</i>	(Ait.) Haw.		
setosa	12. 3	(1.21)	1836	<i>H. setata</i>	Haw.		
succotrina	22. 1	(4. 7)	1842	<i>A. succotrina</i>	Lam.		
sordida	7. 2	(7. 1)	1863	<i>H. sordida</i>	Haw.		
spinulosa	24. 6	(4. 9)	1842	<i>A. mitriiformis</i>	var. <i>spinulosa</i> (Salm) Baker		
spiralis	1. 5	(1. 1)	1836	<i>Apicra pentagona</i>	var. <i>Willdenowii</i> Baker		
spirella	1. 3	(2. 2)	1837	<i>Apicra pentagona</i>	var. <i>spirella</i> (Haw.) Baker		
[quinguangularis]	1.3 ^β	(2. 3)	1837	<i>Apicra pentagona</i>	var. <i>spirella</i>]		
stenophylla	13. 2	(1.23)	1836	<i>H. angustifolia</i>	Haw.		
subalbicans	6. 1	(6. 3)	1854	<i>H. margaritifera</i>	var. <i>subalbicans</i> (Salm) Berger		

⁷ *Aloë principis* (Haw.) Stearn, trans. nov.

"*Aloe africana*" Salm-Dyck, Cat. rais. d'Aloes, 62 (1817) non Miller (1768). *Pachidendron principis* Haworth, Revis. Pl. succul. 37 (1821). *Aloë Salm-Dyckiana* Roemer & Schultes, Caroli a Linné Syst. Veg. 7. I, 710 (1829); Salm-Dyck, Mon. § 27. 1 (1849). *Aloë Salm-dyckiana* Berger in Engler, Pflanzenreich IV. 38 III. II. (Heft 33) 301 (1908)

FIGURES:—Salm-Dyck, Mon. § 27. 1; Berger, loc. cit. figs. 125, 126.

Name adopted by Salm-Dyck (1836-1863)				Name adopted by Berger (1908)			
	§ Fig.	(Fasc. Fig.)	Date				
subattenuata	6.11	(3. 6)	1840	<i>H. subattenuata</i> (Salm) Baker			
subcarinata	29.21	(5.14)	1849	<i>G. subcarinata</i> (Haw.) Haw.			
subfasciata	6.14	(3. 8)	1840	<i>H. subfasciata</i> (Salm) Baker			
subnigricans	29.10	(5.12)	1849	<i>G. subnigricans</i> Haw. = <i>G. pseudo-nigricans</i> (Salm) Haw.			
subrigida	4. 1	(1. 7)	1836	<i>H. tortuosa</i> var. <i>pseudo-rigida</i> (Salm) Berger			
subtortuosa	3. 5	(1. 5)	1836	<i>H. viscosa</i> var. <i>pseudo-tortuosa</i> (Salm) Baker			
subulata Salm ⁸ (1830, non 1822)	6.10	(2.12)	1837	<i>H. subulata</i> (Salm) Baker			
sulcata	29.32	(7.17)	1863	<i>G. sulcata</i> (Salm) Haw.			
supralaevis	27. 6	(7.12)	1863	<i>A. supralaevis</i> Haw.			
tenuior	25. 3	(3.17)	1840	<i>A. tenuior</i> Haw.			
tessellata	8. 1	(1.16)	1836	<i>H. tessellata</i> Haw.			
torquata	3. 6	(1. 6)	1836	<i>H. viscosa</i> var. <i>torquata</i> (Haw.) Baker			
tortuosa	4. 2	(2. 5)	1837	<i>H. tortuosa</i> (Haw.) Haw.			
major	4. 2 ^β	(2. 6)	1837	<i>H. tortuosa</i> var. <i>major</i> (Salm) Berger			
translucens	12. 1	(4. 5)	1842	<i>H. translucens</i> (Haw.) Haw.			
trigona	29.18	(4.15)	1842	<i>G. obtusa</i> (Salm) Haw.			
turgida	9. 5	(2.17)	1837	<i>H. turgida</i> Haw.			
umbellata	23. 1	(7.10)	1863	<i>A. saponaria</i> (Ait.) Haw.			
variegata	20. 2	(3.15)	1840	<i>A. variegata</i> L.			
verrucosa	29.25	(4.17)	1842	<i>G. verrucosa</i> (Mill.) Haw. var. <i>latifolia</i> Haw.			
virens	15. 8	(3.13)	1840	<i>A. virens</i> Haw.			
viscosa	3. 3	(1. 3)	1836	<i>H. viscosa</i> (L.) Haw.			
indurata	3. 3 ^β	(1. 4)	1836	<i>H. viscosa</i> var. <i>indurata</i> (Haw.) Baker			
vittata	29. 6	(5.10)	1849	<i>G. fasciata</i> (Salm) Haw.			
vulgaris	18. 2	(5. 4)	1849	<i>A. vera</i> L.			
xanthacantha	24. 3	(6. 9)	1854	<i>A. mitriformis</i> Mill.			
Zeyheri	29. 3bis	(7.13)	1863	<i>G. Zeyheri</i> (Salm) Baker			

⁸ Through a typographical error in *Obs. bot.* 1822, 1, which converted *subfasciata* into *subulata*, Salm-Dyck used the name *Aloe subulata* for two distinct species:

Haworthia subfasciata (Salm) Baker.

Aloë subulata Salm-Dyck, *Obs. bot.* 1822, p. 1 (1822); Roemer & Schultes, *Caroli a Linné Syst. Veg.* 7. I. 710 (1829). *A. subfasciata* Salm-Dyck in Roemer & Schultes, op. cit. 7. II. 1713 (1830); Salm-Dyck, *Mon.* § 6, 16 (1840). *Haworthia subfasciata* (Salm) Baker in *Journ. Linn. Soc. Bot.* 18. 204 (1880); Berger in Engler, *Pflanzenreich* IV. 38. III. II. (Heft 33) 90 (1908).

Haworthia subulata (Salm) Baker.

Aloë subulata Salm-Dyck in Roemer & Schultes, op. cit. 7. II. 1712 (1830); Salm-Dyck, *Mon.* § 6, 10 (1837). *Haworthia subulata* (Salm) Baker, loc. cit. 206 (1880); Berger, loc. cit. 92 (1908).

Under International Rules of Botanical Nomenclature, art. 61, the name *Aloë subulata* of 1822 would appear to invalidate the name *Aloë subulata* of 1830 applied to a different type. However, in 1830, and again in 1840, Salm-Dyck made it clear that the epithet *subulata* of 1822 was a misprint for *subfasciata*. As implied in International Rules, art. 70, a misprint has no status in botanical nomenclature. The misprint *subulata* of 1822 does not invalidate the later and deliberately published *subulata* of 1830.

SUPPLEMENTARY INDEX TO PLATES PUBLISHED UNDER ALOË

Aloë aristata § 15.7 (as *A. longiaristata*); *brevifolia depressa* § 16.3 (as *A. depressa*); *humilis echinata* § 15.2 (as *A. echinata*); *humilis incurva* § 15.3 (as *A. incurva*); *A. mitriformis* § 24.3 (as *A. xanthacantha*); *mitriformis albispina* § 24.2 (as *A. flavispina*); *mitriformis Commelinii* § 24.5 (as *A. Commelini*); *mitriformis spinulosa* § 24.6 (as *A. spinulosa*); *obscura* § 23.2 (as *A. picta*); *principis* § 27.1 (as *A. Salm-Dyckiana*); *saponaria* § 23.1 (as *A. umbellata*); *succotrina* § 22.1 (as *A. soccotrina*); ? *supralaevis* § 27.5 (as *A. ferox*); *vera* § 18.2 (as *A. vulgaris*).

Apicra aspera § 2.2; *congesta* § 2.1; *foliolosa* § 2.4; *pentagona* § 1.4; *pentagona spirella* § 1.3 (as *A. spirella*); *pentagona Willdenowii* § 1.5 (as *A. spiralis*); *spiralis* § 1.1 (as *A. imbricata*).

Chamaeloe africana § 14.1 (as *A. Bowiea*).

Gasteria acinacifolia § 29.11; *acinacifolia ensifolia* § 29.12 (as *A. ensifolia*); *angulata* § 29.29; *angustifolia* § 29.30; *Bayfieldii* § 29.14; *bicolor* § 29.5; *brevifolia* § 29.8 (as *A. brachyphylla*); *candicans* § 29.13; *carinata* § 29.20; *conspurcata* § 29.31; *decipiens* § 29.16; *disticha* § 29.33 (as *A. Lingua*); *fasciata* § 29.6 (as *A. vittata*); *glabra* § 29.19; *lingua* § 29.33; *maculata* § 29.1; *mollis* § 29.38; *nigricans* § 29.7; *obtusa* § 29.18 (as *A. trigona*); *obtusifolia* § 29.37; *picta* § 29.3 (as *A. Bowieana*); *pseudo-nigricans* 29.10 (as *A. subnigricans*); *pseudo-nigricans denticulata* § 29.9 (as *A. guttata*); *pulchra* § 29.2; *retata* § 29.4 (as *A. dictyodes*); *subcarinata* § 29.21; *subnigricans* § 29.10; *subnigricans glabrior* § 29.9 (as *A. guttata*); *sulcata* § 29.32; *verrucosa* § 29.25; *verrucosa asperrima* § 29.26 (as *A. scaberrima*); *verrucosa intermedia* § 29.24 (as *A. intermedia*); *verrucosa scaberrima* § 29.26 (as *A. scaberrima*); *Zeyheri* § 29.3 bis.

Haworthia albicans § 5.1; *altilinea* § 11.3; *angustifolia* § 13.2 (as *A. stenophylla*); *arachnoides* § 12.2; *asperiuscula* § 3.2; *asperula* § 9.2; *atrovirens* § 10.2; *attenuata* § 6.12; *attenuata clariperla* § 6.12β; *chloracantha* § 13.1; *ciliaris* § 25.1; *coarctata* § 6.17; *cordifolia* § 3.1; *cymbiformis* § 11.1 (as *A. cymbaefolia*); *denticulata* § 11.3β (as *A. altilinea denticulata*); *fasciata* § 6.15; *fasciata major* § 6.15β; *glabrata* § 6.13; *glabrata concolor* § 6.13γ; *glabrata perviridis* § 6.13β; *herbacea* § 10.2 (as *A. atrovirens*); *hybrida* § 4.4; *laetevirens* § 10.3; *margaritifera* § 6.5; *margaritifera erecta* § 6.7 (as *A. erecta*); *margaritifera granata* § 6.6 (as *A. granata*); *margaritifera granata minor* § 6.6β (as *A. granata minor*); *margaritifera subalbicans* § 6.1 (as *A. subalbicans*); *marginata* § 5.1 (as *A. albicans*); *mirabilis* § 9.1; *papillosa* § 6.4; *planifolia* § 11.2; *radula* § 6.8; *recurva* § 7.3; *Reinwardtii* § 6.16; *reticulata* § 10.1; *retusa* § 9.3; *rigida expansa* § 4.3β; *rugosa* § 6.9; *scabra* § 7.1; *semiglabrata* § 6.2; *setata* § 12.3 (as *A. setosa*); *sordida* § 7.2; *subulata* § 6.10; *tessellata* § 8.1; *tessellata parva* § 8.2 (as *A. parva*); *tortuosa* § 4.2; *tortuosa major* § 4.2β; *tortuosa pseudo-rigida* § 4.1 (as *A. subrigida*); *translucens* § 12.1; *turgida* § 9.5; *viscosa* § 3.3; *viscosa concinna* § 3.4 (as *A. concinna*); *viscosa indurata* § 3.3β; *viscosa pseudo-tortuosa* § 3.5 (as *A. subtortuosa*); *viscosa torquata* § 3.6 (as *A. torquata*).

(To be continued.)

Amateur Cactus Collectors and Specialisation

By the Rev. F. C. Champion

ON looking over my Cactus collection in the small greenhouse in which it is housed, I was led to ask myself: What am I going to do when these, or at least some of these, grow to their normal size? Either it means a larger greenhouse, or it means dispensing with the larger varieties. Already I have some very large species constituting a definite problem. I imagine that there must be many more with a confined space in a similar predicament. It appears to me that the only way out of the difficulty is by specialising in the smaller species.

For the best returns in the way of bloom may I suggest *Lobivias* and *Rebutias*. They are not only free in blooming, at least so is my experience, but they are pretty little compact plants. Of course, there are others, *Mammillaras* for example. A collection of these alone can prove a great joy and give a good bloom. The smaller varieties of *Cereus* again make an interesting collection.

If we turn to succulents, there are several varieties which demand only limited space, a collection of various kinds of *Sempervivums* or the smaller *Echeverias*.

By careful collection of just one or two special cacti or succulents, the problem of a limited space can be overcome. I throw out this suggestion in the hope that it might help some ardent collectors of these wonderful plants who have only a small greenhouse, or at best, only a sunny window and who, feeling that limited space, are going to cramp their collection and allow their interest to languish and die.

Editorial

WE are glad to be able to record that the *Cactus Journal*, in its new form, appears to have met with general approval. The second number of Volume VII. shows an increase in size of twelve pages. One reason for this is that we are fortunate in being able to publish a valuable article on Salm-Dyck's historic *Monograph*; this will be of great assistance to anyone interested in the nomenclature of the *Aloes*, *Haworthias* and *Gasterias*, and of the *Mesembryanthemums* (to follow in Volume VII., No. 3), for it clears up the difficulties that have always confronted workers who wished to refer to the *Monograph*.

It is unlikely that the increased size will be regularly maintained, but, if more members would send in contributions, an endeavour would be made to provide a larger *Journal* each quarter.

The Manuring of Cacti

By B. S. Williams

(Read at the Meeting on September 13th, 1938.)

JUDGING from the animated discussion that ensued when I exhibited a few plants at a meeting last Autumn, the manuring of cacti is a subject which seems to divide the members into two distinct schools of thought, the pro's and the very anti's. The plants then shown were noteworthy for greater development of spines or freer growth, or both. The discussion that followed was of the greatest interest to me, as the pro-ites seemed to think all would be well and the anti-ites forecast the loss of plants during the difficult winter months. Happily for me the latter were wrong—but more of this later.

In case anyone may not have read the notes published in the Society's *Journal* of September last year, perhaps I may be allowed to give a brief recapitulation. My perverse and unbelieving nature prompted me to try a rich compost for cacti as I had read and been told that when the roots of cacti come in contact with manure, rot sets in and the plants die. Frankly I do not believe this and, in view of the fact that so many German cactus growers recommend the use of old cow dung in the potting medium, I thought I would experiment and treat my plants to a rich diet. A good loam was used, embodying a liberal amount of manure of high nitrogenous content. Full details of the compost are given in the *Journal* article. In the conclusion, I asked whether these plants were going to collapse and rot during the winter. The answer to this question is the purpose of the present paper. So we can continue the story from where the notes left off.

As is usual with most, if not all, cactus growers, watering was eased off at the end of August and the plants gradually brought to a period of rest. I consider, if bloom is looked for, that a good rest is essential. The collection is kept on zinc trays containing a layer of wet granite chips. These chips were not allowed to dry out during the winter but kept on the moist side. Owing to the porosity of the pots and capillary action, the base of the pot was always damp, the soil at the top of the pot, however, was dry. Overhead spraying was given on suitable days. The thermostat was set at 40 degrees F., so that the minimum did not fall below this figure. As winter set in, some of the plants started to contract, and eventually many were quite shrivelled, but this need give no cause for alarm as, when watering is resumed, plants start to plump up when root action commences.

One point was very noticeable, that owing to the slight moisture available at the roots, the root system was found to be in good living condition when plants were repotted. There is another advantage in keeping roots on the moist side, root bugs dislike it and are much less in evidence in plants kept as I have described. If you wish to give root bugs the conditions under which they thrive, then give them a very dry shelf and burnt clay and brick; they are perfectly content then and will thrive amazingly. I do not wish it to be thought that by keeping roots moist you can exterminate root bug, but they certainly do not multiply so freely as when given dry conditions.

As autumn advanced towards winter, I kept an anxious eye on the collection, as there was always a thought that the doleful prophets might be right after all, but

as the winter advanced the plants continued in health, and hope and confidence soon allayed the doubts. When spring arrived I had lost only two plants, which cannot be regarded as anything but normal, as I generally lose a plant or so each winter.

I mentioned that the thermostat was set at 40 degrees F.; it will be remembered that in early March we enjoyed a period of warm, sunny weather, and then the thermostat was raised to 48 degrees F. and kept at this until heat was no longer necessary. In my notebook I have some records of the maximum day temperatures in the greenhouse during this warm spell, March 6th—84 degrees, 7th—82 degrees, 8th—80 degrees. Such glorious weather did much towards helping the plants into growth again, though many had shown signs earlier than this.

I should like to give some extracts from the notebook :—

February 21st.—First signs of flower buds developing on *Rebutia Marsoneri*.

February 27th.—Started watering by giving small quantity to all established plants, and on this day I commenced repotting.

March 2nd.—Flower buds noted on *Rebutia minuscula*, and by March 5th the watering was in full swing.

March 8th.—*Rebutia chrysacantha* developing a large number of buds. (This plant was exhibited at a meeting in full bloom later on; I noted two series of blossoms, nineteen in the first and four in the second, making twenty-three in all. My plant is similar in size to the photograph reproduced in a German grower's catalogue; his plant musters only three blooms, and as we can assume this was not his poorest plant, we can take it as evidence that the twenty-three flowers on my plant were the result of rich feeding.)

To return to the notebook :—

March 16th.—*Pseudolobivia aurea* commenced to produce silky flower tufts, flower buds noted as forming on *Lobivia Nealeana*, *Allegraiana*, *Mediolobivia nidulans*, *Pygmeolobivia brachyantha*, *Lobivia famatimensis*, *L. achatina* and *Backbergii*.

March 21st.—The effect of fine weather and watering now evident as, with few exceptions, the plants are in full growth.

April 4th.—*Strombocactus disciformis* in flower.

But rather than bore you with any more daily extracts from the notebook, I will give you a list of plants with the buds I counted on April 26th, when *Rebutia Kupperiana*, *minuscula* and *Marsoneri* each commenced opening their flowers.

R. chrysacantha, nineteen in the first series, four in the second (more were later developed in the second series).

R. Kupperiana, fourteen in the first series and nineteen in the second.

R. senilis var. *longispina*, forty-two buds.

R. elegans, nineteen buds.

R. aureiflora, eighteen in the first series and fifteen in the second.

R. minuscula, thirty, more were present but uncountable owing to clusters of offsets.

R. deminuta, two buds.

R. pseudodeminuta var. *Schneideriana*, three buds (these two plants were newly acquired).

R. Reichii, five buds on a small plant 1 in. in diameter.

R. citricarpa, eighteen buds.

R. violaciflora, two buds, a shy but perfectly lovely bloomer.

R. aureiflora var. *albiseta*, six buds in the first series, four in the second.

Lob. Backbergii, thirty-five buds.

Mediolob. Walteriana, ten buds.

Lob. achatina, five buds.

Lob. Nealeana, eight buds, and four buds on a second plant.

Lob. cabradai var. *aureiflora*, fifteen buds.

I am afraid I cannot give you the full list as I got tired of counting, but I can say that, in a small greenhouse, 9 ft. x 6 ft., I had literally hundreds of blooms this year. Lovely flowers have been out since April, and even now flowers are developing on certain Echinopses. This extreme floriferousness is due to certain factors, (a) I am now growing plants that will flower, chiefly Rebutias, Echinopses and Lobivias, (b) a good resting period, following (c), the rich diet to which I attach great importance.

I have heard members condemn the manuring of cacti as unnatural. I would counter this by saying there is no one who can grow cacti naturally in this country; even if it were possible to reproduce the desert or mountain soils and habitats, with very few exceptions we have to protect our plants with glass and, moreover, it is impossible to reproduce ecological factors, atmospheric pressure and atmospheric humidity or the lack of it, so I maintain that anything we can do to assist growth and flower production should be done, as it is only when plants are comfortable that they will grow and flower well.

There is one more point I should like to make; I have shown you plants in which growth is assisted and spines more strongly developed by reason of rich soil, but such is not always the case as I have found many plants do not respond in this manner. When I had Mammillarias, I could not see any difference in the spines after manuring, though all seemed to grow and flower well. Taken as a whole, Echinocacti, Opuntias and certain Cerei show marked increase in spine development, but within these groups certain species show but little response. The response of cacti to manure would form a most interesting line of investigation, but it needs someone with a very comprehensive collection and more time to devote to it than I have.

From what I have said, you will have seen that any of you who care to experiment with manures need have little fear that you will lose your plants provided you keep them cool and give them but little water during the Winter, and I feel sure you will be encouraged by the shiny and healthy appearance they take on and, in the species that flower, by the extra wealth of blossom they will yield, and moreover you will be struck by the contrast when compared with the dull, lifeless-looking specimens one so often sees, condemned to slow starvation in a pot of brick dust and burnt clay.

I should like to acknowledge my indebtedness to Mr. Victor Stansfield for his kindness in taking the photographs of *Lobivia Wrightiana* and *Rebutia Fiebrigii*, and to my colleague, Mr. W. F. Buck, who is responsible for the picture of *Rebutia aureiflora*.



FIG. 8.

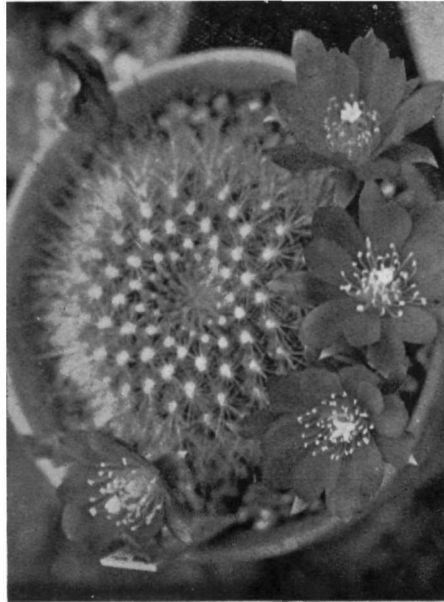


FIG. 10.

FIG. 8.—*Lobivia Wrightiana*. Showing spine formation.

FIG. 9.—*Rebutia Fiebrigii*.

FIG. 10.—*Mediolobivia aureiflora*.



FIG. 11.
Opuntia elata, fruit bearing flower.



FIG. 12.
Alluandia procera.

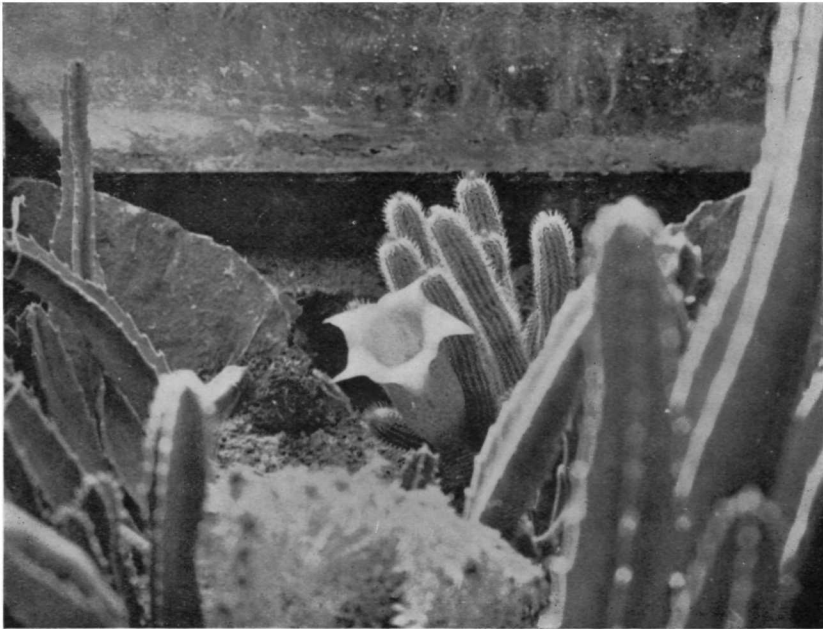


FIG. 13.
Tavaresia grandiflora.

Proliferous Fruits

By C. W. Armstrong

THE fruits of the *Opuntia* family are frequently found producing other fruits one on another until they produce a regular chain or form a bunch similar to a cluster of grapes. *Opuntia fulgida* is a striking instance; these fruits, when detached and planted, readily take root and produce other fruits and branches, and are a pleasing curiosity in a collection. The accompanying illustration (Fig. 11) is a rooted fruit of *Opuntia elata* in a 3 in. pot; the flower is a brilliant deep orange. I have one three years old with one extra fruit and eleven branches. Almost any *Opuntia* fruit will root if not too ripe.

Notes on Two Interesting Plants

By Thomas Sharp

ALLUANDIA PROCERA.—MADAGASCAR.

THE plants shown in Fig. 12 were cuttings last year; they rooted and made an inch of growth, which this year has reached $6\frac{1}{2}$ in. The compost used was loam, a little peat, and liberal sand; the conditions they like are heat, humidity and partial shade, though the last is probably not necessary.

Alluandia procera is a member of the family Didieraceae and comes from Madagascar, where three other species of this genus occur. The plant has an unusual arrangement of spines and leaves, and is related to the rare *Didiera mirabilis*, which also occurs in Madagascar.

Note.—On p. 11 of the *Cactus Journal*, Vol. VII., No. 1, the plant referred to should have been *Alluandia* and not *Allamanda*; the Madagascan plants there referred to thrive with increased shade, plus humidity.

TAVARESIA GRANDIFLORA.—AFRICA.

This plant reached me in the Spring of last year, and made six growths. This year it has made nine, ranging in height from $1\frac{1}{2}$ to $3\frac{1}{2}$ in., and the flower shown in the photograph, Fig. 13. It is kept very near the glass, facing south-west; the duration of incidence of the sun now—October—is three and a half hours. It is grown in a sandy compost of loam, peat and broken pot, $2\frac{1}{2}$ to 3 in. deep on a small bench. Beneath the bench, some 15 in. distant, is a 1-in. hot-water pipe, heated from September to the following June; the general temperature is that of an intermediate house.

Description of *Conophytum* Species

(Continued.)

By Mrs. Louisa Bolus

EXPLANATION OF COLOURED PLATE

PLATE 4.—This plate deals mainly with species belonging to the section *Biloba*, having pink or white petals, and the rest have been added to fill the available spaces.

A. *Conophytum blandum* L.Bol., Mesemb. III., p. 88 (1937).—The type-material of this species (and no other collection since Mr. P. van Heerde's has been recorded) is velvety to the touch all over the body and shows no signs of spots, in which respects it resembles *C. regale*, the other large-flowered, densely petalled species in this group. As in the latter, too, there are staminode-like innermost petals and an absence of style. Otherwise the two species are readily distinguished from each other, not only by the appearance of the body, but by the bracts, which are much more foliaceous in *C. regale* than in *C. blandum*.

Fig. 1, a body and do., with fl., side view; 2, do., opened, with portion of fl; 3, calyx; 4, bracts; 5, corolla-segments—nat. size; 6, long, section through portion of fl. x 3.

