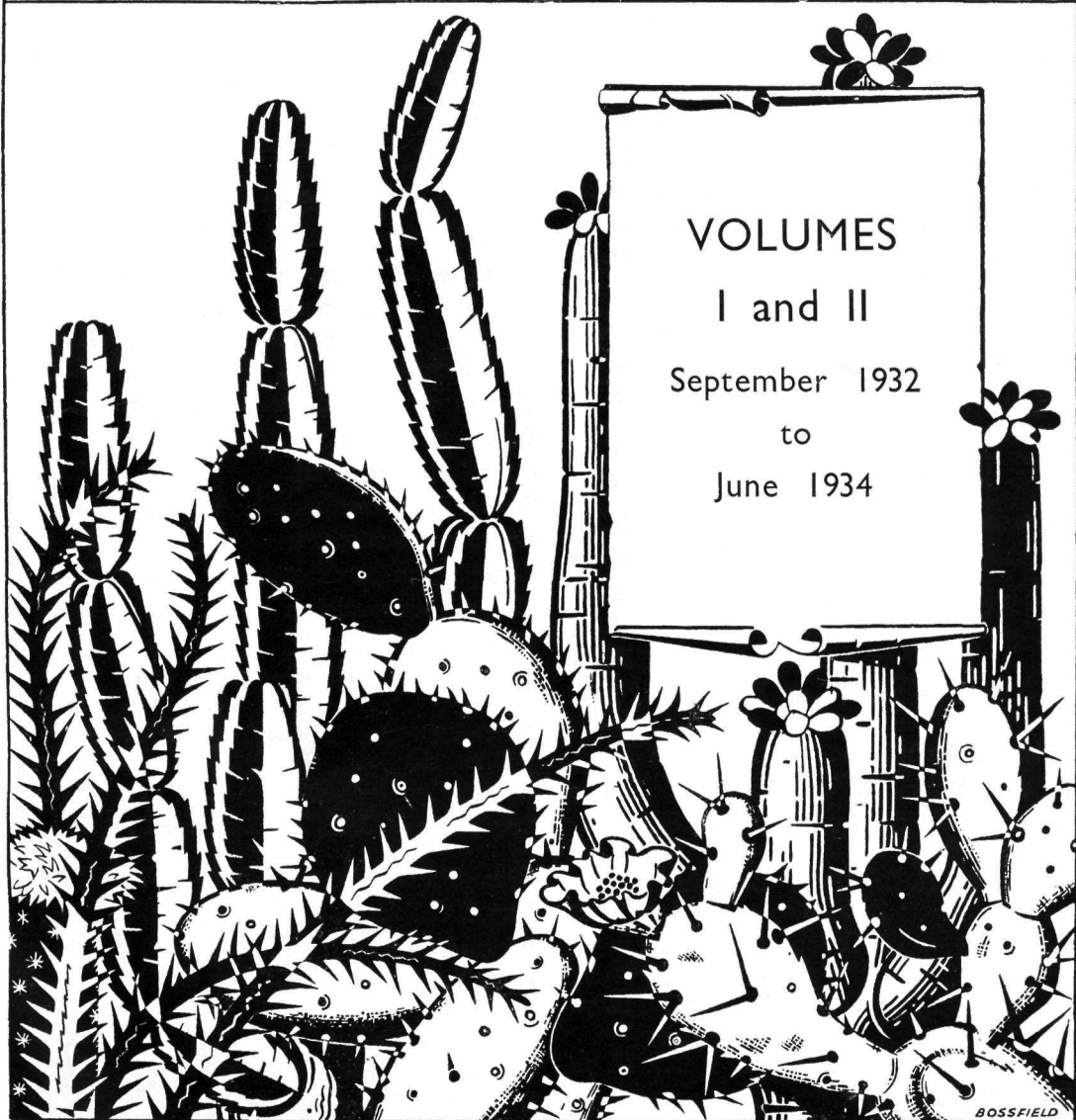


THE
CACTUS
JOURNAL



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THE CACTUS JOURNAL

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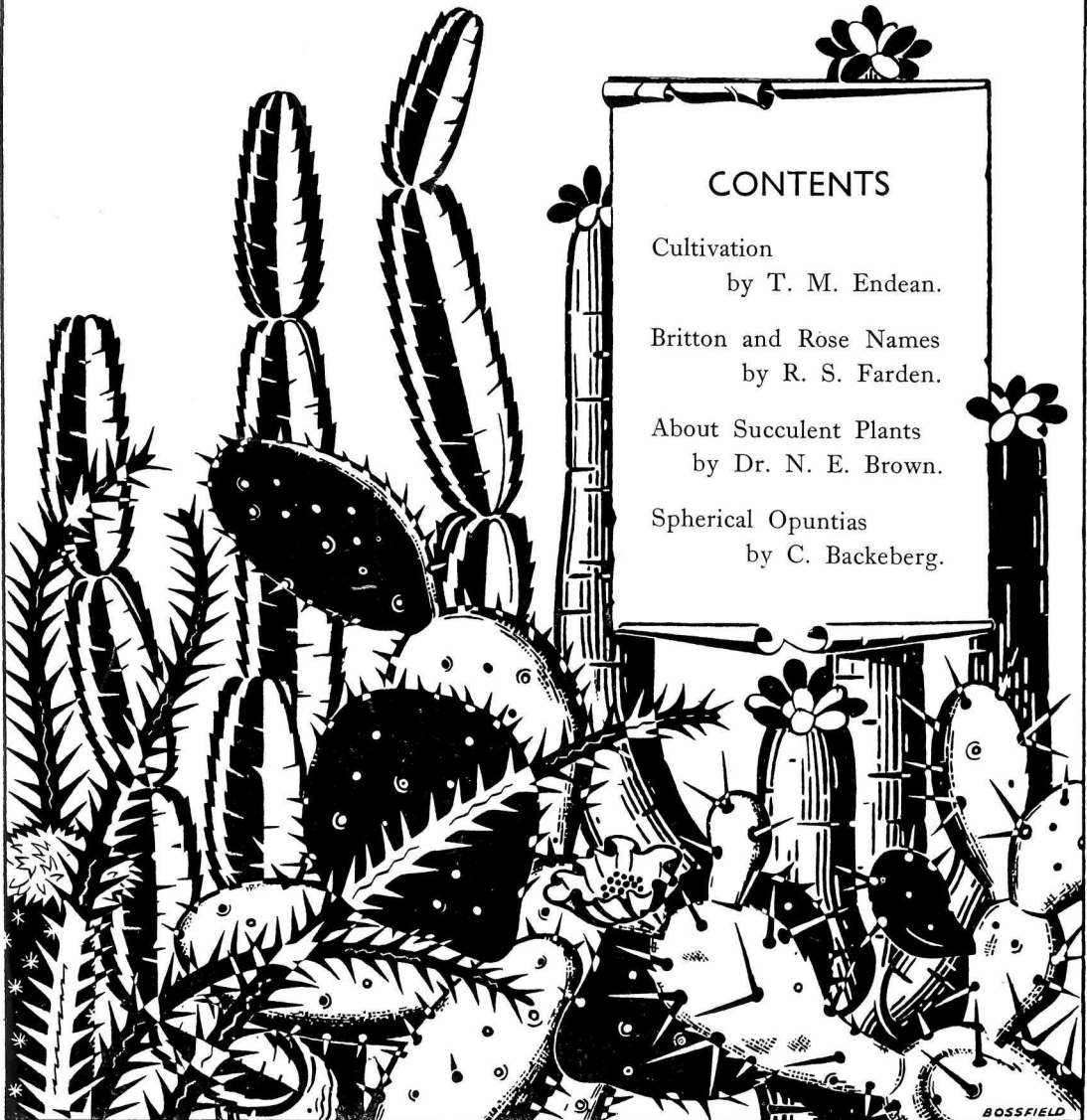
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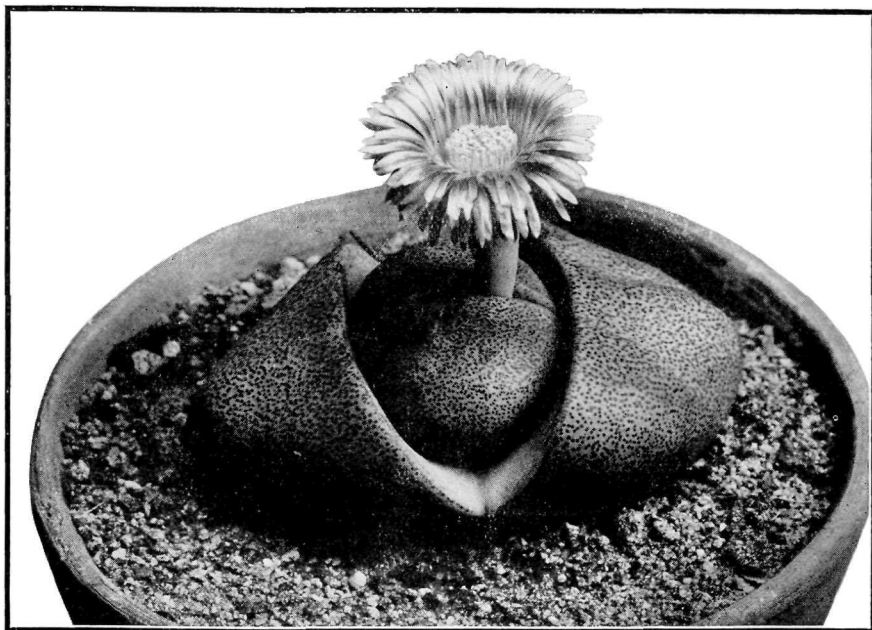
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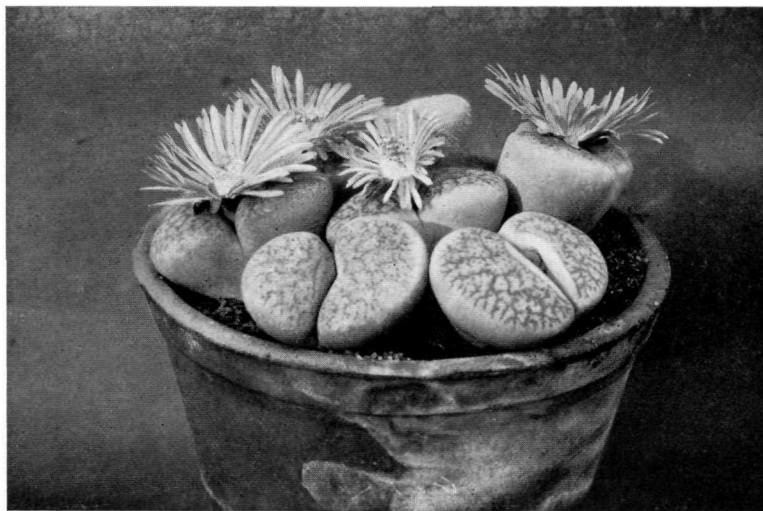
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Lithops Mundtii (F. A. Haage. Jun. Erfurt).

Foreword by the President

OUR Dutch friends whose journal *Succulenta* is now in its fourteenth year, write of *The Cactus Journal*, "Wij zien het *Cactus Journal* met belangstelling tegemoet!" Here then is our first number.

The cultivation of cacti in gardens does not go back so very many years; indeed, until Linnaeus took possession of the word, cactus was the name of the cardoon. My first recollection of cacti were little red pots in a miniature greenhouse at the end of Covent Garden Market; each pot had a neat little saucer which was an encouragement to water, and thus ultimately to kill the little plants, which cost 6d. each. These frequent deceases drove me to collecting postage stamps, but it was not until a few days ago I possessed the farthing stamp of Turks Island and Caicos which is decorated with a large Melocactus. Recently, too, the Torch Cactus has been adopted as the arms of the Republic of Mexico.

On the continent and in the United States these plants are now extensively grown, and

in England there are not far short of a thousand amateurs and professionals who grow cacti. One of the multiple shops specialises in small cactuses and other succulents at very low prices and the nurserymen grow something like 2,000 species and varieties.

Whereas many of these plants demand little trouble and certainly give the Water Company's Inspector no ground for complaining that the domestic supply is used for the garden, the cultivation of certain species and the production of fine specimens requires as much skill as any other branch of horticulture. It is to the Cactus Society, its members, officers and journal that we look for cultural advice. Perhaps even more difficult than the cultivation is the nomenclature. Of a man who caught a strange bird the poet wrote:—

"But as he did not know
Its name or use
He let it go."

With plants it is the other way; it is much

more delightful to find out a plant's latent possibilities and ultimately its name than to buy it all ready-made.

It is common and rather deplorable practice in Spanish countries to write names on the leaves of Agave, Aloe and Prickly Pear. Yet I should love to own a *Cereus* two hundred years or so old on which was engraved my family tree. Perhaps somewhere in Central

America is an ancient survival on which stout Cortes cut his name.

My hope is that *The Cactus Journal* will take a high place amongst horticultural publications and will aim at and reach a peak of accuracy both in description and in nomenclature which will entitle it to the description "*Primus inter pares*."

WILLIAM LAWRENCE.

The Cultivation of Cacti By T. M. Endean

Résumé of an address to the Cactus Society

MR. ENDEAN began by describing the method of raising cacti from seed ; he recommended filling the pots with fine soil on which the seed is scattered, the pots being sunk in a box filled with mould and covered with glass to keep them uniformly moist. If the pots are soaked before sowing no further water is required for some time, and when it is, it is best to water the mould in which the pots are plunged. The seeds may germinate in three days or may take nine months. The seedlings should be pricked out when about a week old ; a sharpened match-stick, if wetted with water will pick up the seedlings after they have been loosened in the seed pan. A sunny shelf or bench is the best place for the seed pots.

As regards the re-potting of cacti, this is best undertaken from June to August ; plants that appear quite healthy need not be turned out every year ; if a plant does not look in good health it may be turned out at any time. The soil should consist of broken brick and coarse sand (silver sand is too fine) and old mortar rubble with a little loam ; pure loam should be avoided as it tends to clog.

The growing period for cacti is from May to mid-September, and during this time they may receive water when dry ; the best way to water is by plunging the pots in a pail rather than by pouring water on the soil, which process in the course of time forms a hard crust. From the end of September till the following May no water should be given, unless April should prove a genial month, when watering may be begun gradually.

Mr. Endean recommends side ventilation rather than top ; if top ventilation is used dust is more likely to blow in and settle on the plants. But the ventilation must be ample ; during the summer the side ventilators, which should be below the staging if possible, may be taken out entirely and left out till the weather becomes cooler. The opening for the ventilators should be covered

with wire netting. Where a top ventilator is arranged it is better to have it in the end rather than in the sloping roof.

With regard to temperature, it is possible for the plants to go as low as freezing point without damage, if they are dry, but it is safer to keep the temperature up to 38° or 40° F. Mr. Endean himself heats his houses only for his own comfort in working in them during winter. A drop in the temperature at night does no harm ; in fact, irregularity of temperature is a benefit.

The pests which chiefly trouble cacti are mealy bug, scale and root bug ; the two former should be removed whenever seen and not allowed to get a firm hold. If the plants are kept clean there should be very little trouble from either of these pests. Mr. Endean carefully described his own method of dealing with the plants ; he recommends dipping them at regular intervals into water which has a film of paraffin on the surface ; for a full pail of rain water the requisite amount of paraffin is obtained by dipping the first finger into the paraffin jar up to the knuckle and then rinsing in the water. He emphasised that too much paraffin was dangerous. A good syringing after dipping will help to keep the plants clean ; the syringe may be used with considerable force. When paraffin has been used the plants should be kept from sunshine till dry by covering them with newspaper. The worst pest is root bug ; this is caused by the dry nature of the soil necessary for the healthy growth of cacti during the resting period ; it is found to attack grass in fields during dry weather. Its presence in a pot can be detected by scratching the soil, when the white fluff which the insect secretes round itself will be seen. Any plant which has been attacked should be knocked out of its pot and the roots thoroughly washed with soapy water (Lifebuoy) and syringed with some force before being re-potted.

The Britton and Rose Names for Certain Cacti

By R. S. Farden

(Read at the Meeting held on April 5th, 1932)

UNTIL Britton and Rose's *Cactaceae* in four volumes was published in 1932, I had always used as my book of reference J. Labouret's *Monograph de la Famille des Cactae*, 1860. The descriptions are good, but there are no illustrations, much less photographs, and I got on very well with this for some thirty years. I looked forward to Britton and Rose's work with extreme interest, and when it came out I obtained Volumes III and IV, the most interesting ones; the others contain *Cerei* and *Opuntiae*, etc. I found their subdivision of *Echinocacti* and *Mammillariae* perfect, making collecting infinitely more interesting. I stage all my plants each genus by itself, and place those plants most similar to one another side by side. As I believe most people have not got easy access to these volumes, I propose to give you the new genera, and to make some remarks about some plants and about Britton and Rose's lists of synonyms.

ECHINOCACTI.

Britton and Rose take out of these 30 new genera, and leave only nine species as *Echinocacti*. Many of these genera have only one or two species in a genus.

- No. 1. *Malacocarpus* (meaning soft-fruited), habitat: S. America, all south of the Equator.
There are 29 species, the type plant being *M. corynodes*.
- No. 2. *Gymnocalcium* (meaning naked bud), habitat: S. America, east of the Andes, and Argentina.
There are 23 species, the type being *G. denudatum*.
- No. 3. *Ferocactus* (meaning fierce cactus), habitat: southern States of America and Mexico.
There are 30 species, the type being *F. Wislizenii*.
- No. 4. *Echinocactus*, habitat: Mexico.
There are 9 species, the type being *E. Grusonii*. The species are *E. Grusonii*, *Palmeri*, *grandis*, *platyacanthus*, *visnaga*, *polycephalus*, *ingens*, *horizontalonius*, *xeranthemoides*.

- No. 5. *Thelocactus* (meaning tubercle cactus), habitat: Mexico.
There are 12 species, the type being *T. hexaedrophus*.
- No. 6. *Echinofossulocactus*, habitat: Mexico. Britton and Rose say this genus is little known, and they only give 22 species, though Mr. Lawrence published 35 species. The type plant is *E. coptonogonus*. These are the many-ribbed varieties *E. crispatus* and *multicostatus*.
- No. 7. *Echinomastus* (meaning hedgehog-like breast), habitat: southern U.S.A. and Mexico.
There are 6 species, the type being *E. erectocentrus*.
- No. 8. *Frailea* (named after Senor M. Fraile), habitat: Paraguay.
There are 8 species, the type being *F. cataphractus*.
- No. 9. *Neoporteria* (named after Carlos Porter of Chile, an entomologist), habitat: mountains of Chile.
There are 7 species, the type being *N. subgibbosus*.
- No. 10. *Ancistrocactus* (meaning fish-hook cactus), habitat: Texas and N. Mexico.
There are 3 species, the type being *A. megarhizus*.
- No. 11. *Astrophytum* (meaning star plant), habitat: Mexico.
There are 4 species, the type being *A. myriostigma*; the other species are *A. ornatum*, *asterias* and *capricorne*.
- No. 12. *Sclerocactus* (meaning cruel hooked), habitat: Arizona and California.
There are 2 species, *S. Whipplei* and *polyancistrus*.
- No. 13. *Arequipa*, named from the town in Peru near their habitat.
There are 2 species, the type being *A. leucotricha*.
- No. 14. *Hickenia* (named after Dr. Hicken), habitat: Argentina.
There is one species, *H. microsperma*.
- No. 15. *Mila* (an anagram of Lima), habitat: Peru.
There is one species, *M. caespitosa*.

- No. 16. *Utahia* (from Utah), habitat : Utah.
There is one species, *U. Sileri*.
- No. 17. *Eriosyce* (meaning woolly fruit),
habitat : Chile.
There is one species, *E. ceratistes*.
- No. 18. *Homalocephala* (meaning flat-
headed), habitat : Texas and
N. Mexico.
There is one species, *H. texensis*.
- No. 19. *Oroya*, from the district in Peru
where the plant grows.
There is one species, *O. peruvianus*.
- No. 20. *Matucana*, from the village in
Central Peru where it grows.
There is one species, *M. Haynei*.
- No. 21. *Hamatocactus* (meaning hooked cactus),
habitat : Texas and N. Mexico.
There is one species, *H. setispinus*.
- No. 22. *Strombocactus* (meaning top-shaped
cactus), habitat : Mexico.
There is one species, *S. disciformis*.
- No. 23. *Leuchtenbergia* (named after the
Duke of that name), habitat :
Mexico.
There is one species, *L. principis*.
- No. 24. *Toumeyia* (named after Dean
Toumey, a great collector).
There is one species, *T. papyrantha*.
- No. 25. *Pediocactus* (meaning plain cactus).
There is one species, *P. Simpsonii*.
- No. 26. *Denmoza*, an anagram of Mendoza,
the province of Argentina where it
is found.
There is one species, *D. rhodacantha*.
- No. 27. *Lophophora* (meaning crest-
bearing), habitat : Central Mexico.
There is one species, *L. Williamsii*.
- No. 28. *Ariocarpus* (meaning fruit like *Aria*),
habitat : Mexico.
There are 3 species, *A. retusus*,
fissuratus and *Kotschoubeyanus*.
- No. 29. *Copiapoa* (a province of Chile),
habitat : Chile.
There are 6 species, the type being
C. marginatus.
- No. 30. *Neolloydia* (named after Professor
F. Lloyd, a collector), habitat :
Texas and N. Mexico.
There are 7 species, the type being
N. conoidea.

MAMMILLARIEAE.

There are only 9 subdivisions of *Mammillarieae* and of these the *Coryphantha* were already taken out by Engelmann.

Of the *Mammillaria* Britton and Rose give 146 species, the type plant being *M. simplex*, habitat : almost exclusively Mexico.

Britton and Rose say : " We have given

much time in attempting to group the species into definite series, but have not succeeded, since many of the species are little known, and have been incompletely described. During the period of our investigations political conditions in Mexico have prevented our obtaining much original information concerning many species, and have made it necessary for us to depend largely upon published descriptions and illustrations." Well, Labouret had succeeded in 1860 in placing the *Mammillaria* in series and groups. One would have thought this would have been a good basis to work on and improve and enlarge.

Labouret divided them into twenty-seven series, such as :—

Heteromorphae,	that is two kinds of spines.
Crassispinæ,	„ flat spines.
Praesulcatae,	„ tubercles in a groove.
Crinatae,	„ exterior spines stiff in tufts.
Uncinatae,	„ hooked spines.
Setosae,	„ exterior spines silky.
Stelleguae,	„ spines disposed as a star.
Etc.	

I was very disappointed, therefore, with these remarks, which I look upon as a retrograde step ; and when one comes to see that the species are not grouped at all, and that under synonyms very many species are lumped together as being one and the same plant, after many writers, from 1839-1922, had described their variations, it is the reverse of helpful ; and in some cases I had to revert to Labouret of seventy years ago.

For instance, *Mammillaria magnimamma*, Volume IV, pp. 77-78, Britton and Rose give 67 synonyms.

Description : Spines 3-5, very unequal in length, the upper ones short and straight, the lower 1 or 2, 1½ cm. to 4½ cm. long, recurved or incurved, all horn-coloured with black tips. Flowers cream.

In Labouret this is included in his group *Macrothele*, i.e. large tubercles, which comprises 9 species, all distinct ; they are all in the above synonyms of Britton and Rose.

Only two of the group have cream flowers. Again, going to the synonyms of the plant, we find Lemaire, 1838, described five of them as different, and Kuntze, 1891, described twenty-two of them as different. Now if Britton and Rose had told us that any slight (or otherwise) variations were field hybrids or garden hybrids, we should have understood better, but they say they are all the same, when they are not, which is not correct.

Mr. Farden gave further examples.

About Succulent Plants

What I Learnt at My First Introduction to Them

By Dr. N. E. Brown

(Read at the Meeting held on June 28th, 1932)

MR. PRESIDENT, LADIES and GENTLEMEN,

Having been asked by our Secretary to come here this evening to talk to you about succulent plants, I feel very much like the schoolboy who played truant and wrote to his schoolmaster: "Dear Sir, Please teacher I am absent to-day, yours truly, Burton primus." For it happens that I am absent too, and on holiday. And if I had been available it is doubtful if I could have talked to you, as my lecturing days are over. So, by the desire of our Secretary, I am writing something to be read to you. But I really do not know what to write that would interest you, so venture to tell you of some of the



Stapelia variegata, Mary Tyler, A.R.P.S.

things I learnt at my first introduction to succulent plants and how that contact influenced my future studies, also a few odds and ends of facts about some of these plants. And if you should not approve of it, you must blame the Secretary, for that is one of the uses of Secretaries; they can always be blamed for things that are not liked.

In the first place, I think we must congratulate ourselves upon the manner in which such good response has been given to the call for the formation of this Society, to which I wish great prosperity and long life.

I remember that about forty years ago a Cactus Society was formed which published a few numbers of a journal and then collapsed for want of proper organisation and support. I do not believe such will be the fate of the present Society, as it has started with quite a different vigour and push, and if those who can will aid and support the journal which I learn is to be started in the near future, there is no reason why it should not go ahead and flourish for an indefinite period. Let all do their little bit to help.

From the list of members I note that more than 170 of us have banded ourselves together for the adoration of prickly and other succulent plants, and it occurs to me that when some of us made our first acquaintance with these plants there may have been connected with it some circumstances that influenced our subsequent lives in some way as it certainly did my own.

Sixty-seven years ago, as a schoolboy of sixteen, I was teaching myself Botany from an elementary book, and knew very little of the subject, when my schoolmaster, knowing I was very fond of plants, asked if I would like to see a collection of curious foreign plants. I was delighted at the offer, and, being furnished with the address, went in keen anticipation of seeing something of interest. I was not disappointed, for upon arrival I found myself confronted with two long houses filled with succulent and a few other plants. Hitherto the only succulent plants I had seen were a few Cacti grown in cottage windows and the Stonecrop and Houseleek. But here were hundreds of succulent plants of all kinds; I was told there were over three hundred species of Mesembryanthemum alone, and all were very strange and new to me. I was both interested and amazed, as I had no idea that such curious plants existed. This grand collection belonged to Mr. W. W. Saunders of Reigate, and was in charge of Mr. T. Cooper, who gave me much information about the plants and the conditions under which he himself had seen them growing during his travels in South Africa. Among other things, I learned that at the end of the eighteenth and the beginning of the nineteenth century, succulent plants

were much in favour and that a botanist named Haworth, at that time had a fine collection of them and published books containing descriptions of all that were then known. When Haworth died, his collection was sold and at a later date sold again, and in that collection I was then looking at were many of the plants that had once formed part of Haworth's type collection. I do not remember what they were, but believe a fine plant of *Haworthia papillosa* was one of them. I remember it as a grand and very striking species, which must be rare, as I have never seen it elsewhere.

To a great many people a succulent plant is—"something of a Cactus kind"—and that was my attitude when I noticed a lot of prickly plants that looked like Cacti to me were not grouped with the other Cacti, so enquired about them, and can well remember how surprised I was when told they were not Cacti but Euphorbias. Now, I did know two of our British species of Euphorbia, and as they were herbs and so very different in appearance from these Cactus-like species, I was puzzled and could not understand why they were placed in the same genus. So it was explained to me that it was the structure of the flower and fruit and not the appearance of the plant that was used to classify it, and as some of the Cactus-like Euphorbias were in flower, a flowering species of some Cactus was placed beside them and the great difference in their structure demonstrated. And it was also pointed out to me that the spines on Cacti and those on Euphorbias were quite different in arrangement and substance, when closely examined, so that they can always be easily recognised even when out of flower. This was the first lesson in botany I had received and it has never been forgot.

With reference to these spines, beside Cacti and Euphorbias they also occur upon Hoodias and some species of Trichocaulon. It is usually supposed that spines are developed to defend plants from browsing animals. I have been informed, however, by a traveller who had journeyed through desert regions of Peru and Chili, where Cacti flourished, that his mules, when thirsty, would quickly scrape the spines off the Cacti with their hooves and suck and eat the pulpy part of the plant. So it is evident that such spines form no real protection from hoofed animals. I think it is possible, however, that spines may be useful to a plant in another way. For, in proportion to their bulk, spines and hairs have a larger

amount of surface than any other part of the plant-body and cool down more rapidly, and as they are capable of absorbing a small amount of moisture, I strongly suspect that they serve to condense moisture from the air at night by their cool surfaces and so supply the plants that bear them. This would also apply to the bristle-like hairs and teeth found upon many Mesembryanthemums.

At the first visit, being desirous of learning to what natural orders many of these plants belonged, I was surprised when told that Haworthias, Gasterias and Aloes belonged to the Lily family, and also that some bulbous-rooted plants that were there were species of Pelargonium, and that a climber with a square succulent stem was a species of grapevine. Being young, with a receptive mind and eager to learn, all the things told me became permanently fixed in my mind and proved not to be of trivial import. Because, some years later, when I went for my final examination for the post then vacant in the Kew Herbarium, it was with some of these succulent orders and genera that my knowledge was tested.

Among the multitude of strange plants I saw in that collection, none took my fancy so much as the Stapelias, some of which were in flower; and next to them the small Mesembs, now put in the genus Conophytum, attracted me most. When my visit ended I was given a cutting of *Stapelia variegata* and invited to come again. That cutting formed the beginning of the fine collection I had many years later when I monographed the whole group.

Upon my second visit I found several groups of plants—Haworthias, Gasterias, Mesembryanthemums, etc., arranged in series. Being a schoolboy and not previously interested in such things I had never heard of Darwin or his theory of evolution. But I was then introduced to that theory and its truth demonstrated to me by means of these plants in such a simple manner, that, boy as I was, I readily grasped its meaning and have never forgotten that lesson. I do not remember what the plants were, only that allied species were grouped together, their resemblance to and difference from one another being pointed out, and how they gradually passed from form to form until at the end of the series they had passed into forms so entirely different from those at the beginning of the series, which seemed to form an unbroken chain, that, as it was pointed out to me, if several of the links present in the chain of alliance

(Continued on page 12.)

Spherical Opuntias

By Curt Backeberg (Translated)

THE Opuntias belong in general to those Cacti which are least valued by the amateur, firstly because they get very lanky so that in the end one does not know what to do with them, but give them to an acquaintance as a birthday present; and then it seems an even greater disadvantage that, with few exceptions, they hardly ever flower in our collections. It is this last point that turns the scale. One can prevent lanky growth by cutting the plant hard back; in this way quite pretty groups may be produced so that the plants look more beautiful than if they had retained their natural habit. But that most Opuntias will not flower is resented by many growers, and therefore people have little use for them.

People will have Cacti which give them flowers to admire!



Left to right : Opuntia Bruchii ; Opuntia Papyracantha ; Opuntia Floccosa.

Many a grower is still not in a position, from various causes, to produce plants that flower well; his interest wanes and he gives up collecting before he realises that the flower on the plants has delighted him at the best for three days only, whilst he gets pleasure the whole year round from a beautiful form. If one cannot produce flowers one can at least grow a variety of forms.

I spoke at the beginning of Opuntias.

Within this family there is a highly interesting section, which is still too little known, the so-called Tephrocacti, that is short-jointed *Cylindropuntias*, perhaps dwarfed descendants of larger ancestors, from the table lands of southern South America.

I give here an illustration of three varieties of *Tephrocactus*, from left to right :—

OPUNTIA BRUCHII *Spag.* Strong spherical bodies up to 10 cm. high standing one on another, with spines up to 8 cm. long, ochre to light blue in colour.

OPUNTIA PAPYRACANTHA *Phil. n.v.* *FORMOSSISSIMA*, joints up to 8 cm. with dark red glochids as much as 1 cm. long in the areoles, and papery spines 15 cm. long and almost 1 cm. broad, which give the whole plant a grotesque beauty, especially when they stand out after watering.

OPUNTIA FLOCCOSA *S.-D.*, cylindrical joints approximately 10-15 cm. long, with areoles on the projecting knobs and penetrating spines at first pale yellow, later brownish. The whole plant is covered with white hair through which the new growth of the rudimentary leaves projects, giving it a specially beautiful appearance.

Besides the Opuntias mentioned there is a whole series of *Tephrocacti* which likewise form unusual and often extremely pretty plants :—

Opuntia andicola Pfeiff., caespitose, dark green, with spines directed downwards.

Opuntia microdisca Web., beautiful round cushions with joints about 3 cm. across in all colours from white, yellow to dark red.

Opuntia ovata Pfeiff., caespitose. Bright green joints with long (1-3 cm.) yellowish brown spines.

Opuntia papyracantha Typ.

Opuntia silvestris sp. nov. Bckbg., round groups, remaining small, with little red spines.

Opuntia strobiliformis Berger., cylindrical joints in form and size resembling a fir-cone.

The list could be further extended, for there are still a large number of other beautiful species which, if grafted on strong *Opuntia* stock and not kept too well-fed and sunny, make beautiful groups with characteristic spines. All occur on the flanks of the high mountains and on the tablelands; their low, usually cushion-like or caespitose growth giving the appearance of plants growing under wretched conditions of existence. The other children of *Flora* are here also low-growing and markedly spiny. In any case all the species are plants which, on account of their beautiful and characteristic shapes, are worthy of collection as representatives of the most extreme section of the Cacti.

(Continued on page 11.)

The R.H.S. Amateur Flower Show

ON June 28th the ninth of the Royal Horticultural Society's Amateur Flower Shows was held. For Cactus lovers two of the 104 classes were of special interest; No. 10 "A group of cacti and/or succulents on a table space with a frontage of 6 ft. and a depth of 3 ft." for which three prizes were offered: First, Silver Trophy, provided from Mrs. Sherman Hoyt's Prize Fund; Second, £3; Third, £2. And Class No. 91, "Three specimen succulents in pots, three genera to be represented," the prizes being: First, £1 10s. od.; Second, £1; and Third, 10/-. Class No. 10 was open to all amateurs; Class No. 91 only to those who do not employ a paid gardener.

This year there were four entrants in Class 10, instead of six the year before. It had been hoped that members of the Cactus Society would be inspired to try their luck, and two members who had not shown here previously did avail themselves of the opportunity; the size of the space to be filled, necessitating as it does a considerable number of plants (the average shown this year by each exhibitor was 60), makes it difficult for many amateurs, as special means of transport of these heavy plants must be provided. The four entries were all of good standard and an extra prize was awarded.

The First Prize was won by Mr. R. S. Farden, who has shown now for a number of years. He had some very fine specimens of *Echinocactus*, such as *E. Grusonii*, *echidne* and so forth; one example of *Astrophytum ornatum* was at least 18 inches high and others were of considerable size. Large *Gymnocalyciums*, some in bud, and some fine large *Mammillarias*, several in flower, were also shown. A large well-grown group of *Mammillaria plumosa* was a striking feature.

The Second Prize was won by Capt. E. J. W. Noakes, a member of the Society, who was showing for the first time. He had large well-grown plants of *Echinocactus Grusonii* and *E. Wislizenii*; and some good groups of *Mammillaria* as well as large single specimens. A fine plant of *Echinocereus pectinatus rigidissimus* had opened a beautiful flower. Some very fine *cristates* were also included.

The Third Prize was won by Dr. P. L. Guisepppe, of Felixstowe, well-known for his interest in succulent and alpine plants. Two large specimens of *Pilocereus* were shown, together with large *Echinocacti*, Mam-

millarias, *Cotyledons* and *Euphorbias*. The front part of the exhibit was occupied by a most interesting collection of excellently grown succulents, such as rare *Haworthias*, *Huernias*, *Trichocaulons*, *Anacamperos*, *Lithops* (including *L. marmorata*, *Friedriche*, *obcordatum*, etc.), *Frithia pulchra* in flower, and *Conophytums* (including *C. albescens*, *Wettsteinii*, *altile*, etc.). This collection probably contained more rare plants than any other exhibit in the Amateur Flower Show.

The Fourth Prize went to Mr. P. V. Collings, another member who was exhibiting for the first time at the Amateur Show. He showed a tall specimen of *Cleistocactus Baumannii* and *Euphorbia cereiformis* 3 feet high; large examples of *Echinocactus Wislizenii*, *Coryphantha elephantidens*, *Aloe Victoria-Reginae*, *Cereus candicans*, with a good number of smaller species including *Astrophytum ornatum* and *Gymnocalyciums* in flower.

It is noticeable that, although the schedule expressly states that cacti and/or succulents are to be shown, the First and Second Prizes were awarded to exhibits showing cacti only, and these certainly contained some very well-grown plants, but it would appear that variety and rarity of plants are not taken into account by the judges.

In Class 91 there were seven entries; the First Prize was won by Mr. H. G. Harrison, with *Lophophora Williamsii*, *Echinocactus nidulans* and *Astrophytum ornatum*. The Second Prize was awarded to Mr. H. S. Stanger, who showed *Mammillaria subpolyhedra*, *Opuntia diademata* var. *papyracantha*, and *Echinocactus* (unnamed). The Third Prize went to Mr. T. King, who showed *Mammillaria Wildiana cristata*, *Huernia Pilansii* and *Haworthia Cooperii*. All the prize winners are members of the Society.

Mr. W. G. Theobald staged a very fine non-competitive exhibit of *Cotyledons* and *Echeverias*; about one hundred plants were included, some being of large size and bearing beautiful flowering sprays; the plants were noteworthy for their remarkable condition, the delicate surfaces of their leaves being quite unspoilt by any marking due to damage or careless handling; and the beautiful range of colouring made them an object of great admiration to visitors to the Show, whilst the variety of species shown was of considerable interest to any one familiar with these genera.

V. H.

The Inception of the Society

I HAD been collecting cacti for a number of years as a result of seeing a collection of miniature plants at a People's Palace Flower Show about 1915.

I thought I had a fine collection, and that I knew quite a lot about my hobby. I was a member of the German, Dutch and American Societies, and I was garnering knowledge and experience all the time. I bewailed the lack of cacti literature in this country, I had the foreign journals and deplored the absence of an English Society and Journal.

My ever-increasing collection disclosed the immense variety of form, flowers and colours, and with the passing years I considered myself quite an expert.

Then, one by one, came the blows to my pride. I had ample proof that I was not an expert, I had not such a wonderful collection as I thought. I learnt basic facts from people who had a few cacti in a warm greenhouse and who watered them almost as ordinary plants. At a village show, where I was making an educational exhibit to interest my fellow villagers, a cottager showed three echinocacti, all of a kind, about eight inches in diameter, dark and vivid green and swollen with water, having several immense blooms and buds on each. In many ways and from very diverse sources I was learning to reverse much of the advice I had read and which many are still reading.

I realised the seriousness of the lack of opportunity to foregather with other collectors for the simple reason that I knew of no one who "collected" cacti. There were several who had an odd plant or two, unnamed, and the owners did not know anything about them and appealed to me for advice. They had the plants for show only and to interest any visitors. There were no avenues of information open to me in this country, as I thought, and I soon commenced to dally with the idea of forming some sort of an association where collectors could mutually help and advise each other. I was in the midst of organising a religious body and business also kept me busy, and the idea remained an idea only.

Letters from Mr. F. E. Cooper, of Shanklin, and our Editor, Mrs. Higgins, appeared in the American Journal and spurred me to action. Mr. Cooper said there were so few collectors in this country, Mrs. Higgins told of the success of some collectors at the Shows. I simply did not know Mr. Cooper was wrong, but I have the combative spirit and had to prove him wrong. I began to

collect names and addresses of those interested in cacti. I contributed articles to the gardening papers appealing for names and addresses with fair results.

These came in too slowly for my energetic soul and I approached the "enemy," Mr. Cooper, on the matter. I had met him a few years before and had purchased some of his plants. He was good enough to loan me his address book and gave me permission to circularise them. He was doubtful of any possibility of success, but with the material he had provided my imagination was fired. Any one who collects cacti will not need much to make them realise my feelings. I had now over one thousand names and I decided to send my first circular letter to those in London and the Home Counties.

I received most encouraging replies and decided to book a hall at St. Bride's Foundation Institute. I made the necessary booking and sent a notice to all those who had replied.

On November 28th, 1931, my ideal was realised. I had got together sixty collectors, and Sir William Lawrence was kind enough to agree to take the chair. I was indeed grateful to Sir William, as his reputation would be of great assistance, and that he should officially act for me is a striking tribute to his good nature. The result was a foregone conclusion. Sixty collectors were met together, suffering under the same disabilities as myself, and were only too eager to band together for mutual help. Forty-three associate subscriptions were paid at this meeting, a committee was formed of Mr. Collings, Mr. Farden, Mr. Harrison, Mrs. Higgins, Mr. O'Donoghue and myself, and we were entrusted with the preliminary details.