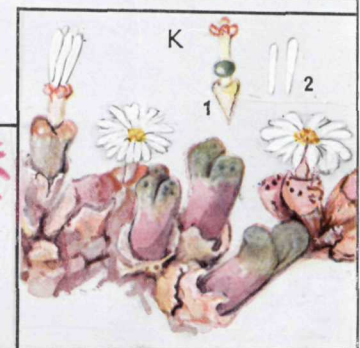
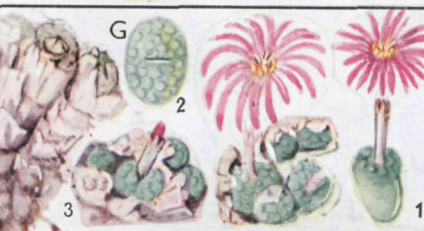
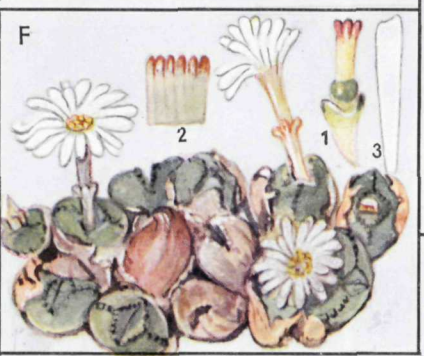
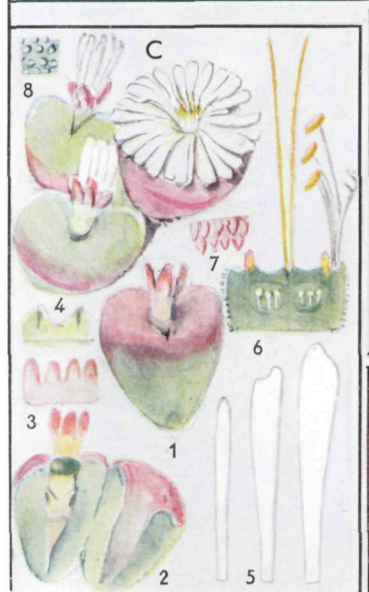
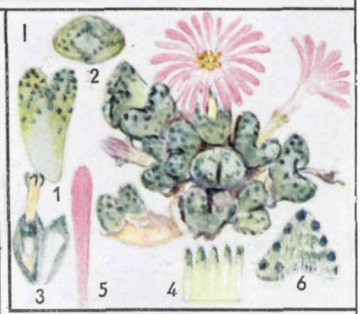
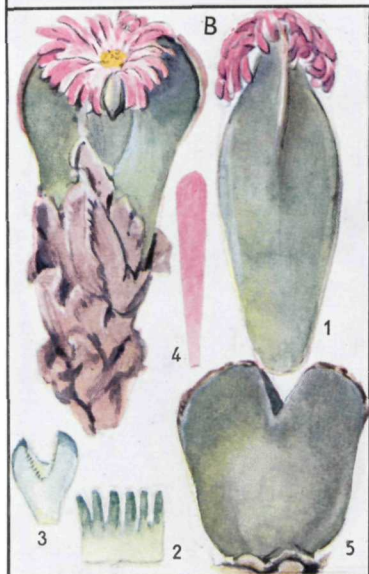
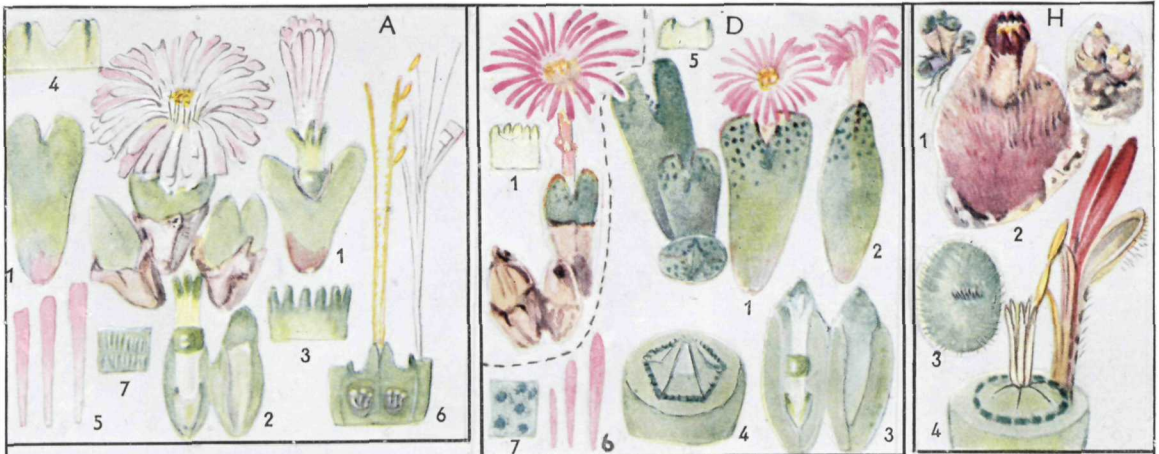
B. *Conophytum regale* Lavis, Mesemb. II., p. 469 (1934).—The drawing represents a portion of the type, collected by Mr. P. van Heerde at Ratelport, near Ookiep, which flowered in the Stellenbosch University Gardens in June, 1934. A subsequent collection is Dr. J. Luckhoff's, north of Springbok on the road to Steinkopf, in clefts of rocks. As well as being the largest of the pink-petalled species of the section *Biloba*, it is the most evidently hairy. The lobes also have the most conspicuously marked margins and keel.

Fig. 1, body, with fl., back view; 2, calyx; 3, bracts; 4, corolla-segment; 5, body, side view—nat. size. See also Plate 4a, B.

C. *Conophytum concavum* L.Bol., Mesemb. III., p. 23 (1936).—In the velvety surface of the body, the general look of the flower, and the absence of a style, this species resembles *C. blandum* and *C. regale*; but, although the body is more or less concave on the upper surface, there is no "lobing", and the species belongs to the section *Euconophyta*. The papillae round the orifice are more or less elongated, and those on the sides of the body, rounded and glistening. The drawing was made from material got in the same locality as the type by Mr. P. van Heerde and grown in his garden at Springbok. The bodies are smaller and the stigmas much longer than in the type-specimen.

Fig. 1, body with portion of fl.; 2, do., opened; 3, calyx; 4, bracts—nat. size; 5, petals; 6, long section through portion of fl.—x 3; 7, papillae from near orifice; 8, papillae from side of body—enlarged.

D. *Conophytum marginatum* Lavis, S.A. Gard., vol. XX., p. 22 (1930).—The drawings were made from two collections of Mr. P. Ross Frames in Bushmanland, between Springbok and Pofadder, which flowered at Kirstenbosch, the left-hand



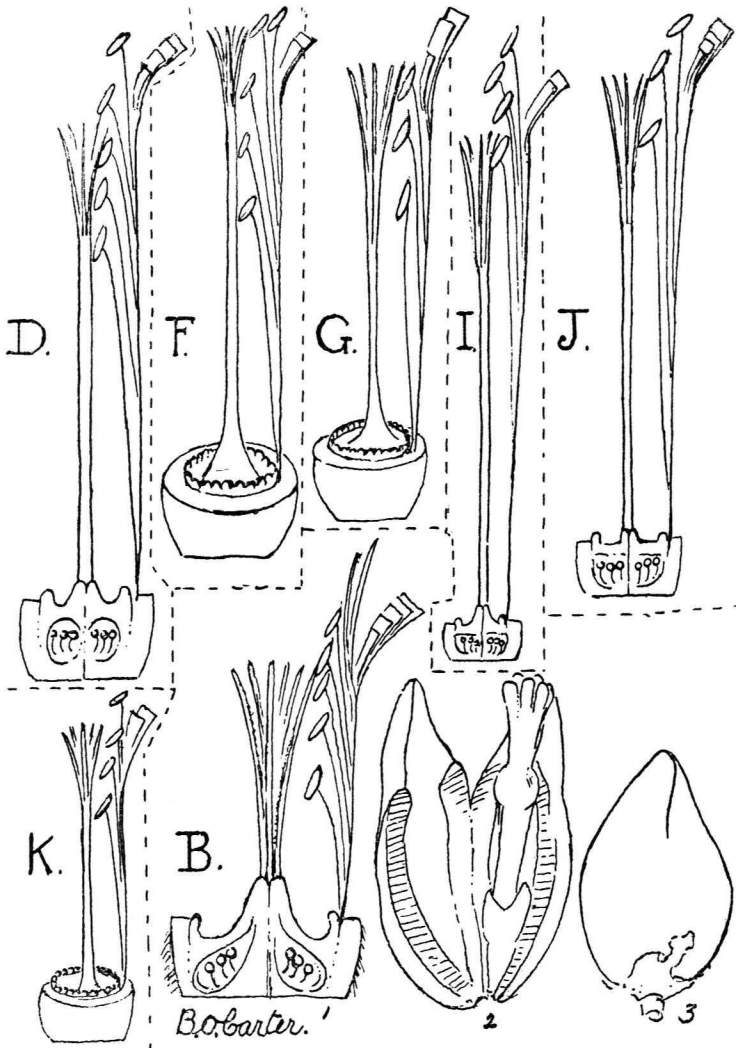


PLATE 4a.

- D. *Conophytum marginatum* Lavis. Long. section through portion of fl. x 5.
- F. *Conophytum* sp.—Long. section through portion of fl. x 5.
- G. *Conophytum Fulleri* L. Bol.—Long. section through portion of fl. x 4.
- I. *Conophytum eenkokerense* L. Bol.—Long. section through portion of fl. x 5.
- J. *Conophytum violaciflorum* Schick et Tisch.—Long. section through portion of fl. x 5.
- K. *Conophytum Primosii* Lavis.—Fig. 1, long. section through portion of fl. x 4; 2, body, opened, with portion of fl.; 3, do., back view—nat. size.

being from the type-material. The red of the margins, conspicuous in the earlier collection and suggesting the specific name, varies in intensity and is sometimes absent.

Fig. 1 (left), calyx; 1 (right) body with fl., side view; 2, do., back view 3, do., opened, with portion of fl.—nat. size; 4, portion of gynaecium with disk x 5; 5, bracts, nat. size; 6, corolla-segments x 2; 7, portion of dotted surface of lobe. See also Plate 4a, D.

E. *Conophytum turrigerum* N.E.Br., *Gard. Chron.*, vol. 72, p. 124 (1922).—The type of this species is Mr. N. S. Pillans's collection on the Paardeberg in the Malmesbury Division, and until quite recently no other localities were known. Now it is recorded from the outskirts of Malmesbury itself and from the Paarlberg, in all cases growing on granite and inconspicuous, when not in flower, among the lichens and mosses with which it is associated. It was described without flowers, the specific name referring to the angular turret-like lobes, which vary considerably in size and somewhat in shape, but the angles are generally well defined and conspicuously dotted. The plants figured are wild and from the type-locality, where they flower in February.

Fig. 1, body, side view; 2, do., opened, with portion of fl., remains of previous year's body and fruit—nat. size; 3, calyx x 2; 4, corolla-segments x 4; 5, corolla, nat. size; 6, long section through portion of fl., x 4; 7, 8, 9, portions of plants showing variations—nat. size.

F. *Conophytum* sp. The drawing represents a plant got by Mr. H. Herre in the neighbourhood of Springbok, which flowered in the Stellenbosch University Gardens (No. 8356) in April, 1932. No description was made at the time and the plant has since died. It is hoped the publication of this drawing may lead to its being collected again. The affinities are with *C. violaciflorum* Schick et Tisch and *C. longibracteatum* L.Bol., and it is from the same locality as the former.

Fig. 1, portion of fl.; 2, calyx—nat. size; 3, corolla-segment x 3.

G. *Conophytum Fulleri* L.Bol., *Mesemb. II.*, p. 62 (1929).—This species is easily recognised by the more or less regularly disposed wart-like pustules which are themselves minutely punctate. The type-plant from the vicinity of Kakamas, on the Orange River, as seen from above formed a flat mat several inches in diameter, and was an impressive sight at Kirstenbosch in the Autumn of 1929, when with its dark green pustulate bodies emerging in all stages from their white resting-sheaths and bursting into pink flowers. Thus do the *Conophyta* also turn the South African Autumn into Spring. The drawings represent portions of the type-plant, named after its discoverer, Mr. E. R. Fuller.

Fig. 1, body, with fl.; 2, do., viewed from above; 3, portion of plant showing branches lengthened by age and bearing the persistent sheaths of several previous years—nat. size. See also Plate 4a, G.

H. *Conophytum pubicalyx* Lavis, *Mesemb. II.*, p. 401 (1933).—This pigmy is probably the smallest *Conophytum* yet recorded. It was discovered by Mrs. J. Luckhoff near Nieuwefontein, in the Rhynsdorp Division, growing on open slopes of "a snow-white quarter-pebbled hill." The flowers are nocturnal, and the colour of the petals is unusual in the genus and not commonly associated with night-flowers.

The specific name alludes to the pubescent calyx, a condition very rarely found in the genus.

Fig. 1, plant, nat. size; 2, body, with fl.; 3, do., viewed from above—enlarged; 4, portion of fl. x 12.

I. **Conophytum eenkokerense** L.Bol., Mesemb. III., p. 89 (1937).—This species is closely allied to *C. violaciflorum*, differing in the longer and more convex lobes of the body which are rounded at the apex and scarcely keeled. The specific name refers to the locality of the type, a place known as Eenkoker (i.e. one koker) by reason of there being a solitary kokerboom (*Aloe dichotoma*, the tree-Aloe of Namaqualand) visible.

Fig. 1, body, side view; 2, do., viewed from above; 3, do., opened, with part of fl.; 4, calyx—nat. size; 5, petal x 2; 6, upper surface of lobe—enlarged. See also Plate 4a, I.

J. **Conophytum violaciflorum** Schick et Tisch., Möll. Deutsche Gart. Zeit., Vol. 43, p. 238 (1928).—With this species must be united *C. geometricum* Lavis, published in 1934. A drawing of the type of the latter is given on the right. The remaining figures are from a collection of Mr. L. E. Taylor, made near Springbok, in 1935, which flowered at Kirstenbosch, in April, 1937.

Fig. 1, body with fl.; 2 (left), do., opened, with portion of fl.—nat. size; 2 (right), bracts x 2; 3, calyx, nat. size; 4, petals x 3; 5, gynaecium and disk x 5. See also Plate 4a, J.

K. **Conophytum Primosii** Lavis, Mesemb. II., p. 267 (1931).—This species has been compared with *C. pellucidum* Schwant. (*C. elegans* N.E.Br.); but it is also very near *C. Roodiae* N.E.Br., apparently a rare plant which does not seem to have been collected since Mrs. E. Rood discovered the type near Van Rhynsdorp. *C. Primosii* was found by Mr. R. Primos at Mesklip, in the mountains near Kom-maggas, and differs chiefly from *C. Roodiae* (which we only know from the description and figure) in having a long style and 4 series of stamens, whereas in the latter there is no style and only 2 series of stamens.

Fig. 1, portion of fl.; 2, petals, nat. size. See also Plate 4a, K.

DATES OF MEETINGS IN 1939.

February 7th.	July 18th.
March 7th.	September 12th.
April 4th.	October 10th.
May 2nd.	November 28th.

The Exhibition will be held on June 20th and 21st, 1939.

FIXTURES.

February 7th.—ANNUAL MEETING.

March 7th.—Mrs. Russell will give a talk on Grafted Plants.

Haworthia Tuberculata V.P. and its Varieties

By Dr. Karl von Poellnitz

(Oberlödla, Germany.)

(Photos: Archiv Botan. Museum, Dahlem.)

1. *Haw. tuberculata* v.P. in Fedde, Repert. XXIX. (1931) 219 et XLIV. (1938) 218; J. R. Brown in Desert Pl. Life VII. (1935) 94, with fig.—“This *Haworthia* in its natural environment seems to be of a uniform brownish-green hue, even the tips of the tubercles being dull in colour except where rubbed. This is caused by a coating of fine soil particles which entirely covers the leaf surface except the tips of the tubercles. Upon cleansing a leaf it is found that the leaf, including the tubercles except the tips, is densely covered with minute papillae or glands, as the plant is evidently quite viscid under certain conditions and only the windows of the tubercles are exposed to the light.” (J. R. Brown, l.c.)—Stem up to 7 cm. long, leafy. Leaves numerous to rather numerous, up to about 7 cm. long, up to 2½ cm. broad towards the base, erect, mostly somewhat curved inwards towards the tip, more or less curved laterally like a sickle, margins tubercled up to the tip. Oudtshoorn, 1930, Mrs. D. van der Bijl, type; Mrs. G. Morris (=Stellenbosch 24); Mr. J. R. Long 471; Mrs. Lategan (=Triebner 1161).—Calitzdorp, 1932, H. Maughan Brown; Mrs. G. King in litt.—Rust en Vrede, Oudtshoorn Distr., Mrs. G. Morris in litt.

2. var. *acuminata* v.P. in Fedde, Repert. XLIV. (1938) 219.—Always stemless. Leaves mostly less numerous, smaller, 2-4 cm. long, about 1 cm. broad or a little broader towards the base, mostly very acuminate, erect, sometimes somewhat incurved towards the tip, not or only very inconspicuously curved laterally, margins with tubercles to the tip.—Keurbooms River Heights, Long Kloof, Uniondale Distr., C. H. F. Wooley (=Long 394), type.—Redcliffe, between Misgund and Avontuur, Long Kloof, solitary or in small clumps, 1935, Miss Frances Archibald 374.—Between Uniondale and Knysa, Mr. Lategan (=Triebner 1138—I.).—Uniondale, Stellenbosch 7711.—Between Avontuur and Uniondale, 4000 8, F. J. Stayner (=Long 619).

3. var. *sublaevis* v.P. in Fedde, Repert. XLIV. (1938) 219.—Stem evident in adult plants, leafy. Leaves numerous, erect, incurved towards the tip, distinctly curved laterally, mostly very acuminate, mostly with a sharp keel on the back; margins and keels from about the middle or towards the tip horny-rough, without tubercles, with a smooth, horny margin at the tip; tubercles of both sides less prominent, mostly somewhat oblongish, their longer axis in the longitudinal axis of the leaf.—Oude Muragie near Great Brak River, Mrs. S. Blackburn (=Triebner 1062).—West and south of Oudtshoorn, Mrs. Lategan (=Triebner 1164).

4.—var. *subexpansa* v.P. var. nov.—Differt foliis subexpansis.—Leaves less numerous, up to 7 cm. long, gradually and lengthily acuminate, very concave on the face, with tubercled margins and keels, somewhat expanded, only a little curved laterally. Stemless.—Ladismith, Mr. Joubert (=Triebner 813=Stellenbosch 7691), type; Mrs. G. King in litt. This variety flowers at Windhoek, in July, i.e. two months before all other forms.



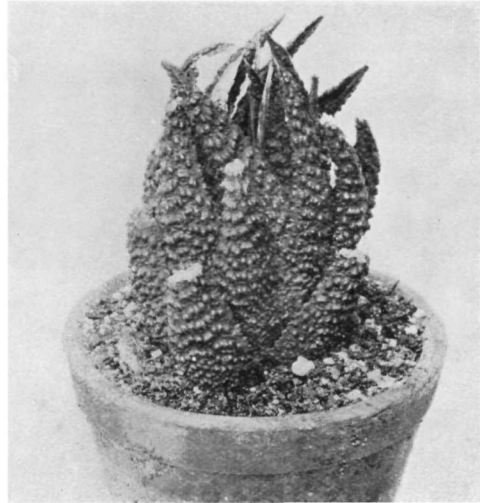
Haworthia tuberculata var. *subexpansa*
v.P. (Triebner 813).



Haworthia tuberculata var. *acuminata*
v.P. (Long 394).

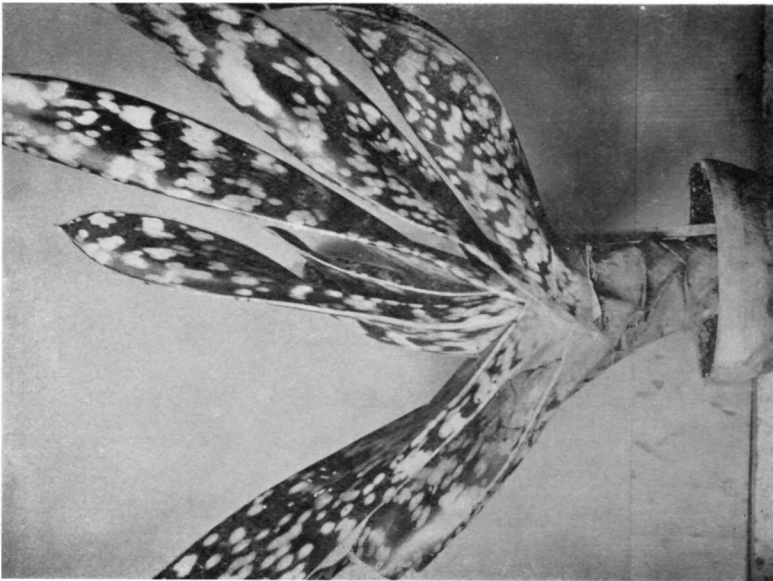


Haworthia tuberculata var. *sublaevis*
v.P. (Triebner 1164).

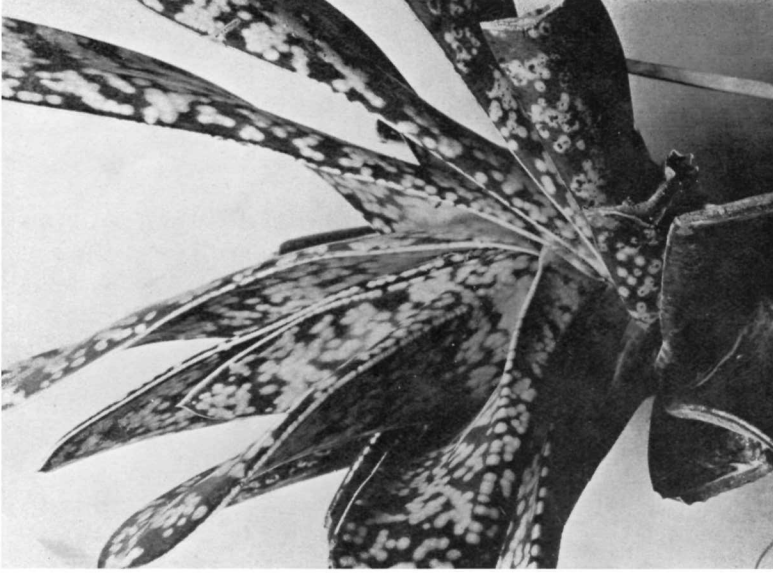


Haworthia tuberculata
v.P. (Triebner 1161).

FIG. 14.



Young Plant.



Adult Plant.

FIG. 15.
Gasteria maculata var. *Dregreana* Berg.

Key to these forms:—

1. Keels and margins tubercled up to the tip. Tubercles of both sides prominent : 2.
- . Keels and margins without tubercles towards the tip. Tubercles of the two sides less prominent : var. *sublaevis*.
2. Leaves up to 4 cm. long. Plant small, stemless : var. *acuminata*.
- . Leaves up to 7 cm. long. Plant taller : 3.
3. Adult plants caulescent. Leaves erect, curved inwards : *Haw. tuberculata*.
- . Always stemless. Leaves more spreading : var. *subexpansa*.

Gasteria Maculata var. Dregeana Berger

By Dr. Karl von Poellnitz
(Oberlödla, Germany.)

GASTERIA *maculata* var. *Dregeana* Berger in Pflanzenreich, Vol. XXXIII. (1908) 144.—The type of this variety was collected by Drège (No. 4182) on rocky hills near Port Elizabeth. The two photographs show plants from Port Elizabeth commonage, growing in the shade of bushes and flowering at the locality in October and November, collected by F. J. Stayner, No. 11.—Stem up to 12 cm. long but in very adult plants surely longer. Leaves spirally distichous, somewhat curved laterally, somewhat twisted, the outer ones nearly spreading, numerous, conferted, lorate, only a little narrowed towards the tip, deltoid-rounded or obtuse at the tip, with a valid mucro, up to 25 cm. long or somewhat longer, about $4\frac{1}{2}$ - $5\frac{1}{2}$ cm. broad towards the base, shining, smooth, dark green, somewhat or distinctly concave on the face, flat on the face towards the tip, convex and very obliquely keeled on the back (keel maginiform towards the tip, third face $1\frac{1}{2}$ -2 cm. long at its base); keel and margin, which reaches the tip, with whitish tubercles or with a white, nearly or completely smooth, horny margin towards the base, white and irregularly serrulate towards the tip, minutely serrulate at the tip; short margin white-tubercled towards the base, nearly smooth towards its tip. Flecks on both sides of the leaf, very numerous, nearly white, mostly somewhat oblongish, about 3-5 mm. long, very often or mostly confluent, irregularly distributed on the face, still more numerous and irregularly distributed or arranged in indistinct cross bands on the back. Peduncle more than 1 m. long, with a few, erect, many-flowered racemes, reddish, pruinose, bracts at the base of the branches ovate-subulate, very acuminate, with a brown midrib. Pedicels red, nodding, 6-8 mm. long, their bracts like the sterile ones, but shorter, the lower ones one and a half times as long as the pedicels (nearly three times as long as the pedicels, Berger). Flowers 15-18 (12-15, Berger) mm. long; swollen part of corolla reddish, lighter towards its tip, oblong, about 1 mm., and broadly, conically narrowed at its base, somewhat curved, 6 mm. across, longer than the tube; tube rose-coloured whitish, with green stripes, about 4 mm. across; segments nearly rose coloured, with green stripes, small, obtuse, somewhat spreading. Longer filaments sometimes as long as the tube.

Book Reviews

BLUEHENDE *Kakteen und Andere Sukkulente Pflanzen*, by Dr. Erich Werdermann; published by Neumann, Neudamm; four parts per annum; price RM.16.

This work presents a series of plant portraits reproduced from the excellent colour photographs of Dr. Erich Werdermann, who is also responsible for the accompanying text, which is sufficient guarantee of its scientific accuracy.

Part 36 includes four cacti; *Opuntia Bruchii* Spegazzini is reasonably well known in collections, being one of the South American *Opuntias* with roundish joints, but the beautiful white flower is rarely seen; the one reproduced opened in the Botanic Gardens at Dahlem on an imported plant. *Cleistocactus hyalacanthus* (K. Schum.) Gosselin is a white-spined, columnar *Cereus* from North Argentina with the characteristic closed, red, tubular flowers; the plant was originally considered a form of *C. Straussii*, but the production of flowers proved that it should be referred to Schuman's *C. hyalacanthus*, known previously as a herbarium specimen. *Sclerocactus polyancistrus* (Eng. & Big.) Br. & R. comes from California and Western Arizona, but is difficult to keep in cultivation; the photograph is of a plant in a collection in Los Angeles, and shows the beautiful crimson flowers. *Parodia setifera* Backeberg var. *longihamata* Werdermann nov. var. was received as the type, but found to differ so much in the form of the spines and the shape of the flower that it must be considered at least as a varietal form.

Cacti for the Amateur, by Scott E. Haselton, published by the Abbey Garden Press, Pasadena, California; 1938; price, paper cover \$1, boards \$1.50, postage 15 c.

This excellent book is just what the amateur grower of cacti has been wanting. Mr. Scott E. Haselton is the Editor of the *Cactus and Succulent Journal* of America, and not only knows the difficulties that beset the beginner, but is also fully conversant with the subject on its scientific side. This combination has enabled him to present the information with an accuracy that the expert will respect and at the same time with a simplicity that will be appreciated by the novice. Collecting, cultivation indoors and out, propagation, pest control, all are faithfully dealt with, and the book is most liberally illustrated with a large number of excellent photographs and line drawings, and a double-page frontispiece in colour. The price of the book gives no indication of its value; in fact the extraordinarily low cost has only been achieved through the co-operation of five of the American dealers who are to be congratulated on their enterprise. The author has carried out his part excellently and the production of the book is in the best traditions of the Abbey Garden Press. English readers need not fear that the book will be too "American"; it should be in the hands of everyone who is interested in the cultivation of cacti.

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THE CACTUS JOURNAL

Vol. 7

March, 1939

No. 3

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THE CACTUS JOURNAL

Vol. 7.

MARCH, 1939.

No. 3.

“Rare” Cacti—IV

By G. Turner

PREVIOUS notes referred to certain species of cacti indigenous to Cuba, particularly Melocacti, of which there are four distinct varieties, endemics to different provinces of the Island.

Many years ago Prof. Leon found the authenticated *Melocactus acunai*. Five plants were discovered and surveyed, and descriptions published in Spanish. The plants were grown for a time in the Botanical Gardens of Havana, and all died so, for four years, only a botanical record remained.

Having good friends resident in Havana interested in botanical subjects is decidedly a great help; nevertheless it is quite a different matter persuading them to collect specimens. A promise was received a long time ago that, if ever a specimen of *M. acunai* became available, my request would receive consideration. *Tempus fugit*. The promise was forgotten until last September when a letter arrived announcing that an unexpected visit to Santiago de Cuba had allowed sufficient time to make a search for specimens. First a three hours' journey by aeroplane, followed by a car trip of 1,000 kilometers into wild, arid desert; finally they hired a boat for one day. The plants are only found growing in high, rocky crevices overlooking Santiago Bay.

Two specimens were found; one, quite small, was transplanted to the Botanical Gardens at Havana. The second one, quite a large specimen developing a cephalium, reached me. At Christmas I received a letter notifying me that the small specimen had died because they neglected to shade it for a few weeks from the direct rays of the sun.

The illustration (p. 63) shows the plant which can claim to be one of the rarest cacti in the world—the first ever to leave its native Cuba. On arrival the roots were in quite good condition and it was potted in chalky soil, a liberal amount of

sea sand and a little bone meal. These specimens are found on grassy cliffs, quite close to the sea.

The following botanical description of *Melocactus acunai* Leon, now published for the first time in English, is not a translation from the Spanish which baffles all efforts to arrive at a correct solution, but a combination of what could be made out of the original, supplemented by personal observation of the specimen itself. The result is correct in every detail. *Melocactus acunai* Leon: Plant long cylindrical, from 8-9 cm. diameter, and 30 cm. high; ribs 10; areoles about 1 cm. apart and in number more than 20 on each rib, with few bristles. Spines up to 16, subulate, slightly incurved, young spines amber, turning dark brown; centrals 4 in adult plants, striated, 5-6 cm. long, 2-3 mm. diameter; radials shorter and thinner, up to 6, 1 cm. long, extended. Flower 3 cm. long to the ovary; lower half of the corolla tube and style dark red; stigmas 6, acuminate, 2 mm. long. Cephalium 8-9 cm. diameter, 10-12 cm. high; pink and white wool. Native habitat: found on the cliffs of Santiago Bay, Cuba.