After meetings and mutual collaboration, the rules and other preliminaries were prepared and a meeting was called for March 8th, 1932, at the R.H.S. New Hall, which again was attended by sixty people. Enthusiastically it was decided to form the Society, the rules were adopted and the President and Council were appointed.

The first Council meeting was held on March 14th, when Mr. Farden was elected Chairman of the Council and it was arranged to hold monthly meetings, and the first was held on April 5th.

At the next Council meeting on May 5th, it was decided, as full memberships were now satisfactory (the membership was nearing two hundred), to commence the publication of a

(Continued on page 12.)

Editorial

WE here present the first number of THE CACTUS JOURNAL, a modest journal so far, but we shall increase in size if we are assured of adequate support. In order that the requirements of readers may be met as far as possible, the Editor will be glad to receive criticisms and suggestions. Limitations of space have necessitated omitting many things that we should like to have included in the first number; in future we shall hope to publish reviews of articles and books dealing with the subject; we shall acknowledge the receipt of catalogues, and in this connection we should like to thank those firms who have generously sent us catalogues to date; these are in the Society's Library, where they can be consulted by members. As regards articles, we shall hope to cover as wide a range as possible from the popular to the scientific, and we hope to increase the number of illustrations.

There are questions of interest and importance to cactus growers that might profitably be discussed in the Journal. For instance, before we hold a show of our own there must be some decision on the question, "What constitutes a succulent plant for the purposes of a horticultural show?" We have heard it rumoured that exhibits have been disqualified by a judge who considers that "only edible plants should rank as succulents"; such a definition would be manifestly absurd and no grower will wish to exhibit his plants unless the nature of the classes is clearly defined.

The Editor has received generous offers of help from many sources; these can only be made full use of if the Society is well supported, so that adequate funds are available; may we therefore ask members to make the Society known as widely as possible, which will be to their own advantage as well as that of the new members they induce to join us.

In 1898 a Cactus Society was formed in this country; it issued a very interesting and well-illustrated publication, THE CACTUS JOURNAL, whose name, thirty years later, we now adopt. It appears that the time was not ripe for the formation of such a society, for after about two years' existence it came to an end. We feel sure that this new Society, in which we are glad to say several members of the earlier Society are interested, will have a longer life; but this depends not only on the energy with which the officers carry out their part of the contract, but on the interest and support of all cactus growers throughout the country. It is our aim that the Cactus and Succulent Society of Great Britain shall become so useful a body that no one interested in Cacti and Succulents in this country will care to own that he or she is not a member of it.

V. HIGGINS.

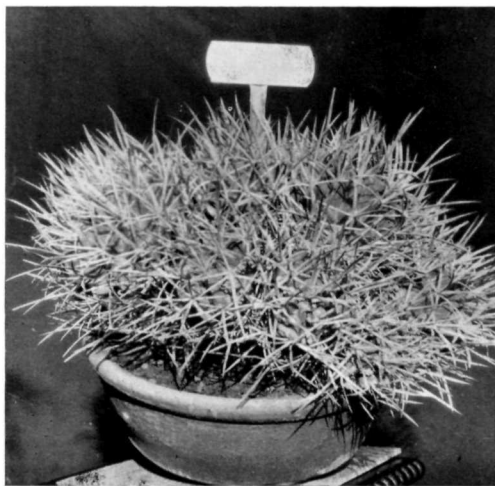
Meetings

MEMBERS have been kept informed of the subjects dealt with at the meetings by the monthly notices and we shall, as far as space permits, give the substance of the papers at these meetings for the benefit of members unable to attend them.

At the meeting on August 9th, Mr. O'Donoghue very kindly agreed to postpone his address as it was learned at short notice that Mrs. van der Bijl was in England; she very kindly attended the meeting and gave the members present an excellent description of the conditions under which South African Succulents grow in nature, supplementing this with photographs. Mrs. van der Bijl is well-known for her wonderful collection of these plants; she has become a member of our Society and, as Secretary of the South African Succulent Society, will welcome any one in this country who cares to join; the subscription is 1/3 (which covers the changed value due to the rate of exchange) and this may be sent to her at Merindol, Great Brak River, C.P., S. Africa.

It was with great pleasure that we welcomed Mr. and Mrs. van der Bijl at our meeting, and we extend a cordial welcome to any foreign members to visit us when they are in this country. The Meetings Secretary will be delighted to make arrangements if they care to communicate with her.

V. HIGGINS.



A fine example of *Echinocactus polyccephalus* in the collection of Mr. F. E. Cooper, of Shanklin, who has kindly loaned the photograph.

We are indebted to F. A. Haage, jun., of Erfurt, for the beautiful photograph of *Lithops Mundtii* on page 1 showing this curious stone-like plant in flower.

Library

THE Society hopes in time to get together as complete a collection as possible of the books dealing with Cacti and Succulents. A beginning has been made through the kindness of members and others, who have presented the following:—

- Knuth, Count F. M. Der Stora Kaktusboken.
- Watson, W. .. Cactus Culture for Amateurs.
- Haage, F. A., jun. Cacti in the Home.
- Schumann, Karl .. Keys of the Monograph of Cactaceae.
- Safford, W. E. .. Cactaceae of the N.E. and Central Mexico.
- Werdermann, E. .. Bluhende Sukkulente, Mappe 3.
- Vaupel, Dr. F. .. Die Kakteen, Vols. I and II.
- Hicks, J. H. A. .. Four books of Verse.
- Endean, T. M. .. Cacti Culture.
- Catalogue of the Darrah Collection, Manchester.

These books are housed at the Royal Horticultural Hall and can be consulted at meetings; and it is proposed to make arrangements for loaning books to members. When funds permit, the Council hope to purchase books; the Librarian will welcome donations, either of books or photographs, and suggests this would be a suitable method for members to dispose of any duplicate copies they may have.

The publications of other societies are, so far, represented chiefly by specimen copies; the Dutch Society, however, has kindly sent us all the numbers that have appeared so far. Now that our Society has a Journal to offer, we shall hope to arrange exchanges with the other Cactus Societies on the Continent and in America.

At the Meeting to be held on October 25th, a paper by Herr Curt Backeberg will be read describing his travels through South America in search of Cacti; this will be illustrated by lantern slides.

Notes

MAMMILLARIA GULZOWIANA is a novelty just come on the market; it is very pretty, a fluffy ball somewhat like Mammillaria senilis; though the spines are thicker and shorter. The flower is deep rose and two inches across with a green stigma and in consequence I do not think it can be a Mammillaria.

R. S. FARDEN.

PTROCACTUS KUNTZEI (syn. Rhipsalis lumbricoides) requires a very deep pot. Early enthusiasts used to knock the bottom out of one pot, put it inside a second one, wire the two together and hang it up. A drain-pipe might make a suitable flower pot for this species! It requires warmth and water when growing, and should be kept very dry when resting.

C. D. O'DONOGHUE.

Members are invited to send in to the Editor short notes on new species, methods of cultivation, etc., which they think will be of interest to their fellow-members.

Exchanges

F. Stuart Matheson, Esq., Upland, Callington, Cornwall, sends the following list of plants which he would be glad to exchange with other members who may have duplicates they wish to dispose of:—

Echinocactus minusculus ..	3 plants.
Echinocereus procumbens ..	2 ..
Opuntia fragilis ..	2 ..
Opuntia microdasys rufida ..	2 ..
Mammillaria pusilla ..	2 ..
" castanoides ..	2 ..
" macrantha ..	1 ..
Gasteria verrucosa ..	3 ..
Haworthia runtwardt major ..	1 ..
Mesembryanthemum lucidum ..	2 ..

SPHERICAL OPUNTIAS—*Contd. from p. 7*

The cultivation of Tephrocacti should be as follows: sandy, well-drained soil, not too rich, plenty of light and sun, when possible, in any case plenty of air and, except on warm summer days, not too much moisture, but yet sufficient; and the plants from the middle of Autumn till the Spring should pass the Winter fairly dry, corresponding to their natural habitat. Their position during Winter should, in accordance with the conditions in the highlands where they grow, be bright and cool (between 4°–8° C when possible) [40°–45° F approx.].

SUCCULENT PLANTS—*Contd. from p. 6.* were destroyed there would be little evidence left of the close relationship of the two end plants of the series. And it is this latter condition that now mostly prevails, for during vast epochs of time the links between big groups have been in most cases abolished by Nature's action. That lesson sank deep into my mind and caused me to observe plants closely, to note their resemblances and differences and to apply my observations to future studies. On this second visit, at leaving, I was presented with a cutting of what was then known as *Echinopsis Pentlandi*, and I have it now.

I paid a few more visits and then, as the lease had expired and the ground was wanted for building upon, that fine collection was sold and dispersed. The vision of that collection, dimmed and blurred by time though it is, and the lessons it taught me in those early days still remain and I think ever will. (*To be continued.*)

THE INCEPTION OF THE SOCIETY—

Contd. from p. 9.

magazine. We were fortunate in obtaining Mrs. Higgins' agreement to act as Editor.

We are already talking about an Exhibition of our very own in 1933. We are showing our American cousins that "pep" is not merely native to the U.S.A.!

It is difficult to give thanks to all the willing helpers as they were so many, but I would like to mention the Provisional Committee in its entirety, also Mr. Cooper, Mr. Haage, Mr. Endean, the American, German and Dutch Societies, as well as Lt.-Col. Durham, the popular Secretary of the R.H.S., for their encouragement and help to me during the formation and early days, with a special commendation to Mrs. Higgins, Sir William Lawrence, and to mention once more, Mr. F. E. Cooper for their exceptional support.

Do not forget these dates and events.

November 28th, 1931.	Preliminary meeting.
March 8th, 1932.	Official founding of the Society.
April 5th, 1932.	First monthly meeting.
May 3rd, 1932.	Decision to publish magazine.
September, 1932.	Publication of magazine.
— 1933.	First Exhibition.

And now for the one thousand membership and onwards to beat the record of our American friends!

E. SHURLY,
Hon. Secretary.

The Cactus and Succulent Society of Great Britain

(Affiliated to the Royal Horticultural Society)

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From Mr. W. J. Caparne.

THE following is an extract from a letter received from W. J. Caparne, Esq., Guernsey, whose beautiful pictures of flowers and gardens will be well-known to all visitors to the R.H.S. Shows:—

"It has occurred to me that the Society would like some literature on the subject brought to its notice, in view of which I am suggesting the series of articles published by the *Revue Horticole* in 1926 and the following years. The first articles, by J. Gerôme, are "Can Cacti be brought back to popularity in our day," and he goes on to say that they ought to be, for the younger generation have not seen them, and he alludes to the famous and magnificent collection of M. Simon, dispersed at his death, at St. Ouen. The numbers are April, May, August, and September, 1926. The address is *Revue Horticole*, 26, rue Jacob, Paris (6c), price per number 2 fr. 50. The subject is carried on by M. A. Guillaumin in January, March, April, July, September, December, 1928, February, March, April, June, August, September, October, December, 1929, and January, April, May, 1930."

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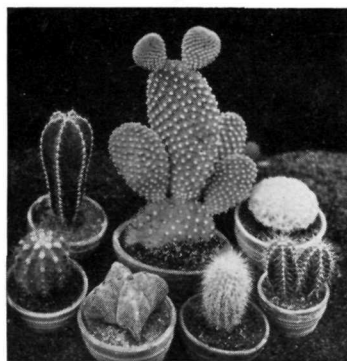
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Espostoa lanata in Northern Peru.

Origin and Migration of Cacti

By Curt Backeberg

(Translated)

MOST amateurs do not pay much attention to the scientific side of the study of cacti; systematic botany and all that it implies does not interest them. And yet closer study of this family of plants shows what an immense amount scientific research has to tell and how much that is useful in our methods of cultivation we can derive from it.

We will consider the history of cacti briefly from this point of view.

It is assumed that the tropical regions are their original home, strictly speaking, South America. Certain results of my studies in this connection, however, lead me to con-

jecture rather that there were two large streams of migration, one from the La Plata and the other from the West Indian region, now submerged, around the former mouth of the Mississippi down to the Caribbean Sea. The primitive families here were related to our Pereskias, old genera still existing to-day originate from them, such as *Rhipsalis*, *Phyllocactus*, the climbing *Cerei*, etc.; all plants which even to-day are still to be found in tropical regions. The structure of the flower and fruit, as well as characteristic growths, such as aerial roots, etc., show a certain progressive evolution from the originally close relationship.

The tropical *Opuntias* also, or such *Opuntias* as prefer warmer regions and the forefathers of the other *Opuntias* arose as a spherical branch of the family from ancestors which were related to the *Pereskia*-stock and separate branches, like the *Tephrocacti* and the Andean *Cylindropuntias*, have early migrated into the mountains. The larger number of the remaining *Opuntias*, the *Platyopuntias*, do not colonise such high regions and the line of descent is probably recognisable through the *Brasiliopuntias* which appeared directly in the tropical underwoods, as well as through certain West Indian species.

We will consider the Andean *Cylindropuntias* and *Tephrocacti*, as well as the *Opuntias* of the Mexican highlands later on. The so-called warmer cacti, *Rhipsalis*, *Pereskia*, *Pereskopsis*, *Hylocereus*, *Selenicereus*, *Epiphyllum*, *Phyllocactus*, *Aporocactus*, *Pfeiffera*, *Acanthocereus*, *Leptocereus*, *Nyctocerus*, *Harrisia*, *Heliocereus*, to name only the best known genera, may well be regarded as genera which are already old; their occurrence in warm regions with humus-containing soil and high rainfall, shows that in cultivation they require more warmth and are not very susceptible to excess moisture, in fact they need a good deal of water.

In South America there follow the *Trichocerei*, which include a large number of sub-genera and with these the further migration of cacti across the southern continent is opened up. The high North Argentine includes:—*Trichocereus* (which is found in Peru at similar altitudes), *Echinopsis*, *Borzicactus*, *Espostoa*, *Denmoza*, *Cleistocactus* and *Binghamia*, which again favour warmer districts, without on the other hand requiring tropical warmth. This branch ends in these latitudes with the genus *Oreocereus*, which even tolerates frost. With the exception of the last group, all prefer more warmth and during the growing time, more moisture. The cacti of the highlands are, on the other hand, used to greater dryness.

Next in South America come the *Gymnocerei* and to these belong the genera *Cereus*, *Stetsonia* and *Monvillea*; they all like more warmth and moisture and the spherical forms of this branch, the *Gymnocalyciums*, like *Cereus* and *Monvillea* and *Stetsonia*, prefer the Pampas, humus-containing soil and semi-shade. This tribe, with *Lophocereus*, *Cephalocereus* and *Cactus*, which are closely related, leads on to the northern centre. All the sub-genera already mentioned, with

the exception of *Oreocereus*, show therefore a distribution in semi-warm regions, rich in humus, from the La Plata system to Peru and are families which have not ventured to very high altitudes.

This has, however, been attempted by certain cactoid branches of the *Trichocerei*, *Rebutia*, *Lobivia*, *Neoporteria* and *Oroya*, which occur as high as 4,000 metres. *Chamaecereus*, *Matucana* and *Arequipa*, which I have brought back for the first time, also belong here.

One thing is peculiar to them all (even the *Rebutias* if they are brought back well-grown)—they want full light, they flower profusely and brilliantly, and besides are without exception not susceptible to damp. This is the result of their place of origin; their occurrence at high altitudes means they can bear full light, in fact, they require it. That they at times even survive frost does not mean that they are hardy. Cold nights, when the air is dry, are quite different from our cold periods. *Neoporteria* is the group with the driest location and to it belongs the beautiful *Echinocactus senilis* and *nigricans*. One must therefore be careful in watering them, for the plants come from the barren regions of Chile.

The *Microspermus*-species also, *Malacocarpus* and *Frailea*, belong to the *Trichocerei* and like somewhat more warmth, and with the exception of the *Microspermus*-species which are characteristically root-sensitive (and therefore are best grafted), more moisture. Next to the *Milas*, the Peruvian *Echinocerei*, the branch containing *Malacocarpus* has the furthest northerly range. They extend as far as southern Colombia.

The *Trichocerei* too, with *Lobivia*, *Oroya*, *Oreocereus*, have reached the greatest altitudes, though only the last genus has been so specialised that it has to be treated more carefully. All the other South American species, so far as they are descended from the *Trichocerei* and *Gymnocerei* are good growers and can be recommended to the amateur, being plants which have evolved further gradually and with due regard to the characteristics of their origin. When grafted some of the exceptions such as *Echinocactus senilis*, the *Microspermus*-species and also a couple of quite small species, are also excellent and, thus grown, are very effective.

To return again to the Andean *Cylindropuntias* and the *Tephrocacti*, these descendants have reached the highest altitudes. I found them in Peru at 5,200 m. above sea level. They are consequently able to with-

stand great cold. They are almost all handsome forms and still too little known, for they are more beautiful and not so ungainly as the other *Opuntias*. The poor quality of the soil and the climatic conditions of their highland home require that the potting soil should be poor but well-drained, and their position not too moist, but with plenty of light and air.

The South American group therefore clearly migrated from the La Plata basin up to Colombia at medium altitudes, and sent part as far as the dry Pacific districts (*Neoraimondia*, *Browningia*, *Copiapoa*) and advance guards to the highest altitudes (*Lobivia*, *Oreocereus* and the *Tephrocacti* among the *Opuntias*).

And now what happened in the North? This cannot yet be definitely established. It is certain that after the subsidence of their original home in the West Indies and the probably more rapid uprising of the Continent, an accelerated development of larger groups must have taken place. The whole district is younger and it must all have taken place rather suddenly, everything adapting itself quickly where the ancestors were already established. Perhaps this may explain the great number of sub-genera which vary so in character and the fact that in the north a whole series of species must be treated with somewhat more expert knowledge. It is nevertheless surprising that the youngest region exhibits the largest variety of forms.

A broad division may be made as follows:

Species which need careful handling.—*Ariocarpus*, *Astrophytum*, the gay-coloured *Echinocacti* which, by their ferocious spines and beautifully coloured appearance, show themselves to be inhabitants of the desert regions or similar districts.

The soil in which they grow generally contains lime which is, according to my observations, an addition to the soil in cultivation necessary for the development of spines, together with dryness, light and air, which are also quite essential. Under such treatment imported plants will remain as beautiful as those which remain in their native home.

Less difficult species.—All the greener plants like *Stenocactus*, the green *Echinocerei*, the *Cerei* and the *Mammillarias*.

They want coarse, well-drained leaf-mould and the gay-coloured kinds want lime. The number of green, strong-growing or less difficult species is here somewhat smaller than in South America. In spite of this the Mexican species, except for a very few kinds,

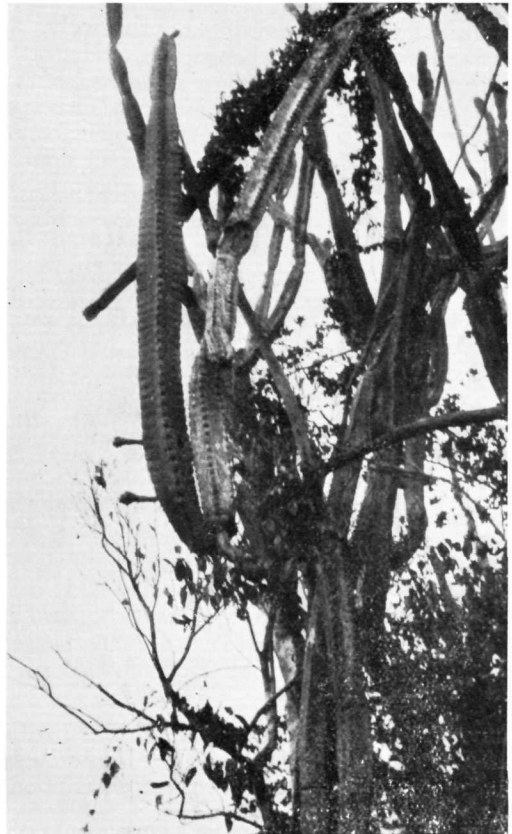
grow easily if one takes into account the character of their habitat, as shown by their habit.

To the less difficult species belong also a number of gay-coloured plants like *Echinocactus bicolor*, *corniger*, *pilosus*, *longihammatus*, the *Mammillarias* with hooked spines and others.

The *Cephalocerei* prefer more warmth and leaf-mould; *Cephalocereus senilis* and *Hoppenstedtii* are rather difficult. The "Old Man" cactus that grows best is not *Cephalocereus senilis* but *Echinocereus DeLaetii*, which sometimes produces beautiful violet flowers.