The species previously described were *Melocactus matanzanus* and *M. Harlowii*. Both are now well established, having survived two English winters; both flowered last year.

There now remains one more very elusive specimen which will complete the Cuban group; it is *Melocactus Guitarti* and a plant is promised sometime before Easter.

Cuban Melocacti are quite small plants compared with the commoner varieties occasionally met with in collections. Their cephaliums develop at ten years of age or thereabouts. Mature plants are not more than four or five inches in diameter or, in the case of the tall growers, 10-12 inches high. They are tropical plants but will submit to a night temperature of 40 degrees F. if kept perfectly dry in winter. During the growing period they require plenty of water and all the sun they can get. During summer and autumn they bloom daily, flowers appearing embedded in the pink and white woolly and bristly cephalium, opening from about 2 p.m. until sunset.

If members of this Society are interested in this species and desirous of acquiring them, my friend has signified his willingness to explore the Matanzan Desert for specimens of *Melocactus matanzanus*, as described in the March issue last year of this *Journal*, provided he can do so without heavy financial loss. He says the expedition would entail an outlay of about sixty dollars and the largest number of plants he could transport would be ten or twelve. In the event of the journey being undertaken, Prof. Leon—now too old and infirm to go himself—has promised to reveal the native habitat of the species. Under the above circumstances the plants would cost one guinea each. This certainly is an opportunity such as may never again be presented. The specimen described was the only one to reach Europe and I doubt if there are any of the original discoveries alive elsewhere. They are very rare indeed.

* * * * *

Last September in these notes I referred to the new and very rare *Cephalocereus alensis*. The illustration (p. 63) shows the plant in flower. The remarkable feature of this cereus is the large quantity of silky white wool covering the spines down one half of the plant. The reverse side shows the ribs in close formation heavily spined, the areoles about $\frac{1}{4}$ in. apart. In the near future I hope to describe this specimen more minutely.



Fig. 17.
Cephalocereus alensis.
(see page 62.)

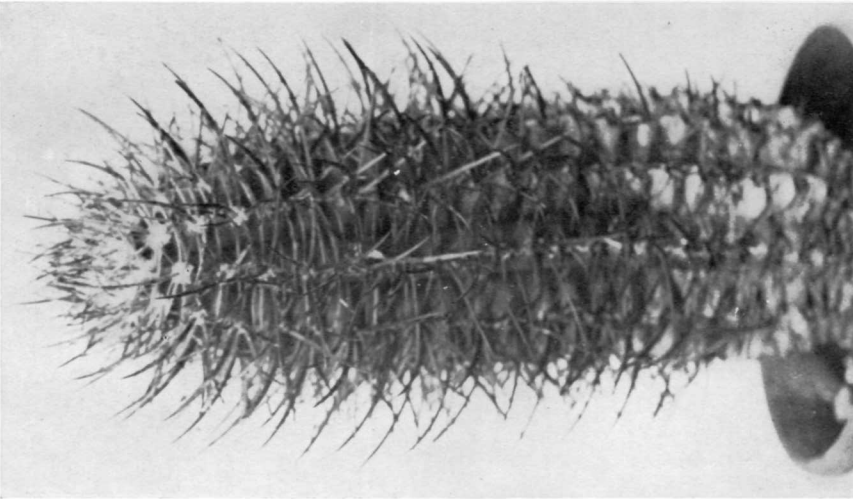


Fig. 16.
Melocactus acunai.
(see page 61.)



Fig. 18.
Mr. Armstrong amongst his plants.



Fig. 19.
Grafted Cacti.
(see page 65.)

Grafted Cacti

By C. W. Armstrong

(Vancouver, B.C.)

THE grafting of cacti has a twofold object, the preserving of rare species and the speeding-up of slow growth with the increased energy imparted by vigorous stocks; there is no object in grafting strong growers on those of the same family like *Opuntias*, with the exception, of course, of some of the small-jointed species, particularly those of South America. To be successful, grafting should be done in the growing season; I find that the easiest method is to cut both scion and stock as nearly alike in diameter as possible, bevelling the ridges of the stock; cut with a perfectly sharp, clean knife horizontally, then hold the two surfaces together with a fine elastic band over the top of the scion and under the pot; keep them in a shady, airy position for week and gradually bring them out to the light.

I have here illustrated (p. 64) a few to show the increase of growth under this treatment; all were grafted in 1937, except where mentioned.

No. 1 *Frailea Grahliana* was a single head and now has over thirty. No. 2 *Mammillaria geminispina cristata* showed an increase of five inches; No. 3, a normal specimen of the same on own roots. No. 4 (figure not shown) *Mammillaria Guelzowiana*, two inches along the crest, is now ten inches; No. 5, normal specimen of the same plant on own roots. No. 6 *Mammillaria fragilis cristata* was half an inch across, now over three inches; it grew so fast that it split; No. 7, normal specimen of the same; I procured this in 1930 as a half-inch nubbin, grafted it in 1932 on *S. Macdonaldi* and though I have cut four branches out of it, it still shows fifty offsets. No. 8 *Coryphantha Nellieae*, normally seldom over three-quarters of an inch; I grafted it in 1937, this spring it had four flowers; when they were over I cut off the apex and in three months it has made eighteen heads, completely hiding the original. No. 9 *Mammillaria woburnensis* came to me as a grafted single head last year and now has over twenty. No. 10 *Rebutia pygmaea* from one inch head has made seventeen, after cutting off the apex. No. 11 *Mammillaria plumosa*, this is the pride of my collection; I received it as a single head in 1930, in two years it only increased half an inch, then I grafted it on *Nyctocereus serpentinus* and to-day it has seventy heads. No. 12 *Chamaecereus crassicaulis cristata* was only one inch across and is now like a ram's horn, measuring nine inches following the curves. No. 14 *Chamaecereus Silvestris aureus* was only a single half-inch nubbin. No. 15 *Rebutia senilis* was a single head; this spring I found four grubs eating the heart out of it so I had to cut most of it away and it now has seven heads. No. 16 *Rebutia orurensis*, same result as No. 10. No. 17 *Notocactus scopa* this spring a one-inch head, now two inches with ten offsets; No. 18 a crest of the same, increased by five inches. No. 19 *Notocactus apricus*, this spring half an inch deep by one inch across, smaller than the stock and now with a circumference of eight inches. No. 20 *Coryphantha vivipara*, a one-inch offset grafted in 1936, now has forty heads, and No. 21 *Rebutia Einsteinii* was a one-inch head this spring.

I hope this little list will show the advantages to be expected from grafting in better growth and brighter spines with the realisation of many more blooms.

An annotated Index to Salm-Dyck's "Monographia Generum Aloes et Mesembryanthemi"

By William T. Stearn

(Lindley Library, Royal Horticultural Society, Westminster.)

[Continued from p. 44.]

THE situation in Mesembryanthemum to-day is not unlike that in the Linnean genus Cactus about a century ago. Up to 1921 students of Mesembryanthemum accepted the the group as one highly variable genus made up of several hundred species and divisible into sections primarily on leaf-form and habit of growth. Sixty-five sections (see pp. 68-72) were adopted by Salm-Dyck and his plates are numbered in accordance with them. Since 1921 the investigations of N. E. Brown at Kew, Gustav Schwantes at Kiel and Louisa Bolus at Cape Town have led to the division of Mesembryanthemum, as formerly understood, into more than a hundred minor genera separable on fruit- as well as leaf- and habit-characters.⁹ Linnaeus in his *Species Plantarum* of 1753—the starting point of modern botanical nomenclature—distinguished thirty-three species of Mesembryanthemum. These are now placed in twenty-three different genera! Unfortunately Brown and Schwantes have selected different species to typify the Linnean genus. Mesembryanthemum L. emend. N.E.Br. (with *M. umbellatum* L. as standard species) corresponds to *Ruschia* Schwantes; Mesembryanthemum L. emend. Schwantes (with *M. tenuifolium* L. as standard species) to *Lampranthus* N.E.Br.¹⁰ Thus hardly a species known before 1921 has escaped renaming.

Most of the species described and figured by Salm-Dyck were described originally by the English naturalist Adrian Hardy Haworth (1768-1833), chiefly from plants introduced into cultivation by Francis Masson, William John Burchell and James Bowie,¹¹ and grown by Haworth personally or in the Royal Gardens at Kew. Haworth's knowledge of Mesembryanthemum as of other succulents was based on intimate acquaintance with the living plants. A Bavarian professor, J. A. Schultes of Landshut, who visited him at Chelsea in 1824, found that he grew no less than two hundred aloes, 362 mesembryanthemums and ninety crassulaceous plants.¹² Like his successor N. E. Brown (1849-1934), he had a keen eye for minute differences. Unfortunately his later descriptions are written in the concise "telegram style" which

⁹ See K. von Poellnitz, "Die Aufteilung der Gattung Mesembryanthemum L." in Fedde, *Rep. Sp. Nov.* **32**. 1-73 (1933); H. Jacobsen, "Verzeichnis der Arten der Gattung Mesembryanthemum nebst deren abgetrennten Gattungen" in Fedde, *Rep. Sp. Nov. Beihefte* **106** (1938), a valuable guide of 198 pages to synonymy and literature published since 1908.

¹⁰ See N. E. Brown in *Gard. Chron.* (3) **78**. 232 (Sept. 1925); G. Schwantes in *Zeitschr. f. Sukkulentenk.* **3**. 27 (March, 1927). *M. umbellatum* L. is the standard species proposed in *International Rules of Botanical Nomenclature*, 3rd ed., 141 (1935).

¹¹ For "Personalia of botanical Collectors at the Cape," see P. MacOwen in *Trans. S. Afr. Philosoph. Soc.* **4**. XXX-LIII (1887); J. Britten in *Journ. Linn. Soc. Bot.* **45**. 29-51 (1920).

¹² See *Flora oder botanische Zeitung* **8**. Beilage **1**. 38 (1825), translated in Hooker, *Bot. Misc.* **1**. 68 (April 1829) and *Philosoph. Mag.*, new ser. **6**. 432 (Dec. 1829), for an account of Schultes's visit to England.

Linnæus made popular, and by themselves they are rarely sufficient to distinguish his plants with certainty. As N. E. Brown pointed out in 1920, "they are often only comparisons with other known species, yet they are accurate as far as they go. Fortunately, it happens that a large number of his species are represented in the Kew Herbarium by a series of excellent coloured drawings¹³ made from the type plants, so that the majority can be correctly determined. These drawings were made by George Bond and Thomas Duncannon, two skilful artists who were employed at Kew Gardens between 1822 and 1835 to make drawings of the plants cultivated there. . . . Soon after the period when these drawings were being made, the publication of Salm-Dyck's Monograph of Mesembryanthemum commenced. . . . It is splendidly illustrated and the descriptions of the plants represented are excellent, but unfortunately the names and synonymy attached to the plants figured in many cases do not belong to the species so well figured and so excellently described. This was brought to my notice early . . . when I first came to Kew¹⁴ whilst naming cultivated specimens of Mesembryanthemum I noticed that some of the species figured by Salm-Dyck were different from the plants bearing the same name that I had been familiar with at Reigate in the rich collection of Mr. W. Wilson Saunders, who had (about 1865 and 1866) over three hundred species of Mesembryanthemum in cultivation; some of them, I was informed, were plants that were originally in Haworth's collection and therefore presumably types of his species. This caused me to compare one or two of Salm-Dyck's figures and descriptions with the original descriptions given by Haworth and with the unpublished drawings of the plants at Kew, when it became evident that mistakes of identification had been made by Salm-Dyck; and during subsequent years more and more of these wrong identifications were discovered in the same manner."¹⁵

Brown noted many of these misidentifications in his papers on Mesembryanthemum, but he did not live to print them all. He did, however, pencil his opinion on a number of Salm-Dyck plates in the Kew Herbarium. These unpublished notes are cited in the footnotes below as "N.E.Br. ms."

Recent investigations have thus turned the nomenclature of Salm-Dyck's work topsy-turvy, so that the names he used often bear little or no resemblance to those now considered correct. In order to make his beautiful plates more readily

¹³ One of these Kew drawings, depicting Haworth's *M. cruciatum*, i.e. *Glottiphyllum cruciatum* (Haw.) N.E.Br., is reproduced on p. 69, right-hand figure, by courtesy of the Kew authorities.

¹⁴ Nicholas Edward Brown was born at Redhill, near Reigate, Surrey, in 1849; after leaving Reigate Grammar School he was employed for six years as curator of William Wilson Saunders' private museum at Reigate; he joined the Kew botanical staff in 1873, and retired from his official duties in 1914. Always industrious and conscientious, he continued to work at the Kew Herbarium, mostly on Iridaceae and Mesembryanthemum, for nearly twenty years more. He was a quaint-looking, rather hunched, little man with a narrow face and a short goatee beard, somewhat deaf (at least in old age), but endowed with a keen sense of humour and a kindly disposition that made him ever ready to share his vast knowledge of South African plants. The genera *Nicolasia* S. L. M. Moore and *Brownanthus* Schwantes and a few species such as *Caralluma Nebrownii* Berger (*Caralluma N.-E.-Brownii* Stapf) and *Lampranthus* (*Mesembryanthemum*) *Brownii* (Hook. f.) N. E. Br. commemorate him. *The Cactus Journ.* **3**, 51 (1935), *Gard. Chron.* (3) **96**, 417 (Dec. 1934), *Journ. Bot.* **73**, 19-21 (1935), *Journ. Kew Guild*, **5**, XLII, 460-461 (1935), *Kew Bull.* **1935**, 58-61, *Proc. Linn. Soc.* session **147**, 165-167 (1935), White & Sloane, *Stapelieae*, 2nd. ed., **1**, 115-117 (1937) contain obituary notices and appreciations of his work.

¹⁵ N. E. Brown, "New and old Species of Mesembryanthemum, with critical Notes" (in *Journ. Linn. Soc. Bot.* **45**) 53-54 (1920).

accessible, these modern names are entered below, in the right-hand column of the index. They are admittedly provisional—the future will probably see the union of various genera now kept apart—and in some instances alternative names have been included. Brown's publications provided many of them and his notes a few more. Mr. A. A. Bullock of Kew and Herr H. J. H. Jacobsen of Kiel determined most of the others. The footnotes indicate where further information may be found.

INDEX TO PLATES OF MESEMBRYANTHEMUM WITH THEIR DATES OF PUBLICATION

Salm-Dyck placed the sixty-five sections he adopted in six major groups distinguished in his "Mesembryanthemorum Conspectus" (published in fasc. 1; 1836) by the following characters:—

Plants not papillose :

Stem lacking or very short I. SUBACAULIA (§1-14)

Stem evident, erect or prostrate :

Leaves more or less three-cornered in section :

Leaves distinct or almost distinct from one another

II. TRIQUETRA (§ 15-31)

Leaves joined at base by sheathing the stem

III. PERFOLIATA (§ 32-38)

Leaves more or less round in section ... IV. TERETIUSCULA (§ 39-47)

Plants papillose :

Leaves more or less round in section ... V. PAPILLOSA (§ 48-58)

Leaves flat VI. PLANIFOLIA (§ 59-65)

The plants grouped in Salm-Dyck's sixty-five *sections* (§), listed below in the *left-hand* column—with references [in square brackets] to Berger's *Mesembryanthemen und Portulaceen* (1908) where much the same classification is used, Berger's work being largely based on Salm-Dyck's—are now placed in the forty-five *genera* listed in the *right-hand* column below :

I. SUBACAULIA :—

§ 1.	Sphaeroidea [280]	=	Conophytum N.E.Br. [§ 1.1. unpublished]
§ 2.	Subquadrifolia;		[unpublished]
§ 3.	Rostrata [254]	=	Cheiridopsis N.E.Br. [§ 3 figs. 1-5 unpublished]
§ 4.	Aloidea [259]	=	Punctillaria N.E.Br. (§ 4.1); Rabiea N.E.Br. (§ 4.3); [§ 4.2 unpublished]
§ 5.	Ringentia [265]	=	Faucaria Schwant. (§ 5 figs. 1-3); Stomatium (§ 5 figs. 4-6); Chasmatophyllum Schwant. (§ 5.7); Agnirictus Schwant. (§ 5.8); Carruanthus Schwant. (§ 5.9); Machairophyllum Schwant. (§ 5.10)

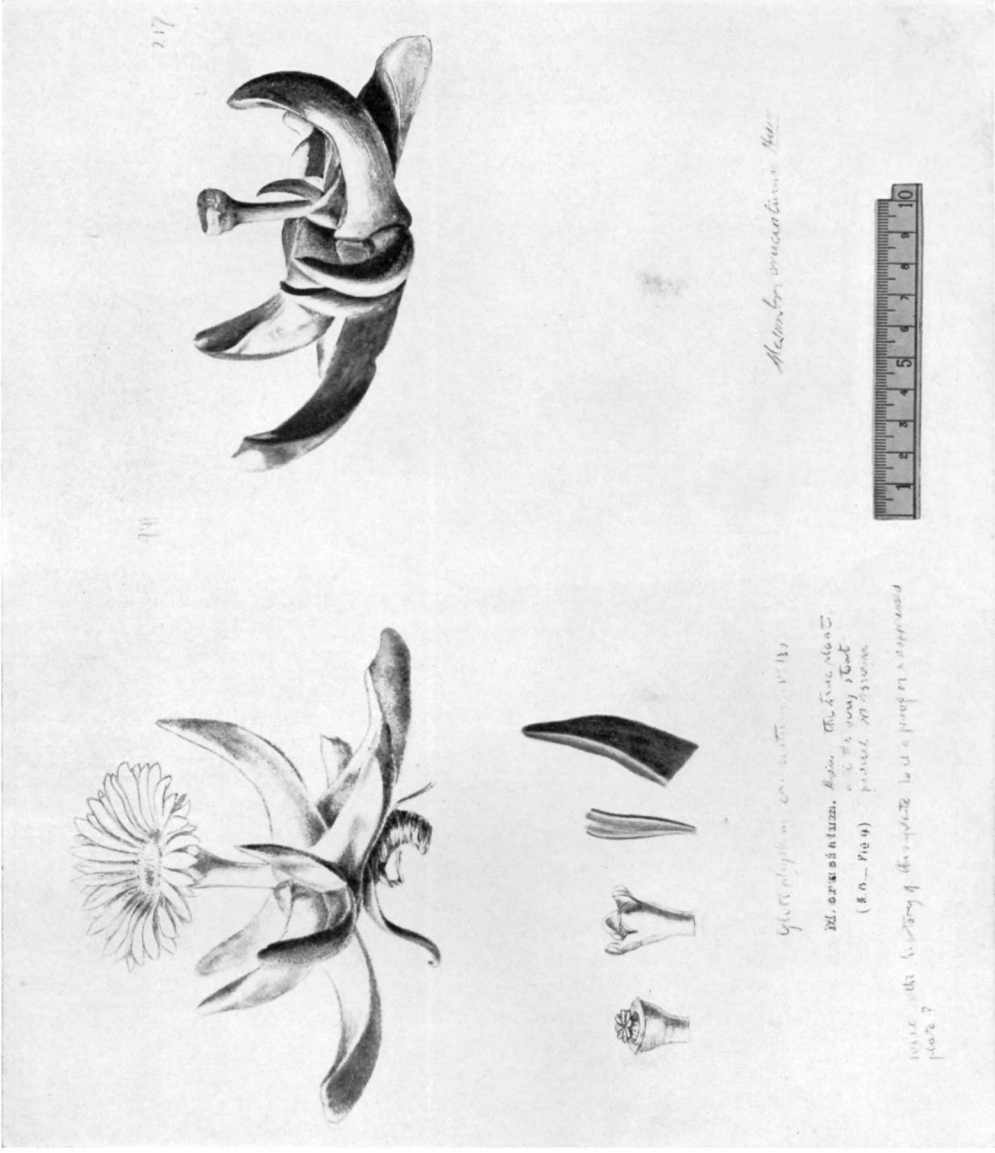


Fig. 20. *Glottiphyllum cruciatum* (Haw.) N.E.Br. Right—Unpublished proof-plate by Salm-Dyck. Left—Unpublished Kew Drawing.



M. virascens.

(8.10). — Fig. 3.)

Fig. 21.

One of the Plates from Salm-Dyck's Monograph.
(Reduced to half-scale.)

- § 6. Dolabriformia [213] = Bergeranthus Schwant. (§ 6 figs. 1-2);
Rhombophyllum Schwant. (§ 6 figs.
3, 5); [§ 6.4 unpublished]
- § 7. Difformia [230] = } Glottiphyllum N.E.Br. [§ 8.9 unpublished;
8. Linguaeformia [235] = } cf. footnote 46 on p. ...]
- § 9. Gibbosa [226] = [unpublished]
- § 10. Calamiformia [225] = Cylindrophyllum Schwant.
- § 11. Teretifolia [224]; = [unpublished]
- § 12. Bellidiflora [220] = Acrodon N.E.Br.
- § 13. Acuta [221] = Cephalophyllum N.E.Br.
- § 14. Macrorrhiza [219]; = [unpublished]

II. TRIQUETRA :—

- § 15. Corniculata [134] = Lampranthus N.E.Br. (§ 15.1); Cephalo-
phyllum N.E.Br. (§ 15 figs. 2-4, 6-8);
[§ 15.5 unpublished]
- § 16. Pugioniformia [215] = Conicosia N.E.Br.
- § 17. Sarmentosa [209] = ?
- § 18. Reptantia [205] = ? (§ 18.1); Disphyma N.E.Br. (§ 18.2);
Lampranthus N.E.Br. (§ 18.3)
- § 19. Acinaciformia [202] = Carpobrotus N.E.Br. (§ 19 figs. 1-3, 5-6)
- § 20. Rubricaulia [198] = Ruschia Schwant.
- § 21. Heteropetala [191] = Semnanthe N.E.Br. (§ 21.1); Erepisia
N.E.Br. (§ 21 figs. 1-4)
- § 22. Bracteata [175] = Erepisia N.E.Br.
- § 23. Virgata [182] = Ruschia Schwant.
- § 24. Virentia [197] =)
- § 25. Aurea [164] =) Lampranthus N.E.Br.
- § 26. Blanda [162] =)
- § 27. Amöna [159] =)
- § 28. Pallidiflora [172] = ?
- § 29. Falcata [184] = Lampranthus N.E.Br.
- § 30. Deltoidea [188] = Oscularia Schwant.
- § 31. Forficata [190] = Ruschia Schwant.

III. PERFOLIATA :—

- § 32. Geminata [117]; = [unpublished]
- § 33. Uncinata [103] = Ruschia (§ 33 figs. 1, 3-7); Smicrostigma
N.E.Br. (§ 33.2)
- § 34. Microphylla [167] =)
- § 35. Rostellata [115] =) Ruschia Schwant. [§ 36.3 unpublished]
- § 36. Vaginata [109] =)
- § 37. Tumidula [112] =)
- § 38. Crocea [173] = Hymenocyclus Dinter & Schwant.;
[§ 38.1 unpublished]

IV. TERETIUSCULA :—

- § 39. Veruculata [126] = ?
- § 40. Haworthiana [154] = Erepisia N.E.Br. (§ 40 figs. 1-3); Lampran-
thus N.E.Br. (§ 40 figs. 4-5)
- § 41. Spinosa [133] = Eberlanzia Schwant.
- § 42. Cymbaeformia [128] = Corpuscularia Schwant.
- § 43. Defoliata [123] =)
- § 44. Splendentia [118] =) Aridaria N.E.Br.

- § 45. *Juncea* [57] = *Psilocaulon* N.E.Br.
 § 46. *Tenuifolia* [149] = *Lampranthus* N.E.Br.
 § 47. *Adunca* [140] = *Lampranthus* N.E.Br. ; (§ 47 figs. 1, 3-5);
 ? (§ 47.2)

V. PAPILOSA :—

- § 48. *Scabrída* [145] = *Lampranthus* N.E.Br. ; [§ 48 figs. 5-6 unpublished]
 § 49. *Trichotoma* [99] = *Delosperma* N.E.Br. ; [§ 49.1 unpublished]
 § 50. *Aspericaulia* [93] = } *Drosanthemum* Schwant ; [§ 50 figs. 1, 6
 § 51. *Hispida* [87] = } unpublished]
 § 52. *Barbata* [80] = *Trichodiadema* Schwant.
 § 53. *Echinata* [77] = *Trichodiadema* Schwant. (§ 53.1);
Delosperma N.E.Br. (§ 53.2)
 § 54. *Spinulifera* [65] = *Drosanthemum* Schwant. (§ 54.1);
Aridaria N.E.Br. (§ 54.2); *Sphalman-*
thus N.E.Br. (§ 54 figs. 3-5)
 § 55. *Moniliforma* [55]; [unpublished]
 § 56. *Crassulina* [70] = *Sphalmanthus* N.E.Br. (§ 56 figs. 1-2);
Delosperma N.E.Br. (§ 56.3); ?
 (§ 56.4)
 § 57. *Geniculiflora* [63] = *Aridaria* N.E.Br.
 § 58. *Nodiflora* [41]; [unpublished]

VI. PLANIFOLIA :—

- § 59. *Scaposa* [38] = *Dorotheanthus* N.E.Br.
 § 60. *Platyphylla* [32] = *Cryophytum* N.E.Br. (§ 60 figs. 2, 4);
Aethephyllum N.E.Br. (§ 60.3); [§
 60.1 unpublished]
 § 61. *Cordifolia* [53] = *Aptenia* N.E.Br.
 § 62. *Expansa* [48] = *Sceletium* N.E.Br. ; [§ 62.3 unpublished]
 § 63. *Relaxata* [44] = *Prekia* N.E.Br.
 § 64. *Tripolia* [42] = *Skiatophytum* L.Bolus
 § 65. *Helianthoidea* [29] = *Carpanthea* N.E.Br.

Abbreviations used :—

Ait.—W. Aiton ; Berger—Alwin Berger ; D.C.—A. P. de Candolle ; Donn—J. Donn ; E. & Z.—C. F. Ecklon and K. L. P. Zeyher ; E.B.J.—Engler, *Botanische Jahrbücher* ; Fl. Pl. S. Afr.—*Flowering Plants of South Africa* ; G.C.—*Gardeners' Chronicle* ; Haw.—A. H. Haworth ; Jacq.—N. J. von Jacquin ; J.B.—*Journal of Botany* ; J.L.S.B.—*Journal of Linnean Society, Botany* ; L.—C. von Linné ; Lam.—J. B. P. A. de M. de Lamarck ; L.Bolus—H. M. Louisa Bolus (née Kensit) ; M.—*Mesembryanthemum* ; Mill.—P. Miller ; Mol.—J. L. Molina ; N.E.Br.—N. E. Brown ; Salm—Joseph M. F. A. H. I. zu Salm-Reifferscheid-Dyck ; Schwant.—M. H. Gustav Schwantes ; Sol.—D. Solander ; Thunb.—C. P. Thunberg ; trans. nov.—new transfer of epithet ; var.—variety ; Willd.—C. L. Willdenow.

* (in left-hand column) designates a name first published by Salm-Dyck in the *Monographia*.

^A (in left-hand column) designates a name published by Salm-Dyck previous to the *Monographia*.

^T (in right-hand column) designates a name based on Salm-Dyck's plate, i.e. a name of which Salm-Dyck's plate is the type.

Name adopted by Salm-Dyck (1836-1854)	§ Fig.	(Fasc. Fig.)	Date	Provisional modern name.
abbreviatum	19. 5	(5.17)	1849	<i>Carpobrotus glaucescens</i> (Haw.) Schwant. ¹⁶
acinaciforme	19. 6	(4. 8)	1842	<i>Carpobrotus acinaciformis</i> (L.) L.Bolus ¹⁷
acuminatum	44. 4	(6.20)	1854	<i>Aridaria notha</i> (N.E.Br.) ^T N.E.Br. ¹⁸
acutangulum	36. 5	(5.21)	1849	<i>Ruschia acutangula</i> (Haw.) Schwant.
acutum	13. 1	(1.13)	1836	<i>Cephalophyllum subulatooides</i> (Haw.) N.E.Br. ¹⁹
adscendens	8. 4	(5. 8)	1849	<i>Glottiphyllum latum</i> (Haw.) N.E.Br. ²⁰
aduncum	47. 3	(1.32)	1836	<i>Lampranthus aduncus</i> (Haw.) N.E.Br.
aequilaterale	19. 1	(1.19)	1836	<i>Carpobrotus aequilaterus</i> (Haw.) N.E.Br. ²¹
chiloënsis*	19. 1γ	(5.16)	1849	<i>Carpobrotus chilensis</i> (Mol.) N.E.Br. ²²
agninum	5. 8	(3. 2)	1840	<i>Agnirictus agninus</i> (Haw.) Schwant.
albicaule	44. 5	(6.21)	1854	<i>Aridaria albicaulis</i> (Haw.) N.E.Br. ²³
albidum	5.10	(5. 2)	1849	<i>Machairophyllum albidum</i> (L.) Schwant.
hybridum*	5.10β	(5. 3)	1849	<i>Machairophyllum</i> var.
aloides	4. 3	(3. 1)	1840	<i>Nananthus cibdelus</i> (N.E.Br.) Schwant.
				<i>Rabiea cibdela</i> (N.E.Br.) N.E.Br. ^T 24
amönum ^A	27. 2	(2.12)	1837	<i>Lampranthus amoenus</i> (Salm) N.E.Br.
anatomicum	62. 1	(4.32)	1842	<i>Sceletium anatomicum</i> (Haw.) L.Bolus
anceps	22. 2	(4.12)	1842	? <i>Erepsia anceps</i> (Haw.) Schwant. ²⁵
angustum				
pallidior*	7. 6	(5. 6)	1849	<i>Glottiphyllum taurinum</i> (Haw.) N.E.Br. ²⁶
heterophyllum				
asperum	7. 6β	(5. 7)	1849	<i>Glottiphyllum proclive</i> N.E.Br. ^T 27
	22. 3	(4.13)	1842	? <i>Erepsia aspera</i> (Haw.) L.Bolus; <i>E. restiophila</i> L.Bolus ²⁸
asperulum*	50. 2	(5.28)	1849	<i>Drosanthemum asperulum</i> (Salm) Schwant. ^T

¹⁶ J.B. 66. 324 (1928).