All the *Melocacti*, on account of their peculiarity in forming a "head," should be allowed to grow on and should only be propagated,—and this is not as a rule recommended for amateurs,—by grafting plants raised from seed on *Cereus Jusbertii*. Then they may be very beautiful.

The different levels of the Mexican landscape and the somewhat sudden development has led to a large number of forms difficult to



Pilocerei in the West Indies.

separate, as regards appearance and cultivation, as well as relationships. The inter-relationship of the northern species is extensive and cannot be cleared up in a short article. After the glacial period a migration towards Canada began and here occur the species which are hardy with us when the soil is well-drained. The conclusion is interesting, that the Mexican region has sent representatives even to Southern Colombia. Clearly groups were already formed in the higher altitudes of the original West Indian region which were able to migrate over the mountain passes of the Antilles, as it is known on the

map, before the lower districts had subsided. This leads one to believe that in Mexico a further development was already in progress. There are *Mammillarias* (*M. bogotensis*) which in their wanderings from the north have reached a southerly point at which they meet the northern representatives of the La Plata system, and also in the barren deserts of the South American continent the same is true, showing under what necessity of migrating and developing is this most unusual of plant families.

(Photographs by C. Backeberg.)

Mamillaria or Mammillaria?

THE above question arose at one of the Meetings of the Society and the former spelling was said to be an error. Memory fails one sometimes, but I was then of the opinion that the second alternative was the error. The spelling with the double "m," although incorrect derivatively, is undoubtedly right, as it was that of Haworth, himself the author. [Haw. *Synopsis*, p. 177 (1812)]. Priority is the universal rule in dealing with Natural History Nomenclature, hence *Mammillaria* the name with the double "m," the prior name given by Haworth, is the spelling.

When Haworth wished to refer to the main character of the plants he was grouping, the "teat"-like, or "pap"-like covering, he did not choose the appropriate Latin word "mamilla" = a breast, pap, teat, but coined his genus "Mammillaria," from the Latin word "mamma" = mother.

Most "cactus fiends" have referred to the "mammas" of the *Mammillaria* instead of the strictly correct term "mamillae."

I have looked up the following authors in my library, all of whom spell the name with one "m":—Forster (1846); Salm-Dyck (1850); Engelmann (1858); Labouret (1858); Watson (1886); Schumann (1898); Schelle (1926); Berger (1929); Guillamin (1931). Hence those of us, who have erred, have done so in good company.

NOTE.—Schumann (1898) in his reclassification uses the derivatively correct *Mammillaria*, and places his own initials to the description: *Mamillaria* K.Sch. (1898).

HY. J. TURNER, F.E.S., F.R.H.S.

Notes

THE following method of treating a diseased plant may be of interest.

During last winter a *Mammillaria albicoma* was badly damaged by having a pot fall on it. Some time later I noticed that the whole of the centre of the plant had rotted. The plant is very similar to *M. Schelhasei*, very soft and fleshy with rather long tubercles tipped with white hairs, but without the hooked spines. On cutting away the bad part I found nothing left but the root and a few tubercles. The tubercles were about 3/8ths inch long and 1/8th inch wide. I dried these well in the sun and then set in some sharp sand. I kept in a dry sunny place until I noticed small roots coming from the base of the tubercles. I then sprayed occasionally and after a time the skin at the base burst and a tiny plantlet appeared. The strange thing about one of them is that, as if to emphasise its vitality, the tiny tubercle that had produced a plant at its base has now sprouted at the tip and another plantlet is growing there.

Meanwhile after having scraped the bad away from the root of the original plant I removed some of the top soil in the pot and kept the pot fairly dry, just damping the soil occasionally. After a time I noticed two white swellings appear at the top of the root and the skin broke and two small plantlets grew. These I took off and planted, and have now in October, two nice little plants, one of which is now budded for flower, although not an inch across.

This goes to show that it is not policy to throw away even the root until efforts have been made to obtain new growth.

A. BOARDER.

About Succulent Plants

By Dr. N. E. Brown

(Continued from Page Twelve, September 1932).

I have mentioned that my visit to that collection engendered a great liking for *Stapelias*, which greatly increased when I joined the Herbarium staff at Kew in 1872, and had access to books and the Kew collection, so I began to study them in earnest preparatory for a monograph. In the early part of my career Sir Henry Barkly was Governor at the Cape, and being himself much interested in the group, sent numerous old and new species of *Stapelia* and allied genera to Kew. Later, Mr. N. D. Pillans also sent many more, so being desirous of learning what I could about the natural conditions under which these plants grew and their uses, I applied to those gentlemen for information, and the following are extracts from their replies, received at various dates between 1875 and 1914. It seems that although widely distributed, yet often only one species is found in the same area of several square miles, except in Little Namaqualand, which is their headquarters. And in many places where they were once common they are dying out because they are eaten by sheep and goats. They are stated as a rule to grow under the shelter of rocks and low bushy shrubs, where they get shade from the noontide heat, with good drainage and sufficient soil for their roots to penetrate. I suspect, however, that this shelter is due to the fact that their seeds, which are crowned with a tuft of long hairs like those of a thistle, are blown about by the wind and are finally stopped by being wafted against a rock or bush and germinate there.

In Namaqualand they mostly occur about 1,200–1,500 feet above sea-level, growing among gneiss rocks, where, in the wettest seasons the annual rainfall does not exceed 5-6 inches.

Possibly some of those present have possessed species of the genus *Trichocaulon* and therefore know how difficult these plants are to cultivate. This is not surprising when we learn that even under natural conditions they are very selective of their habitat. For Mr. Pillans informed me that these plants "never grow upon flat country nor upon the eastern side of a hill, but *always* on the upper western slope of a fair-sized hill or range of hills, and then it picks out the driest spot

where most shale and least soil is to be found. It is a marvel how they stand the drought." From this it would seem that the right way to cultivate these plants—and also *Hoodias*—would be to plant them in a pot filled with broken rock, which should not be limestone rock, with a little soil among the stones at the lower part of the pot and expose them to bright sunshine.

Plants belonging to the genus *Trichocaulon*, with spines on them, are called "Guaap" by the natives and are greedily eaten by Bushmen and Hottentots, which has caused them to become rare. The Dutch also, after cutting their ridges of thorns off, preserve the stems in sugar syrup, and they are said to taste very good. In Bechuanaland the natives slice the stems of *Trichocaulon officinalis*, dry and pound them to powder, which they boil, and with the water wash their diseased parts three or four times a day as their witch-doctors direct.

Guaap seems to be a generic name for these plants, for *Hoodias* are called "Wolves Guaap," and the hairy stemmed *Stapelias* "Slang Guaap," or "Snake Guaap," because snakes in Bechuanaland and Griqualand West eat them.

Mr. Pillans had a Hottentot in his employ, whom he saw take some stems of *Stapelia flavirostris*, split them down the middle and hold them before the fire to wither and then apply them to a cut, so he made enquiry of the Hottentot as to the uses Bushmen and Hottentots made of these plants, for Kaffir races do not appear to make use of them, as *Stapelias* are rare in the region they inhabit. This is what Mr. Pillans wrote: "Several times I got the Hottentot to taste as many of the edible kinds in my collection as I could spare bits from, and to point out which of the others were edible and which poisonous. He comes from Griqualand West and is well acquainted with most of the species, for he was with De Wet and then with the British during the Boer War, and of his own accord he wandered about Cape Colony and Orange River Colony, so he should have seen many different kinds. As a result, I find that of the genus *Stapelia*, all in the sections *Orbea*, *Tridentea* and *Podanthes* are edible, *S. variegata* and *S. verrucosa* being favourites.

Sections Tromotriche and Caruncularia have none that are edible, *S. pedunculata* being known as 'sore head' ('Kop Zeer'), as when a little of the juice gets on your tongue the bitterness gives a headache, and if too much sap is taken violent sickness and death results. In the section Stapletonia those species with stout, hairy stems are poisonous, only a few of the kinds with thin stems are edible. Many Carallumas are eaten, but some are poisonous. Huernias are all edible so far as I can make out although some are not liked, being too bitter. I tried *H. primulina* and could not get the bitterness out of my mouth for two days, but it is eaten by the Hottentots as a cure for headache. The stems of certain Duvalias and Piaranthus are taken instead of pills or castor oil.

"The sap of *Stapelia flaviverticillata* and allied species or 'Slang Guaap' is used by natives to inoculate themselves to keep off certain diseases. Little slits are made anywhere in the body and the juice rubbed in. They also mix the sap of 'Slang Guaap' with snake-poison; the mixture is put on their arrows, so that when a buck is shot the poison does not circulate through the whole body.

"He knows *Huerniopsis decipiens* and says it has often been his only food for a day when travelling in Griqualand West. *Lithops turbiniformis* he considered a delicacy. I had often heard of Hottentots subsisting for many days on Stapelieae in the Karoo, for that is about the only food growing wild there. This chap confirmed the fact and tells me that when he left his Boer master and walked westward to the towns of the Bechuanas, he was without provisions and his only covering a shirt and sheep's skin, and obtained his food from the veld, which only provided 'Guaap' (Trichocaulon) and other Stapelias. Water was obtained from wild gourds, and occasionally meat was possible when he could kill a bird with a stone." Journeying day after day under such conditions must indeed be unpleasant.

It is well known that the flowers of many Stapelieae have a strong and disagreeable odour, and that flies lay their eggs on the centres of the flowers. I never took notice of the species in which flies laid their eggs, but in 1902 Mr. Pillans wrote to me saying: "It may seem strange that although the flowers of *Stapelia Pillansii* have a very strong scent, yet no flies ever lay eggs on them. This is interesting to me because *S. Pillansii* belongs to the only group that is visited by these blue-bottle flies. I find that all Stapelias having glabrous stems, and flowers coloured

like those of *S. variegata* have the same odour, which is like that of carrion. No eggs are laid on flowers of glabrous-stemmed species, no matter how strong the odour."

This does not quite correspond with the behaviour of flies in this country, because they do sometimes lay eggs on the flowers of *S. variegata* here.

A problem connected with succulent plants is how they manage to exist under such arid conditions. That they store up water in their tissues and can exist upon a very small amount of it and even without any for a long time is well known. I have had a piece of *Conophytum truncatellum* shut up in a box where it got neither light, fresh air nor water for over eighteen months, yet when planted it soon rooted and flourished. The secret of this I think may be, although I have not tested my theory, that if the plant is at rest it has so prepared its tissues that they can withstand drought for a long time, but if they have started to grow and drought follows, then chemical changes have begun in the plant that affect it adversely and prevent it from adapting itself to the dry condition. I do not know how Cacti grow under natural conditions, but from many enquiries made as to the manner in which succulents grow in South Africa, it appears they mostly grow in stony ground or on rocks (often in less than half an inch of soil) or in the crevices of rocks. Also that many spread their roots in a horizontal manner a little below the surface of the soil. This connection with rocks and stones and the spreading roots are significant factors. Under the scorching sun the rocks and stones become heated and the soil very dry and hard, but at night the stones and rocks rapidly cool and become very much cooler than the air and condense moisture from it, which the plants avail themselves of, store up and go on for another day; and their roots, being near the surface, are able to obtain some of the water condensed from the air by the cold surface of the soil. Under cultivation, however, the soil and staging of a greenhouse do not cool down to the same extent and the conditions are different, so that the deficiency has to be made up by judicious watering.

I regret to tell you that I learn from various sources that some of these succulent plants that we love so well are becoming rare in their own locality and in certain cases likely to become extinct in the near future. So that all who cultivate them should endeavour to keep and increase them and not think "there are plenty more where that came

from " and that they can be easily replaced if lost. For that is not always the case. For example, I learn that in an area where *Lithops Leslei* grew in profusion some ten or twelve years ago, not a plant of it can now be found. Several other strange succulent plants I know of, each belonging to a different genus, are each confined to a single, and very limited area and may easily become extinct. This applies both to the Cacti of America and the succulent plants of South Africa. To preserve these interesting plants, very rightly both Mexico and South Africa have now prohibited their export except under a special permit. One way to retain and increase some of the rare species in our collections is by seed that is not hybridised, but properly fertilised by pollen from one of its own species. Many are easily hybridised and others are not fertile on their own pollen which should, if possible, be obtained from another plant of the same species derived from different seed. After pollination the flower should be protected by gauze netting from visits by insects. For I have witnessed in my own greenhouse pollen-eating flies, who on visiting a flower, first eat the pollen off the stigmas before eating that on the anthers, and thus destroy the chance of fertilisation. Probably the pollen on the stigmas had begun to germinate and so had become more tasty to the flies, in the same way that malted barley (i.e. barley that has commenced the process of germination) is more tasty than unmalted barley.

No plants known to me have so many peculiarities as the group known as Mesembs. Among them we have individuals no larger than a small pea, and others with large flat leaves 9-15 inches long and 3-7 inches broad, and so full of water that in times of scarcity it is squeezed out of the leaves and used for washing purposes. Other species have a strong odour of fish, so much so that cats are deceived by it. Then we have the strange windowed plants, which grow nearly buried in the ground under natural conditions, the top of the plant or its leaves being semi-transparent, permit light to enter and so reach the green chlorophyll-containing cells under ground. This partly buried habit is particularly characteristic of the genus *Lithops*, whose species are well known to be coloured so as to closely resemble the ground and stones in and among which they grow. As you probably know, the first species of *Lithops* was discovered over one hundred years ago by the traveller Burchell, who states that he picked up what he thought was

a curious pebble and was surprised to find that it was a plant, which resembled the stones among which it grew. This plant remained unknown to science until after the war. Hoping for its rediscovery I asked Dr. Pole Evans to look for it if he ever happened to be near the place where Burchell discovered it. One day I received two letters from Dr. Pole Evans; the first I opened informed me he had spent a whole day in the region where Burchell found it, hunting for the plant in vain. Farmers knew the plant from his description, but said that it buried itself and could not be found at that season. The second letter informed me that the next morning he had ridden out again and enquired of some children and people at a farm if they knew the plant but could get no information until a boy came along who happened to know it, and, being offered 5/- for one if he could find it, took Dr. Pole Evans to the place where it grew and soon found one, and afterwards a few more. Upon looking around and by the aid of a map Dr. Pole Evans discovered that he was actually on the same road and either at or near to the same place that Burchell found the plant, as the same features of the country and the same bushes, etc., were growing around the place that Burchell mentioned; thus the long lost pebble-plant, *Lithops turbiniformis* was rediscovered.

The statement by the farmers that these *Lithops* bury themselves in the ground seems to be true. Under favourable conditions the top of the plant is slightly above the surface level of the ground, but when drought is prolonged, as it frequently is where these plants grow, they gradually shrink in bulk and become less and less until they have shrunk in their sheaths below the level of the ground, then, when windy, dust is blown over them and they are hidden from view until rain comes and causes them to start growing again.

These, Ladies and Gentlemen, are some of the things I have learned during my study of these interesting plants, and I trust I have not bored you in relating them.

THE CACTUS JOURNAL is published quarterly, in March, June, September and December. It is sent free to Full Members of the Cactus and Succulent Society of Great Britain, the annual subscription for Full Membership being 10/-, payable to the Hon. Sec.

Growing Cacti from Seeds

By Dr. H. T. Marrable

MEMBERS of our Society who have not yet tried growing their cacti from seed should certainly try it this coming winter. It involves no large outlay, presents no great difficulties, and with a few simple contrivances can be carried on during times of the year when mature Cacti are dormant and require little or no attention.

You can of course start at any time of year, but I suggest January or February as a good time to commence, chiefly because it is a slack season for Cactus lovers.

The first thing to do is to order your seeds. These can be supplied by members of our own Society, who are in the trade, and many Continental firms specialise in seed. Small packets of 10 seeds, varying in price from 3d. to 6d., are the most suitable, and are sufficient to allow for occasional failure and to provide duplicates.

You might imagine when I suggest sowing seeds in January or February that that necessitates a heated greenhouse; as a matter of fact you don't need a greenhouse at all. A "Sunlight" soap or similar kind of wooden box can be got from your grocer. Cut it down to 9 inches in depth, take off the wooden bottom and replace it with a sheet of perforated zinc tacked on and strengthened with two slats of wood across the bottom. Four pieces of wood about 18 inches long are nailed to the four corners to serve as legs and raise the box from the ground. Underneath is placed a small paraffin lamp or, better, an electric bowl, the current for which is taken off the lighting system and costs little. Two or three panes of glass on top and your hot house is complete. A small thermometer inside is essential, and the temperature can be regulated at will by opening or closing the panes of glass or raising or lowering the height of the box above the lamp. A temperature of 75°-80° F. is easily maintained and is high enough. The majority of seeds will germinate within a week if ripe.

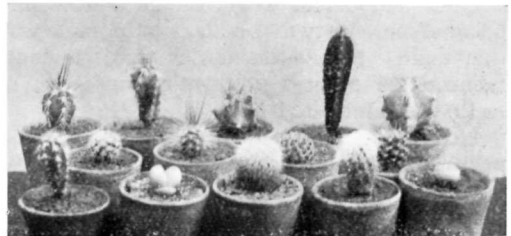
I use tiny pots, 1½ inches diameter, and each variety of seed has its own pot, but you can sow seeds in anything you like, from cigar boxes to tobacco tins. I use a compost of equal parts of peat and silver sand, sifted through a piece of perforated zinc. Half the pot is drainage, the upper half compost lightly pressed down.

Most cactus seeds are large enough to be taken up with the point of a pocket knife and placed in position. Seeds of some of the

Succulents, notably Lithops, are almost microscopic and require the greatest care when the packet is opened or there will be none to sow.

Having sown the seeds and labelled the pots, they should be placed in shallow trays inside the box. Tops of biscuit tins do excellently if you solder the corners. A little water in the tray, sufficient to keep the soil in the pots moist, is much the better plan. Spraying merely moistens the surface and the heat of the lamp beneath dries up the soil below. Until the seeds germinate it is essential to keep the soil damp. If you let the soil dry for even a few hours it means death to the seeds; with a little water in the tray you need not be afraid of leaving the pots unattended for a day or two.

A little more air and light may be given when the seedlings appear. In about a fortnight they should be big enough to transplant and the compost should be made up of loam, peat and coarse sand, with a little lime. Powdered egg shell is an easily assimilated form of lime, or crushed mortar from the debris of old buildings.



A group of 2-year-old seedlings (¼th nat. size).

When the plants have been pricked off, the same treatment may be continued, though it is not necessary to keep them continually damp. The surface of the soil should be stirred up occasionally to prevent moss growing and a little powdered charcoal worked in keeps it sweet.

When May comes and your other cacti are beginning to sit up and take notice and require attention, the seedlings should be needing less attention, and may be watered like the others when they are dry. They will grow throughout the summer without artificial heat, and in the autumn and winter they will live in a cool greenhouse with the frost excluded. On the other hand you can shorten the period of babyhood by judicious

Editorial

warmth and watering throughout the second winter ; a temperature of 65° F. is sufficient. Under these conditions they will slowly but surely increase in size. The third winter they should be given a rest.

A word of warning is necessary. The vast majority of seedlings under the treatment I have described will survive and thrive. Unless you are growing for the trade or for friends it is as well to exercise some measure of birth control. The box I have described will take 25 small pots, each containing 10 seeds. In two years time each seedling will need a pot to itself—250 pots or very nearly !

To sum up the advantages of growing cacti from seed :—1. It is cheap, compared with buying mature plants which will cost you from 2/6 to 7/6 each.

2. It is sure, compared with the care needed to nurse back into growth elderly imported plants with roots broken or hacked off. Most of us, I expect, have experienced the annoyance caused by one of these plants taking up room for a year and then, when you think it is getting established, start giving it a little more water, and it begins to plump up, and you give it a little more water, and then you discover one fine day that it has become a horrid pulp. Your seedlings won't let you down that way. They get used to your little ways and survive in spite of quite a lot of foolish treatment.

3. The seedlings will satisfy that urge to be doing something and occupy your idle hands and keep them from mischief during the winter, to the great benefit of your older plants.

Exchanges

Major G. Nottidge, River House, Earls Colne, Essex, offers for exchange small plants (seedlings and rooted off-shoots) of :—

Echinocactus longihamatus.

” ” *lamellosus.*

” ” *lophothele.*

” ” *pilosus.*

” ” *ingens.*

Cereus pruinosus.

Mammillaria senilis.

” ” *spimosissima.*

Various *Echinopsis* and *Haworthias.*

THE second number of THE CACTUS JOURNAL is here presented and we hope that it will again meet with approval. Readers will note that a slight increase in size has already been achieved.

The Editor has received numerous letters expressing approbation, which are very encouraging. Such criticism as there has been chiefly refers to “carrying over” the ends of certain articles ; it was not intended that this method should be followed as a rule, and since it is obviously widely disliked, it will not be repeated. We are very glad if we are providing the sort of Journal that members want, and comments will always be welcome. We hope that every one will make use of these pages to bring before their fellow members matters of interest that they may meet with, and to raise subjects for discussion. We are much indebted to all those who have contributed articles, photographs and notes, and hope they will continue to do so.

We are glad to see that a question of nomenclature has been raised ; there has been a certain amount of laxity and error in the naming of cacti and it is important to aim at accuracy in this matter. The Cactus and Succulent Society of America has adopted the Monograph on the CACTACEAE by Drs. Britton and Rose as their standard. A good many people in this country are also adopting this classification, as it is obvious that these authorities had exceptional opportunities of examining plants in their habitats, and were able to see in flower plants that, in this country, are known only in their young or immature forms. Though the use of this system (probably with modifications) is the ideal to be aimed at, it is not possible at this stage to adopt it exclusively in the Journal ; but it is possible to aim at accuracy even if the large number of synonyms in existence makes this often a matter of great difficulty. There are two distinct problems ; the name of a plant should be correct in that the specimen fits the description to which the name was first applied ; this is a question of diagnosis. And also the name should be correct in that it follows the rules of nomenclature ; these rules have been drawn up after careful consideration over a number of years by the leading botanists of the world and aim at simplifying the whole vexed question and clearing up the difficulties caused by the haphazard naming of plants by different authorities. To some people it is sufficient

“OPUNTIAS.”—“Pilatius,” The Mall, Park Street, Nr. St. Albans, offers for sale or exchange a collection of over 100 *Opuntias.* *Mammillarias* or *Globular Cacti* wanted.

that they can persuade the plants to grow, but the majority of cactus lovers are also anxious to know them by their correct names. It is one of the aims of the Society to assist in this matter as far as possible.

Another point to which we should like to refer is that the advertisements are of considerable assistance to the Society in providing revenue in support of the Journal, and it is hoped that our readers will encourage the advertisers by making mention of the CACTUS JOURNAL when corresponding with them.

V. HIGGINS.

Secretary's Note

MEMBERS will be pleased to learn that the Annual Meeting of the Society will be held in the Lecture Room of the R.H.S. New Hall, Greycoat Street, Westminster, on February 7th, 1933, at 6.30 p.m. This will be followed by a dinner at 7.30 p.m. in the Restaurant of the New Hall; I shall be sending details of the arrangements to all members in good time.

The Council has decided to hold an Exhibition of Cacti and Succulents on June 26th, 1933 in the R.H.S. Old Hall of which I shall send out particulars in due course. The schedule, which is now under consideration, will include classes for amateur and for professional growers, and non-competitive exhibits will also be welcome. It is understood that an award, to be known as the Founder's Trophy, has already been proposed, and if any member cares to offer an award or contribute to the prize fund this would be a great encouragement. This further evidence of the forward policy of the Society will, it is hoped, be enthusiastically supported by members in the provinces as well as in the Metropolitan area, for such an exhibition is sure to add to the interest and education of all members attending. There will be an ambitious competitive section in addition to trade exhibits, so please start to make your arrangements so that we may have a good show, for members of the general public as well as Fellows of the R.H.S. will be interested. We have a great opportunity of showing all who are curious that we are not cranks and that our hobby is one worthy of adoption by all members of the public, especially the horticulturalists.

May I ask members when writing about subscriptions, renewals, etc., please to give me their membership numbers.

E. SHURLY.

Library

THE Librarian is glad to report further additions to the Library, as under, and also that the Council have been able to vote a small sum for the purchase of books, the selection of these being now in progress.

Mr. A. Emm has kindly presented a copy of Lewis Castle's *Cactaceous Plants*, and the current publications of the Dutch, Belgian and German Societies have been received.

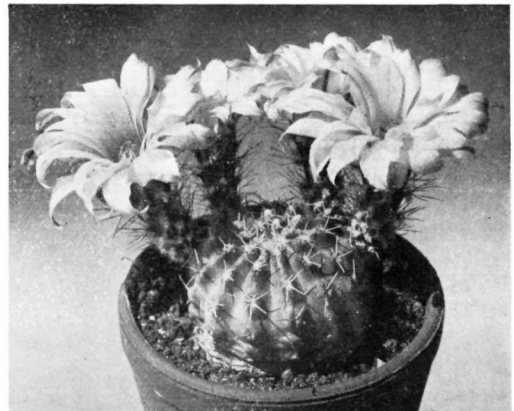
The following catalogues have also been received :—

C. Backeberg, Volksdorf, Hamburg.	P. S.
Mrs. van der Bijl, South Africa.	S.
Miss B. I. Foster, Leigh-on-Sea.	P.
R. Hollis, Norwich.	P.
W. Janz, Rotterdam.	P. S.
J. A. McDowell, Mexico.	P.
Max Richter, Leipzig.	P.
Shiner Seed and Plant Co., Texas.	P. S.
K. C. Stanford, South Africa.	S.
H. Stern, San Remo.	P.
R. Templeman, South Africa.	P. S.
H. Winter, Frankfurt a.M.	P. S.
R. Zetzsche, Theissen.	P.

P = Plants. S = Seeds.

The Librarian will always be glad to receive Catalogues for the Library, or extra copies for distribution at meetings.

V. HIGGINS.



Echinocereus pulchellus (Mart) K. Schum. This species, which often grows in clumps, comes from Mexico. The flowers are white or pale pink. The photograph is of a plant in the collection of F. A. Haage, Jun., Erfurt.

Haworthias and Apicras

By R. S. Farden

THESE are some 70 to 80 varieties of Haworthias all from South Africa, from the borders of the Karoo, and the coast belt. Though the flowers are all very much alike, yet the plants vary very much, so that one would not imagine they were of the same genus, until one saw the flowers.

Mr. Thomas Cooper, of Redhill, Surrey, a great collector of them, wrote an article upon them in THE CACTUS JOURNAL, April, 1898, mentioning some of their sub-divisions. These names do not agree with those of Mr. John Baker, F.R.S., the acknowledged authority upon these plants. His descriptive lists are to be found in the *Flora Capensis*, Vol. VI.

He divides them into three series :

- A. Leafy stem elongated.
- B. Leafy stem not elongated ; leaves multifarious, not ciliated (that is, toothed) on the margins.
- C. Leafy stem short ; leaves multifarious, that is arranged in many rows, leaves margined with distinct teeth or bristles.

These 3 series he subdivides into 14 sections.

Series A.

- Section I. *Triquetae* : Leaves forming triangle, unspotted. *Cordifolia*, *Asperiuscula*, *Viscosa*.
- „ II. *Tortuosae* : Leaves in triangle spirally, rough with raised pimples. *Tortuosa*, *Subrigida*.
- „ III. *Papillosae* : Leaves multifarious, with raised or indented pimples. *Papillosa*, *Reinwardtii*, *Cassytha*, *Coardata*, *Greenii*, *Peacockii*.
- „ IV. *Hybridae* : Leaves multifarious unspotted. *Hybrida*, *Rigida*, *Nigra*.

Series B.

- Section V. *Margaritiferae* : Leaves entire, with raised white pimples. *Attenuata*, *Fasciata*, *Subfasciata*, *Margaritifera*, *Semiglabrata*, *Subattenuata*, *Glabrata*, *Radula*, *Subulata*, *Rugosa*.
- „ VI. *Vircescentes* : Leaves firm in texture, neither lineate nor

distinctly pimpled, not conspicuously recurved.

Albicans, *Scabra*, *Sordida*, *Icosiphylla*, *Tisleyi*.

Section VII. *Recurvae* : Leaves short, very thick, much recurved.

Recurva, *Asperula*, *Retusa*, *Turgida*, *Cuspidata*.

„ VIII. *Mucronatae* : Leaves smooth, pale green, not recurved, limpid and lineate towards the tip. *Reticulata*, *Altilinea*, *Cymbiformis*.

Series C.

Section IX *Chloracanthae* : Leaves firm in texture, not lineate, toothed on the margin. *Augustifolia*, *Chloracantha*.

„ X. *Tessellatae* : Leaves very thick, recurved firm in texture, lineate, toothed on the margins. *Tessellata*, *Venosa*.

„ XI. *Denticulatae* : Leaves lineate on the face in the upper half, toothed on the margins. *Mirabilis*, *Affinis*, *Bilineata*, *Columnaris*, *Subregularis*, *Atrovirens*, *Laetivirens*, *Polyphylla*, *Denticulata*, *Vittata*.

„ XII. *Pallidae* : Leaves pale green with long transparent awn (soft spike) and margined with small teeth. *Mimima*, *Tranlucens*, *Pallida*, *Pilifera*, *Cooperi*, *Sessiliflora*.

„ XIII. *Arachnoideae* : Leaves pale green, not recurved, with long transparent awn and margined with teeth 1/12 inch. *Setata*, *Xiphiphylla*, *Arachnoidea*, *Bolusii*.

„ XIV. *Linearifoliae* : Leaves lined. *Stenophylla*, *Tenuifolia*.

I will give the characteristics of the *Margaritiferae*, as they are perhaps the most complex.

Attenuata : Flat on face, scabrous, rough, with minute whitish pimples ; back of leaves with middle sized white pimples confluent in a series of regular transverse bands.

Variety B. *Clariperla* : Pimples rather large and in less regular bands.

Fasciata (arranged in bundles) : Flat on the

face or rather concave without any pimples; back with about 20 bands of white middle sized pimples.

Variety B. *Major*: More robust, with longer, larger and thicker leaves.

Subfasciata: Face unspotted; back with middle sized white pimples aggregated into regular transverse bands.

Argyrostigma: Smaller and narrower leaves than type and more crowded pimples.

Margaritifera (Pearl bearing): Both sides with copious scattered large white pimples.

Variety B. *Erecta*: Leaves rather smaller, pimples more crowded and rather smaller.

Variety C. *Granata*: Plant much smaller, leaves more triangular, pimples smaller and more crowded.

Variety D. *Semimargaritifera*: Same as type, but fewer pimples on the back and on the face, almost restricted to the keel.

Variety E. *Corallina*: Scabrous and sparsely pimpled on the face, those on the back middle sized and aggregated into irregular transverse bands.

Semi-glabrata: Hardly any pimples on face; back with copious middle sized white pimples in very irregular cross rows, specially developed in central half.

Sub-attenuata: Face almost destitute of pimples; back with copious middle sized scattered white pimples.

Glabrata (smooth): No pimples on the face, back with distinct scattered middle sized whitish pimples.

Variety B. *Pervivida*: Pimples much more crowded and greenish white.

Variety C. *Concolor*: Leaves scabrous on the back with minute pimples same colour as leaf.

Radula (file): Face and back scabrous all over with minute white pimples.

Subulata (tapering): Face scabrous with pimples same colour as leaf; rough on the back with crowded small white tipped pimples.

Rugosa (wrinkled): Both sides scabrous all over with whitish pimples, larger and less crowded than those of *Radula*.

CULTIVATION: Remarks by F. W. Mathews, Kirstenbosch, South Africa. The *Triquetrae*, *Tesselatae*, *Recurvae* and *Papillosae* require full sun. All the others require shade.

The *Pallidae* with transparent ends to the leaves are best with their leaves

below the soil, up to the transparent part. When the whole of the rosette of leaves is to be constantly above ground, in the usual manner of plants, shade from the direct sun is essential during the greater part of the day. This also applies to *H. Bolusii* and *H. Arachnoides*.

APICRAS

All very similar and closely allied to the *Haworthias*; the flower is very similar, but with rather shorter leaves (6) and more in the form of a rosette.

N.B.—*Haworthia Peacockii* seems to have the characteristics of an *Apicra*.

These are sun loving plants. There are only eight of them:

A. Pentagona, *Turgida*, *Deltoidea*, *Spiralis*, *Foliolosa*, *Congesta*, *Bicarinata*, *Aspera*.

Meetings

AT the meeting held on September 6th the Society had the pleasure of an address from its President Sir William Lawrence, on "Sempervivums"; a summary of this is given in another part of the Journal.

On October 25th, Herr Curt Backeberg gave a lecture on his cactus collecting trip round South America; the trip was arranged with a view to studying the evolutionary theories set forth by the great succulent expert, Alwin Berger, and especially to establishing whether the West Indies had been one of the centres of origin from which cacti spread. Starting in Venezuela, where interesting *Pilocerei* are found, the journey was continued through Colombia to Panama and thence southwards down the Pacific coast, through Ecuador to Peru. After traversing the Peruvian deserts the return journey was made across Bolivia and Argentina and finally Uruguay and Brazil to Santos. The lecture was illustrated by 150 slides, showing plants in detail and also in their native haunts, together with pictures of the country traversed and of the peoples met with on the way. The slides were very beautiful and the series very well arranged to give a comprehensive idea of the journey. Herr Backeberg was able to be present in person, and after the lecture he showed a collection of rare plants that he had brought back with him.

V. HIGGINS.

Sempervivums

By Sir William Lawrence, Bt.

(Résumé of an Address to the Cactus Society)

SIR WILLIAM began his talk with a reference to the monograph by Dr. Lloyd Praeger on Sempervivums, recently published by the Royal Horticultural Society, which has helped very considerably to clear up the confusion existing in the nomenclature of this family. This confusion is due to several causes; for one thing the species show extreme variation, as many as 50 different varieties of *Sempervivum tectorum* occurring in France alone. When growing together, the species hybridise very readily and in the garden many garden hybrids are raised intentionally or accidentally. Another source of confusion arises in collections where labels are changed in error, or misspelled when copied.

Sempervivums should always be propagated by offsets. Seed is very rarely pure and should be avoided. The Botanic Gardens are the worst sinners in this respect, for they like to produce long seed lists and collect and disseminate the seeds of Sempervivums freely, the result being a large crop of hybrids. Another difficulty is that herbarium specimens cannot be relied on for purposes of identification, since, owing to the succulence of the plants, they do not dry well.

The characteristics of Sempervivums are that they have free carpels; the stamens are at least twice as numerous as the petals; the petals are free (which distinguishes the species from *Cotyledon*); the carpels are in sixes (which separates them from *Sedum* where they are in fives).

Sir William dealt with the European rosulate species which alone are now classed under the genus Sempervivum; they all occur in the alpine regions of Europe, with the exception of *Sempervivum atlanticum* from Morocco.

Sempervivum tectorum, the houseleek, was known in very early times since it is mentioned by Dioscorides, who called it *Aeizoon to micron*, little Live-for-ever. This name appears to be appropriate, for a collector who brought back some rosettes from Albania in his waistcoat pocket, forgot them but found them still green and alive after the suit had been sent to and returned from the cleaners!

Linnaeus knew four species of Sempervivum; J. G. Baker in 1879 recognised 36-38 species and Rouy and Camus described 50 species as occurring in France alone. The

number of species found by some collectors is terrific; Correvon described over 200 in his list and of these at least 70 were forms of *S. tectorum*. Dr. Lloyd Praeger has reduced the number of species to 23; he says that it is not possible in classifying them to rely on the flowers alone but vegetative characters and distribution should also be taken into account. The three species *S. arachnoideum*, *S. montanum* and *S. tectorum*, which are closely associated with one another in the Alps, breed and interbreed indefinitely, so that they give great happiness to the gardener, but confuse the botanist in a bewildering manner.

The 23 species are divided into two groups, the first being EUSEMPERVIVUM; this is characterised by the floral parts numbering 8-16 and comprises the first 18 species.

The first species is *S. arachnoideum* which is noteworthy for the clear red colour of the flower; the leaves bear soft wool stretching from tip to tip of the leaves like a cobweb; in all the hybrids the "cobweb" is broken as the wool does not stretch. The only hardy non-European Sempervivum is *S. atlanticum* found in the Atlas Mountains; it resembles a small *S. tectorum*. *Sempervivum tectorum* is the most prolific in hybrids of all the species; it was originally planted on the roofs of cottages and houses as a protection against lightning! There are two forms, one, which is small-leaved, is found in the Northern and Central Alps and the other, a stronger form, occurs in the Eastern Alps. A species which resembles *S. tectorum* is *S. grandiflorum* from North Italy, but is distinguished from it by having yellow instead of purple flowers.

The second group which comprises the remaining five species is the JOVISBARBA group in which the floral parts number 6-7. The best known member is *Sempervivum Heuffelii*; this species does not send out offsets but the rosette itself splits up. *S. soboliferum* is familiarly known as Hen and Chickens, owing to the way the offsets pile up; the species was a favourite with Linnaeus who planted it on a wall near his house at Hammarby in Sweden, where it still grows abundantly, in spite of the fact that visitors constantly take rosettes as souvenirs.

Sir William showed several beautiful pans of Sempervivum species and hybrids.



Rebutia Haagei var. *chamaeleon*. Fric & Schelle. From Argentina growing at 15,000 feet. Photograph loaned by A. V. Fric.

The Sherman Hoyt House

THE collection of Cacti and Succulents at Kew is well known and has enjoyed a considerable reputation for many years. The latest addition was made at Easter of this year when the Sherman Hoyt House was opened. This house is an annexe to the T-range and is built facing south with a semi-circular apse forming its northern wall. On this wall is painted a desert scene and the plants are arranged amongst sand and rock so that they appear to be growing in their native home. In May, 1929, at the Chelsea Show, Mrs. Sherman Hoyt of Pasadena arranged a striking exhibit of desert plants with a typical Southern Californian panorama for background; this exhibit, at the close of the flower show, she presented to the authorities at Kew. Owing to limitations of space it was found difficult to place these plants so that visitors could see them to advantage or to make suitable use of the panorama. Realising the difficulty Mrs. Sherman Hoyt therefore offered to build a suitable house for their display, and the house which now bears her name is the result. Among the most striking specimens may be mentioned *Cereus giganteus*, one plant being 8 ft. high, *Ferocactus Lecontei*,

Echinocereus Engelmannii, *Echinocactus polycephalus*, together with Mammillarias and other smaller species. Phyllocacti and Aloes also are accommodated on staging in the same house.

It is hoped to include a description of the Kew collection in the next number of the Journal.

Meetings in 1933.

THE following are the dates proposed for monthly meetings in the new year; notice of the subject to be dealt with on each occasion will be sent to each member as heretofore. It should be noted that February 7th is the date of the annual meeting, and June 20th that of the exhibition.

January 10th.	June 20th.
February 7th.	July 4th.
March 7th.	September 12th.
April 4th.	October 10th.
May 9th.	November 7th.
	December 12th.

It is not proposed to hold a meeting in August as so many people are on holiday during this month.

Clayburn

By C. J. Lambert

EVERY ONE knows that clay grows good roses, and when burnt, makes good bricks and china. There are parts of England where clay is burned for drives and paths, but this is only practised locally, where the clay is of a particular type. The burners of clay are highly skilled, and can produce various degrees of "Clayburn," both soft and hard as required. Though burnt clay flower pots have been used universally for centuries, it is only lately that clayburn is beginning to be recognised as the perfect material for the cultivation of cacti and of most succulents.

It has the wonderful property of absorbing half its own weight of water, but, owing to its porous nature, all surplus water drains immediately away.

I have learned by sad experience that cacti and succulents need perfect drainage throughout their lives, and have spent tedious hours waiting for pans, filled with gritty loam and sand, to absorb moisture from below. When filled with clayburn, a seedpan will show top moisture within a minute of being placed in water, nor is there any chance of over-watering. Seedlings grown in soil are liable to become cloggy if overwatered, and there follows that bugbear of gardeners, "damping off."

The usual method of lightening loam is with sand, which is non-absorbant, and incapable of retaining moisture for any length of time. I have found during the hot summer that clayburn-filled pans retained their moisture some forty-eight hours longer than the usual mixture. It also appears to be the most perfect rooting mixture ever found for pot work.

To-day I potted on some South African succulents which foolishly I had thought to encourage with leaf mould and sand on the top of clayburn. In every case the young plants had gone straight down, ignoring the tempting feed on top, and had made their fibrous roots in the clayburn, leaving an inch of hard root stem above it, with no sign of fibre.