¹⁷ J.B. 66. 324 (1928).

¹⁸ *Aridaria notha* (N.E.Br.) N.E.Br., trans. nov.

"*Mesembryanthemum acuminatum*" Salm-Dyck, Mon. §44.2 (1854) non Haw. (1824). *M. nothum* N.E.Br. in J.L.S.B. 45. 109 (1920). *Aridaria notha* N.E.Br. ms. in herb. Kew.

¹⁹ J.B. 67. 18 (1929).

²⁰ G.C. (3) 82. 510 (Dec. 1927).

²¹ J.B. 66. 324 (1928).

²² J.B. 66. 324 (1928).

²³ *Aridaria albicaulis* (Haw.) N.E.Br., trans. nov.

Mesembryanthemum albicaule Haworth in Philosoph. Mag. 68. 331 (1826); Salm-Dyck, Mon. §44. 5. (1854). *Aridaria albicaulis* N.E.Br. ms. in herb. Kew.

²⁴ J.L.S.B. 45. 64 (1920), Kew Bulletin 1938. 159.

²⁵ "Salm-Dyck, non Haw., probably = *M. gracile* Haw." (N. E. Br. ms.), i.e. *Erepsia gracilis* (Haw.) L. Bolus.

²⁶ G.C. (3) 82. 470 (Dec. 1927).

²⁷ G.C. (3) 82. 470 (Dec. 1927).

²⁸ "Salm-Dyck, non Haw. = *M. compressum*" (N. E. Br. ms.), i.e. *Erepsia compressa* (Haw.) Schwant.; L. Bolus in Fl. Plant. S. Afr. 7. t. 254 (1927) cites this plate as *Erepsia restiophila* L. Bolus, sp. nov.

Name adopted by Salm-Dyck (1838-1854)	§ Ftg.	(Fasc. Ftg.)	Date	Provisional modern name.
attenuatum	51. 2	(2.27)	1837	<i>Drosanthemum attenuatum</i> (Haw.) Schwant. ²⁹
aurantiacum	25. 2	(1.21)	1836	<i>Lampranthus aurantiacus</i> (Haw.) Schwant.
aureum	25. 3	(1.22)	1836	<i>Lampranthus aureus</i> (L.) N.E.Br.
australe	18. 2	(3.12)	1840	<i>Disphyma australe</i> (Sol.) N.E.Br.
barbatum	52. 1	(4.27)	1842	<i>Trichodiadema stellatum</i> (Mill.) Schwant. sec. Stearn ³⁰
bellidiflorum	12. 1	(3. 5)	1840	<i>Acrodon bellidiflorus</i> (L.) N.E.Br. ³¹
subulatum	12. 1γ	(3. 7)	1840	<i>Acrodon subulatus</i> (Mill.) N.E.Br. ³²
viride	12. 1β	(3. 6)	1840	<i>Acrodon bellidiflorus</i> var. <i>viridis</i> (Haw.) N.E.Br. ³³
bicolorum	46. 3	(4.18)	1842	? <i>Lampranthus bicolor</i> (L.) N.E.Br. ³⁴
bidentatum	7. 1	(2. 1)	1837	<i>Glottiphyllum semicylindricum</i> (Haw.) N.E.Br. ³⁵
bigibberatum	7. 4	(6. 4)	1854	<i>Glottiphyllum semicylindricum</i> (Haw.) N.E.Br. ³⁶
blandum	26. 1	(4.16)	1842	<i>Lampranthus blandus</i> (Haw.) Schwant. ; <i>L. multiradiatus</i> (Jacq.) N.E.Br. ³⁷
brevicaule	16. 2	(3. 8)	1840	<i>Conicosia brevicaulis</i> (Haw.) Schwant. ³⁸
brevifolium	50. 4	(4.23)	1842	<i>Drosanthemum erigeriflorum</i> (Jacq.) Stearn ³⁹
bulbosum	52. 3	(2.30)	1837	<i>Trichodiadema bulbosum</i> (Haw.) Schwant.

²⁹ " = *M. striatum* var." (N.E.Br. ms.), i.e. var. of *Drosanthemum striatum* (Haw.) Schwant.

³⁰ *Mesembryanthemum barbatum* L., Sp. Pl. 1. 482 (1753) is a mixture of several species but seems to be primarily based on *Mesembryanthemum radiatum*, *ramulis prolixis recumbentibus* Dillenius, Hort. Eltham. 245, t. 190 f. 234 (1732) which is the same as *M. barbatum* L. sec. Curtis in Bot. Mog. 2. t. 70 (1789) i.e. *M. stelligerum* Haw. Synop. Pl. Succul. 278 (1812).

The identity of *M. barbatum* L. sensu stricto with *M. stelligerum* Haw. was recognised by Haworth in Philosoph. Mag. 64. 61-62 (1824), but, instead of abandoning the epithet *stelligerum* altogether, he adopted it as a new name for the plant he had formerly called *M. barbatum*. This new *M. stelligerum* seems to be the same as *Ficoides Capensis, frutescens, folio tumido, extremitate stellata, flore purpureo* Bradley, Hist. Succul. Pl., Dec. 1, p. 6. t. 5 (1716) on which Miller based his *M. stellatum* (Gard. Dict. ed. 8, Art. Mesemb. no. 14: 1768) and is quite distinct from *M. hirsutum* Haw. ("*M. stellatum*" auct. non. Mill.). These species are now transferred to *Trichodiadema*:—

A. Plants bushy, loose-growing; pedicels glabrous:—

B. Petals notched at tip . . . **Trichodiadema barbatum** (L.) Schwant. (1926); syn. *M. barbatum* L. (1753) in part; *M. stelligerum* Haw. (1812); *T. stelligerum* (Haw.) Schwant. (1926).

BB. Petals acute at tip . . . **T. stellatum** (Mill.) Schwant. (1926); syn. *M. stellatum* Mill. (1768)—non D.C. (1800) and other authors.

AA. Plant low, compact-growing; pedicels hairy . . . **T. hirsutum** (Haw.) Stearn (1939), syn. *M. hirsutum* Haw. (1795), "*M. stellatum*" auct. e.g. Haw. (1821), Salm (1854), Berger (1908), Stapf. (1926)—non Mill.

³¹ J.B. 66. 77 (1928). ³² J.B. 66. 77 (1928). ³³ J.B. 66. 78 (1928).

³⁴ Identity uncertain. ³⁵ G.C. (3) 82. 409 (Nov. 1927). ³⁶ G.C. (3) 82. 409 (Nov. 1927).

³⁷ J.L.S.B. 45. 125 (1920). ³⁸ J.L.S.B. 45. 126 (1920). G.C. (3) 90. 136 (Aug. 1931).

³⁹ **Drosanthemum erigeriflorum** (Jacq.) Stearn, trans. nov.

Mesembryanthemum erigeriflorum Jacq. Hort. Schoenbr. 4. 39. t. 477 (1804). *M. lateriflorum* D.C., Pl. Succul. Hist. 2. t. [164] (1829). "*M. brevifolium*" Salm., Mon. §50. 4 (1842)—non. Ait. (1789), fide N.E.Br. in Bothalia 1. 149 (1923). "*Drosanthemum brevifolium*" Jacobsen, Verz. Art. Mesemb. (Fedde, Rep. Sp. Nov. Beih. 106) 72 (1938) quoad syn. Jacq.—non (Ait.) Schwant. sensu stricto.

Name adopted by Salm-Dyck (1836-1854)	§ Fig.	(Fasc. Fig.)	Date	Provisional modern name.
calamiforme	10. 1	(4. 6)	1842	<i>Cylindrophyllum calamiforme</i> (L.) Schwant.
calycinum	51. 3	(2.28)	1837	<i>Drosanthemum calycinum</i> (Haw.) Schwant.
canaliculatum	56. 1	(5.33)	1849	<i>Sphalmanthus salmoneus</i> (Haw.) N.E.Br. ⁴⁰
candens	51. 4	(4.25)	1842	<i>Drosanthemum candens</i> (Haw.) Schwant.
caninum	5. 9	(3. 3)	1840	<i>Carruanthus caninus</i> (Lam.) Schwant. ⁴¹
capitatum	16. 3	(4. 7)	1842	<i>Conicosia communis</i> N.E.Br. ⁴²
caulescens	30. 1	(3.23)	1840	<i>Oscularia caulescens</i> (Mill.) Schwant.
clandestinum	60. 4	(6.36)	1854	<i>Cryophytum clandestinum</i> (Haw.) N.E.Br. ⁴³
clavellatum	18. 1	(1.17)	1836	
coccineum	46. 1	(3.33)	1840	<i>Lampranthus coccineus</i> (Haw.) N.E.Br.
compressum	22. 4	(4.14)	1842	<i>Erepsia compressa</i> (Haw.) Schwant.
concauum	62. 5	(4.33)	1842	<i>Scelletium concauum</i> (Haw.) L.Bolus
congestum*	23. 2	(6. 8)	1854	<i>Ruschia congesta</i> (Salm) L.Bolus ^T
conspicuum	27. 1	(2.11)	1837	<i>Lampranthus Dyckii</i> (Berger) N.E.Br. ^{T 44-45}
coralliflorum*	40. 2	(1.28)	1836	<i>Erepsia coralliflora</i> (Salm) Schwant. ^T ; <i>Lampranthus coralliflorus</i> (Salm) N.E.Br.
cordifolium	61. 1	(4.31)	1842	<i>Aptenia cordifolia</i> (L.) N.E.Br. ⁴⁶
corniculatum	15. 6	(2. 7)	1837	<i>Cephalophyllum loreum</i> (L.) Schwant.
crassicaule	62. 6	(4.34)	1842	<i>Scelletium crassicaule</i> (Haw.) L.Bolus
crassifolium	18. 3	(1.18)	1836	? <i>Lampranthus reptans</i> (Ait.) N.E.Br.
crassulinum	56. 3	(2.34)	1837	<i>Delosperma crassuloides</i> (Haw.) L.Bolus
croceum	38. 3	(3.27)	1840	<i>Crocanthus croceus</i> (Jacq.) L. Bolus; <i>Hymenocyclus croceus</i> (Jacq.) Schwant.
cruciatum	7. 7	(2. 2)	1837	<i>Glottiphyllum longipes</i> N.E.Br. ^{T 47}
crystallophanes*	60. 2	(5.35)	1849	<i>Cryophytum Aitonis</i> (Jacq.) N.E.Br. ⁴⁸
cultratum ^A	8. 5	(5. 9)	1849	<i>Glottiphyllum latum</i> var. <i>cultratum</i> (Salm) N.E.Br. ⁴⁹
curtum	36. 6	(5.22)	1849	<i>Ruschia curta</i> (Haw.) Schwant.
curviflorum	26. 2	(2.10)	1837	<i>Lampranthus curviflorus</i> (Haw.) N.E.Br.
curvifolium	47. 2	(1.31)	1836	
defoliatum	43. 1	(3.29)	1840	<i>Aridaria defoliata</i> (Haw.) Schwant.
deltoides	30. 2	(3.24)	1840	<i>Oscularia deltoides</i> (L.) Schwant. var. <i>pedunculata</i> (N.E.Br.) Schwant. ^{T 50}

⁴⁰ G.C. (3) 84. 34 (July 1928). ⁴¹ J.B. 66. 325 (1928). ⁴² G.C. (3) 90. 137 (Aug. 1931).

⁴³ G.C. (3) 84. 128 (Aug. 1928).

⁴⁴⁻⁴⁵ E.B.J. 57. 635 (1922); G.C. (3) 87. 212 (March 1930). ⁴⁶ G.C. (3) 84. 313 (Oct. 1928).

⁴⁷ G.C. (3) 82. 429 (Nov. 1927). In the Kew Herbarium there are two Salm-Dyck plates under the name *M. cruciatum*—the published plate §7. 7 depicting *G. longipes* N.E.Br. and an unpublished proof plate §8. 9 depicting the true *G. cruciatum* (Haw.) N.E.Br. This proof plate §8. 9, together with the unpublished Kew drawing of Haworth's *M. cruciatum* mentioned by N.E.Br., is reproduced on p. 69, by the courtesy of the Kew authorities.

⁴⁸ G.C. (3) 84. 128 (Aug. 1928).

⁴⁹ G.C. (3) 82. 510 (Dec. 1927).

⁵⁰ J.L.S.B. 45. 118 (1920).

Name adopted by Salm-Dyck (1836-1854)	§ Fig.	(Fasc. Fig.)	Date	Provisional modern name.
densum	52. 6	(6.32)	1854	? <i>Trichodiadema densum</i> (Haw.) Schwant.
depressum	8. 7	(5.11)	1849	<i>Glottiphyllum latum</i> var. <i>cultratum</i> (Salm) N.E.Br. ⁵¹
difforme	7. 3	(1.12)	1836	<i>Glottiphyllum semicylindricum</i> (Haw.) N.E.Br. ⁵²
dilatatum	28. 1	(6. 9)	1854	<i>Cephalophyllum diversiphyllum</i> (Haw.) N.E.Br. ⁵³
diversifolium	15. 2	(2. 3)	1837 }	
congestum	15. 2 ^β	(2. 4)	1837 }	
dolabriforme	6. 3	(3. 4)	1840	<i>Rhombophyllum dolabriforme</i> (L.) Schwant.
dubium Haw. (1803) non. Haw. (1795)	15. 4	(2. 6)	1837	<i>Cephalophyllum dubium</i> (Haw. 1803, non 1795) L.Bolus ⁵⁴
echinatum	53. 2	(4.28)	1842	<i>Delosperma echinatum</i> (Ait.) Schwant.
Ecklonis*	49. 5	(6.29)	1854	<i>Delosperma Ecklonis</i> (Salm) Schwant. ⁵⁵
elongatum	16. 1	(2. 8)	1837	<i>Conicosia affinis</i> N.E.Br. ⁵⁶
emarginatum	48. 4	(6.26)	1854	<i>Lampranthus emarginatus</i> (L.) N.E.Br.
ermininum	5. 6	(1. 8)	1836	<i>Stomatium ermininum</i> (Haw.) Schwant. ⁵⁷
expansum	62. 2	(1.34)	1836	<i>Sceletium expansum</i> (L.) L.Bolus
falcatum	29. 2	(3.22)	1840	<i>Lampranthus falcatus</i> (L.) N.E.Br.
falciforme	29. 1	(1.23)	1836	<i>Lampranthus falciformis</i> (Haw.) N.E.Br.
fastigiatum Haw. non Thunb.	44. 3	(6.19)	1854	<i>Aridaria plenifolia</i> (N.E.Br.) Stearn ⁵⁸
felinum	5. 2	(1. 6)	1836	<i>Faucaria felina</i> (Haw.) Schwant. ⁵⁹
filamentosum	20. 1	(3.14)	1840	<i>Ruschia filamentosa</i> (L.) L.Bolus
filicaule	47. 4	(1.33)	1836	<i>Lampranthus filicaulis</i> (Haw.) N.E.Br.
flavum	50. 7	(2.25)	1837	<i>Drosantheum flavum</i> (Haw.) Schwant.
flexuosum	44. 7	(3.32)	1840	<i>Aridaria acuminata</i> (Haw.) Schwant. ⁶⁰
floribundum	51. 7	(3.36)	1840	<i>Drosantheum floribundum</i> (Haw.) Schwant.
forficatum	31. 1	(1.25)	1836	? <i>Ruschia forficata</i> (L.) L.Bolus ⁶¹
formosum	27. 4	(3.21)	1840	<i>Lampranthus formosus</i> (Haw.) N.E.Br.

⁵¹ G.C. (3) 82. 510 (Dec. 1927). ⁵² G.C. (3) 82. 409 (Nov. 1927). ⁵³ J.B. 67. 17 (1929)

⁵⁴ *M. dubium* Haw., Misc. Nat. 39 (1803) Revis. Pl. Succul. 110 (1821) is rendered invalid by the prior homonym *M. dubium* Haw., Obs. Gen. Mesembr. 471 (1795); hence if *M. decipiens* Haw., Revis. Pl. Succul. 110 (1821) or *M. procumbens* Haw., Revis. Pl. Succul. 110 (1821) is regarded as conspecific, *Cephalophyllum dubium* (Haw, 1803 non 1795) L. Bolus must take the name *C. decipiens* (Haw.) L. Bolus or *C. procumbens* (Haw.) L. Bolus.

⁵⁵ fide N.E.Br. in *Bothalia* 1. 167 (1923) = *M. villosum* L.

⁵⁶ G.C. (3) 84. 253 (Sept. 1928).

⁵⁷ "The rough surface of the leaves badly represented," fide N.E.Br. in J.L.S.B. 45. 75 (1920).

⁵⁸ *Aridaria plenifolia* (N.E.Br.) Stearn, trans. nov.
Mesembryanthemum fastigiatum Haw., Obs. Gen. Mesembr. 210 (1795)—non Thunb. (1791). *M. plenifolium* N.E.Br. in *Bothalia* 1. 155 (1923). *Aridaria fastigiata* (Haw.) Schwant. in *Gartenflora* 77. 69 (1928).

⁵⁹ J.L.S.B. 45. 76 (1920).

⁶⁰ J.L.S.B. 45. 107 (1920).

⁶¹ "Salm-Dyck, non Jacq." (N.E.Br. ms.).

Salm-Dyck Name adopted by (1836-1854)	§ Fig.	(Fasc. Fig.)	Date	Provisional modern name.
fragrans ^A	8. 2	(4. 4)	1842	<i>Glottiphyllum fragrans</i> (Salm.) Schwant. ⁶²
geminiflorum	17.4	(1.16)	1836	
geniculiflorum	57. 1	(5.34)	1849	<i>Aridaria geniculiflora</i> (L.) N.E.Br. ⁶³
glaucum	25. 1	(3.20)	1840	<i>Lampranthus glaucus</i> (L.) N.E.Br.
glomeratum	48. 1	(6.23)	1854	<i>Lampranthus polyanthon</i> (Haw.) N.E.Br. ⁶⁴
gracile	22. 1	(4.11)	1842	<i>Erepsia gracilis</i> (Haw.) L.Bolus
grandiflorum	8. 3	(4. 5)	1842	<i>Glottiphyllum grandiflorum</i> (Haw.) N.E.Br. ⁶⁵
granulicaule	45. 2	(2.21)	1837	<i>Psilocaulon granulicaule</i> (Haw.) N.E.Br.
grossum	54. 3	(2.31)	1837	<i>Sphalmanthus carneus</i> (Haw.) N.E.Br. ⁶⁶
Haworthii	40. 1	(1.27)	1836	<i>Erepsia Haworthii</i> (Donn) Schwant.
heteropetalum	21. 2	(3.17)	1840	<i>Erepsia heteropetala</i> (Haw.) Schwant.
hispidum	51. 6	(4.26)	1842	<i>Drosanthemum hispidum</i> (L.) Schwant.
imbricatum	37. 2	(6.15)	1854	<i>Ruschia imbricata</i> (Haw.) Schwant.
inaequale	46. 4	(4.19)	1842	<i>Lampranthus inaequalis</i> (Haw.) N.E.Br.
inclaudens	21. 4	(3.18)	1840	<i>Erepsia inclaudens</i> (Haw.) Schwant.
incomptum	56. 4	(2.35)	1837	} <i>M. invalidum</i> N.E.Br. (= ? <i>Delosperma</i> sp.) ⁶⁷
Ecklonis*	56. 4 ^β	(6.33)	1854	
inconspicuum	47. 5	(6.22)	1854	? <i>Lampranthus inconspicuum</i> (Haw.) Schwant.
intonsum	52. 2	(2.29)	1837	<i>Trichodiadema intonsum</i> (Haw.) Schwant.
junceum	45. 1	(2.20)	1837	<i>Psilocaulon junceum</i> (Haw.) Schwant.
lacerum	21. 1	(4. 9)	1842	<i>Semnanthe lacerum</i> (Haw.) N.E.Br.
Lehmanni	42. 1	(5.27)	1849	<i>Corpuscularia Lehmannii</i> (E. & Z.) Schwant. ⁶⁸
lineolatum	33. 7	(2.16)	1837	<i>Ruschia lineolata</i> (Haw.) Schwant.
linguaeforme	8. 8	(6. 5)	1854	<i>Glottiphyllum latum</i> var. <i>cultratum</i> (Salm) N.E.Br. ⁶⁹
latum	8. 8 ^β	(6. 6)	1854	<i>Glottiphyllum latum</i> (Haw.) N.E.Br. ⁷⁰
longispinulum	54. 4	(2.32)	1837	<i>Sphalmanthus commutatus</i> (Berger) N.E.Br. ⁷¹
longum declive	8. 9 ^β	(5.12)	1849	<i>Glottiphyllum latum</i> var. <i>cultratum</i> (Salm) N.E.Br. ⁷²
lunatum	29. 3	(1.24)	1836	<i>Lampranthus lunatus</i> (Willd.) N.E.Br.
lupinum	5. 3	(6. 2)	1854	<i>Faucaria lupina</i> (Haw.) Schwant.

⁶² G.C. (3) 83. 14 (Jan. 1928).

⁶³ *Aridaria geniculiflora* (L.) N.E.Br., trans. nov.

Mesembryanthemum Capense geniculiflorum Dillenius, Hort. Eltham. 271 t. 205 (1732). *M. geniculiflorum* Linné, Sp. Pl. 1. 481 (1735). *Aridaria geniculiflora* N.E.Br. ms. in herb. Kew.

⁶⁴ fide N.E.Br. ms., "*M. glomeratum*" Salm, Mon. §48. 1, non L.f. = *M. polyanthon* Haw., i.e. *Lampranthus polyanthon* (Haw.) N.E.Br.; "*M. polyanthon*," Salm, Mon. §48. 2, non Haw. = *M. violaceum* D.C., i.e. *Lampranthus violaceus* (D.C.) N.E.Br.; *M. roseum* Willd., Salm-Dyck Mon. §29. 4 = *M. glomeratum* L., non auct., i.e. *Lampranthus glomeratus* (L.f.) N.E.Br.; "*M. violaceum*" Salm, Mon. §48. 4, non D.C. = *M. emarginatum* L., i.e. *Lampranthus emarginatus* (L.) N.E.Br.

⁶⁵ G.C. (3) 82. 489 (Dec. 1927).

⁶⁶ G.C. (3) 84. 34 (July, 1928).

⁶⁷ J.L.S.B. 45. 105 (1920).

⁶⁸ J.L.S.B. 45. 106 (1920), Fl. Pl. S. Afr. 7. t. 259 (1927).

⁶⁹ G.C. (3) 82. 510 (Dec. 1927).

⁷⁰ G.C. (3) 82. 510 (Dec. 1927).

⁷¹ E.B.J. 57. 631 (1922), G.C. (3) 84. 35 (July, 1928).

⁷² G.C. (3) 82. 510 (Dec. 1927).

Name adopted by Salm-Dyck (1836-1854)	§ Fig.	(Fasc. Fig.)	Date	Provisional modern name.
luteum	38. 2	(3.26)	1840	<i>Hymenocyclus luteus</i> (Haw.) Schwant.
macrorrhizum				
Haw. non D.C.	49. 3	(4.22)	1842	<i>Delosperma macrorrhizum</i> (Haw.) Schwant. ⁷³
micans	50. 8	(4.24)	1842	<i>Drosanthemum micans</i> (L.) Schwant.
micranthum	45. 3	(2.22)	1837	<i>Psilocaulon parviflorum</i> (Jacq.) Schwant.
microphyllum	34. 2	(6.12)	1854	<i>Ruschia microphylla</i> (Haw.) Schwant.
multiceps*	6. 2	(6. 3)	1854	<i>Bergeranthus multiceps</i> (Salm) Schwant. ^{T 74}
multiflorum	37. 1	(5.23)	1849	<i>Ruschia multiflora</i> (Haw.) Schwant.
multi-punc- tatum ^A	3. 6	(1. 2)	1836	<i>Cheiridopsis bifida</i> (Haw.) Schwant. ⁷⁵
muricatum	30. 3	(3.25)	1840	<i>Oscularia deltoides</i> (L.) Schwant. ⁷⁶
murinum	5. 4	(5. 1)	1849	<i>Stomatium murinum</i> (Haw.) Schwant.
musculinum	5. 7	(1. 9)	1836	<i>Chasmatophyllum musculinum</i> (Haw.) Dint. & Schwant. ⁷⁷
mustellinum	5. 5	(1. 7)	1836	<i>Stomatium mustellinum</i> (Salm) Schwant.
mutabile	21. 3	(4.10)	1842	<i>Erepsia mutabilis</i> (Haw.) Schwant.
nitidum	54. 1	(4.29)	1842	<i>Drosanthemum nitidum</i> (Haw.) Schwant.
nobile	4. 1	(4. 1)	1842	<i>Pleiospilos compacta</i> (Ait.) Schwant. ; <i>Pl. nobilis</i> (Haw.) Schwant. ; <i>Punctil- laria compacta</i> (Ait.) N.E.Br. ⁷⁸
noctiflorum	43. 2	(4.17)	1842	? <i>Aridaria noctiflora</i> (L.) Schwant.
fulvum*	43. 2 ^β	(6.17)	1854	? <i>Aridaria fulva</i> (Haw.) Schwant.
obconellum	1. 3	(1. 1)	1836	} <i>Conophytum obcordellum</i> (Haw.) N.E.Br. ⁷⁹
obcordellum	1. 2	(6. 1)	1854	
obliquum Haw.				<i>Drosanthemum lique</i> (N.E.Br.) Schwant. ⁸⁰
non Willd.	50. 5	(2.24)	1837	
pallens	63. 2	(1.36)	1836	<i>Prenia pallens</i> (Ait.) N.E.Br.
parvifolium	50. 3	(3.35)	1840	<i>Drosanthemum parvifolium</i> (Haw.) Schwant.
patulum	22. 5	(4.15)	1842	? <i>Erepsia patula</i> (Haw.) Schwant.
perfoliatum	33. 1	(2.14)	1837	<i>Ruschia perfoliata</i> (Haw.) Schwant.
pinnatifidum	60. 3	(6.35)	1854	<i>Aethephyllum pinnatifidum</i> (L.f.) N.E.Br.
polyanthon	48. 2	(6.24)	1854	<i>Lampranthus violaceus</i> (D.C.) N.E.Br. ⁸¹
pomeridianum	65. 1	(4.36)	1842	<i>Carpanthea pomeridiana</i> (L.) N.E.Br. ⁸²

⁷³ *M. macrorrhizum* Haw. (1826) is placed by N. E. Brown (ms. in herb. Kew) in an unpublished genus distinct from *Delosperma*. *M. macrorrhizum* D.C. (1828) = *M. napiforme* N.E.Br. = *Delosperma napiforme* (N.E.Br.) Schwant.

⁷⁴ J.B. 66. 267 (1928).

⁷⁵ J.L.S.B. 45. 79 (1920), G.C. (3) 79. 407 (June, 1926).

⁷⁶ J.L.S.B. 45. 118 (1920).

⁷⁷ J.B. 67. 18 (1929).

⁷⁸ G.C. (3) 80. 228 (Sept. 1926), 84. 493 (Dec. 1928). ⁷⁹ G.C. (3) 71. 307 (June, 1922).

⁸⁰ *Drosanthemum lique* (N.E.Br.) Schwant.

Mesembryanthemum obliquum Haw., Revis. Pl. Succul. 183 (1821) non Willd. (1799). *M. lique* N.E.Br. in J.L.S.B. 45. 103 (1920). *Drosanthemum obliquum* (Haw.) Schwant. and *D. lique* (N.E.Br.) Schwant. in Zeitschr. f. Sukkulente. 3. 30 (March, 1927).

⁸¹ See footnote 63 (under *M. glomeratum*).