Of some hundred and fifty types of cacti and succulent seeds sown in clayburn, eighty per cent. germinated within four days, and almost all showed within a week. They were all pricked off, with lovely bunches of root, and didn't appear to check in any way, due, I imagine, to their roots being undamaged, as the surplus clayburn falls away.

Cuttings root excellently in clayburn, and I have one small pan capable of holding twenty-five cuttings, which has given me one hundred and fifty well rooted plants in four months. The original clayburn appears as fresh as when first put in.

My wife has been experimenting with alpines, and now uses a third clayburn in the soil, as well as a third for pot drainage, instead of crocks and leaves, or moss. She not only finds that root action is wonderfully improved, but the plants appear far less affected by heavy rains. She has also changed over from lime and stone chippings for topping, as offshoots appear to root most readily in the burnt clay, and growth is encouraged.

We have also eliminated the usual drainage for all pot work, and find in every case that growth is much quicker, and the plants appear healthier.

After many tests I have found that clayburn is most economically used in grades. No. 1 is all that passes through a fine mesh sieve. No. 2 is the passings through a quarter inch sieve, and the remains are No. 3 which are half inch, and excellent for bottom drainage. Almost the same effect can be produced by gently shaking clayburn in a box, as the fine goes to the bottom and the coarse remains above. For topping seedpans I remove the very fine dust, which might tend to impede the porosity. Insect pests appear to dislike clayburn, and even slugs find it too gritty to walk over in comfort.

DR. N. E. BROWN has recently published (Hooker's *Icones Plantarum* t. 3171, 1932) a description of a very curious plant to which he gives the name *Rhopalota aphylla*. This plant, a member of the Crassulaceae, was discovered in 1896 and described from dried specimens in 1898 as *Crassula aphylla*. It has recently been found again and living plants sent to Kew where they flowered in May, 1931. It is a small club-shaped body, branching, but without leaves; the curious part is that though succulent, the plant is an aquatic, being found in rock pools at the top of the Tafelberg, under as much as nine inches of water, though presumably it flowers when the pools are comparatively dry.

Book Review

“MESEMBRYANTHEMA,” by N. E. Brown, A. Tischer and M. C. Karsten, edited by E. J. Labarre, published by L. Reeve and Co. Ltd., 1931, price 36s. net.

In recent years there has been a considerable revival of interest in the formation of collections of cacti and succulents, and in the latter section probably the most attractive group is that which embraces the stemless Mesembryanthema, including the “mimicry” and “windowed” forms. All lovers of these plants are indebted to Dr. N. E. Brown for his painstaking investigations into their botanical characteristics and the descriptions that he has published over a period of many years in the *Gardener's Chronicle* and various scientific journals. This debt of gratitude is greatly enhanced by Dr. Brown's participation in the production with Dr. Tischer and Miss Karsten of the book now under review.

The work comprises three parts: the first is a contribution by Dr. A. Tischer on the cultivation of Mesembryanthema and deals explicitly with the soil, potting and treatment most suited to these plants, together with methods of propagation from seed and by division. The information given is very sound and is clearly set out; it should prove very helpful to those whose experience of these plants is limited or not hitherto successful. The second part is by Miss M. C. Karsten, the Secretary of the Netherlands Society of Succulent Collectors and deals with the general ecology of the stemless Mesembryanthema. This discussion of the specialised development of these plants in relation to their natural habitat cannot fail to be of absorbing interest to cultivators, while the knowledge gained will be of help in giving the plants the sympathetic treatment essential to the most successful results. The third and largest section is due mainly to Dr. N. E. Brown and gives descriptions of some 150 species in the genera *Argyroderma*, *Cheiridopsis*, *Conophytum*, *Glottiphyllum*, *Lithops*, *Mitrophyllum*, etc., to mention but a few of the numerous genera into which the stemless Mesembryanthema have been divided. Each description is accompanied by a photograph of the plant in cultivation. These photographs, together with a large number of others in the first and second sections of the book, are most carefully selected and beautifully reproduced, and, with the concise descriptions, should render identification of the plants an easy matter. It is greatly to be regretted that the space and probably the photographic material available

have not permitted all known species in these genera being included. Nevertheless, the material actually embodied in the book, will prove most helpful to lovers of these plants, and it is to be hoped that the demand for the book will be such as to induce the co-operators to continue their labours so that all known species receive similar treatment. The book does not pretend to be a botanical treatise, and in consequence no enumeration of the characteristics of the genera or keys to the species are given. In view of the lack of collected literature on the subject, the more serious cultivator may find this disappointing. This criticism is in reality a tribute to the excellence of the production in all other respects. Another feature to which, in conclusion, reference may be made is that the entire text is given in three languages, English German and Dutch, so that the book should appeal to a very wide circle of enthusiasts in many countries; incidentally this plan affords any one national an easy and congenial way of familiarising himself with the language of his principal fellow cultivators abroad.

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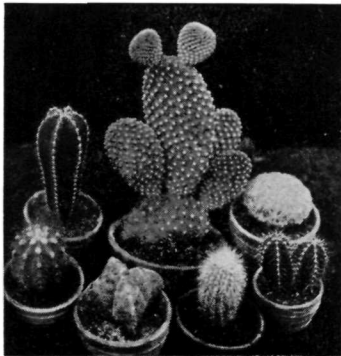
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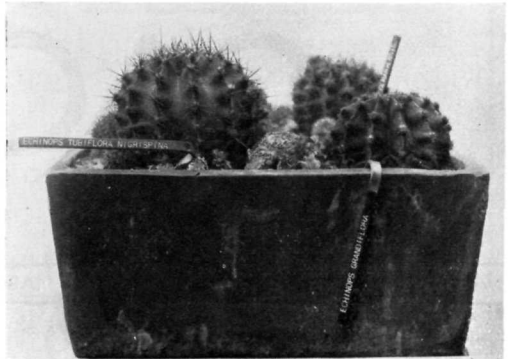
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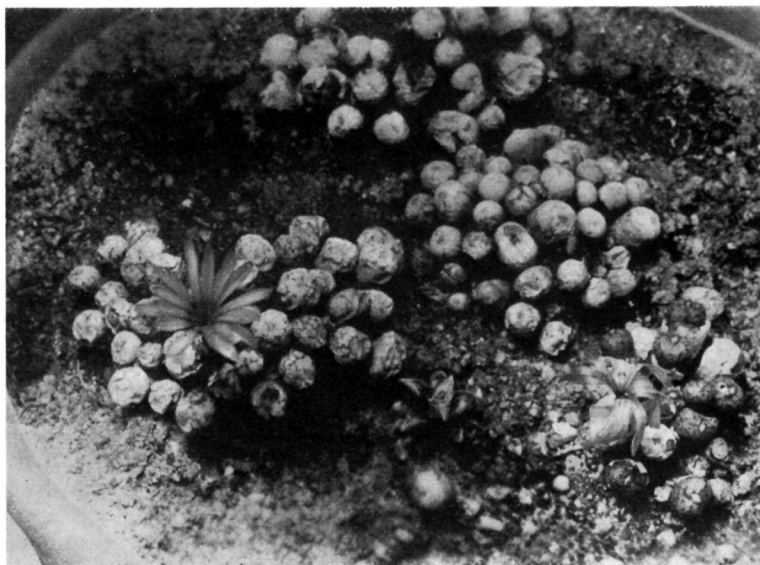


Fig. A. *Conophytum Herrei*.

Nat. Size.

Conophytum Herrei, Schwantes

By Dr. N. E. Brown

THIS is one of the smallest species of the genus at present known, which was originally published without a figure in the *Zeitschrift für Sukkulantenkunde*, 1928, p. 179, with a very imperfect description, to which I am now able to add further details, through the kindness of Mr. H. Herre, after whom the plant was named, who has favoured me with living plants and two photographs of it, which are here reproduced.

It is curious that dwarfs among mankind seem always to attract attention, while dwarfs among plants do not attract much notice unless they are pretty. The smallest known flowering plant is *Wolffia arhiza*, of which probably about 200 flowering plants could be

placed in an ordinary thimble. There are minute orchids and a minute gentian of each of which a dozen complete plants in flower could be placed in a thimble. Yet such plants would probably scarcely be noticed and be deemed to be miserable, insignificant weeds. *Conophytums*, however, are an exception, they are the pygmies of the *Mesembryanthema*, and as such they receive recognition and are much appreciated by lovers of succulent plants, and when in flower find favour with the general public. Of these pygmies, *C. Herrei* is one of the smallest dwarfs, and when flowerless is very insignificant in appearance, but when in flower must be a gem that would evoke admiration from all,

as its flowers are 3-4 times as large as the diameter of the growths producing them, as may be seen from Fig. A, which represents a cultivated plant about one-third larger than natural size.



Fig. B. *Conophytum Herrei*.
Natural Habitat.

The growths of *C. Herrei* are naturally about $1\frac{1}{2}$ - $2\frac{1}{2}$ lines long (becoming under cultivation up to 4 lines long) and $\frac{3}{4}$ -2 lines in diameter, and are densely crowded in flattish tufts; they are circular in outline seen from above, convex on the top, with a small gaping and somewhat diamond-shaped orifice almost level with the surface, which is glabrous, dull olive green with a purplish tint or more or less brownish purple, with the orifice rather conspicuous from being covered by a minute whitish pubescence and surrounded by a slightly prominent dark chocolate-coloured line, and with a few slightly prominent irregular lines and dots of the same dark colour scattered over the top and extending a short distance down the sides. I have not seen a flower, but according to the photograph it is half an inch or perhaps more in diameter, with 15 or 16 rather broad, obtuse petals in one series, stated to be bright red (possibly magenta) with the basal part yellow. The stamens are not evident, being included in the tube of the flower.

C. Herrei was discovered by Dr. H. Brauns on the Giftberg, and afterwards found near Clanwilliam by Mr. H. Herre, who took the photograph reproduced at Fig. B, representing it as it grows under natural conditions,

flourishing among lichens in flat masses on rocks, with very little or scarcely any soil; from this view we can understand how under natural conditions its supply of moisture must be derived from dew deposited upon the rocks at night when they have cooled, just in the same way as the lichens we sometimes see growing on walls and tombstones in old churchyards in this country obtain the water necessary for their growth.

Meetings

At the meeting held on December 13th, Mr. P. V. Collings introduced a discussion on "Soil versus burnt clay." Mr. Collings began by saying that the only way to judge which was the right potting medium was by the results obtained. Cacti are plants which can put up with great hardships, but some people are apt to overdo it. The compost he recommended consists of a mixture of loam, mortar rubble and coarse sand, but no leaf mould.

The important thing with all cacti is drainage; burnt clay, being very porous, certainly affords excellent drainage; plants root very quickly in it and it is the safest material for rooting newly imported or damaged plants.

Mr. O'Donoghue began by giving sound advice; if you are satisfied with your present potting material, don't change. Personally, he was using burnt clay because he found it difficult to reach all his pots and there was less chance of doing damage by overwatering.

Mr. Boarder considered burnt clay was very handy for people who had only limited time to devote to their plants, especially as it was often difficult in a town to get good loam.

Mr. Lambert said that he used burnt clay for all cacti and succulents and also for alpines. He thought it was very important to keep plants true to type; lush green growth was not, in the case of cacti, true to type.

Several other speakers contributed to the discussion, which, though spirited and very interesting, was naturally not conclusive. There was a general feeling that any one who had the opportunity should experiment with several types of soil and that it would be very useful if a further discussion on the subject could be held at a future date, when, it was hoped, more data would be forthcoming as a result of experiments.

The Succulent House at Kew

ONE of the several functions of the Royal Botanic Gardens, Kew, is the maintenance of a collection of representative plants of the different countries of the world. No such collection would be complete without examples of the succulents, including the *Cactaceae*, and visitors to Kew will find a large house devoted exclusively to these types of plant. This house, 200 ft. long and 30 ft. in width, was built in 1845, and a brief description of its present contents will doubtless be of interest to members of the Cactus and Succulent Society. A description of the new Sherman Hoyt Cactus House was given in the last number of the *Journal* so that further reference to this is not necessary here. The Succulent House is of span-roof type running from north to south, and in internal arrangement is provided with central beds and side staging. It will be convenient in the first place to deal with plants exhibited on the staging, entering by the south door and turning to the right. The first main group comprises examples of the tender *Sempervivums*; many species are represented including fine plants of *Aeonium arborescens* and *A. nobile*, the latter being distinguished by the large size of the rosette of leaves. These are followed by the *Cotyledons*, whose glaucous leaves are in strong contrast to the bright green of the *Aeoniums*. Noteworthy in this group is *Cotyledon paniculata*, which has a thin-skinned succulent stem, some eight inches in diameter at the base, tapering sharply upwards and much branched; it is practically leafless in January. Adjoining the *Cotyledons* are the closely related *Echeverias*. Several fine plants of *E. devensis*, a garden hybrid, were in full bloom during January and bore scapes of flowers of the typical Indian red colouring of this genus, on stems two to three feet long. The next group includes the *Senecios* and *Kleinias*, among which may be mentioned good specimens of *Senecio Haworthii*, whose stems and leaves are closely covered with white hairs, giving the plant the appearance of being made of white felt, and *Kleinia Nerifolia* with stout cylindrical stems, marked lengthwise with parallel lines and branched like candelabra, the young growths carrying the oleander-like leaves.

At intervals, climbing plants are to be found at the back of the staging, and mention may be made of the curious *Bowiea Volubilis*, whose thin stems rise from almost spherical succulent basal growths much as in the case of *Testudinaria*, but in the former case the

growth is bare and soft-skinned, while in the latter it is covered with a thick, corky layer. The stems of both die down to the base annually. Numerous examples of *Testudinaria elephantipes* and of the less well-known *T. paniculata* are to be seen in this house. *T. paniculata* has a flatter and smoother basal growth than *T. elephantipes*, but larger leaves. The likeness of the basal growth of *T. elephantipes* to an elephant's foot enables the plant to be identified at a glance; some of the specimens are twelve to eighteen inches across and their age must be very considerable.

To continue with the plants on the staging, a group of *Ceropegia*, chiefly *C. dichotoma* and *C. trinerva* follows the *Kleinias*; superficially, the bare stems of these resemble some of the *Kleinias* and *Sececios*, but botanically they are of unrelated family, the former being members of the curious family *Asclepiadaceae*, while the latter two are members of the vast family of *Compositae*. Recently the collection of *Ceropegias* has been greatly enriched by the presentation to Kew of the late Mr. W. E. Ledger's collection of tender plants.

Passing examples of the tender *Sedums*, the next main group comprises *Crassulas*, of which *C. lactea* was in flower during January, bearing trusses of small, starry, white flowers. *C. Cooperi*, easily recognised by its close growth and small red-tinted and dark-spotted leaves, had just finished flowering. Of the larger *Crassulas* there are several good examples of *C. portulacae*, a compact shrubby species, with thick, much-branched stems, tipped with short, succulent leaves. This plant resembles *C. arborescens*, of which specimens are also exhibited, but it is of much more compact habit of growth and leaf. Near here will be found good specimens of *Cissus Juttae*, of which the thick stem, leafless in January, closely resembles *Cotyledon paniculata*. Botanically, these plants are quite unrelated, the *Cissus* being in the same family as the vines.

At this point the collection of *Cacti* starts, the first group comprising a large number of *Cereus*; these are followed by a few *Echinocacti* and *Mammillarias*; others will be found in the Sherman Hoyt House. An extensive collection of *Opuntias* occupies the remainder of the staging on the east side of the house as far as the north door. The Britton and Rose system of classification has been followed in recent years. While the *Cerei* and *Opuntias* are well represented in the Kew collection, the other genera, which perhaps to

many members of the Cactus and Succulent Society, are the most interesting, are not very numerous. This is much to be regretted, as many growers of cacti would like to be able to make use of our national collection to verify the names of their own plants and to see specimens about which they have read, but which they do not possess. Kew is mainly dependent upon gifts from collecting expeditions and exchange with other botanical gardens, chiefly within the Empire. It is no doubt for this reason that the Kew collection is far richer in the succulents from South Africa than in cacti, which are almost entirely confined to foreign countries.

Before passing to the other side of the house, mention must be made of the *Haworthias* situated on a shelf above the *Cereus* collection and of a very fine specimen of *Hechtia argentea* to be found in the extreme north-east corner of the house. The large rosette of long, flat, silvery leaves armed on each edge with sharp recurved teeth, is particularly noticeable.

On the staging to the west of the north door is grouped a collection of the smaller plants of *Euphorbia*; the larger species will be dealt with later. The species to be found here include *E. balsamifera*, *E. lactea*, *E. cereiformis*, *E. aphylla*, *E. mamillaris*, and many others.

After the *Euphorbias* comes a very representative collection of *Aloes*, which had been greatly enriched in recent years by new species from South Africa. A distinctive plant is *Aloe plicatilis*, of which a very fine specimen of considerable age is shown. This plant is noticeable for its grey stems and straggling branches, ending in flat folds of grey, strap-shaped leaves. The *Aloes* are followed by the allied genus *Gasteria*, of which again the Kew collection has many examples. Of these two genera some plants are generally to be found in flower. Next to the *Gasterias* will be found a group of several species of *Rhipsalis*, the following species being in flower or fruit during January: *R. rhombea*, *R. trigona*, *R. crispata* and *R. clavata*. The flowers of this genus of the family *Cactaceae* are not very conspicuous, but are rather attractive, particularly in the flat-stemmed types where they fringe the edges of the leaf-like stems and are succeeded by small, round, translucent berries rather like the fruits of mistletoe. The family *Cactaceae* is also represented here by several species of *Pereskia*; it is in this genus that cacti most closely resemble a normal plant as leaves are borne during most

of the year on woody stems, the whole plant superficially resembling a small orange tree.

Next on the staging will be found representatives of the family *Bromeliaceae*, several species of the genera *Dyckia* and *Puya* being exhibited; the resemblance of these plants to the pineapple plant, another member of the same family, will not be overlooked. It may perhaps be questioned whether these *Bromeliads* are true succulents, but culturally it is convenient to group them here rather than with the other representatives of the family, which are mostly tropical.

These plants are succeeded by *Dasyliirions* and *Agaves* of which a large number of species are exhibited. At the south end of the staging an interesting addition has recently been made. This takes the form of a rock bed in which are planted an interesting collection of *Mesembryanthema* of the mimicry type, together with a few of the rarer small *Euphorbias* and other succulents. Good groups of the following are exhibited: *Mesembryanthemum albescens*, *M. Bolusii*, *M. calcareum*, *N. candidissima*, *M. ficiforme*, *M. fulviceps*, *M. Heathii*, *M. Hortenseae*, *M. Lesliei*, *M. Pillansii*, *M. pseudotruncatellum*, *M. scitulum*, *M. testiculare*, *M. truncatellum*, etc. The nomenclature based on Dr. N. E. Brown's work has unfortunately not been used; it may be that this is thought to be unduly confusing to the general public, but on the other hand, those who are not keenly interested will not bother about the names in any case, while those who are studying the group would like to have the extra information. Among the *Euphorbias* are several specimens of *E. obesa*, the rare *E. stellaspina*, *E. meloformis*, *E. bupleurifolia*, etc., while the other succulents include *Haworthia setosa*, *H. pseudotortuosa*, and *Apicra rubriflora*. Young plants of *Welwitschia mirabilis* are also exhibited here; this is a plant which is but rarely seen in collections. It comes from the desert regions of tropical West Africa, where the rainfall is negligible. Only two leaves are produced, which continue to grow at the base, wearing away at the tip. It is a member of the family *Gnetaceae*, which also includes the xerophytic genus *Ephedra*; the family *Gnetaceae* comes under the Gymnosperms, the lower of the two main groups into which the seed-bearing plants are divided.

Turning now to the two central beds, the southern one contains the larger *Agaves* of which *Agave coccinea* immediately facing the south door is a very fine example, specimen plants of the genera *Dasyliirion*, *Acrotichum*,

etc., are also to be found here. Large plants of *Strelitzia Kewensis* and *S. augusta*, reaching almost to the roof of the house, will be noted. At the end of the bed adjoining the central cross-gangway, a rock bed planted with South African succulents will be found. The plants include several species of *Euphorbia*, *Gasteria*, *Crassula* and *Haworthia*, the square-stemmed *Vitis succulenta*, related to the grape vine, and a fine specimen of *Aloe umbellata* which was in flower in January. The orange and yellow colouring of the typical tubular Aloe inflorescence is very attractive.