⁸² J.B. 66. 323 (1928)

Name adopted by Salm-Dyck (1836-1854)	§ Fig.	(Fasc. Fig.)	Date	Provisional modern name.
praepingue	7. 5	(5. 5)	1849	<i>Glottiphyllum subditum</i> N.E.Br. ^{T 83}
productum	40. 4	(2.19)	1837	<i>Lampranthus productus</i> (Haw.) N.E.Br.
pugioniforme	16. 4	(5.15)	1849	<i>Conicosia communis</i> N.E.Br. ⁸⁴
pulchellum	34. 1	(2.17)	1837	<i>Ruschia pulchella</i> (Haw.) Schwant.
purpureo- album	15. 3	(2. 5)	1837	<i>Cephalophyllum purpureo-album</i> (Haw.) Schwant. ⁸⁵
pustulatum	8.10	(5.13)	1849	} <i>Glottiphyllum longum</i> (Haw.) N.E.Br. ⁸⁶
lividum*	8.10β	(5.14)	1849	
pyropaeum	59. 1	(6.34)	1854	<i>Dorotheanthus gramineus</i> (Haw.) Schwant. ⁸⁷
relaxatum	63. 1	(1.35)	1836	<i>Prenia relaxata</i> (Willd.) N.E.Br. ⁸⁸
reptans	15. 1	(6. 7)	1854	? <i>Lampranthus reptans</i> (Ait.) N.E.Br.
rhomboideum*	6. 5	(5. 4)	1849	<i>Rhombophyllum rhomboideum</i> (Salm) Schwant. ^T
rigidicaule	17. 2	(3.10)	1840	<i>Ruschia rigida</i> (Haw.) Schwant.
rigidum	36. 2	(6.13)	1854	
roseum	29. 4	(5.18)	1849	<i>Lampranthus glomeratus</i> (L.) N.E.Br. ; <i>L. roseus</i> (Willd.) Schwant. ⁸⁹
Rossi	19. 2	(3.13)	1840	<i>Carpobrotus Rossii</i> (Haw.) N.E.Br. ⁹⁰
rostellum	35. 1	(2.18)	1837	<i>Ruschia rostella</i> (Haw.) Schwant.
rostratum	3. 7	(1. 3)	1836	<i>Cheiridopsis tuberculata</i> (Mill.) N.E.Br. ⁹¹
brevibrac- teatum*	3. 7β	(1. 4)	1836	<i>Cheiridopsis bibracteata</i> (Haw.) N.E.Br. ⁹²
rubricaulis	20. 3	(3.16)	1840	<i>Ruschia rubricaulis</i> (Haw.) L.Bolus
Salmii	7. 8	(4. 2)	1842	<i>Glottiphyllum Salmii</i> (Haw.) N.E.Br. ⁹³
salmoneum	56. 2	(2.33)	1837	<i>Sphalmanthus canaliculatus</i> (Haw.) N.E.Br. ⁹⁴
sarmentosum	17. 3	(3.11)	1840	⁹⁵
scabrum	48. 7	(6.27)	1854	<i>Lampranthus scaber</i> (L.) N.E.Br.
scalpratum	8. 1	(4. 3)	1842	<i>Glottiphyllum linguiforme</i> (L.) N.E.Br. ⁹⁶
scapiger	6. 1	(1.10)	1836	<i>Bergeranthus scapiger</i> (Haw.) N.E.Br. ⁹⁷
Schollii ^A	17. 1	(3. 9)	1840	
semi- cylindricum	7. 2	(1.11)	1836	<i>Glottiphyllum semicylindricum</i> (Haw.) N.E.Br. ⁹⁸
semidentatum ^A	33. 5	(1.26)	1836	<i>Ruschia semidentata</i> (Salm) Schwant.
serrulatum	20. 2	(3.15)	1840	<i>Ruschia serrulata</i> (Haw.) Schwant.
speciosum	50. 9	(6.30)	1854	<i>Drosanthemum speciosum</i> (Haw.) Schwant.
spectabile	27. 3	(2.13)	1837	<i>Lampranthus spectabilis</i> (Haw.) N.E.Br.

⁸³ G.C. (3) 82. 409 (Nov. 1927).

⁸⁴ G.C. (3) 90. 137 (Aug. 1931).

⁸⁷ Bothalia 1. 157 (1923).

⁸⁹ See footnote 64 (under *M. glomeratum*).

⁹¹ J.L.S.B. 45. 88 (1920), G.C. (3) 80. 73 (July, 1926).

⁹² J.L.S.B. 45. 77 (1920).

⁹⁴ G.C. (3) 84. 13 (July, 1928).

⁹⁶ G.C. (3) 83. 13 (Jan. 1928).

⁸⁵ J.B. 67. 18 (1929). ⁸⁶ G.C. (3) 82. 470 (Dec. 1927).

⁸⁸ G.C. (3) 84. 268 (Oct. 1928).

⁹⁰ J.B. 66. 325 (1928).

⁹³ G.C. (3) 82. 429 (Nov. 1927).

⁹⁵ " = *M. laxum* Willd." (N.E.Br. ms.).

⁹⁷ J.B. 66. 267 (1928). ⁹⁸ G.C. (3) 82. 409 (Nov. 1927).

Name adopted by Salm-Dyck (1836-1854)	§ Fig.	(Fasc. Fig.)	Date	Provisional modern name.
spiniforme	47. 1	(1.30)	1836	<i>Lampranthus spiniformis</i> (Haw.) N.E.Br.
spinosum	41. 1	(5.26)	1849	<i>Eberlanzia spinosa</i> (L.) Schwant.
spinuliferum	54. 2	(4.30)	1842	<i>Aridaria spinulifera</i> (Haw.) N.E.Br. ⁹⁹
splendens	44. 2	(6.18)	1854	<i>Aridaria splendens</i> (L.) Schwant.
stellatum	52. 5	(6.31)	1854	<i>Trichodiadema hirsutum</i> (Haw.) Stearn ¹⁰⁰
stelligerum Haw. (1812, non 1824)	52. 4	(5.30)	1849	<i>Trichodiadema barbatum</i> (L.) Schwant. sec. N.E.Br. ¹⁰¹
stenum	46. 5	(4.20)	1842	<i>Lampranthus stenus</i> (Haw.) N.E.Br.
stipulaceum	40. 3	(1.29)	1836	<i>Erepsia stipulacea</i> (L.) Schwant.
striatum	51. 1	(2.26)	1837	<i>Drosanthemum striatum</i> (Haw.) Schwant.
strumosum	53. 1	(5.31)	1849	<i>Trichodiadema strumosum</i> (Haw.) L.Bolus
subcompressum	51. 5	(5.29)	1849	<i>Drosanthemum subcompressum</i> (Haw.) Schwant.
subincanum	49. 4	(2.23)	1837	<i>Delosperma subincanum</i> (Haw.) Schwant.
sulcatum	44. 1	(3.30)	1840	<i>Aridaria acuminata</i> (Haw.) Schwant. ¹⁰²
tenellum	36. 1	(5.20)	1849	<i>Ruschia tenella</i> (Haw.) Schwant.
tenuifolium	46. 6	(4.21)	1842	<i>Lampranthus tenuifolius</i> (L.) Schwant.
tigrinum	5. 1	(1. 5)	1836	<i>Faucaria tigrina</i> (Haw.) Schwant.
tortuosum	62. 4	(2.36)	1837	<i>Sceletium tortuosum</i> (L.) N.E.Br.
tricolorum	15. 7	(1.14)	1836	<i>Cephalophyllum tricolorum</i> (Haw.) N.E.Br. ¹⁰³
Tripolium	64. 1	(4.35)	1842	<i>Gymnopoma Tripolium</i> (L.) N.E.Br. ; <i>Skiatophytum Tripolium</i> (L.) L.Bolus ¹⁰⁴
tuberosum	49. 2	(6.28)	1854	<i>Delosperma tuberosum</i> (L.) Schwant.
tumidulum	37. 3	(5.24)	1849	<i>Ruschia tumidula</i> (Haw.) Schwant. ¹⁰⁵

⁹⁹ *Aridaria spinulifera* (Haw.) N.E.Br., trans. nov.

Mesembryanthemum spinuliferum Haworth, Obs. Gen. Mesemb. 206, 443 (1795), Misc. Nat. 57 (1803), Synop. Pl. Succul. 252 (1812), Rev. Pl. Succul. 176 (1821). *Aridaria spinulifera* N.E.Br. ms. in herb. Kew.

¹⁰⁰ *Trichodiadema hirsutum* (Haw.) Stearn, trans. nov.

Ficoides Capensis humilis, folio tereto, pilis in extremitate stellatis, flore purpureo Bradley, Hist. Succul. Pl. Dec. 2. 6 t. 15 (1717). *Mesembryanthemum radiatum humile, foliis minoribus* Dillenius, Hort. Eltham. 246 t. 190 f. 235 (1732). *M. barbatum* β Linné, Sp. Pl. 1. 482 (1753). *M. hirsutum* Haworth, Obs. Gen. Mesemb. 297 (1795), Misc. Nat. 105 (1803), Synop. Pl. Succul. 279 (1819). "*M. stellatum*" ? D.C., Pl. Succul. Hist. t. 29 (1800); Haw., Revis. Pl. Succul. 191 (1821); Salm, Mon. §52. 5 (1854); Stapf in Bot. Mag. 151. t. 9103 (1926)—non Miller (1768). "*Trichodiadema stellatum*" Jacobsen, Verz. Art. Mesemb. (Fedde, Rep. Sp. Nov. Beih. 106) 198 (1938)—non (Mill) Schwant. (1926) sensu stricto. As pointed out in footnote 30, *M. stellatum* Mill. is based entirely on the *Ficoides Capensis, frutescens* Bradley, Hist. Succul. Pl., Dec. 1, p. 6. t. 5 (1716), a loose-growing species distinguishable at a glance from this dwarf compact one.

¹⁰¹ See footnote 30 (under *M. barbatum*). ¹⁰² J.L.S.B. 45. 107 (1920).

¹⁰³ J.B. 67. 18 (1929).

¹⁰⁴ *Skiatophytum* L. Bolus in South Afr. Gard. 17. 435 (Dec. 1927), L. Bolus, Notes on Mesemb. 15, 124, 126, 134 (1928); *Gymnopoma* N.E.Br. in G.C. (3) 83. 194 (March, 1928).

¹⁰⁵ J.L.S.B. 45. 130 (1920); "a mere colour variety of *M. umbellatum* L." (N.E.Br. ms.).

Name adopted by Salm-Dyck (1836-1854)				Provisional modern name.	
	§ Fig.	(Fasc. Fig.)	Date		
umbellatum	37. 4	(6.16)	1854	<i>Ruschia umbellata</i> (L.) Schwant.	
umbelliflorum	44. 6	(3.31)	1840	<i>Aridaria umbelliflora</i> (Jacq.) Schwant.	
uncatum*	8. 6	(5.10)	1849	<i>Glottiphyllum uncatum</i> (Salm) N.E.Br. ¹⁰⁶	
uncinatum	33. 3	(6.10)	1854	<i>Ruschia uncinata</i> (L.) Schwant.	
uncinellum	33. 4	(5.19)	1849	<i>Ruschia uncinella</i> (Haw.) Schwant.	
unidens	33. 6	(6.11)	1854	<i>Ruschia unidens</i> (Haw.) Schwant.	
vaginatum	36. 4	(6.14)	1854	<i>Ruschia vaginata</i> (Haw.) Schwant.	
validum	15. 8	(1.15)	1836	<i>Cephalophyllum dissimile</i> (N.E.Br.) N.E.Br. ^{T 107}	
variabile	46. 2	(3.34)	1840	<i>Lampranthus variabilis</i> (Haw.) N.E.Br.	
verruculatum	39. 1	(3.28)	1840		
violaceum	48. 3	(6.25)	1854	<i>Lampranthus emarginatus</i> (L.) N.E.Br. ¹⁰⁸	
virens	24. 1	(3.19)	1840	<i>Lampranthus erratus</i> N.E.Br. ^{T 109}	
virescens	19. 3	(1.20)	1836	<i>Carpobrotus disparilis</i> N.E.Br. ^{T 110}	
virgatum	23. 1	(2. 9)	1837	<i>Ruschia virgata</i> (Haw.) L.Bolus	
viride	33. 2	(2.15)	1837	<i>Smicrostigma viride</i> (Haw.) N.E.Br.	
viridiflorum	54. 5	(5.32)	1849	<i>Sphalmanthus viridiflorus</i> (Ait.) N.E.Br. ¹¹¹	
Zeyheri*	40. 5	(5.25)	1849	<i>Lampranthus Zeyheri</i> (Salm) N.E.Br. ^{T 112}	

¹⁰⁶ G.C. (3) 82. 470 (Dec. 1927).

¹⁰⁷ J.L.S.B. 45. 105 (1920), J.B. 66. 327 (1928).

¹⁰⁸ See footnote 64 (under *M. glomeratum*).

¹⁰⁹ G.C. (3) 87. 212 (March, 1930).

¹¹⁰ J.B. 66. 324 (1928).

¹¹¹ G.C. (3) 84. 34 (July, 1928).

¹¹² G.C. (3) 87. 212 (March, 1930).

SUPPLEMENTARY INDEX TO PLATES PUBLISHED UNDER MESEMBRYANTHEMUM

Acrodon bellidiflorus § 12.1; *bellidiflorus viridis* § 12.1β; *subulatus* § 12.1 γ
(as *M. bellidiflorum subulatum*).

Aethephyllum pinnatifidum § 60.3.

Agnirictus agninus § 5.8.

Aptenia cordifolia § 61.1.

Aridaria acuminata § 44.7 (as *M. flexuosum*), § 44.1 (as *M. sulcatum*);
albicaulis § 44.5; *defoliata* § 43.1; *fastigiata*, cf. § 44.3 footnote 58; ? *fulva*
§ 43.2β (as *M. noctiflorum fulvum*); *geniculiflora* § 57.1; ? *noctiflora* § 43.2;
notha § 44.4 (as *M. acuminatum*); *plenifolia* § 44.3 (as *M. fastigiatum*); *spinulifera*
§ 54.2; *splendens* § 44.2; *umbelliflora* § 44.6.

Bergeranthus multiceps § 6.2; *scapiger* § 6.2.

Carpanthea pomeridiana § 65.1.

Carpobrotus acinaciformis § 19.6; *aequilaterus* § 19.1 (as *M. aequilaterale*);
chilensis § 19. γ (as *M. aequilaterale chiloëense*); *disparilis* § 19.3 (as *M. virescens*);
glaucescens § 19.5 (as *M. abbreviatum*); *Rossii* § 19.2.

Carruanthus caninus § 5.9.

Cephalophyllum ? *decipiens*, see § 15.4 footnote 54 (under *M. dubium*); *dissimile* § 15.8 (as *M. validum*); *diversiphyllum* § 15.2 (as *M. diversifolium*) § 15.2 β (as *M. diversifolium congestum*); *loreum* § 15.6 (as *M. corniculatum*); ? *procumbens*, see § 15.4 footnote 54 (under *M. dubium*); *purpureo-album* § 15.3; *subulatoides* § 13.1 (as *M. acutum*); *tricolorum* § 15.7.

Chasmatophyllum *musculinum* § 5.7.

Cheiridopsis *bibracteata* § 3.7 β (as *M. rostratum brevibracteatum*); *bifida* § 3.6 (as *M. multipunctatum*); *tuberculata* § 3.7 (as *M. rostratum*).

Conicosia *affinis* § 16.1 (as *M. elongatum*); *brevicaulis* § 16.2; *communis* § 16.3 (as *M. capitatum*), § 16.4 (as *M. pugioniforme*).

Conophytum *obcordellum* § 1.2, § 1.3 (as *M. obconellum*).

Corpuscularia *Lehmanii* § 42.1.

Crocanthus *croceus* § 38.3.

Cryophytum *Aitonis* § 60.2 (as *M. crystallophanes*); *clandestina* § 60.4.

Cylindrophyllum *calamiforme* § 10.1.

Delosperma *crassuloides* § 56.3 (as *M. crassulinum*); *echinatum* § 53.2; *Ecklonis* § 49.5; *macrorrhiza* § 49.3; *subincanum* § 49.4; *tuberosum* § 49.2.

Disphyma *australe* § 18.2.

Dorotheanthus *gramineus* § 59.1 (as *M. pyropaeum*).

Drosanthemum *asperulum* § 50.2; *attenuatum* § 51.3; *brevifolium*, see § 50.4 footnote 39; *calycinum* § 51.3; *condens* § 51.4; *erigeriflorum* § 50.4 (as *M. brevifolium*); *flavum* § 50.7; *floribundum* § 51.7; *hispidum* § 51.6; *lique* § 50.5 (as *M. obliquum*); *micans* § 50.8; *nitidum* § 54.1; *obliquum*, see § 50.5 footnote 80; *parvifolium* § 50.3; *speciosum* § 50.9; *subcompressum* § 51.5.

Eberlanzia *spinosa* § 41.1.

Erepsia ? *anceps* § 22.2; ? *aspera* § 22.3; *compressa* § 22.4; *coralliflorus* § 40.2; *gracilis* § 22.1; *Haworthii* § 40.1; *heteropetala* § 21.2; *includens* § 21.4; *mutabilis* § 21.3; *patula* § 22.5; *restiophila* § 22.3 (as *M. asperum*); *stipulacea* § 40.3.

Faucaria *felina* § 5.2; *lupina* § 5.3; *tigrina* § 5.1.

Glottiphyllum *cruciatum*, see § 7.7 footnote 47; *fragrans* § 8.2; *grandiflorum* § 8.3; *latum* § 8.4 (as *M. adscendens*), § 8.8 β (as *M. linguaeforme latum*); *latum cultratum* § 8.5 (as *M. cultratum*), § 8.7 (as *M. depressum*), § 8.8 (as *M. linguaeforme*), § 8.9 β (as *M. longum declive*); *linguiforme* § 8.1 (as *M. scalpratum*); *longipes* § 7.7 (as *M. cruciatum*); *longum* § 8.10 (as *M. pustulatum*), § 8.10 β (as *M. pustulatum lividum*); *proclive* § 7.6 β (as *M. augustum heterophyllum*); *Salmii* § 7.8; *semicylindricum* § 7.2, § 7.1 (as *M. bidentatum*), § 7.4 (as *M. bigibberatum*), § 7.3 (as *M. difforme*); *subditum* § 7.5 (as *M. praepingue*); *taurinum* § 7.6 (as *M. angustum*); *uncatum* § 8.6.

Gymnopoma *Tripolium* § 64.1.

Hymenocyclus *croceus* § 38.3; *luteus* § 38.2.

Lampranthus (= *Mesembryanthemum* L. emend. Schwant.) *aduncus* § 47.3; *amoenus* § 27.2 (as *M. amönum*); *aurantiacus* § 25.2; *aureus* § 25.3; ? *bicolor* § 46.3; *blandus* § 26.1; *coccineus* § 46.1; *coralliflorus* § 40.2; *curviflorus* § 26.2; *Dyckii* § 27.1 (as *M. conspicuum*); *emarginatus* § 48.4, § 48.3 (as *M. violaceum*); *erratus* § 24.1 (as *M. virens*); *falcatus* § 29.2; *falciformis* § 29.1; *filicaulis* § 47.4; *formosus* § 27.4; *glaucus* § 25.1; *glomeratus* § 29.4; *inaequalis* § 46.4; ? *inconspicuus* § 47.5; *lunatus* § 29.3; *multiradiatus* § 26.1 (as *M. blandum*); *polyanthon* § 48.1 (as *M. glomeratum*); *productus* § 40.4; ? *reptans* § 15.1, § 18.3 (as *M. crassifolium*); *roseus* § 29.4; *scaber* § 48.7; *spectabilis* § 27.3; *spiniiformis* § 47.1; *stenus* § 46.5;

tenuifolius § 46.6; *variabilis* § 46.2; *violaceus* § 48.2 (as *M. polyanthon*); *Zeyheri* § 40.5.

Machaiophyllum *albidum* § 5.10.

Nananthus *cibdelus* § 4.3 (as *M. aloides*).

Oscularia *caulescens* § 30.1; *deltoides* § 30.3 (as *M. muricatum*); *deltoides pedunculata* § 30.2 (as *M. deltoides*).

Pleiospilos *compacta* § 4.1 (as *M. nobile*); *nobilis* § 4.1.

Prenia *pallens* § 63.2; *relaxata* § 63.1.

Psilocaulon *granulicaule* § 45.2; *junceum* § 45.1; *parviflorum* § 45.3 (as *M. micranthum*).

Punctillaria *compacta* § 4.1 (as *M. nobile*).

Rabiea *cibdela* § 4.3 (as *M. aloides*).

Rhombophyllum *dolabriforme* § 6.3; *rhomboideum* § 6.5.

Ruschia (= *Mesembryanthemum* L. emend. N.E.Br.) *acutangula* § 36.5; *congesta* § 23.2; *curta* § 36.6; *filamentosa* § 20.1; ? *forficata* § 31.1; *imbricata* § 37.2; *lineolata* § 33.7; *microphylla* § 34.2; *multiflora* § 37.1; *perfoliata* § 33.1; *pulchella* § 34.1; *rigida* § 36.2; *rostella* § 35.1; *rubricaulis* § 20.3; *semidentata* § 33.5; *serrulata* § 20.2; *tenella* § 36.1; *tumidula* § 37.3; *umbellata* § 37.4; *uncinata* § 33.3; *uncinella* § 33.4; *unidens* § 33.6; *vaginata* § 36.4; *virgata* § 23.1.

Sceletium *anatomicum* § 62.1; *concauum* § 62.5; *crassicaule* § 62.6; *expansum* § 62.2; *tortuosum* § 62.4.

Semnanthe *lacerum* § 21.1.

Skiatophytum *Tripolium* § 64.1.

Smicrostigma *viride* § 33.2.

Sphalmanthus *canaliculatus* § 56.2 (as *M. salmoneum*); *carneus* § 54.3 (as *M. grossum*); *commutatus* § 54.4 (as *M. longispinulum*); *salmoneus* § 56.1 (as *M. canaliculatus*); *viridiflorus* § 54.5.

Stomatium *ermininum* § 5.6; *murinum* § 5.4; *mustellinum* § 5.5.

Trichodiadema *barbatum* § 52.4 (as *M. stelligerum*); *bulbosum* § 52.3; ? *densum* § 52.6; *hirsutum* § 52.5 (as *M. stellatum*); *intonsum* § 52.2; *stellatum* § 52.1 (as *M. barbatum*); *stelligerum*, see § 52.4 footnote 30; *strumosum* § 53.1.

ADDENDA.

Page 37.—Mr. A. J. A. Uitewaal of Amsterdam has called my attention to his article on "Dr. Mart. van Marum als plantenliefheber en plantkundige" in *Cactussen en Vetplanten* 2. 2-11 (1936), from which it appears that the Dutch scientist, Martinus van Marum (1750-1837), director of the Museum Teyler at Haarlem, by his advice and gift of plants helped Salm-Dyck considerably in the preparation of the *Monographia*. The Hollandische Maatschappij der Wetenschappen at Haarlem possesses about 300 letters addressed to van Marum between 1813 and 1834 by Haworth and Salm-Dyck.

Page 39—Salm-Dyck planned more plates of Aloë, as of *Mesembryanthemum*, than he was able to achieve. The following plates of Aloë are missing from all copies of the *Monographia* examined:—§ 1.2, § 2.3, § 6.3, § 9.4, § 15.4, § 15.5, § 15.6, § 16.2, all § 19, § 25.2, § 27.3, § 27.4, § 29.23, § 29.27, § 29.28, § 29.34, § 29.35, § 29.36. As already mentioned (pp. 37, 39), all the plates of fasc.

7 (1863), namely § 7.2 (*A. sordida*), § 16.1 (*A. brevifolia*), § 17.1 (*A. lineata*), § 17.2 (*A. glauca*), § 17.3 (*A. caesia*), § 18.3 (*A. consobrina*), § 23.1 (*A. umbellata*), § 24.2 (*A. flavispina*), § 24.5 (*A. Commelini*), § 24.7 (*A. nobilis*), § 27.2 (*A. africana*), § 27.6 (*A. supralaevis*), § 29.3 bis (*A. Zeyheri*), § 29.4 (*A. dictyodes*), § 29.5 (*A. bicolor*), § 29.12 (*A. ensifolia*), § 29.32 (*A. sulcata*) were published without descriptions.

Page 39.—*Haworthia marginata*, under the invalid name *H. albicans*, is discussed and figured by A. J. A. Uitewaal in *Succulenta* 20. 140-144 (Oct. 1938).

Page 41.—*Aloë intermedia*, as figured in § 29.24, "does not seem to be Haworth's *intermedia*, which has more obtuse leaves and a branching peduncle." (N.E.Br. ms.)

Page 41.—*Aloë microstigma* Salm (1854) according to K. Wein in *Zeitschr. f. Sukkulentenk.* 3. 46 (1925) should be called *A. ferox* Miller (1768) sec. Wein and "*A. ferox*" as commonly interpreted should be called *A. muricata* Haw. (1804).

These conclusions are highly debatable, since *Aloë Vera costa spinosa* Munting, *Phytogr. Curios.* 20.t. 97 (1702) on which *Aloë ferox* Mill. (1768) and *A. dorsalis* Haw. (1804) are based, has a branched inflorescence and leaves spiny along the back, while *A. microstigma* Salm has an unbranched inflorescence and leaves not spiny along the back, though spiny at the margin.

Page 42.—*Aloë nigricans*, as figured in § 29.7, is "entirely different from the true *G. nigricans*" (fide N.E.Br. ms.).

Page 43.—*Aloë translucens*: although Berger (1908) adopts the name *Haworthia pellucens* Haw. (1812) for this, the correct name is *H. translucens* (Haw.) Haw. (1819), based on *A. translucens* Haw. (1804); "*pellucens*" was clearly a *lapsus calami* for "translucens."

A SUMMARY IN GERMAN FOR THE CONVENIENCE OF FOREIGN READERS FOLLOWS.

ZUSAMMENFASSUNG.

Auf S. 34-37 gibt der Verfasser einige Einzelheiten aus dem Leben des Fürsten Joseph zu **Salm-Reifferscheid-Dyck** (1773-1861), der, als Schüler des französischen Meisters Pierre Joseph **Redouté**, ein hervorragenden Zeichner von Sukkulente-pflanzen wurde; er brachte in seinem Schlosse in der Nähe von Düsseldorf eine bedeutende Sammlung von Aloineen, Kakteen und Mesembryanthemen zusammen. Die *Monographia Generum Aloes et Mesembryanthemi* mit ihren schönen lithographischen z. T. handkolorierten Tafeln und mit lateinischen Beschreibungen ist sein wichtigstes Werk. Es wurde in 6 Heften zwischen den Jahren 1836 und 1854 veröffentlicht. Nach dem Tode des Fürsten kamen weitere 17 Tafeln von Aloineen zum Vorschein und diese Tafeln (s.S. 39, 83) wurden ohne Beschreibungen und ohne Register als ein letztes Heft herausgegeben. Nunmehr sind die Erscheinungsjahre der einzelnen Hefte und der Tafeln von dem Verfasser entdeckt worden: diese Jahreszahlen sind für die Hefte auf S.38-39, für die Tafeln von Aloë (einschliesslich *Apicra*, *Chamaealoe*, *Gasteria*, *Haworthia*) auf S.39-43 und für diejenigen von *Mesembryanthemum* auf S. 73-81 angegeben. Allmählich ist die wissenschaftliche

Nomenklatur zur Revision gelangt und viele Namen, die zur Zeit des Fürsten von Salm-Dyck bekannt waren, sind nicht mehr im Gebrauch. Deswegen sind die jetztigen Namen für die Aloë-Arten nach der Bergerischen Monographie (1908) hier gegeben und im Falle der schwierigeren Namen von Mesembryanthemum nebst deren abgetrennten Gattungen hat der Verfasser die jetztigen Namen, die auf dem Salm-Dyck'schen Tafeln in den Veröffentlichungen und Handschriften von Herrn Dr. Nicholas Edward Brown (1934) aufgezeichnet sind, zitiert; die Namen für die übrigen Mesembryanthemum-Tafeln waren zum grossen Teil von Herrn Arthur Allman Bullock (Kew) und Herrn Hermann Johannes Heinrich Jacobsen (Kiel) bestimmt.

Am Fusse der S.37 sind die wahrscheinlichen Jahre der Veröffentlichung von Augustin Pyramus de Candolle's *Plantarum succulentarum Historia* gegeben.

In Einklang mit den internationalen Regeln der botanischen Nomenklatur müssen die Namen **Aloë princeps** (Haw.) Stearn für *A. Salm-Dyckiana* Schultes (s.S.42), **Aridaria plenifolia** (N.E.Br.) Stearn für *A. fastigiata* (Haw. non Thunb.) Schwantes (s.S. 76), **Drosanthemum erigeriflorum** (Jacq.) Stearn für "*D. brevifolium*" auct. (s.S. 74), **Drosanthemum lique** (N.E.Br.) Schwantes für *D. obliquum* (Haw. non Willd.) Schwant. (s.S. 78), **Gasteria pseudo-nigricans** (Salm) Haw. für *G. subnigricans* Haw. (s.S. 41), **Haworthia marginata** (Lam.) Stearn für *H. albicans* (Haw.) Haw. (s.S. 39), **Haworthia herbacea** (Mill.) Stearn für *H. atrovirens* (D.C.) Haw. (s.S. 40), und **Trichodiadema hirsutum** (Haw.) Stearn für "*T. stellatum*" auct. (s.S. 80) acceptiert werden.

Book Review

THE *Cultivation of Succulents*, by H. Jacobsen, translated by Vera Higgins; published by Williams and Norgate, 1939; price 5/-.

Many people are more attracted now-a-days by succulent plants as distinct from cacti, but there has been no book to help the beginner (and even the more advanced grower) who wants to know what soils are suitable, when to water, how to propagate, although Herr Jacobsen has already given great assistance in identifying the plants in his earlier work *Succulent Plants*. Now he has given us these instructions in a new book in a very clear and adequate manner. The treatment of the plants is described in simple language, amplified by the illustrations, and no one need hesitate to acquire a collection now that there is this most helpful guide to their requirements.

J. R. Scott, Strathmore, Baildon, Shipley, Yorks. has a bound copy of the original edition of Britton and Rose's Monograph for disposal.

A Wonderful Cactus Collection

By Gerd Solhjell

(Norway.)

DURING a summer vacation in Nürnberg, Bavaria, this year, I was introduced to a gentleman, Herr Robert Gräser, and when hearing about his famous cactus collection I hastened to accept an invitation to see his conservatory.

Herr Gräser lives outside the old walls and towers of the fascinating mediæval town of Nürnberg. His cactus house is situated close to his villa, and at the time of my visit he had between 5- and 6,000 plants, large and small. In the summer he has a great number of them outside in the garden.

The hot house itself is 10 ft. high, about 30 ft. long and about 15 ft. wide, and is centrally heated. At the one end of it there is a separate room where he experiments in cross fertilization.

Just when I was there six of the *Cereus grandiflorus*—"Queen of the Night"—opened (about 9 p.m.), and on this annual occasion a great many callers from far and near come to see this wonderful blossom. Apart from occasions like this Herr Gräser, who is a very quiet and modest man, does not like too many people coming to disturb him.

Though Herr Gräser, as a teacher, has always, of course, had to spend several hours of his day in the schoolroom, in his free time he has devoted himself to his hobby with a love and never-failing patience seldom found. He had only a few plants when he started 20 years ago, and gradually from seeds and cuttings he has built up his present beautiful and valuable collection. Indeed, the word "hobby" is no longer the correct expression since he has worked systematically on strictly scientific lines to realize his plan: the highest standard of culture and beauty. Herr Gräser told me that (perhaps unlike many other collectors) it is not rarity but beauty that decides whether he thinks it worth while to cultivate the plant; nor is he aiming merely at large numbers. And it was easy to see that beauty of colour must have been one of the most important features to him.

Another characteristic feature of this collection is the many successful experiments carried out with great care and on the strict basis of the laws of heredity, the results of which have confirmed their correctness. For instance, Herr Gräser has made numerous interesting experimental crosses with the *Astrophytums* through three generations and also with *Gymnocalycium* and varieties of *Cereus*. He has himself cultivated the plants from seeds and cuttings and watched them grow up during these twenty years.

In the German cactus periodical, *Kakteen-Kunde*, issued in Berlin, the editor, Dr. Wilhelm v. Roeder, once wrote of Herr Gräser's collection:—

"I may, perhaps, be called 'unscientific' and 'aesthetic,' but I for my part cannot but say that the collection of Herr Gräser is the most beautiful one in Germany, perhaps in all Europe, and it is to be hoped that this collection in a not too distant future may provide a valuable and important foundation upon which future scientific research work may be based."

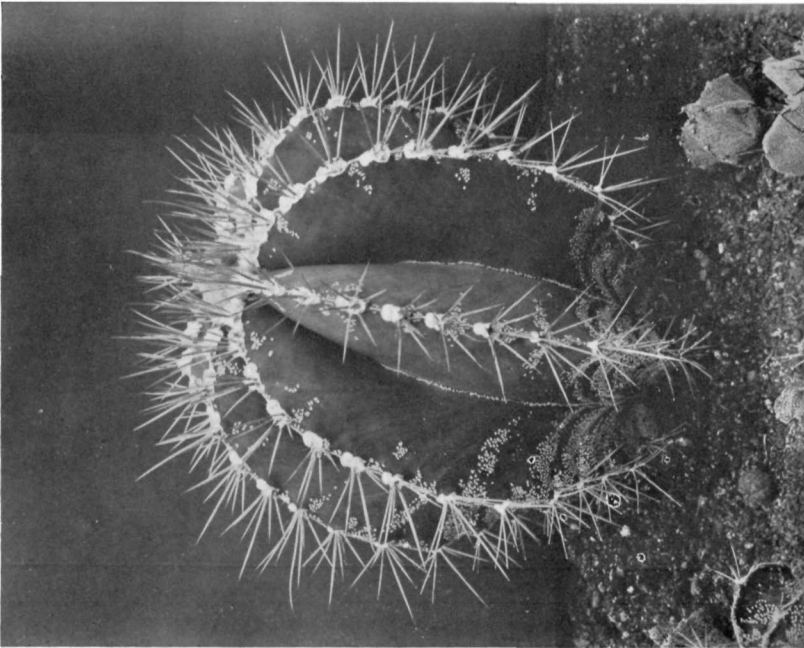


Fig. 22.
Astrophytum ornatum var. *glabrescens*.
An eight-year-old seedling.

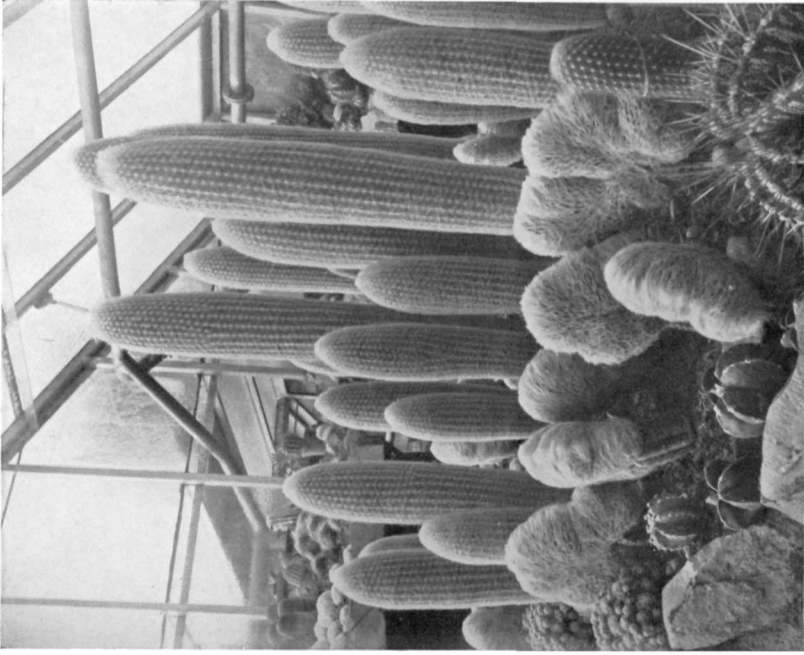


Fig. 23
Cereus lanatus and var. *cristatus*.
Plants in Herr Gräser's Collection. (see page 86.)

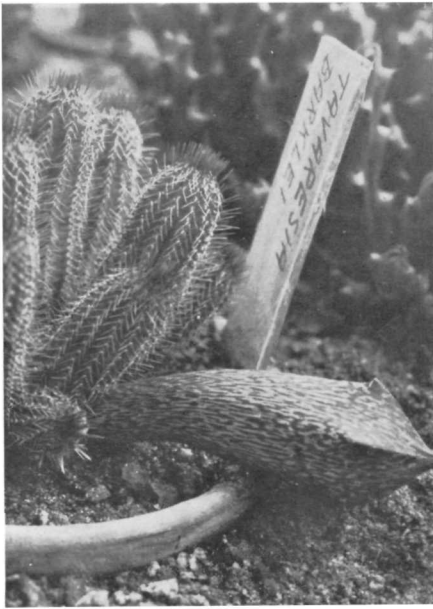


Fig. 24.
Tavaresia grandiflora.
(see page 89.)

Tavaresia Grandiflora

By S. G. Fiedler

I WAS very interested in Mr. Sharp's note on *Tavaresia grandiflora* and the very fine photograph.

Three years ago I bought a small plant labelled *Tavaresia Barklyi* and was told at the same time it was rather difficult. I, therefore, treated it with great respect, did not transfer it to a larger pot and kept it very dry all winter. In late spring next year it was transplanted to a 3 in. shallow pan and it responded to this kindness by increasing to nine growths about 2 in. high. During autumn, 1937, it was placed in my new greenhouse in the Stapelia section, which is housed in the south-east end where the plants are shaded till about 1 o'clock. Here it was plunged to the rim of its pot in sandy soil and put to rest for the winter. It was very late to start growing in spring, showing signs of being rather cramped, and in the middle of July it was transplanted to a 4¼ in. wide and 5½ in. deep pot. The roots were healthy but remarkably short, no longer than 3 inches, the depth of the pan. The new compost consisted of 2 parts loam, 1 part broken mortar rubble, 1 part leafmould, 3 parts sand. A lump of old, dry, well-seasoned cowdung, the size of a walnut, rubbed quite fine, was mixed with a 2 in. layer of soil at the bottom of the deep pot. In this it grew rapidly; by the end of August there were twenty growths in all, those in the centre approximately 3 in. high. One bud formed but did not develop, and during September three other buds appeared. I tried giving more water, a daily splash round the edge of the pot, and one bud started growing and bloomed eventually in the middle of October. The flower, nearly 4 inches long, was pale yellow, densely speckled with purple-brown spots. It lasted in good condition for ten days, long enough to appear at the Royal Horticultural Society's Show on 25th-26th October, where it received a Botanical Certificate under the name of *Tavaresia grandiflora*, the description of which I thought fitted it better.

Although there seems to be a definite difference between the flower on Mr. Sharp's plant and mine, it shows very distinct, almost acute, angles at the base of the five lobes; the former photograph is not sharp enough to show the spines on the stems. As the description which White and Sloane give in their Monograph on the Stapeliae says that *Tavaresia Barklyi* and *grandiflora* are so similar that it is almost impossible to distinguish between them, and that the flowers on the same plant may vary very considerably in size, I shall let my plant remain under the name *T. grandiflora*.

Home again from the Show, the flower did me a last good turn. Just before, I had made a very sad discovery. A number of fine *Huernias* and *Duvalias* had suddenly collapsed. The cause, a multitude of woodlice living happily on the roots and the bases under the plants where they had avoided detection. All had to come up and a merciless massacre was carried out amongst the brutes. Two days after the return of *Tavaresia*, I noticed one morning perforations in the flower tube and found it packed tight with the last refugees of the woodlouse tribe, some thirty in all, from a couple of venerable grandparents to quite small members of a third generation. What more could they ask for than being carried, flower-enshrouded, to the bonfire, and that was the last I have seen of woodlice in the greenhouse.

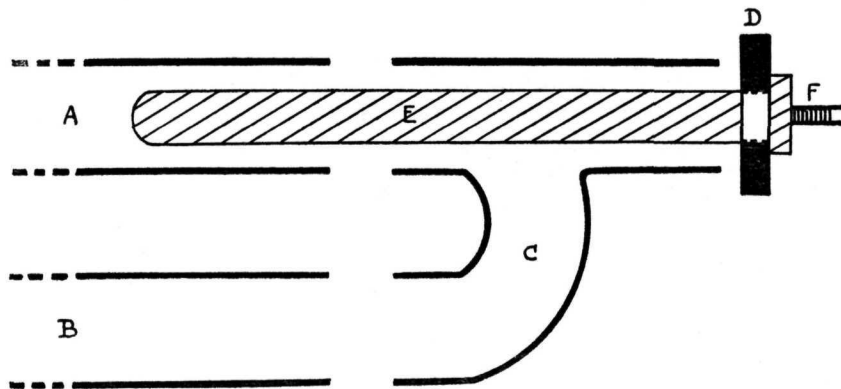
Installing an Immersion Heater

By Stuart H. Griffin

A WELL-KNOWN proverb says: "Necessity is the mother of invention;" the paternity is more doubtful, but I think that laziness might be a good guess, or shall we say labour saving? After nearly forty years of stoking, a change is welcome, and though a good boiler is efficient and not a very bad master, it is one that never allows even one day off, and there is that horrible feeling when really warm in bed—"Did I replace the bottom damper—or the top one?" and more than once the answer (as they say at Westminster) has been in the negative, and the results have been most unpleasant.

I had put in an Immersion Heater for the bathroom which was so successful that I began to think of having one in the greenhouse, and I got an estimate which included a 30-gallon tank or cylinder to replace the boiler, the price being over £20. This was far too high for me, as my one idea was to use the pipes as they were and not to heat 30 gallons of water unnecessarily, which greatly added to the cost; I wanted no boiler or cylinder, just hot pipes, but I had no idea how to do this.

One day I was looking through a list of fixtures and pipes and I saw a two-way branch pipe, price 4s. 9d. (see illustration below), and I knew that my problem was solved.



A, B = old pipes; C = two-way branch; D = blank end; E = Immersion heater;
F = electric cable.

Join A and B to C by means of expansion joints; place blank end D over the third arm of C and join up. The immersion heater is then screwed through a hole tapped in the centre of D.

The correct pattern of heater for this work is one in a metal tube either two or three feet long according to the power, and about two inches in diameter, so that it will lie easily in a four-inch pipe.

I bought a four-inch, two-way branch, a blank end and two expansion joints, at a cost of 13s. 1d.; the blank end was tapped to take the screw in the head of the immersion heater and fitted to the two-way branch by its expansion joint, and the other ends to the existing hot water pipes. Expansion joints are very easy to make;

this part of the job I did myself in less than half an hour, and when the cable was connected, the apparatus was 100 per cent. efficient. Members with pipes 2 or 3 inches in diameter could easily adapt them cheaply.

The greenhouse is 20 ft. x 10 ft., span roof, average height about 6½ ft., cubic capacity about 1,300 cubic feet; heating costs of course depend entirely on the number of cubic feet to be heated and that is why needlessly lofty houses are very extravagant. I tried a 2-kilowatt heater at first but this never raised the water in the pipes above 111 degrees or 112 degrees F. in mild weather, so I changed it for a 3-kilowatt heater which does all that is needed and the house has never been below 40 degrees F. and could have been 5 degrees or so warmer.

Now as to cost, the two-way branch and joints cost 13s., the immersion heater, wiring and main switch cost £5 12s. 4d.; the fixing charge would, of course, vary according to distance; there is no meter hire for water heating, and current for this purpose is ½d. a unit in this rural area.

Later I added a thermostat; my scale ranges from 35 degrees to 55 degrees F., and I keep it set at 45 or 46 degrees; this cost £2 and 5s. for fixing and will soon pay for itself, as it cuts off current directly the set temperature is reached; other scales are available if required. Electric rates are in great confusion, a few miles from here the rate is only ¼d.

My boiler used to be on duty from October to March inclusive, burning rather over two tons of best anthracite nuts at 78s. to 80s. per ton, say 27s. per month. In October and November last warm weather saved me 54s., but in December the current cost £1 10s. 5d.

Now for the pros and cons. All life is a balance of compromises. A critic may say: "Why keep your fire going like that?" The answer is that I hate raking out and laying in new fires, perhaps after the 6 o'clock news says "Severe ground frost locally," and even if laid in, of standing about in the cold and dark while the fire starts up, and freshly-lit fires are very heavy on coal.

The critic would, I am sure, reply: "Excuses for laziness," but Chamber's Dictionary says: "critic—a faultfinder"! With the heater there is no more coal to be delivered, carried or stoked, no storage room, no sticks, no clinker, no out-of-doors; the meter is in the hall, and a glance tells you all is well; there is a complete saving of time, dirt and unpleasant work. You may even avoid, or, if this is impossible, almost enjoy a day or two in bed with lumbago or a chill, if you are an optimist; you can come home really late, or take a week-end or a week off, without bothering neighbours or friends; these are very great advantages.

And the critic—he is wondering why he cannot find any dry sticks!

All human things fail, breakdowns occur, the fire is out, the coal unburnt, the pipes cold, or the fire has burnt through and the water boiled, owing to a sudden gale. Once there was 6 inches of snow on the ground, no lorries on the road, and no coal—these things happen; with electricity there is the telephone and an emergency break-down gang on duty; so far I have not needed them.

To sum up, I have carried out my idea and used existing apparatus, which is 100 per cent. efficient (for I hate waste) and saved labour. There is such a nice boiler sitting idle in my shed, not even on the dole, and genuinely seeking employment. Would the critic like to become its master—or servant?

Three New and Interesting Species of the Genus *Gasteria*, Duval

By Karl von Poellnitz

(Oberlödla, Germany.)

1. *Gasteria chamaegigas* v.P. in Fedde, Repert. XLV. (1938) 159.—This species, which is probably near *Gast. maculata* (Thunb.) Haw., was discovered by J. R. James on the top of a hill north-east of Mackay Bridge, Sundays River, 27 miles from Port Elizabeth; the type is *Stayner* 33; it grows either in sun or shade. In the following description the remarks in brackets () belong to a type plant grown in shade. Stem elongated, up to 8 cm. long, leafy or covered with leaf-bases towards its base. Leaves conferted (laxer), spirally distichous (nearly distichous), 6-7 (-8) cm. long, $2\frac{1}{2}$ cm. broad at the base, lorate-linguiform, rounded or rounded-truncate or rounded-deltoid at the tip, with a tall mucro, dark green (green), smooth, shining, flecked; face somewhat concave towards the base, flat or flat-convex (mostly a little concave) towards the tip; back a little convex, obliquely keeled, keel marginiform towards the tip, third face 7-10 mm. broad at its base; margins much dilated at the base, margins above this part and keels with a few light flecks sometimes somewhat prominent, above the middle or towards the tip with a light, serrulate horny border smooth at the very tip; flecks whitish (light greenish), roundish-oblong, rather numerous (more numerous), mostly somewhat (more) confluent, arranged in indistinct crossbands on the upper side, more numerous (still more numerous), more confluent, arranged mostly in more distinct crossbands on the lower side. Scape always simple. Flowers unknown.

2. *Gasteria liliputana* v.P. in Fedde, Repert. XLV. (1938) 159.—*Gast. pulchra* Phillips in Pole-Evans, Flow.Pl.S.Afr. IX. (1929) t.360—non Haw.—This species was confused by Phillips with *Gast. pulchra* (Ait.) Haw. but in this species the stem is very elongated, the leaves are spirally distichous, 20-30 cm. long, they differ in shape and are otherwise flecked. The type which is figured and which I have not seen, was collected by Miss L. Britten and Mr. R. A. Dyer at Peddie Road, 20 miles from Grahamstown (Nat. Herb. Pretoria 8173). I saw plants from Pluto's Vale, Grahamstown Distr., growing on shady slopes, collected by Mr. W. H. Jones (= *Stayner* No. 15); also according to Mr. Stayner this material completely agrees with the illustration in Flow.Pl.S.Afr. This species was introduced to Europe a few years ago by Haage junior, Erfurt.—Stem very short, with a rosette of leaves spirally arranged. Leaves $3\frac{1}{2}$ -6 cm. long, 1-1 $\frac{1}{2}$ cm. broad at the base, the outer ones very spreading and sometimes somewhat recurved at the tip, dark green, shining, flecked, lanceolate, gradually or somewhat suddenly acuminate, acute, with a tall mucro, face concave, flat towards the tip; back convex, obliquely keeled, keel marginiform towards the tip, third face 5-7 mm. broad at the base, margins dilated at the base; keel and the margin which reaches the leaf tip with minute, irregularly arranged, nearly light or greenish tubercles towards the base, with a serrulate, white or greenish horny border from about the middle, this border smooth to the very tip; flecks about roundish, 1-2 mm. across, on the face greenish-white, irregularly distri-



Gasteria chamaegigas v.P.

Left—Plant grown in shade.

Right—Plant grown in sun.

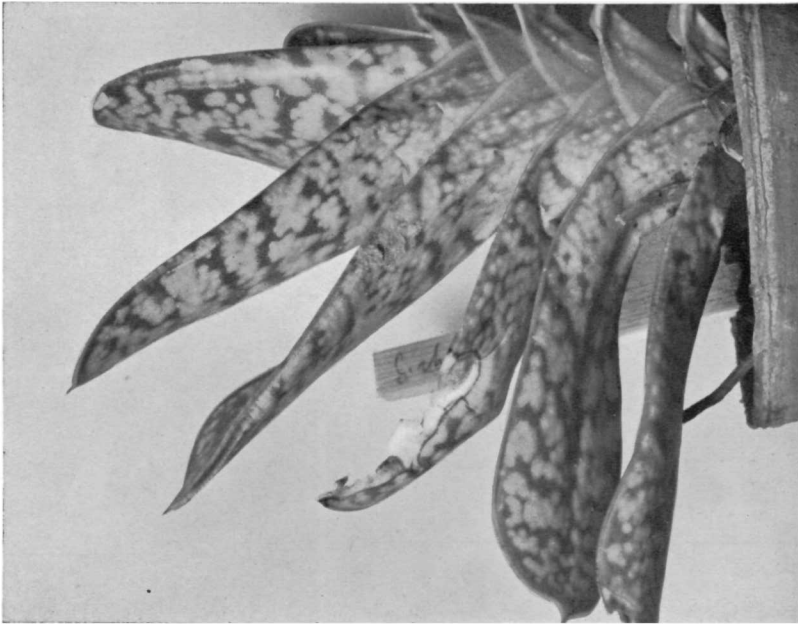


Fig. 25.

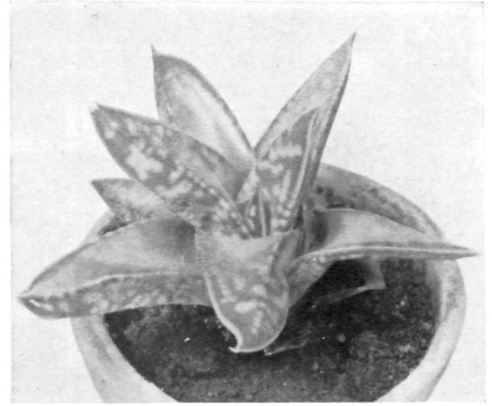
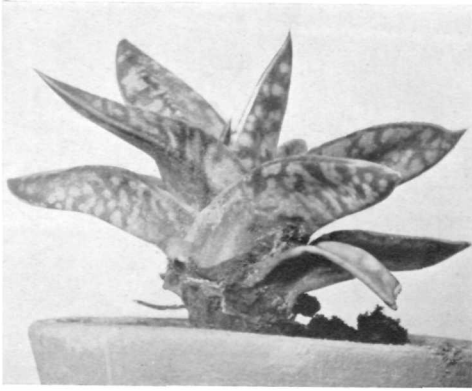


Fig. 26.
Gasteria liliputana.

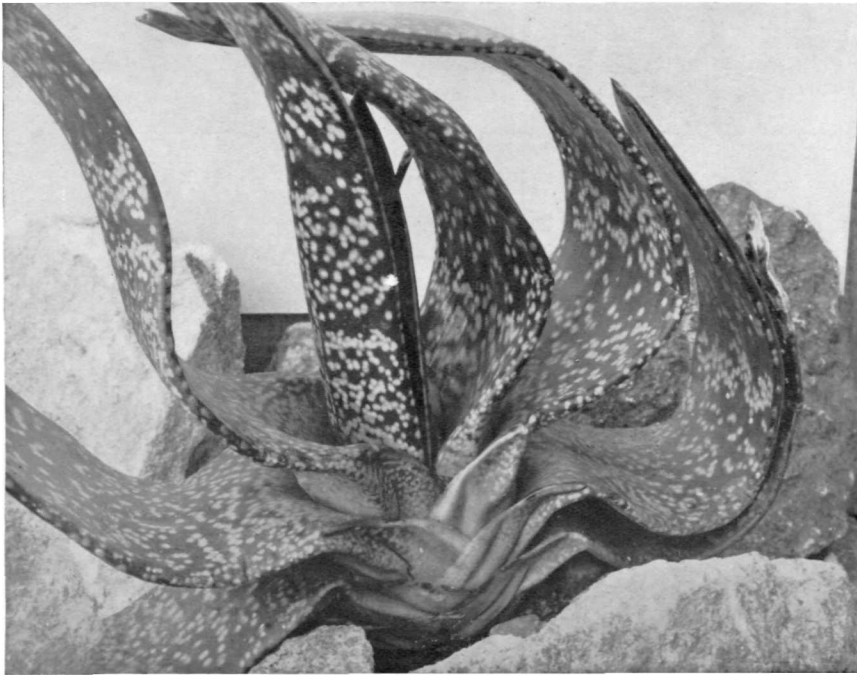


Fig. 27.
Gasteria Triebneriana v.P.

Jacobsen.

buted, often or very often irregularly confluent, rather numerous, on the back more numerous, a little lighter, nearly whitish, more separate towards the tip, otherwise very confluent, more or less covering the ground colour, often arranged in very indistinct crossbands. Scapes 2-4, always simple, 20-40 cm. long. I have not seen the floweres and the following remarks are taken from the text and figure of Phillips. Sterile bracts 6-8 mm. long. Pedicels 10 mm. long, their bracts 5-6 mm. long. Flower $1\frac{1}{2}$ cm. long, swollen base longer than the tube, distinctly narrowed at the base, more than 5 mm. across, somewhat curved, red, tube nearly straight, greenish, segments obtuse, only a little spreading.—In young plants the leaves are distichous and their flecks at first somewhat prominent.

3. *Gasteria Triebneriana* v.P. in Fedde, Repert. XLV. (1938) 158. The type of this species was collected by Mrs. S. Blackburn three miles north-east of Calitzdorp (=Triebner No. 1713), cultivated in the Botanic Garden, Kiel; the photograph was taken by Herr Jacobsen; the species is named in honour of Herr W. Triebner, of Windhoek; it is near *Gast. angustifolia* (Ait.) Haw., *Gast. conspurcata* (Salm) Haw. and *Gast. obtusifolia* (Salm) Haw., it is easily distinguished from these three species by its ascending-incurved, long-acuminate leaves.—Stem very short. Leaves 15-20 cm. long, 4-5 cm. broad, rarely somewhat narrower, distichous, linguiform, gradually and rather long-deltoid-acuminate towards the tip, acute, mucronate, smooth, dark green, a little shining, the older ones ascending and mostly incurved, more rarely recurved; face a little concave, but flat towards the tip, with an inconspicuous longitudinal middle furrow, back somewhat convex, not keeled; margins above the dilated base somewhat rounded, rather acute towards the tip, smooth or with single tubercles towards the base, towards the tip with a serrulate, light horny border smooth at the very tip; flecks whitish or nearly white, roundish or somewhat oblong, on the face numerous, separate or a few confluent, irregularly distributed, on the back more numerous, more confluent, especially numerous towards the leaf-base, arranged in indistinct crossbands or nearly regularly distributed over the whole back of the leaf. Scape branched, up to more than 1 m. long; pedicels 9-10 mm. long, their bracts 1 mm. longer. Flowers 20-22 mm. long; swollen base oblong, a little curved, narrowed at the base, 6 mm. across, red, lighter towards the tip, longer than the slightly curved, whitish tube, which has green stripes; segments short, obtuse, somewhat spreading, light-rose coloured with green central stripes.

DATES OF MEETINGS IN 1939.

March 7th.	September 12th.
April 4th.	October 10th.
May 2nd.	November 28th.
July 18th.	

FIXTURES.

April 4th.—To be arranged.

May 2nd.—Mr. G. S. Fiedler will talk on Succulents from Seed, with examples.

Annual Meeting

The Annual Meeting was held on February 7th, 1939, when the Report of the Council for 1938 and the Balance Sheet were presented and adopted. Lord Mansfield, who presided, was unanimously re-elected President; Mr. C. H. Rowland was elected Hon. Secretary, Mr. C. Clarke was re-appointed Hon. Treasurer and the vacancies on the Council were filled by the election of Mr. H. N. Minchin, Mr. G. A. Snelling and Mr. H. K. Walden. Mrs. Higgins retains the office of Hon. Editor.

Report of the Council for 1938

The Council have to report that the number of members joining during the year is 57, but as the number who have left the Society is also 57, the membership still stands at 376, of which 9 are Associates. Three members have died during the year, 20 have resigned and 34 names have been removed for non-payment of subscriptions. Persons resident abroad may receive the *Journal* at a reduced subscription, as they cannot take advantage of the other privileges of membership, and the number of people now doing so is 40.

The *Cactus Journal* is now in its seventh year; with the seventh volume a change was made in the format, the covers being made stiffer and the paper changed; the altered form seems to have met with general approval. With this volume too, the Society itself took over publication.