The second of the central beds is mainly devoted to the columnar *Cerei* and the larger *Euphorbias*. Of the *Cerei* there are good specimens of *C. validus* and *C. Forbesii*, together with many others. A large plant of *Opuntia ficus-indica*, the true prickly pear, is grown around one of the central pillars. Near here is an example of the very spiny *Fouquieria splendens* and a large plant of the equally spiny *Euphorbia splendens*, the attractive flowers of which can be seen nearly all through the year. Another spiny plant is *Didierea mirabilis* from Madagascar; the specimen exhibited is a particularly fine example of this rare plant, about two feet in height and two inches thick, leafless and closely covered with spines of star-like form. Among the *Euphorbias* there are many specimens reaching almost to the roof, such as *E. candelabrum*, *E. triangularis*, one of the latter having a thick stem, bare to a height of about ten feet, and *E. abyssinica*. Facing the north door is a large plant of *E. canariensis* whose tangled branches make an impenetrable mass many feet across. Behind this is an enormous specimen of *E. Tirucalli* forming a dense shrub of spineless, short, thin, cylindrical, jointed, interwoven, leafless branches. Other plants in this area to which attention may be drawn include the climbing *Aloe*, *A. ciliaris*, with many stems, trained around one of the pillars supporting the roof, *Aloe Thraskii*, which has a very straight slender stem some ten or twelve feet high, crowned at the top with the typical leaf growth of the genus and plants of *Aloe arborescens* bearing in January numerous flower spikes of orange tipped with green.

Before leaving this house reference must be made to the enormous plant of *Cereus (Hylocereus) undatus*, which covers a large area of the roof at the centre of the house. During the summer of 1932 this plant flowered profusely and set many fruits. Being a night-flowering plant, the full beauty of its large white blooms could not be appreciated by the

ordinary visitor, but to see the large buds or closed flowers hanging from the stems gave some idea of the wonderful display which must be afforded by the giant climbing *Cerei* in their native habitats.

In conclusion, mention may be made of the display of various species of *Kalanchoe*, including *K. thyrsiflora*, *K. crenatum*, *K. tubiflora*, *K. beharensis*, *K. Waldheimii*, etc., to be found at the north end of the tropical range, adjacent to the Sherman Hoyt House; in this house a large collection of shrubby *Mesembryanthema* will also be found.

The Exhibition

THE plants in which we are interested are re-awakening after the winter resting period; some people may have Mamillarias already in flower, for these start early, and most plants will be filling out again and producing new spines. It is a time when one wanders round one's collection frequently, hoping to find new signs of growth and, often, those hopes are fulfilled. We would like to suggest that, this year, members watch their plants from a new angle, with the query at the back of their mind all the time: "Will that be ready for the Exhibition?" For this year, on June 20th, the Society has arranged to hold its first Cactus and Succulent Exhibition, for which schedules will shortly be issued. The fixing of the date, making arrangements for the hall, etc., can be done by the officials of the Society, but the success of the Exhibition itself depends on the interest taken by the members individually. The fact that they possess only a small collection need deter no one; there may very likely be some fine plants in it which other members would like to see. The difficulties of transport may seem to some people prohibitive, but six plants, say, could easily be brought by hand by bus, train, tram, or car; and if every member brought six of his plants, that would mean 1,750 plants on show. But naturally, it is hoped that all who can will bring larger numbers, entering in several classes or setting up groups. And especially would it be acceptable if those members who specialise would bring examples so that other members may realise the extraordinary variety that may occur in one genus alone.

Healthy competition is a great incentive, so when you come to the Exhibition, hoping to learn what other people are doing, bring some of your own plants so that other members may also learn from your experiences.

Raising Cacti from Seed

By A. Boarder

(Résumé of a talk given to the Cactus Society)

MR. BOARDER began his talk by saying that his first attempts at seed raising were not particularly successful, and he had almost decided to give up, but after trial and error he found a method which yielded good results. He showed examples of seedlings of various ages, all good strong plants with well developed and well coloured spines. A *Mammillaria rhodantha*, five years old, measured $4\frac{3}{4}$ in. high and $3\frac{1}{2}$ in. in diameter; *Echinocactus Fiebrigii*, sown in 1928, measured $2\frac{3}{4}$ in. by 3 in., and had flowered twice, whilst a three-year-old *M. rhodantha Pfersdorffi* was $3\frac{1}{2}$ in. by $3\frac{3}{4}$ in. Mr. Boarder has been improving his methods and this year's seedlings show the rate at which he gets them to grow; *Mammillaria Gulzowiana* ($1\frac{1}{4}$ in. high and $1\frac{3}{4}$ in. across), *M. Ocamponis* ($1\frac{1}{2}$ in. high and $1\frac{3}{4}$ in. across), *M. dioica* ($1\frac{1}{4}$ in. high and 4 in. across) are good examples, all having been sown on January 22nd, 1932, and measured in November. *M. Scheidiana*, sown at the same time actually has a flower-bud developing.

Mr. Boarder emphasised that he does not grow his plants in a hot house; he has an oil heater with hot-water pipes, which does no more than keep out the frost in the ordinary way; in fact, on March 10th, 1931, the temperature in the house dropped to 26° F.

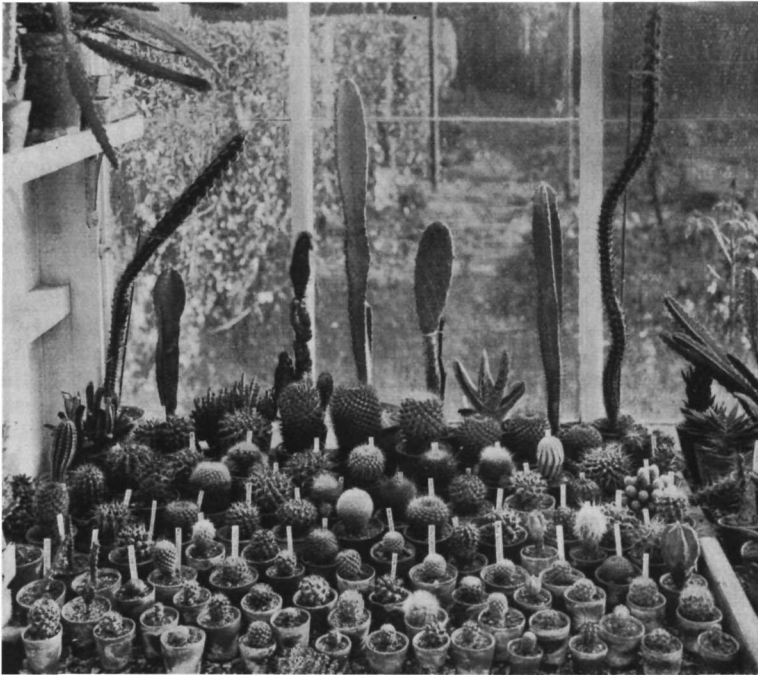
Seed is most easily obtained from abroad; seed of one's own saving is easy to grow because it is fresh, but it is not much use when the object is to obtain plants not previously in one's collection. Ten seeds is usually the smallest amount offered, though five seeds is enough, as they usually germinate well. The seed may be sown at any time, provided a temperature of 70° F. can be maintained; the best time is the early spring, and the end of January gives better results than April sowing. The reason for this is that in the early part of the year all the heat must be artificially supplied and can therefore be controlled; later, when the sun may send the thermometer up many degrees in the daytime, it is not nearly so easy to maintain an even temperature.

The soil used should consist of loam and silver sand; the loam should be turfy and have been stacked for some time and not just earth out of the back garden; the soil should be fine but open and porous, the lower layers

being coarser than the upper ones. The best drainage is not crocks but broken brick and granulated charcoal, the soil should be sterilised before being used, one method being to water with Cheshunt Compound and then bake for two hours in an oven. Boxes or pans may be used, divided up into compartments for each lot of seed, each being carefully labelled. The seeds should be sown on the top of the soil and not covered; in the case of large seeds these may be pushed in a little way, but should not be covered by more than their own thickness.

The seed box should then be placed so that it can be kept at a temperature of 70° F.; open slats over the water pipes answer very well, and if covered with a bottomless frame moist air is maintained round the boxes. It is important to keep the temperature as even as possible and 70° F. seems to be the best mean to aim at. A higher temperature does not produce better results. The ideal way of watering seeds is by soaking them from below; after a preliminary soaking, Mr. Boarder does not usually do this, however, but uses a fine mist spray and warm rain water always, so that there is no cooling down. The surface must always be kept damp, and never allowed to dry out. Under these conditions, germination, in the case of fresh seeds, may be expected in three days; older seeds may take considerably longer, even as much as a year in exceptional cases.

The period at which the seedlings should be transplanted depends largely on the state of the soil; if it gets caked they should be shifted at once, otherwise there is no need to hurry the operation. The compost should be similar to that used for the seeds, but coarser. Leaf mould is not advised. Mr. Boarder showed seedlings of several species which he had, for experimental purposes, transplanted into good leaf mould; the result in each case was very striking, the seedlings grown in leaf mould being less than half the size of those grown without it. Perhaps the reason is that leaf mould makes the soil too acid. The seedlings are most easily transplanted by means of two sticks, one pointed and the other cut to a V-shaped notch. At first they should not have much water, and are best in a box or pan, as this is easier to keep moist than individual pots. They should be kept at the warmer end of



EXPLANATION OF PHOTOGRAPH

These seedlings have all been raised during the past five years. *Cereus Bonplandi*, 1927 (on right), *Cereus Peruvianus*, 1928 (in centre), *Mam. rhodantha*, 1927 (in front of *C. Peruvianus*). The *Opuntia* in back row is two years old, and the *Mam.* in front of it, *M. Pfersdorffi*, is three years old. The first three rows are nearly all 1932 seedlings. The white fluffy plant in the centre foreground is *M. Gulzowiana* 1932 seed and is in a 2-inch pot. The plant in centre, like a golf ball, is *M. Klissingiana*, 1929 seedling. The pane of glass at back measures 18 in. by 20 in.

the house and do well near the glass, but they should be kept growing continuously and not allowed to get dry and scorched. The surface of the soil should be broken occasionally.

As the plants grow they should be potted singly; the pots should be clean and not too small; the best drainage material is broken brick with a layer of granulated charcoal on the top; above this crushed bones may be added with advantage; bone meal should not be used, as it tends to clog. The compost recommended is:—

- 3 parts Turfy loam.
- 1 part Sharp sand (more if loam is close).
- 1 part Mortar rubble.
- 1 part Broken brick, $\frac{1}{4}$ in to $\frac{3}{8}$ in.
- 1 part Granulated charcoal, $\frac{1}{4}$ in.
- 1 part Crushed bones, $\frac{1}{4}$ in.

The seedlings should be firmly planted but not pressed in too tightly, the soil being moist at the time but not wet. Care should be taken that the roots are not damaged, as in some species they will bleed, and especial care is needed with *Coryphanthas* as these form tap-roots which may easily be damaged.

Plants should be moved to larger pots as soon as their roots have filled the original one, as the rate of growth is checked when this happens; it is a mistake to think that all plants must be root-bound to flower.

Failures in seed-raising are due to old seed, planting too deep, insect pests in the soil (for which *Limax* is an effective deterrent), woodlice and earwigs (which should be trapped), and damping off (which should not occur if the soil has been treated with Cheshunt Compound).

Editorial

THE third number of the CACTUS JOURNAL makes its appearance at that pleasant time of year when the plants we cultivate are beginning to show signs of life again after their winter sleep, and articles on seed-raising and the composition of potting soil may perhaps be helpful at this season, when many people will be thinking of re-potting and increasing their stock. Various experiments are being tried and it is probable that the best way to grow the various species of cacti and succulents has yet to be discovered. We would like to urge those members who are interested to keep careful notes of their procedure and to send us the results they may get, for the guidance of others. For it is only by pooling our results and by carefully sifting the evidence that we can arrive at any definite conclusions.

The ideal to be aimed at in growing cacti may be said to differ somewhat from that of the general horticulturalist. Gardeners have for generations now aimed at improving nature; flowers are larger and of better colour; fruits are larger and sweeter and can be had over a wider range of time than formerly; vegetables are greatly improved in quality and variety. In fact, the knowledge of hybridising and selecting has increased so much that the gardener to-day can do almost anything he likes with the material at his command.

The *Phyllocacti* and *Epiphyllums* have been extensively hybridised, especially by the French and German growers, so that most of the specimens growing in our collections are not pure species at all. In this case the plant itself has no special beauty and a very definite improvement in size and colour of the flowers has been obtained. Beautiful as they are when in bloom, the *Phyllocacti* seem to rank nearer to florists' flowers than the other kinds, and, moreover, they grow well in the warm, moist heat of any ordinary greenhouse.

But the extreme—the desert—types of cacti are admired for the form of the plant body rather than for their flowers, much as these are admired and welcomed when they appear. The symmetry of an *Echinocactus* or *Mammillaria* is among the most wonderful things that nature has produced. No two species are alike but there are countless variations of the main theme, tubercles arranged in perfect spirals, plants divided into ridges as though a mathematician had been called in to assist. But symmetry of

arrangement is not the end of the story; the colouring varies from grass green in the more sheltered forms, to the glaucous green, or blue, or grey produced by the protective covering of wax; and the whole is decorated with spines ranging from the soft feathery ones of *Mammillaria plumosa* to the strong hooks of the *Ferocacti*, and here again the colour may be anything from snowy white, through all shades of yellow, brown and red, to black. These forms and colourings are the direct result of environment, which is thus responsible for the beauty of these strange plants. How, then, can the gardener make any improvement? The answer is that he cannot, unless some two thousand different forms are insufficient for the grower to choose from, so that more must be provided.

But since the form is the result of environment there is grave danger that imported plants may lose their natural beauty, not necessarily at once, but by a gradual process of accommodation through the years. If we cannot keep the conditions suitable, the glaucous covering will go, the spines will soften and dwindle, the plant assume a bloated appearance and its natural beauty be lost. It is important, therefore, in testing the different methods of cultivation to remember that the ultimate aim is, not to produce the largest possible plant in the shortest possible time, regardless of form (those who like this sort of thing would get quicker results growing prize marrows), but to try and produce plants which are true to type. The achievement of this object is no easier—it may, in fact, prove much more difficult—than producing garden variations, but it is an aim well worth striving after. V. HIGGINS.

Cactus growers in common with other horticulturists have long been familiar with the useful "serpent label" which is made of imperishable lead and is permanent and very adaptable in use. The manufacturers are willing to supply free labels for any of the exhibits in the Cactus show in June, and as the use of serpent labels adds greatly to the neatness and general appearance of an exhibit, their generous offer will, no doubt, be highly appreciated by members of the Society.

THE CACTUS JOURNAL is published quarterly, in March, June, September and December. It is sent free to Full Members of the Cactus and Succulent Society of Great Britain, the annual subscription for Full Membership being 10/-, payable to the Hon. Treasurer.

Succulence and Succulent Plants

By F. J. Chittenden, F.L.S., V.M.H.

(Résumé of an address to the Cactus Society)

MR. CHITTENDEN began his talk by pointing out that most plants are so constructed that they are fitted to grow in medium conditions, neither too wet nor too dry. And yet there are very few places in the world, no matter how barren, which are not inhabited by one plant or another. On the tops of mountains the rocks may appear bare, but close inspection reveals even there the presence of lichens. In places where they grow sparsely and competition is not great, plants are apt to adopt unusual forms. An example found in this country is the horned poppy, which grows on shingle banks. If the seed is sown in the garden it grows much better, yet it is never found growing wild except on sand or shingle; the reason is that it is specially adapted to make its home in shingle, but is unable to compete with other plants. This is found to be the case all over the world; owing to their special structure plants adapted to certain circumstances cannot survive in close competition with other plants.

The particular condition which makes a greater impression on the form of a plant than any other is the water supply. Nearly every gardening operation has for its purpose the regulation of this supply. Many parts of the world, including this country, may be said to have a regular supply, but in spite of this, certain plants are protected from too great loss of water. The quantity needed may be realised from the fact that a well-grown, standard apple tree on a hot summer's day will take in as much as 36 gallons of water in one day,—and this is given off into the air again by means of the leaves. An acre of cabbages, sown in May and cut in September, will take in 200 tons of water per month, that is about 1,100 tons in all, equivalent to some 11 inches of rain. There are two main reasons why the plant takes in so much water and retains so little; in the first place all the material which is required from the soil is taken in in solution and, as a rule, the solutions in the soil are very dilute; and secondly, the water helps to keep the plant cool. There is a further advantage in that it helps to keep the plant stiff; if there is not sufficient water present the plant flags.

Not all the material required in building

up a plant is taken from the soil; carbon dioxide is absorbed from the air during daylight and nearly all plants give out this gas again at night. Carbon dioxide is taken in through minute pores in the skin (stomata); these openings can be made wider or less wide according to conditions, and they usually close at 5 p.m.

The quantity of water available is not the only controlling factor; though the supply in this country is abundant in winter yet the majority of trees lose their leaves in autumn, thereby reducing the amount of water given off. This is because, although the soil is physically wet, it is physiologically dry, the temperature being too low to permit of free absorption. In a warm temperate climate most of the trees are evergreen, and in wet tropical countries, too, the trees are evergreen, but where there are definite rainy periods most of the trees drop their leaves during the dry intervals.

In cacti we find plants that have gone to extreme limits in adapting themselves to conditions of life. The majority of them have no leaves at all, since they are of no use and may even be a menace. In both cacti and other succulents the outer covering is corky to prevent loss of water, but the openings in the skin still occur. If these were too numerous, the risk of loss of water would be great so that usually the number is much reduced; but then arises the difficulty that if water cannot easily get out, carbon dioxide cannot readily be taken in. In normal plants, carbon dioxide is absorbed from the air during daylight and split up into carbon monoxide and oxygen; water is also split up within the plant and as a result sugar is formed, which may be stored as starch; the power to effect these changes is acquired from sunlight. If the supply of carbon dioxide is limited, growth can only take place at a slow rate, but succulent plants have found an extraordinary method of overcoming this difficulty. The cactus takes in carbon dioxide but instead of giving it off again at night as normal plants do, the results of the breaking-down process are not passed out into the air; instead they remain in the plant tissues in the form of an acid, which in the presence of sunlight can be split up again to form sugar.

In this way carbon dioxide is utilised as fully as possible.

Various adaptations are found to prevent loss of water, such as the burying of the pores in the grooves; more stomata are found in the grooves than on the ridges of cacti. Experiments made with cacti in Arizona have shown that a plant weighing 70-80 lb. may lose 20-lb. of water in the course of a year and still live. The great majority of cacti have their roots near the surface, these being thin and fibrous and ready to take up water at the slightest chance. Very few succulent plants have roots that go down at all deep.

Some succulents have no roots in the soil, but grow on trees and rocks with their roots hanging in the air; some cacti, such as *Epiphyllum* and *Rhipsalis* (the only cactus found outside America, which occurs in Madagascar and perhaps on the coast of Africa) also adopt this mode of growth; many orchids and swollen pseudobulbs or fleshy leaves are found growing on trees in this manner; in fact, any definition of succulent plants would naturally include many epiphytic orchids. Such a definition might be: A succulent plant is one which stores up water in its swollen stems or in its swollen leaves. The point to emphasise is that the water is *stored*; certain plants, such as samphire and *salicornia*, appear to be succulent, but they very soon wilt and die when pulled up. A cactus, on the other hand, can lose a considerable part of its water supply without damage to the plant.

Annual Meeting and Dinner

THE Annual Meeting of the Society was held on February 7th and, after the minutes of the previous meeting had been read and confirmed, the Secretary gave a report on the progress of the Society. The balance sheet showed a balance in hand at the end of the year 1932 of £37 15s. 3½d. Mr. C. T. Lloyd had kindly acted as auditor for the Society. Monthly meetings have been held throughout the year, which have been well attended; the Library has been added to by gift and by purchase, and a quarterly Journal has been begun; thus the Society has been able to carry out the major part of the programme proposed at its inauguration.

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The membership has increased continuously throughout the year and, on the date of the Annual Meeting, stood at 299.

After the adoption of the balance sheet and the Secretary's report, the meeting proceeded to the election of officers for the coming year.

Sir William Lawrence was unanimously re-elected President and was thanked for the great assistance he had already given to the Society.

It was learned with much regret that Mr. Shurly was obliged, on account of ill-health, to relinquish the post of Hon. Secretary; and he was warmly thanked by the President for the great amount of work that he had carried out which had resulted in the successful founding of the Society. The only nomination for this office was Mrs. V. Higgins, and she was therefore elected. The office of Treasurer, previously vacant, was filled by the election of Mr. J. Haddon, and Mr. P. V. Collings was elected Librarian.