The Meetings have been continued as usual; the Council would like to thank those people who have kindly given talks during the year: March, Dr. Marrable, "Euphorbias"; June, Miss Mackenzie, "Phyllocactus, Epiphyllums and Rhipsalis"; September, Mr. B. S. Williams, "Manuring of Cacti"; November, Mr. J. B. Southgate, "Watering Cacti." The other Meetings were devoted to discussions and the exhibition of plants.

For the sixth successive year an Exhibition was held in the Royal Horticultural Society's Old Hall. This was on similar lines to the preceding shows and was equally—but not more—successful than previous ones. To make a really good exhibition far more entries are needed.

The Library continues to be of service to members and a number of books are constantly on loan, the postal distribution taking up a considerable amount of the Librarian's time. Members are asked to remember that there is often a waiting list and to return books as quickly as possible.

The Council would like to thank the authorities of the Royal Horticultural Society for their generous assistance in a number of ways, and also the Press for their kindness in publishing notices of the Society's activities.

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THE CACTUS JOURNAL

Vol. 7

June, 1939

No. 4

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JUNE, 1939.

No. 4.

Description of *Conophytum* Species

(Continued.)

By Mrs. Louisa Bolus

EXPLANATION OF COLOURED PLATE

Plate 5.—This plate deals chiefly with species found in the Karroo in an area well between the 33rd and 34th parallels of latitude, and extending from the Ceres Division in the west to the Oudtshoorn Division in the east. It thus includes the Ceres Karroo, the Little Karroo, and a considerable portion of the Great Karroo. About 30 species have been recorded from this area, and of these only a few are fairly well known. But all will have to be carefully studied with ample material before their limits as good species can be decided. It is quite likely several will be reduced when more is known about them. All the plants portrayed are night-flowering and more or less fragrant.

A. ***Conophytum Wiggettae*** N.E.Br. *Gard. Chron.*, vol. 79, p. 12 (1926).—This species was described without flowers from material sent to Kew by Mrs. Wiggett from Hazenjacht, near Oudtshoorn. The plant figured here was sent to Kirstenbosch (N.B.G. 637/26), by Miss B. Hops from the type-locality. It flowered in April, 1928, when the drawing was made.

Fig. 1, body, viewed from above, enlarged; 2, do., opened, with part of fl. nat. size. See also plate 5a, A.

B. ***Conophytum brevipetalum*** Lavis, *Mesemb. II*, p. 290 (1931).—The large anthers and short corolla-segments ("petals") seem to distinguish this *Conophytum* from its close allies. For it seems to be very near *C. piluliforme* N.E.Br. from the neighbourhood of Montagu. It is known only from the type-collection of Mr. R. Morgan, probably made in the Little Karroo, which flowered at Kirstenbosch in April, 1931.

Fig. 1, body, opened, with part of fl., nat. size; 2, gynaecium and portion of corolla and androecium x 5.

C. **Conophytum Leightoniae** L. Bol., *Mesemb. III*, p. 85.—The drawing represents a portion of the type-material collected by Miss F. M. Leighton (Mrs. Isaac) a few miles from Montagu in November, 1935. It flowered well at Kirstenbosch in May, 1937. It is evidently very closely allied to *C. piluliforme* N.E.Br. and to *C. advenum* N.E.Br. The latter was described without flowers, but some of the material collected with the type, and sent to Kirstenbosch at the same time as the type was sent to Kew, flowered in the National Botanic Gardens. The corolla-segments were a copper-red outside and paler and more yellow on the inner side, in which respect, as well as in respect to other parts of the floral structure, it agreed with *C. piluliforme*. It may be noted here that the fourth species recorded from Montagu, *C. Archeri* Lavis, is quite distinct from the three species mentioned above.

Fig. 1, body, with fl., nat. size; 2, do., viewed from above x 2; 3, do., opened, with part of fl., nat. size; 4, calyx x 2; 5, corolla-segments x 3; 6, bracts x 2; 7, long. section through portion of fl. x 5.

D. **Conophytum catervum** N.E.Br.?—The locality (near Laingsburg) of this plant is not far from that of the type of *C. catervum* N.E.Br., which was described without flowers. The markings on the body vary (see figs. 2 and 3); but there is a tendency for the dots, even when they are not confluent, to assume a radiating direction from the orifice, as described in *C. catervum*. It was found by Miss G. J. Lewis and sent to Kirstenbosch (N.B.G. 2709/32), where it flowered in May, 1937.

Fig. 1, body, with fl., nat. size; 2 and 3, do., viewed from above x 3; 4, do., opened, with part of fl., nat. size; 5, long. section through portion of fl. x 5.

E. **Conophytum spectabile** Lavis, *Mesemb. II*, p. 264 (1931).—The plant represented is part of the type which flowered at Kirstenbosch in May, 1927 and April, 1929. It was got by Mr. M. H. Giffen near Triangle, in the Worcester Division, and is perhaps the finest of the *Conophyta* found in the Karroo. The flowers are described as having a fruity smell.

Fig. 1, body, viewed from above x 2; 2, do., opened, with part of fl.; 3, calyx—nat. size; 4, corolla-segments; 5, stamens; 6, gynaecium—x 5. See also plate 5a, E.

F. **Conophytum** sp.—The affinity of these plants appears to be with *C. Muirii* N.E.Br., a species we have not yet been able to observe carefully. Both plants were collected by Professor Compton, the one on the right (N.B.G. 1392/27) near Barrydale and that on the left (N.B.G. 2307/27) between Muis Kraal and Barrydale. The latter locality might easily include the area from which the type of *C. Muirii* was derived, and it is possible this species may have a fairly wide distribution in the Little Karroo and may prove to be a variable one.

Fig. 1 (left) body, viewed from above; 2, half a body and part of fl.—enlarged. Fig. 1 (right) body; 2, do., with fl.—nat. size; 3, do., viewed from above, enlarged; 4, calyx x 2; 5, long. section through portion of fl. x 4.

G. **Conophytum spirale** N.E.Br.? *Gard. Chron.*, vol. 78, p. 500 (1925).—The identification of this plant with *C. spirale* is doubtful, since the petals do not show the characteristic spiral arrangement of that species. In other respects, however, it agrees fairly well with the description of the type, especially in having 6 sepals, whereas most of the species located in the Prince Albert area have 4 sepals. The plant drawn was one of several collected by Dr. Mary A. Pocock near Prince Albert, which flowered at Kirstenbosch (N.B.G. 1440/27) in April, 1928.

Fig. 1, half a body and part of fl.; 2, calyx—nat. size.



H. *Conophytum praecinctum* N.E.Br., *Gard. Chron.*, vol. 71, p. 307 (1922).
 —Of the two drawings reproduced here the lower represents the type-plant, and is part of what Dr. N. E. Brown called “the excellent coloured drawing made by Miss M. Page from a living plant” upon which the species was founded. The upper drawing is of a plant got by Mr. J. Acock (N.B.G. 2029/33) at Touws River in the Worcester Division. The name, *praecinctum* (encircled) alludes to the circular form of the marking on the body. This marking varied on bodies of the same plant in the collection from Touws River. Both plants flowered at Kirstenbosch—the former in May, 1919 and the latter in May, 1937.

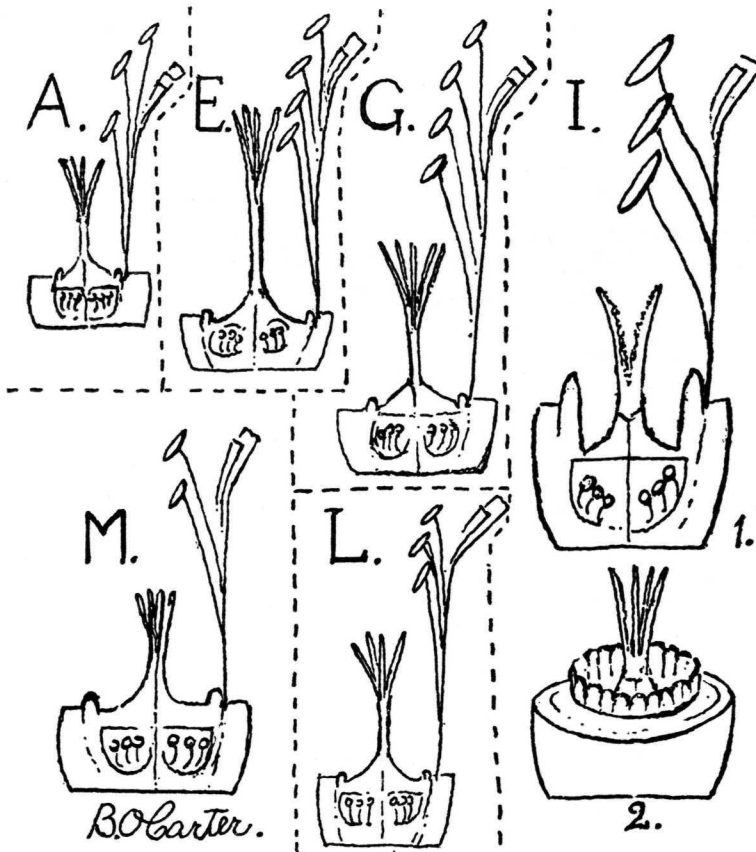


PLATE 5a.

- A. *Conophytum Wigettae* N.E.Br.—Long. section through portion of fl. x 3.
- E. *Conophytum spectabile* Lavis.—Long. section through portion of fl. x 5.
- G. *Conophytum spirale* N.E.Br.?—Long. section through portion of fl. x 5.
- I. *Conophytum calitzdorpense* L. Bol.—Fig. 1, long. section through portion of fl.; 2, gynaeceum—x 7.
- L. *Conophytum subglobosum* Tisch.—Long. section through portion of fl. x 4.
- M. *Conophytum Renniei* Lavis.—Long. section through portion of fl. x 4.

Fig. 1, body, with fl., nat. size; 2, do., viewed from above; 3, do. x 2; 4, do., opened, with fl., nat. size; 5, corolla-segments x 5; 6, calyx, nat. size; 7, long. section through portion of fl. x 5—all taken from N.B.G. 2029/33.

I. **Conophytum calitzdorpense** L. Bol., *Mesemb. III*, p. 21 (1936).—This represents the type and is one of the plants collected by Dr. J. Luckhoff at Calitzdorp and grown in the Stellenbosch University Gardens, where it flowered in April, 1936. It is very closely allied to *C. Muirii* N.E.Br. and may prove to be merely a form of that species. The colour of the corolla is a pale flesh-pink or cream and the lemon-yellow of the flower in fig. 3 is incorrect.

J. **Conophytum pisinum** N.E.Br., *Gard. Chron.*, vol. 71, p. 214 (1922).—The plant figured was a portion of the type sent by Dr. N. E. Brown to Kirstenbosch (N.B.G. 1086/27), where it flowered in April, 1929, when the drawing was made. The notes taken then describe the corolla as greenish-white and the style 0.5 mm., and the stigmas 1 mm. long. The species was described without flowers and without precise locality.

Fig. 1, body, with part of fl.; 2, half of do., with fl.; 3, calyx—nat. size; 4, corolla-segments; 5, stamens—x 2; 6, gynaecium, with part of androecium and corolla x 4; 7, portion of epidermis, enlarged.

K. **Conophytum** sp.—The locality of this plant is unknown. It was sent to Kirstenbosch (N.B.G. 762/30) by Messrs. Starke & Co., among other plants collected by Mr. R. Morgan (after whom *C. Morganii* Lavis is named), probably in the Karroo, and flowered in May, 1931. Only one or two flowers were produced and an expanded one was not seen. It does not seem to agree with any of the descriptions of *Conophytum*, and the publication of this drawing may be the means of gaining more knowledge of the plant and its locality.

Fig. 1, body, viewed from above—x 2; 2, do., opened, with fl.; 3, calyx—nat. size; 4 corolla-segments; 5, long. section through portion of fl.—x 5.

L. **Conophytum subglobosum** Tisch. in *Cactus Journ.*, vol. 6, p. 37 (1937).—This is one of the four or five *Conophyta* we have recorded from the Ceres Karroo. It was found by Mrs. M. R. Levyns and sent to Kirstenbosch (N.B.G. 1374/26), where it flowered in April, 1929. We have not seen the type of *C. subglobosum*, but our plant agrees fairly well with the description of that species.

Fig. 1, body, viewed from above; 2, do., opened, with part of fl.—nat. size; 3, calyx; 4, corolla-segments; 5, stamens—x 2; 6, gynaecium x 4.

M. **Conophytum Renniei** Lavis, *Journ. Bot.*, vol. 68, p. 78 (1930).—This species is closely allied to *C. spirale* N.E.Br., and in old flowers the corolla-segments are spirally twisted. It also comes from the vicinity of Prince Albert. The chief differences are in the arrangement of the dots round the orifice, in the 4 calyx-segments, and the 4 stigmas which are shorter than the style. The drawing represents the type, collected by Mr. J. Rennie near the Dwyka River and sent to Kirstenbosch (1422/28), where it flowered in April, 1929.

Fig. 1, body, with part of fl., nat. size. See also plate 5a M.

PLATE 5.—A. *CONOPHYTUM WIGGETTAE* N.E. Br. B. *C. BREVIPETALUM* LAVIS. C. *LEIGHTONIAE* L. Bol. D. *C. CATERVUM* N.E. Br.? E. *C. SPECTABILE* LAVIS. F. *C.*, sp. G. *C. SPIRALE* N.E. Br.? H. *C. PRAECINCTUM* N.E. Br. I. *C. CALITZDORPENSE* L. Bol. J. *C. PISINNUM* N.E. Br. K. *C.* Sp. L. *C. SUBGLOBOSUM* TISCH. M. *C. RENNIEI* LAVIS. B. *O. Carter* del.



Fig. 28.
Part of an Amateur's collection.

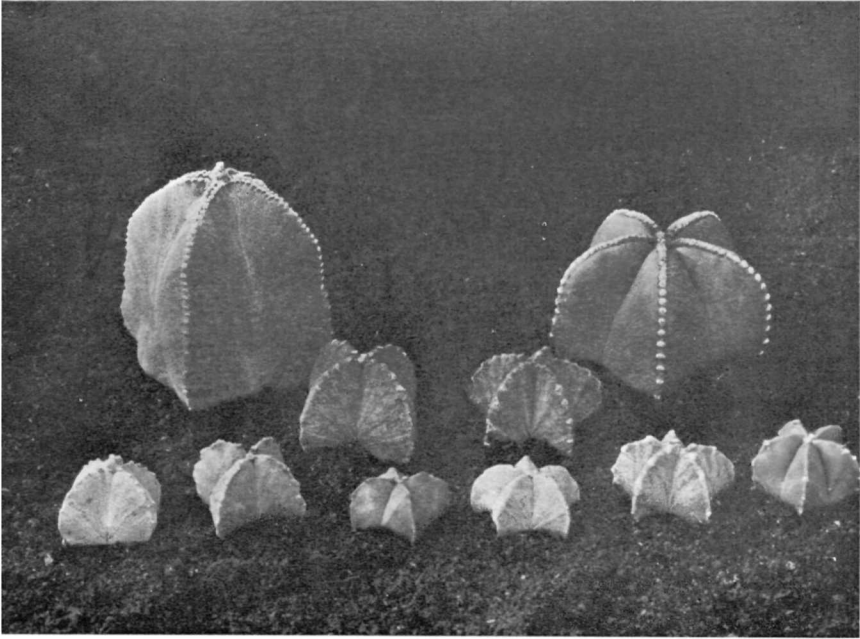


Fig. 29.
Three generations of *Astrophytum myriostigma*.

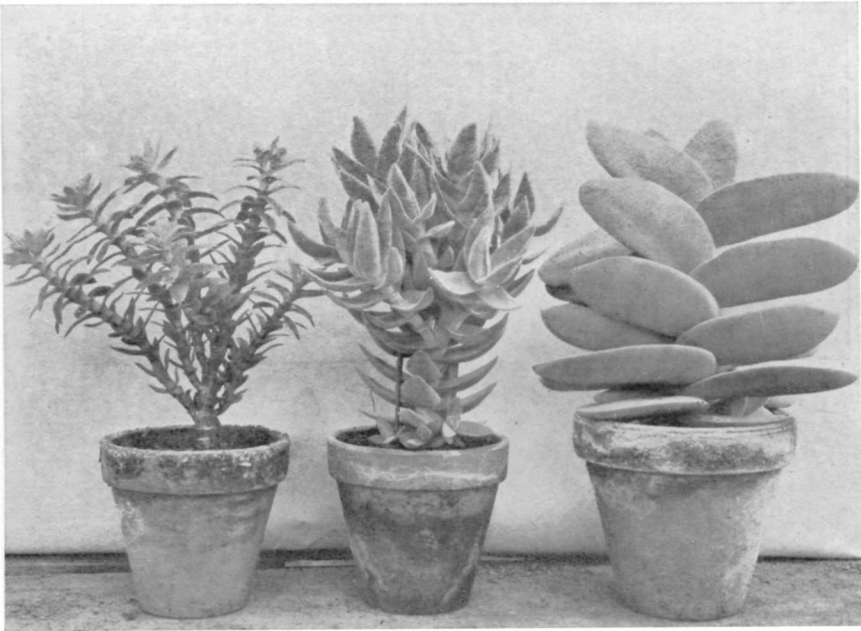


Fig. 30.
The centre plant is a hybrid between
Crassula falcata (right) and *Rochea coccinea*.

An Experiment in Hybridisation with *Astrophytum Myriostigma*

By Robert Gräser

THERE is in collections a variety *nuda* of the well-known, five-sided *Astrophytum myriostigma*. In this plant the little white woolly flecks are wanting, so that it looks green. Of the four-sided *Astrophytum myriostigma* var. *tetragona* there is no var. *nuda*. Being fond of myriostigmas I have tried to raise such a plant.

As parents I used *Astrophytum myriostigma* var. *tetragona* and *A. myriostigma* var. *nuda*—the two large plants in the illustration (see p. 102). By fertilisation with pollen from plants of the same type these two plants had produced similar offspring, only four-sided white or five-sided green “Bishop’s Caps”; they were, therefore, of pure stock and suitable for such an experiment. The plants had maintained a constant number of ribs for many years, until they had reached a diameter of about 14 cm. Then the four-sided ones as well as the five-sided often increase the number of ribs up to 6-8, or even more.

Whether I used pollen from *nuda* or *tetragona*, or the reverse, the result was always the same. In the F₁-generation plants were obtained that had fewer woolly flecks than *tetragona*, about half-way between the parents. A mean between four and five ribs is not possible for individual plants; about half the plants were four-sided, the other half having five sides. Later, when they had reached a diameter of 4-5 cm., the four-sided ones often became five-sided, so that finally the proportion of five-sided ones was greater. When the plants of the F₁-generation—in the centre of the illustration—had reached flowering size, they were pollinated with each other. In the F₂-generation—the front row in the illustration—all conceivable combinations appeared: four-sided plants, closely covered with woolly flecks, others with less wool, and others again where it was entirely wanting. And the same with the five-ribbed plants. The aim of the experiment, a plant with four sides and without woolly flecks, was thus achieved.

It is noteworthy that, as regards the density of the woolly flecks in the F₂-generation, there was no division according to the simple Mendelian rule 1 : 2 : 1. Amongst 100 plants, at most only one or two were pure *nuda*; the other plants showed all transitional and intermediate stages from a dense covering to almost naked. The external distinguishing character, with flecks—without flecks, does not rest, therefore, on one single hereditary factor; there are at least three, possibly even more, such factors to be traced.

The experiment is being continued. A number of green four-sided plants will be flowered and inter-pollinated. Not till two plants have been obtained, whose offspring are *only* four-sided green plants, will the final object have been achieved, namely, a new species of pure ancestry, *tetragona* var. *nuda*, which can then be raised with certainty from seed.

Fig. 30 shows the result of an interesting experiment in hybridisation which is being carried out by Herr Gräser’s brother.

Cactus Surgery

By the Rev. F. C. Champion

FROM time to time, as all cactus enthusiasts know, we have to deal with injured cacti and succulents, much as surgeons have to deal with injured and diseased human bodies. Recently this has in my case become a necessity, for despite all precautions, the severe frost has done some damage here and there, and all the year through there are sick patients needing drastic treatment such as the amputation of limbs, or even, in very bad cases, decapitation. As I have come to be known in my parish as a cactus-growing vicar, I am often brought sick plants which need the care and attention that they have apparently never been given.

Only last week a lady called me in to see a *Phyllocactus*; she told me how sad she was about it, how it had always had glorious white flowers with such a lovely scent. I beheld it. It indeed was a sorry sight; I fear that it will be some time before that plant will again fill that sitting-room with its lovely scent. I brought it home with me and operated upon it pretty drastically; so sodden were the roots that they were half rotten and had to be cut away; its stems were sappy and had to be cut back and, when it was repotted in some suitable soil, I may say that it was a much smaller plant in a much smaller pot. It is in hospital at present, and I hope for a good recovery.

Usually, I am thankful to say, I am pretty fortunate with my patients, although I do suffer at times from doubts and fears. My little hospital consists of a firm though small bench in a sunny window, and my instruments are very simple, if not crude—a good sharp knife, pointed and double-edged like a dagger for preference; a small three-pronged fork for dissecting purposes; a long thin stick about nine inches to twelve inches long, pointed at one end and wedge-shaped at the other, a useful instrument for getting down between spines, especially when repotting; a good pair of scissors and, for filling the pots with soil, I always use a long-handled spoon, very pointed, as it gets the soil into just the right places. For drying up severed joints—flowers of sulphur; for cleaning—wood naphtha and methylated spirits (which my small boy steals to make his steam engine work). A small camel-haired brush or two, a hard brush (a good stiff toothbrush will do), a good magnifying glass and a strong pair of gloves, and my nursing home is all set for any and every operation. It is extremely interesting work and often enough the means of saving valuable plants.

MEETINGS.

June 20th and 21st.—CACTUS EXHIBITION.

July 18th.—Mrs. Russell will give a talk on "Cacti, hybrid, grafted and monstrous."

August 29th.—Date changed owing to R.H.S. Autumn Show.

The meetings are held at the Royal Horticultural Society's Old Hall, Westminster, at 6 p.m.

“Plantæ succulentæ, in Horto Alenconio.

Auctore H. A. Duval.

Parisiis apud Gabon et Socios. 1809”

A facsimile, with an introduction by William T. Stearn

(Lindley Library, Royal Horticultural Society, Westminster.)

THE credit of naming and separating from Aloë the now universally accepted genera *Gasteria* and *Haworthia* belongs to an obscure French doctor, **Henri Auguste Duval** (1777-1814) of Alençon in Normandy. Here, sometime before 1809, an enthusiastic gardener-botanist had got together a good collection of succulent plants. Duval's modest catalogue, *Plantae succulentae, in Horto Alenconio* (17 by 10 cm.; Paris, 1809) in which he listed these and various other plants and published the original descriptions of *Gasteria*, *Haworthia* and *Ligularia*, is among the rarest of all publications relating to succulents. It is so rare and little known that such comprehensive bibliographical works as G. A. Pritzel's *Thesaurus Literaturae botanicae* and the *Catalogue of Books*,*** in the *British Museum (Natural History)* do not mention it. As far as can be ascertained no copy is now to be found at Alençon, Amsterdam, Berlin, Geneva, Haarlem, Kew, Leiden or Paris. A distinguished French botanist has even called it “un mythe litteraire!” There is, however, a copy bound up with other small tracts in the library of the British Museum at Bloomsbury.

This copy is of special interest in that it formed part of the magnificent botanical library bequeathed to the British Museum by Sir Joseph Banks (1743-1820). Sir Joseph was for forty-two years President of the Royal Society. Although he published little himself, he was famed throughout Europe for his keen encouragement of scientific studies. He built up an unrivalled collection of books and specimens at his London residence in Soho Square, and generously made them and the services of his botanist-librarians (successively Solander, Dryander and Robert Brown) available to all scientific men of the day, British and foreign, who cared to take advantage of his well-known hospitality. Duval was among the many foreigners who sought publicity and preservation for their work by sending a copy to Sir Joseph. Duval also sent one to Adrian Hardy Haworth (1768-1833).¹ Probably he also sent copies elsewhere. So unimportant-looking a booklet had, however, as little chance of preservation as a nurseryman's catalogue or the seed exchange list of a botanic garden of the period, and Sir Joseph's copy seems to be the only one that has survived. From this, by kind permission of the British Museum authorities, the following facsimile has been prepared.

¹“Catalogue of the Succulent Plants in Horto Alenconio. . . . This work M. Duval obligingly sent to me through a stranger; and I soon after sent to him my *Synopsis Pl. Succ.*” (Haworth in *Philosoph. Mag.*, n.s. 2, 346; 1827). The preface to Haworth's *Synopsis* is dated “Nov. 1811,” so presumably he received Duval's work some time in 1811. C. L. Willdenow's “Bemerkungen über die Gattung Aloë” in *Berlin, Ges. Naturf. Freunde Mag.* 5, 163-283 (1811) on the other hand never reached Haworth at all (cf. Haworth, loc. cit.; 1827).

Haworth made Duval's *Plantae succulentae* known, at least by name, through citing it in his *Synopsis Plantarum succulentarum*, 44, 85, 90 (1812), and *Supplementum Plantarum succulentarum*, xv (1819) and *Saxifragæarum Enumeratio*, vii, 50 (1821) and in the *Philosophical Magazine*, new series, 2. 346 (Nov. 1827). He reprinted Duval's diagnoses of *Haworthia* and *Gasteria*. Duval dedicated to him the genus *Haworthia*, which corresponds to Haworth's *Aloë* sect. *Parviflorae*, and in 1812 he repaid the compliment by separating from *Stapelia*, under the name *Duvalia*, a group of succulent South African *Asclepiadaceae* which now comprises about fifteen species.²

Duval was evidently a keen and discriminating botanist. In 1786 Friedrich Kasimir Medikus (1736-1808) of Mannheim had broken the Linnean genus *Aloë* (which contained plants now referred to *Aloë* proper, *Sansevieria*, *Apicra*, *Gasteria*, *Haworthia* and *Kniphofia*!) into four genera (*Catevala*, *Kumara*, *Aloë* and *Acyntha*)³ but these were too ill-defined and his work too little known for them to be accepted by his contemporaries. Even Haworth, when in 1804 he published his monograph of *Aloë*,⁴ did not separate *Haworthia* and *Gasteria* as genera, although his sections *Parviflorae* and *Curviflorae* show that he knew their characters. It was left to Duval to give them their now generally accepted generic rank. His diagnoses contrast the more or less straight-sided regular perianth ("calyx") of *Aloë* with the pendent, curved, basally swollen perianth of *Gasteria* and the erect, more or less straight-sided, two-lipped perianth of *Haworthia*. The groups thus defined now include many more species than Duval and Haworth were acquainted with in 1809, and these species exhibit considerable diversity in leaf and habit; nevertheless in floral structure and colour they are surprisingly uniform. Duval was thus the first to appreciate fully the characters which later experience has shown to be the most constant and therefore significant for the recognition of these groups as genera. He also doubted whether *Pulmonaria maritima* should be kept in the genus *Pulmonaria*; to-day it is placed in another genus, *Mertensia*. A German botanist, Moritz Balthasar Borkhausen (1760-1806), had, however, anticipated him in referring the younger Linnaeus's *Saxifraga sarmentosa*, the well-known "mother of thousands" of cottage windows, to a genus of its own, distinct from *Saxifraga*. The group typified by this species, although a natural and easily recognisable one, is usually treated as a section of the large genus *Saxifraga*, namely section *Diptera* (Borkhausen) Reichenbach, with *Diptera* Borkhausen (1794) and *Ligularia* Duval (1809) as synonyms, and the name *Ligularia* Cassini (1816) non Duval has come into use for a genus of *Compositae* closely related to *Senecio*.⁶

² A. White and B. L. Sloane, *The Stapeliae*, 2nd ed., 2. 741-782 (1937).

³ F. K. Medikus, *Theodora speciosa, eines neues Pflanzen Geschlecht*, 65-96 (1786). *Catevala*, op. cit. 67, consisted of species now referred to *Aloë* and *Haworthia*; *Kumara*, op. cit. 69, to *Aloë*; *Aloë* amend Medik. to *Apicra* Haw. vix Willd., *Aloë*, *Haworthia* and *Gasteria*; *Acyntha*, op. cit. 76, to *Sansevieria*.

⁴ A. H. Haworth, "A new Arrangement of the genus *Aloë*, with a chronological Sketch of the progressive Knowledge of that Genus, and of other succulent Genera" (read Dec. 1801) in *Transact. Linnean Soc. London* 7. 1-28 (1804).

⁵ A. Engler and E. Irmischer, "Saxifragaceae—Saxifraga," 645, in Engler, *Das Pflanzenreich* IV. 117, II. (otherwise Heft 69): Leipzig, 1919.

⁶ H. Handel-Mazzetti, "Die chinesischen Arten der Gattung *Ligularia*" in Engler, *Bot. Jahrb.* 69. 95-142 (1938). The name *Ligularia* Cassini (*Compositae*), rendered invalid by the prior homonym *Ligularia* Duval (*Saxifragaceae*), has been proposed for conservation in *Kew Bull.* 1935. 425.

As a horticultural work Duval's *Plantae succulentae* is of considerable interest in showing what plants were to be found over a century ago in a small French provincial botanic garden. Despite the title, it lists many plants (about 70 out of a total 272) which would hardly be classified as succulents to-day. Imagine an exhibit at a cactus and succulent show consisting only of sprays of *Alstroemeria*, *Hydrangea* and *Tamarix* or pots of *Drosera rotundifolia*, *Parnassia palustris* and *Tradescantia virginiana*! Yet all these figure in Duval's list. The geographical origin of the plants listed is worthy of note. From early times down to about 1560, as Gregor Kraus has pointed out,⁷ the few plants to be found in European gardens were mostly native to Europe. Then European gardens began to draw upon the floral wealth of the Near East; 1560 to 1620 may be described as primarily an Oriental period. From the early seventeenth century onwards the introduction of new plants into Europe corresponds roughly with the progress of British, Dutch and French overseas expansion and exploration. The period 1620 to 1680 is one during which attention was focussed mostly upon herbaceous plants from eastern North America (Virginia and Canada), followed by a period, roughly 1680 to 1772, during which Cape plants and North American woody plants came more into prominence; the return of Capt. Cook and Sir Joseph Banks from Botany Bay inaugurated a New Holland period extending roughly from 1772 to 1820. During the twentieth century, as glasshouse construction improved and tropical and subtropical plants from Central and South America and the East Indies became available, interest in the, once popular Cape and Australian plants waned. Duval's Alençon catalogue portrays a garden of the Cape period. About one hundred and fifty of its plants are natives of South Africa. About sixty-odd—and few of these truly succulent—are natives of Europe. America contributes barely thirty, the Canaries seven, China and Japan only three. Of the richness of America in cacti hardly anything was then known, for the botanical exploration of Central and South America had hardly begun. The five cacti of the Alençon garden—*Aporocactus* (or *Cereus*) *flagelliformis*, *Selenicereus* (or *Cereus*) *grandiflorus*, *Rhipsalis baccifera* (syn. *Cactus pendulus*),⁸ ? *Opuntia humifusa*, *Nopalea cochenillifer*—are natives of readily accessible parts of North and Central America and the West Indies, and even in 1809 they had

⁷ G. K. M. Kraus, *Geschichte der Pflanzeneinführungen in die europäischen botanischen Gärten* (Leipzig, 1894); *Die bot. Gart. Univ. Halle* 2. 83-155 (1894).

⁸ *Rhipsalis baccifera* (J. Miller) Stearn, trans. nov.

Cassyta baccifera J. Miller, *Illust. Sex. Syst. Linn.* class IX. ord. 1 (1771-77), ed. German. per Borckhausen, t. 29 (1800).

Rhipsalis Cassutha Gaertner, *De Fruct. Sem. Plant.* 1. 137, t. 28 (1788); *Bot. Mag.* 58. t. 3080 (1831) as "*R. Cassutha*."

Cactus pendulus Swartz, *Nov. Gen. Sp. Plant. Prodr.* 77 (1788), *Fl. Ind. Occid.* 2. 876 (1800); Aiton, *Hortus Kew.* 2nd ed. 3. 178 (1811).

For further synonymy, distribution, etc., see K. Schumann, *Gesamtbeschr. Kakt.* 621 (1899), Britton & Rose, *The Cactaceae*, 4. 225 (1923).

Johann Sebastian Müller (1715—c. 1790), a German draughtsman and engraver who came to London from Nürnberg in 1744 and anglicised his name to John Miller, should not be confused with his contemporary, Philip Miller (1691—1771) of the Chelsea Physic Garden, whose works he helped to illustrate. His figure and description of *Cassyta baccifera* are obviously done from a living plant, almost certainly one cultivated at Chelsea or Kew, and as Gaertner later based his *Rhipsalis Cassutha* on a specimen sent from Kew by Sir Joseph Banks, the two names may actually have had the same type. Swartz (1800) cited both as synonyms of his *Cactus pendulus*; there seems no doubt about their belonging to the one species, which, according to Aiton, was introduced into cultivation from the West Indies by Philip Miller in 1758.

been for at least fifty years in English gardens. The pride of the Alençon garden was clearly its South African collection. And this, with its crassulas, haworthias, gasterias and mesembryanthemums (comprising species now referred to the segregate genera *Dorotheanthus*, *Argyroderma*, *Glottiphyllum*, *Cheiridopsis*, *Pleiospilos*, *Carruanthus*, *Faucaria*, *Stomatium*, *Machairophyllum*, *Acrodon*, *Micropterum*, *Skiatophytum*, *Rhombophyllum*, *Cylindrophyllum*, *Conophytum*, *Aethephyllum*, *Aptenia*, *Cryophytum*, *Apatesia*, *Carpanthea*, *Sceletium*, *Psilocaulon*, *Aridaria*, *Ruschia*, *Lampranthus*, *Delosperma*, *Erepsia*, *Cephalophyllum*, *Sphalmanthus*, *Drosanthemum*, *Trichodiadema*, *Disphyma*, *Eberlanzia*, *Malephora*, *Circandra*, *Conicosia*, *Carpobrotus*, *Oscularia* and *Prenia*) would be a creditable collection for a small botanic garden even to-day.

About Duval himself a little may be gleaned from his two other publications and contemporary records. He was born on April 28th, 1777 at Alençon and died on March 16th, 1814 at Paris. When he was thirteen the Paris mob stormed the Bastille. The revolt spread and, after the execution of Louis XVI in January, 1793, the young Republic faced a European coalition. A nervous and weakly lad, Duval was pressed into service like the rest. He took no part in the actual fighting but had charge of some branch of military administration. The medical and botanical studies nearer his heart were pushed aside for years, and when at last he took them up again, he did so with an ardour that endangered his health. At Paris, about 1802, he became a pupil of Louis Claude M. Richard (1754-1821), one of the best botanists of the day. Richard had studied intensively the structure of fruits. He promised the world a detailed, magnificently illustrated treatise but, owing to financial difficulties, it never appeared. The diligence of his pupil saved the results of his labour from oblivion, for Duval put in order the notes taken at his classes, induced him to revise and confirm them and then published them as a little volume entitled *Démonstrations botaniques, ou Analyse du Fruit* (111 pages; Paris, 1808). This brought considerable repute to both author and editor. A German translation *Analyse der Frucht und des Saamenkorn *** nach der Duval'schen Ausgabe übersetzt* (xvi + 216 pages; 1 folded plate; Leipzig) by Friedrich Siegmund Voigt appeared in 1811. In 1819 John Lindley, himself but a lad of nineteen, published an English translation entitled *Observations on the Structure of Fruits and Seeds* (xx + 100 pages; 6 plates; London and Norwich). Duval's medical studies culminated in his thesis, *Essai sur le Pyrosis ou Fer-Chaud* (44 pages, quarto; Paris, 1809) presented to the Paris Faculty of Medicine in February, 1809. It is concerned with a form of indigestion (heart-burn) from which he himself seems to have suffered much and it throws considerable light on his weak constitution. He died five years later. The authors of the brief biographical notes in A.J.L. Jourdan, *Dictionnaire des Sciences médicales, Biographie médicale* 3. 566 (1821) and F. Hoefer, *Nouvelle Biographie générale* 15. 518 (1856) rightly speak of him as one whose promise was never fulfilled. They mention his *Démonstrations botaniques* and *Essai sur le Pyrosis* but not his *Plantae succulentae*, the little tract which to-day constitutes his claim to remembrance. The essay on indigestion, which in the author's eyes probably seemed so very important, has long been forgotten. His interest in succulent plants has saved him from oblivion.

For the convenience of foreign readers, summaries in French and German follow.

SOMMAIRE

L'honneur de nommer et de séparer du genre Aloë les deux genres *Haworthia* et *Gasteria* aujourd'hui si bien connus par les cultivateurs des plantes grasses repose sur un médecin français presque enseveli dans l'oubli, Henri Auguste Duval, qui naquit en 1777 à Alençon et mourut en 1814 à Paris. Son petit catalogue des plantes grasses cultivées à Alençon (*Plantae succulentae, in Horto Alenconio*) en 1809 est probablement le plus rare de tous les ouvrages relatifs aux plantes grasses. La seule exemplaire connue se trouve à Londres (au British Museum, Bloomsbury) et autrefois fit partie de la bibliothèque botanique du célèbre Sir Joseph Banks (1743-1820). La plupart des plantes énumérées sont originaires du Cap de Bonne Espérance. Les 94 espèces de *Mesembryanthemum* (distribuées aujourd'hui entre 39 genres; voyez p. 108) contrastent d'une manière frappante avec les 5 espèces des Cactées (distribuées aujourd'hui entre 5 genres; voyez p. 107). A cette époque l'Amérique du Sud avait contribué peu aux serres de l'Europe. Les diagnoses des genres nouveaux révèlent l'esprit juste de l'auteur. Il fut un élève de L. C. M. Richard. En 1809 il a présenté à la Faculté de Médecine de Paris sa thèse de doctorate, un *Essai sur le Pyrosis ou Fer-Chaud*, qui renferme quelques renseignements autobiographiques. Evidemment il avait des connaissances fort étendues et promettait beaucoup, mais sa constitution était peu robuste et il mourut prématurément. Seulement le genre *Duvalia* (*Asclepiadaceae*) et la petite brochure reproduite ici nous rappellent so mémoire.

ZUSAMMENFASSUNG

Der Duval'sche Katalog der im Jahre 1809 in der nordfranzösischen Stadt Alençon kultivierten Sukkulente n pflanzen ist vielleicht die seltenste von allen Veröffentlichungen über Sukkulente n pflanzen, aber er enthält die originalen Diagnosen von drei neuen Gattungen (*Haworthia*, *Gasteria* und *Ligularia*) und auch einige neue Namenkombinationen. Daher ist ein Faksimileabdruck, mit einigen Besprechungen über das gartenbaugeschichtliche und botanische Interesse dieses kleinen Werkes und auch eine kurze Biographie von H. A. Duval (1777-1814), hier gegeben.

This facsimile, together with the introduction by W. T. Stearn, will be available as a reprint (price 1/-) to members and non-members of the Society on application to the Hon. Editor, Mrs. Vera Higgins, 28, Northampton Road, Croydon, Surrey.

Growing Stapelias

By S. G. Fiedler

IT may interest some readers to see a picture of the *Stapelia* corner of my greenhouse. The house, 30 ft. long and 10 ft. wide, $\frac{3}{4}$ span, is built in an east-westerly direction. To the south is a 2 ft. 6 in. high by $4\frac{1}{2}$ in. thick hollow-block cement wall, to the north a 7 ft. high similar wall carries the glass. Through the centre is a 2 ft. 6 in. wide cement path, on the edges of which is built a 24 in. high by 4 in. thick wall, forming a 3 ft. 6 in. wide bed on either side. These are filled entirely with soil. First, one foot of broken bricks, large pieces in the bottom, smaller pieces from $\frac{1}{2}$ in. to 1 in. on top to give sharp drainage. The remaining twelve inches are filled with a compost of two parts fine, fibrous loam, one part broken mortar rubble from $\frac{1}{2}$ in. to dust, one part leafmould, one part old, spent hotbed well mixed with an equal amount of sharp, yellow river sand. This mixture is both rich and porous, retains the moisture well, but never gets too damp. The house is heated by a 30 ft. run of 4 in. hot-water pipe just sufficient to ensure a temperature of 40 degrees F. in severe frost. In the eastern end of the south bed, where the potting shed behind and an Alpine house at right-angles to the succulent house gives shade till about one o'clock, the *Stapelia* family are housed.

I had noticed that most photographs I had seen taken of *Stapelias* in their natural habitation showed them growing in half shade under other shrubs, and concluded that they did not like too much sun, and they have certainly responded very well.

The arrangement shown in the photograph (p. 111) taken in July, 1937, is only temporary, most of the plants were plunged in pots 3 in. diameter, $4\frac{1}{2}$ in. deep; a few were planted direct in the bed. During the summer they received moderate daily watering, and they grew by leaps and bounds. In a month they had outgrown their pots and continued to spread, rooting in all directions in the deep, rich soil.

Flowering was prolific, one *Stapelia variegata* had in all thirty-two flowers, and the *Huernias* did extremely well for the first time with me, until they were severely damaged by woodlice.

It is difficult to point out the separate plants in the photograph, but close to the edge of the bed, to the left of the first label, is *Tavaresia Barklyi*. The bunch of labels indicate a number of cuttings of uncommon *Stapelias* just received, all of which rooted nicely.

STAPELIA HIRSUTA.

In the background under the left-hand centre pane is a fine plant of *Stapelia hirsuta*, shown in close-up. It quickly overflowed its pot and took to growing like a cucumber, stems 12 in. high, and flowering for months; it had in all eighteen flowers during the summer, the last as late as the middle of December.

The photograph taken on July 17th, 1938, shows, from left to right, a just withering flower, a bud, two flowers, above the first of which is a fertilised seed pod.

The flower is very handsome, 4 in. across, the tips and edges are deep purple-brown with long, white hair; towards the base the ground colour is yellow, clearly marked with purple-brown stripes. The centre is an amazing large powder-puff of long, purple, downy hair. It lasts about seven days, does not smell quite as objectionable as other *Stapelias*, and is the prettiest *Stapelia* I have seen so far.



Stapelia Bed.



Stapelia hirsuta.

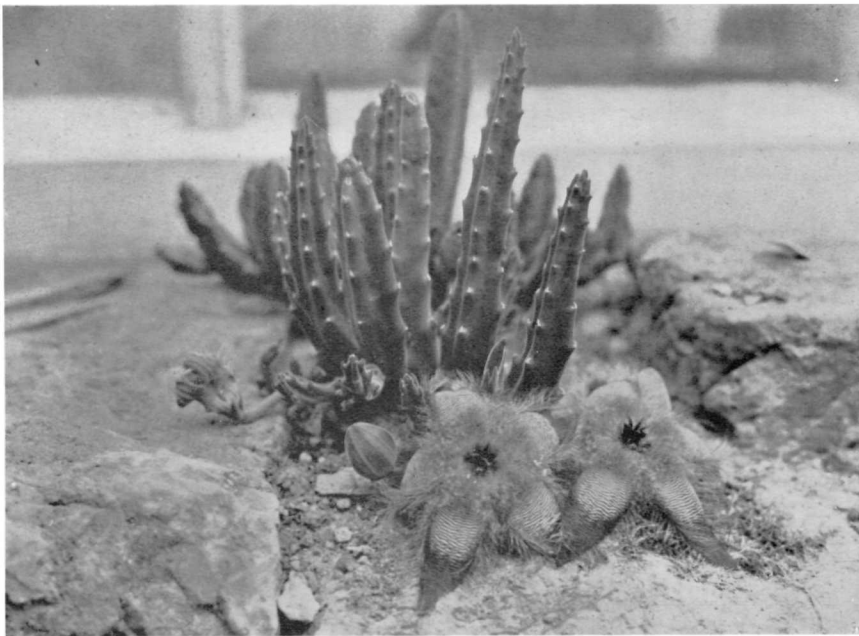


Fig. 31.
Stapelia hirsuta.

S. G. Fiedler.

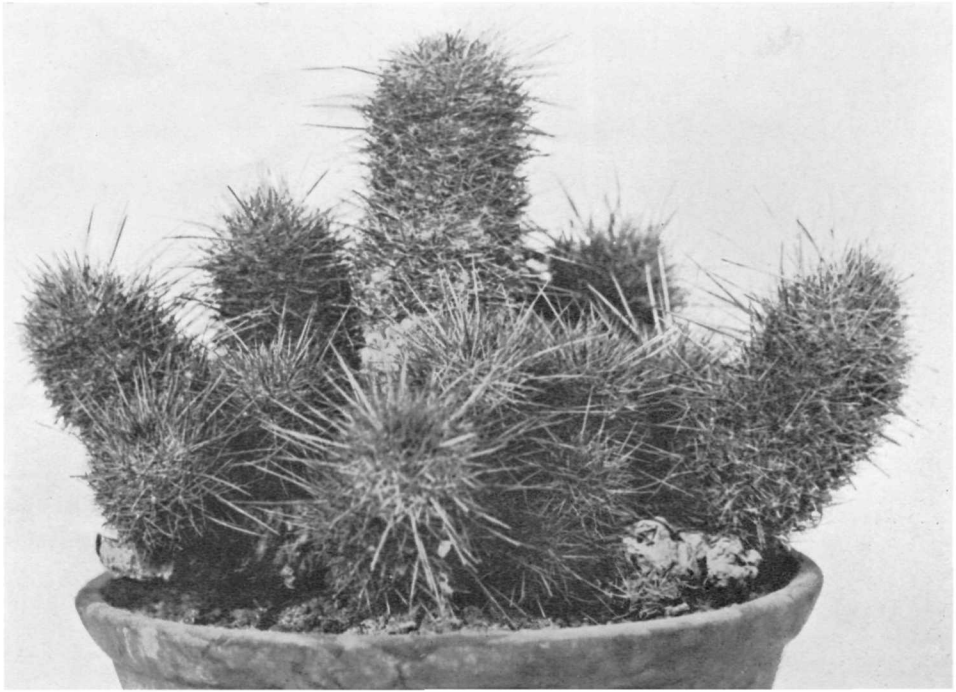


Fig. 32.
Cochemia Halei.

G. Turner.

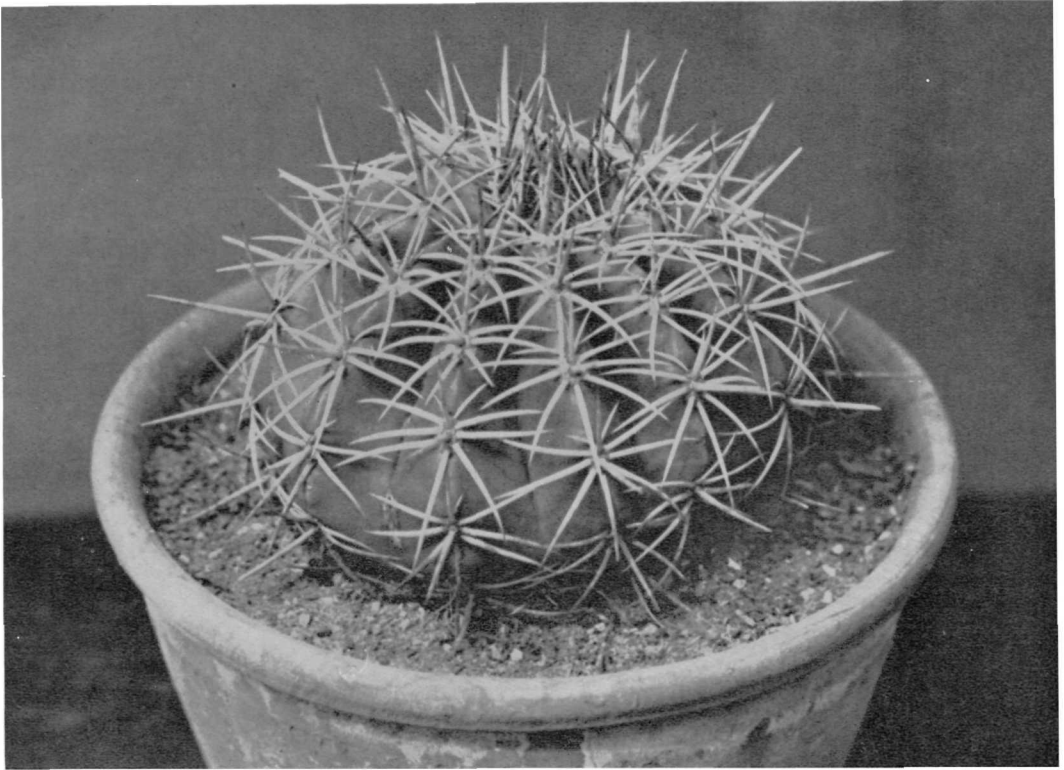


Fig. 33.
Melocactus Guitarti.

G. Turner.

“Rare” Cacti—V

By G. Turner

THE Federal District of Lower California and adjacent islands provide collectors with many of the most desirable and rarest of the Cactaceae. Unfortunately the Peninsula is not readily accessible, being mountainous, arid desert, and forbidding, in fact a somewhat hazardous undertaking if carried out on the commercial scale. The type localities of many species are only vaguely described by the early botanists, with the result that many miles of territory must be covered when searching for particular specimens, often with negative results.

Ferocactus Diguetii is unquestionably the rarest of the Lower Californian species of *Ferocactus*. About five years ago the collector Radley went in search of this species, and after seven weeks he found four plants growing on Santa Catalina Island; since then two smaller expeditions have been out and have failed to find any. They are of the opinion that Radley collected all that remained of them. In a letter to me Radley confirmed that belief and offered to send me a specimen for thirty dollars, and later advised me that he had disposed of them and was out of pocket on the trip. At the moment *Ferocactus Diguetii* remains on my “want” list.

Another species very seldom seen or heard of in collections, either European or American, is *Cochemia Haleii* Walton. The specimen illustrated (see p. 112) is the only one I know, and came from Magdalena Island, where it is plentiful. There may be others about, but it would be safe to wager they would not be entered for a show unless they happened to be in bloom at the time. Most collectors at home seem to be in favour of what are termed “attractive” cacti; that is, plants that look “pretty,” no matter how common they are. For instance, a friend of mine thinks and believes that *Echinocactus viridescens*, with its reddish-tinted spines, is far and away superior to any other variety, not excluding that pet of collectors *Echinocactus Grusonii*. His candid opinion is that it simply outclasses the rare *Ferocactus coloratus* from every angle of view. Of course, that kind of grower cares nothing for rare plants simply because he cannot appreciate them at their intrinsic value. He is, however, entitled to his opinion. The real object of these notes is to encourage those cactophiles who, like myself, have but limited time to look after a collection which must be relatively small in number, and to point out that a small collection may be, at the same time, more valuable than many a large collection. There are many species described by Britton and Rose well worth the trouble of collecting. Some of them have not been heard of since, but they must exist, and the enthusiastic collector should find ways and means to get them. Some of my plants have taken five years to acquire.

Probably the fundamental reason why *Cochemia Haleii* is seldom seen is because it is the most unattractive, dejected-looking cactus imaginable, a dirty sage-greenish mauve in colour, with long, vicious spines. Even the hideous, loathsome-looking Creeping Devil becomes handsome in comparison with it. I do not believe a collector in the field would trouble to dig one up and transport it across miles of desert unless he had a definite order for it. Probably the only place where it would fit and look happy would be in the miniature desert at Kew.

Another species that has quite recently become a rarity is *Bergerocactus Emoryi cristata*. This monotypic genus is found in abundance over a wide area, but the cristate form is rarely found. There was a fine clump yielding crests near Descando, about midway between Ensenada, on the border, and Tia Juana, known only to a few collectors. They only collected a limited number of cuts at each visit to ensure survival; alas, when visited late last year it was found that a local bush fire had completely destroyed all that remained, with the result that the only specimens commercially available were withdrawn from sale. Small portions of the crests were grafted and the propagated plants are now offered from five dollars upwards. They are beautiful golden plants with long spines, resistant to cold temperatures; both the ordinary, and especially the cristate, forms are most desirable acquisitions, quick growers, sending up new shoots from the base. They require similar treatment to the *Opuntias*, and plenty of water during the growing season.

In the last notes on this subject a description of *Cephalocereus alensis* was promised. First discovered by Leon Diguët about 1900, and later described by Weber, it is a very rare plant, with a limited distribution. Erect, 5-6 metres high, branching from the base; branches slender; ribs 12-15, tuberculate; spines 10-15, acicular, 1-1.5 cm. long, brown. Flowering areoles on one side of stem only, developing white hairs 5 cm. long. Flower mauve to purplish-green; perianth segments fleshy, rounded at apex; ovary naked. Fruit unknown. Illustrated in the March, 1939 issue, p. 63.

Whilst writing these notes I had a pleasant surprise; a large parcel arrived and amongst its contents was the long-awaited *Melocactus Guitarti*, the last of the Cuban quads, to complete my collection of Cuban Melocacti. Its description is as follows: Plant globular, flattened, geniculated; height 11 cm., diameter 15 cm.; areoles 2 cm. apart, 5-6 on each rib; radial spines 9-10, extended horizontally, slightly curved, yellow, red and straw coloured; central spines 2, larger and thicker than the radials, 30-35 mm. long, 1.5 mm. diameter; two, sometimes three, superior radial spines are smaller than the others by 2.5 mm. Cephalium 7.5 to 8.5 cm. diameter; height 3 cm.; bristles brown and red overtopping a little white wool. Flowers 3-4 cm. long, white portion embedded in wool, protruding part above, approximately 1.5 cm. long, bright pink; corolla tube 4-5 mm. diameter with slight narrowing at the level of the ovary and 6 mm. from the base; segments of perianth 22, oblong, line-like and up to 2 mm. wide, extended and curved, more or less round and at times concave at the apex. Stamens short and numerous, the superior ones with slender filaments, the same length as the anther, the inferior ones with filaments slender only in the superior part, the lower part greatly broadened and longer than the oblong anthers. Style white, 2 cm. long, including stigma; lobes of the stigma filiform, 3-4 mm. long, curved at the stem. Fruit lustrous red, 3-4 mm. long, up to 14 mm. broad. Seeds numerous, lustrous black, 1.5 mm. x 1.2 mm. The three species of Cuban Melocacti previously described are all diurnal, this new species is nocturnal, which habit alone is sufficient evidence to establish that it is definitely a new species and not a variety of *Melocactus communis*, which is not indigenous to Cuba. Besides being one of the greatest autocrats of the rarest cacti, it is also one of the most beautiful. As a specimen it undoubtedly commands the respect and admiration accorded to classical beauty.

Book Reviews

GROW THEM INDOORS by Allen H. Wood, published by Lindsay Drummond Ltd., 1939; price 5/-.

This book is one of a series—The Small Garden Series—and is intended for the man who has not much time or money to spend on his plants but wants to grow some interesting ones. It is very pleasantly written and covers a wide field; the advice on potting, light, watering and propagating is sound and clearly set out in simple language without sacrifice of scientific accuracy. The range of plants suggested for growing in the house or in a small greenhouse attached to it is a very large one, but the chapter that most concerns us here is the one devoted to Cacti and Succulents. Mr. Wood evidently realises the position, for he says: "Cactus collecting, growing, hybridising and grafting is an international disease; once contracted there is no known remedy for it." He gives in a brief space a very good idea of the habitats of the different types and consequently their probable needs in cultivation, and follows this with lists of suitable species and the treatment appropriate to each. These lists are by no means exhaustive, but would usefully give a beginner a good start and, if one were to make any comment, it would be that the names proposed seem to have been taken rather from botanical books than dealer's catalogues, for one or two would probably be hard, if not impossible, to obtain in this country. But on the whole the reader will not go far wrong if he follows the instructions given and will certainly have his enthusiasm aroused if he reads this book; the large number of excellent illustrations are a helpful addition.

BLUEHENDE KAKTEEN UND ANDERE SUKKULENTEN by Dr. Erich Werdermann; published by J. Neumann, Neudamm, 4 parts per annum, price RM 16.

In part 37 of this beautiful work four cacti are represented; *Echinocereus acifer* (Otto) Lemaire var. *durangensis* (Posel.) K. Schum is a well-known species which produces annually its lovely scarlet flowers. *Parodia sanguiniflora* (Fric) Backeberg, discovered during the last decade in Argentina, is another species already popular, for it flowers freely, the colour of the blossoms being blood red. *Thelocactus hexaedrophorus* (Lem.) Br. & R. is a variable species with grey-green body and large white flowers. *Mammillaria Aylostera* Werdermann is a recent discovery with large golden flowers which much resemble those of a *Rebutia*; it comes from Mexico.

Part 38 also deals with four cacti, two being first descriptions. *Lobivia boliviensis* Br. & R. has golden yellow blossoms, and the long, pale spines of the imported plant are not, unfortunately, so well developed under cultivation. *Lobivia aurea* (Br. & R.) Backeberg has longer flower-tubes covered with greyish-brown wool; the plant is very variable and is intermediate between *Echinopsis* and *Lobivia*, in fact, Britton and Rose who discovered it placed it originally in *Echinopsis*. *Lobivia hastifera* Werdermann nov. spec. is a species which was sent back from Argentina by H. Blossfield in 1936; it flowered in the Botanic Gardens of Dahlem for the first time in 1938, when the colour photograph was taken, and the plant is here described for the first time; the body is not unlike *Lobivia boliviensis*, but the flowers differ in shape and are rose pink. *Notocactus Mueller-Melchersii* Fric was first mentioned in 1929 by Fric, who discovered it in Uruguay, but the name remained a 'nomen nudum' till Backeberg gave a description in Danish in the *Cactus ABC*, and as this was hardly adequate, Dr. Werdermann has here supplied the Latin description; the illustration shows a plant crowned with silken yellow flowers.

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