Mr. H. G. Harrison and Mr. Potter had resigned from the Council, and Capt. Noakes was ineligible for re-election since he had been unable to attend the requisite number of Council Meetings; to fill these vacancies, and those created by the election of Mr. Haddon and Mrs. Higgins as officers, Mr. A. Boarder, Mr. W. Denton, Mr. W. F. Higgins, Mr. S. J. Pullen and Mr. E. Shurly were elected.

This concluded the official business of the meeting and was followed by a short discussion on methods by which the scope of the Society might be enlarged.

At 7.30, fifty-six members and friends attended a dinner held in the R.H.S. New Hall Restaurant. Sir Arthur Hill, the Director of Kew, was present and proposed the toast of the Society, which was responded to by our President, Sir William Lawrence; the Journal was also toasted, being proposed by Lt.-Col. Durham, Mrs. V. Higgins, as Editor, replying. Mr. Shurly then proposed "The Visitors," and Mr. Emmerson replied on their behalf. The function was very successful and gave members an opportunity of getting to know each other better; it is hoped to repeat it in future years. During the dinner it was announced that the 300th application for membership had been received.

Will members kindly note that subscriptions should be sent to J. Haddon, Esq., and that all other communications, including matters relating to the Journal, should be addressed to Mrs. V. Higgins.

Lower California and Mexico

By Howard E. Gates

LOWER CALIFORNIA is the long, narrow finger of land pointing south-easterly from the southern boundary of California. Its width varies from twenty-five to one hundred and fifty miles. Its length of over seven hundred miles reaches down into the tropics. On the western side cooling fogs come in from the Pacific. Its parched eastern shore borders the Gulf of California, which separates Lower California from the Mexican mainland. The climate ranges from chilly mountain tops rising above the timber line to warm coastal valleys where grows bananas and mangoes. The northern third receives light winter rains and no summer showers. The southern third receives only thunderstorms in the warm fall months. In between these is a third that may get rain at any time or none for two or three years. This part is so dry that along three hundred and fifty miles of road there are only twelve watering places. All in all, Lower California had best be considered as a great desert, the strangest in the world, as all portions are close to the sea, which surrounds it on three sides.

Lower California is essentially a land of mountains. There are many separate ranges and very few plains and large valleys. There is every kind of mountain imaginable from great heaps of white granite to sharp volcanic cones and lava-capped flat-topped buttes. Many ranges have been stripped bare by the elements leaving only their rocky ribs. Strangely, the crest of these mountains is usually very close to the eastern shore line. There are no living rivers or permanent lakes.

The first permanent settlements were made more than two hundred years ago, yet to-day the Peninsula supports only about seventy thousand people. These live in scattered cattle ranches and in villages at mines and around giant springs that provide water for irrigation. There is one space of five hundred miles between two towns and another of two hundred and forty miles without store, school nor post office.

The greater portion of the Peninsula of Lower California is not used for anything except cattle grazing. Much land is necessary to support one cow. In the greater portion of the Peninsula there is no grass. The cattle live on weeds, cactus, branches of trees and shrubs. Transportation is usually

by burro (ass) or mule. Very few wagons are used, as freight is usually carried by pack animals.

The only through road meanders back and forth across the Peninsula for eleven hundred and fifty miles before reaching the tip. In places this road has only been open for three years. Travel is very slow and difficult because of the poor condition of the road. Of my five long journeys in the Peninsula I have never completed one without having serious repair work to do on my van. This very poor condition of the road is to be expected because of the rough terrain, great distances and sparse population.

The people are of a very friendly and hospitable disposition; the wayfarer is welcome at any habitation. The animal life is harmless except for the rattlesnakes and such pests as the scorpions and centipedes.

Because of peculiar climatic conditions, the flora is different from that of any other place on earth. On the Pacific side the flora of the northern portion merges into that of California, but south of the thirtieth degree of latitude it is all different. Familiar forms of trees give way in the central third of the Peninsula to widely spaced, wiry, sparsely leaved and thorny growths. The only large plants in this district are the cardon, cirio, tree yuccas and the elephant wood. The cardon (*Pachycereus Pringlei*), one of the largest cactus known, throws its great arms up to an occasional height of sixty feet. The cirio, (*Idria columnaris*) is known to travellers from the north as the "Living Telegraph Pole." To picture this monstrosity, imagine an inverted carrot root extending forty or fifty feet into the air with nothing but wiry twigs for branches. In winter it is a pillar of green, but in summer it is leafless. The elephant wood (*Pachycornis discolor*) is a much branched tree with extremely heavy and contorted branches and trunk. The tree yucca (*Yucca valida*) has numerous branches covered with dagger-like leaves. In summer great clusters of creamy white flowers appear on the tips of each branch.

The lower third of the Peninsula bears many forms of small, wiry, branched trees. Unfortunately for the botanist who must get out among them, most species bear some form of spine or thorn. Two well-named species are called by the natives the claws of the cat and of the lion.

In all, some twenty-five species of *Agave* are found in the Peninsula. Every district has from one to three forms. The plants range from one to three feet in height, except at blossoming time, when the flower stalk rapidly grows up to a height of from ten to twenty feet. There are several species of *Nolina* and *Yucca*. *Euphorbias* are represented by the shrubby *Jatrophas* and the *Eupedilanthus*. Up to the present time no *Echeverias* have been discovered in Lower California. Their place is taken by many species of *Dudleya*, especially along the Pacific littoral. These plants are very similar to *Echeverias*, except that the leaves are more pointed and the plants often larger. Most of the Lower California *Dudleyas* have never been described.



Pachycereus Pringlei, with *Machaerocereus gummosus* in foreground.

It is in cactus that Lower California really excels. The traveller is never out of sight of some form of them. They grow all the way from the ocean's edge to the mountain's top. Several are only found on small islands, while at least one never descends much below the five thousand foot level. The smallest is the tiny *Mammillaria Blossfeldiana*,

which grows half buried in the earth along the shore. The largest and tallest is the *Pachycereus Pringlei*. The strangest is probably the *Machaerocereus eruca*, a large *Cereus* which grows prostrate on the ground and whose after part dies as the head advances so that it actually travels. The *Peniocereus Johnstonii* has a tuber shaped like a large beet, and the *Wilcoxia striata* bears a whole clump of tubers resembling a dahlia's. *Pereskopsis Porteri* and *P. Gatesii* clamber over small trees in the manner of wild blackberries. In all, some eighty-five species have been described. At least fifty of these are found nowhere else. Possibly there is still another fifty to be described.

It will be a pleasure to write in detail of many of these interesting plants for your CACTUS AND SUCCULENT JOURNAL. Which shall be first will depend upon the requests to your Editor. In Lower California there is one described species each of *Bartschella*, *Bergerocactus*, *Myrtillocactus*, *Peniocereus* and *Wilcoxia*, one described and one undescribed of *Lemaireocereus*, three forms of *Lophocereus*, four *Cochemias*, nine *Echinocereus*, nineteen *Ferocactus*, two *Machaerocereus*, two *Pereskopsis*, at least a score of *Mammillarias*, two *Pachycereus* and *Opuntias* galore, as well as a new *Grusonia*. Most of these I am familiar with by actual field observation and collection.

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Again the Food Problem

By H. J. De Vries

THE mind of the cactus and/or succulent collector and grower, not only in England, but everywhere is busy with the same problem: what soil must I give my cacti? Nearly everybody feels instinctively that it won't do to give different plants uniform food. Some among our English collectors and growers think, or are convinced, that they have solved the difficulty, but unless we put the whole problem on a scientific basis, we never will get out of it.

Modern agriculture and horticulture with their laboratories for chemical analysis of soil, manure, etc., tell us quite clearly what we have to do.

The fact that one grower has been successful with "burnt clay" does not prove much, not even if a second, and a third, and a fourth have been successful, specially not when they have used the same kind of clay.

What is clay? Clay is the worn-off material of rocks, caused by the agency of water or ice, and as rocks differ, so will one clay layer differ from the other in chemical composition. It is therefore quite possible that a chemical analysis of the soil or rock in or on which a cactus grows in its native land gives about the same result as that of, for instance, London clay. But as we said, there is a difference in one kind of clay and the other, and the possibility remains that some kinds of clay will not suit most cacti so well apparently as London clay does, according to the results of some cactus growers in the London area. Nobody can deny that the plants exhibited by them in the Horticultural Hall look healthy and seem in good condition, but I am afraid that the uniformity of food and treatment will gradually lead to a difference in type, that we are making "drawing-room plants," that we are creating a "civilised" kind of cactus. There is a real danger; the plants adapting themselves to a change of food, having already to struggle against new atmospheric and climatic conditions, will gradually lose their true type; these three items are bound to influence the type.

The only way—and really the only one,—scientifically speaking, is to approach as much as possible the growing habitus of the plants—and even then the result will only be an approach, but certainly as near as possible to the true thing.

Everybody who has studied the history of

the cactus knows to what extent the cactus not only adapts itself to new soil and new climatic conditions but also gradually changes its habitus and form. If it was only for this reason, one should be careful with this food problem. Let us not forget that just as a result of that adaptive power, out of a few kinds (no more than six) we have got that great number of different kinds that we now know. *We are going to make new types and are losing the original one.*

Looking at the geological differences occurring in the enormous region where most of the cacti grow (between the south of Canada and the north of Patagonia); igneous rocks of different formations, various limestones, lava, sandstones, sandy deserts,—on altitudes between sea-level and nearly the tops of the Peruvian, Chilean and Bolivian Andes—exposed to the most different temperatures and usually to strong, clear sunlight, some cacti living only on decayed vegetable matter in tropical forests, is it not in contradiction with common sense that we should give all these plants a uniform food: London clay, and, more or less, a uniform treatment?

Nearly all the cacti want lime of some sort,—they grow on rocks or in soil containing calcium—with the exception of the epiphytes: *Rhipsalis*, *Phyllocacti*, etc., which grow on and in decayed vegetable matter, in mosses, etc. Alwin Berger (*Kakteen*, pp. 89, 90) points out that the *Rhipsalis* wants different treatment from other cacti, and because, as a rule, they do not get it, they do not thrive and are in disfavour. To *Phyllocacti*, Berger gives only pure, old, well-rotted cow manure mixed with very coarse sand.

Most spiny cacti will undoubtedly benefit by London clay, because they all want calcium. Still, only chemical analysis will decide what has to be added to burnt clay for each kind, even for every individual plant.

Several succulents will grow well in London clay, although some of them, at least, will want an addition of lime: *Aloe*, *Haworthia*, *Gasteria*, *Echeveria* (not all of them, though), and some *Mesembryanthemums*. A few do not want lime at all, or only just a little,—in other words, the lime in the London clay is either too much for them or is, to say the least of it, pernicious; *Hoya* and *Cotyledon* want a little lime, *Kalanchoe* very little and *Adenium*, *Pachypodium*, *Cerbera* and *Plumiera* none at all. What I have said about the *Rhipsalis*

can be said about the whole family of *Stapeliae*; they are not as a rule favourites, but it is here not the food that is at fault, but the atmosphere. (G. D. Duursma, *Vetplanten*, pp. 30, 31.)

Many rock plants and alpinists will grow and thrive in some kind of burnt clay—as long as the clay contains the same elements as the rock on which they grow in nature,—although one has to be careful. Look round in the Alpine or Rock Garden at Kew and observe with what infinite care every plant is given just what it wants. Kew certainly gives us a *scientific* lead.

The Royal Horticultural Society has its own laboratories with a staff of chemists. As I am convinced that—however praiseworthy individual experimenting may be—Science will help us directly, is it not for our Society to ask the assistance of our Mother Society in this most important matter?

Book Reviews

“THE NEW ILLUSTRATED GARDENING ENCYCLOPEDIA,” edited by Richard Sudell, F.I.L.A., A.R.H.S., published by Odhams Press, 1932, price 20s.

So many people are interested in gardening nowadays that there is always a demand for information on the subject. The present volume covers a very wide range; it deals with the majority of the plants grown to-day, giving in each case a description of the plant and the methods of cultivation and propagation; pests and their treatment are fully considered, and details of the various horticultural societies in this country are also given. In the larger sections the Editor has had the assistance of experts; Carnations are dealt with by C. G. Engelmann, F.R.H.S., Fertilisers by the Technical Staff of Imperial Chemical Industries, Rock Garden Construction by Clarence Elliot, F.R.H.S.,—to mention but a few. Beautiful photographic illustrations, five of them in colour, are contributed by Messrs. Sutton & Sons and 470 excellent black and white drawings help to make the text clear.

The section which is of most interest to our members is that dealing with the Cactus contributed by our Hon. Secretary, Mr. E. Shurly, F.R.H.S. After a general survey, the main families are briefly dealt with; methods of cultivation are given and there is a section on the economic values of cacti. This interesting article concludes with a list of a dozen plants worth growing of each of the main genera, viz. *Cereus*, *Echinocactus*,

Echinocereus, *Echinopsis*, *Mammillaria*, *Opuntia* and *Rhipsalis*. The *Phyllocacti* seem to be somewhat neglected; a later section in the *Encyclopedia* gives a description and mentions several species but refers to the cactus articles for the cultivation.

It is doubtful if any gardening encyclopedia of recent years has dealt so fully with the cacti, and we hope that this useful survey of the subject will induce people who are not yet growing them to take up the cultivation of these interesting plants.

The Cactus and Succulent Society of Great Britain receives special mention, for which we are very grateful to the Editor, whom we should like to congratulate on the production of a really useful guide to gardening.

“THE CURIOUS GARDENER,” by “Jason Hill,” published by Faber & Faber, Ltd., price 7s. 6d.

In the delightful collection of essays recently published under this title, Jason Hill has included two chapters which will make a special appeal to members of the Cactus and Succulent Society. The ardent cultivators of cacti who form our Society need no extenuation of their motives in taking up the study of this “curious” family of plants, but the writer of this review believes that all members will agree that Jason Hill has succeeded in finding one of the reasons for the fascination which these plants excite. In writing of cacti in a chapter entitled “The Return of the Cactus,” he says: “In well-grown specimens the proportions are so just and the whole design is so satisfying that it is not altogether fantastic to compare them with a good Chinese pot of one of the early dynasties. The comparison is sustained by a beauty of surface texture, which is common to both, and varies from a translucent waxy lustre, like that of New Zealand jade, through the glaucous procelain of *Cereus imbricatus* to the blue-grey suede of *Anhalonium Lewinii*.”

Under the heading “Queer Plants,” Jason Hill alludes briefly to the mimicry species of *Mesembryanthemum*, certain *Euphorbias* and other succulents which are to be found in most collections. Apart from these two chapters all who are interested in plants will enjoy dipping into this “record of exploration along the less frequented by-ways of gardening” compiled by a “Curious Gardener,” who shows in the pages he has written the wealth of pleasure obtainable from the cultivation of plants. The book is illustrated with seven drawings by John Nash.

EDITOR.

The Discovery of *Echinopsis violacea*

A YEAR or so ago one of my collectors in South America sent me a number of spherical *Echinopsis* plants with fairly long, yellow spines. When the plants were unpacked, I said, "that is certainly *Echinopsis spiniflora*, but the spines are much longer than those on our plants." *Echinopsis spiniflora* is a neat little species, but nothing very special. In a letter, which arrived with the consignment, the collector went into raptures over the beautiful flowers of this new species; "... gorgeous lilac, as beautiful as an orchid,..." he wrote. Since I had already had disappointing experiences of this collector's over enthusiastic descriptions of colour, I was sceptical about it. I wrote to him again; "It is probably a geographical variety of the white-flowered *Echinopsis spiniflora*; the spines are certainly more beautiful than those of *spiniflora*, but it is nothing special."



Echinopsis violacea Werd. Sp. nov.

It was not till six months later that I saw my collector had been right. The plant, which for so long had hardly been noticed, had, in the meantime, grown well, and when I went through the nurseries one morning, the first flower had opened. Then I understood my collector's enthusiasm. One does not see so beautiful a flower every day. The flowers, in delicate shades of lilac, certainly suggest an orchid. In the following

days each one of the few plants of this species produced one or more flowers. It was a sight! But so far few people know this beautiful new introduction. The visitors to my nurseries during the weeks that it was in flower, however, were so enraptured by it, that each one took a plant away with him. It seems to grow well from seed, though each flower produces only a few seeds. The cultivation is easy as with most *Echinopsis*, and this species certainly deserves to become popular.

This description and the accompanying photograph are reproduced through the courtesy of A. F. Haage, Jun., Erfurt, Germany.

Mamillaria or Mammillaria?

To the Editor of the "Cactus Journal."

MADAM,

Why should we perpetuate Haworth's spelling mistake and waste space by writing the clumsy word Mammillaria. Is it not obvious that "mamilla"—a teat, is the word he had in mind? Had he meant to derive from "mamma" which also means a teat (v. *Smith's Latin Dictionary*), and from which we derive "Mammalia," he would surely have spelt the name "Mammalaria." The "ill" shows that "mamilla" is the parent word and that Mammillaria is erroneous.

I am told that as a matter of fact this is not a case of mis-spelling, for in the seventeenth century the word was spelt either mamilla or mammilla. I protest that orthography in the seventeenth century was so uncertain that people did not even stick to one spelling of their own names and wrote Shaksper, Shakespere, Shakespeare and even Shakspur. Their spelling of Latin cannot be taken as a standard by which to be guided.

When travelling with pack animals in the Near East I found the great difficulty was to prevent a pack-mule tumbling into a mud-hole from which the beast in advance of him had just been dragged. Each mule insisted on following exactly the errors of his predecessor. Let us not be pack-mules. The classical spelling is "mamilla" and there is no excuse for the superfluous and erroneous "m," no matter who perpetuated the blunder. Haworth was a better botanist than a classic. Let us profit by his knowledge and bury his mistakes.

Yours,

M. E. DURHAM.

This further reference to the spelling of Mammillaria will be sympathetically received

by many people who dislike the cumbersome form with the double "m." Unfortunately it cannot be altered now except by disregarding the rules of nomenclature. It may be of interest to give very briefly the history of the nomenclature of plants.

The early botanists gave plants names, usually in Latin, which became so complicated as to be short descriptions of the plants concerned, as for instance: CYTISUS FACIE QUIBUSDAM ALISSUM FRUCTICANS. Bauhin in 1643 and Tournefort in 1700 tried to produce order out of chaos, but it was not till Linnaeus, realising that the clumsy names were a great handicap, undertook the stupendous task of revising the then known plants and gave to each two names only, the specific and the generic. The publication of his *Species Plantarum*, in 1753, is taken as the historical beginning of scientific nomenclature.

The binomial system was readily adopted by botanists, but they felt at liberty to give what names they liked, and the question of the naming of plants was still very confused. In 1867, therefore, Alphonse de Candolle was asked to prepare a code to be discussed at the International Botanical Congress at Paris. The code then drawn up was followed by many workers, but was by no means universal; others, such as the Kew Rule, also found adherents.

When the International Botanical Congress again met in Paris in 1900 a commission was appointed to consider the whole question and to report at the following meeting in 1905 at Vienna. The code then drawn up, and known as the Vienna Code, recognised as the main principle the law of priority, that is to say, that the name first published for a plant should be recognised as the correct one, later names being disregarded; where, however, a later name had come into general use it might, under certain circumstances, be retained, in which case it was put on the list of NOMINA CONSERVANDA.

The Vienna Code was adopted by most botanists; in America, however, another code—known as the American Code—was drawn up, which recognised no exceptions to the law of priority; most of the workers in the States (though not those in other parts of America) adhered to this code, but at the International Congress held at Cambridge in 1930, the American codists agreed to accept the International Rules, so that these may now be considered as the system that is being followed by the chief botanists all over the world.

Page Forty-four

In point of fact, Haworth himself did not originate the name, but was the first person to use it for a genus of cacti. He took it from *Cactus mammillaris* Linnaeus, which in turn was based on *Ficoides s. Melo-Cactus mammillaris glabra* Plukenet (1696). As pointed out earlier, the spelling used by Linnaeus in *Species Plantarum* is, under International Rules, considered to be correct.

In adopting the form *Neomammillaria*, the authors Britton and Rose were following the American Code, by which a name once used cannot be used again; the name *Mammillaria* was given to an alga two years before Haworth used it for a genus of cacti. At the Cambridge meeting the name was considered and with the agreement of the former American codists, it was put on the list of NOMINA CONSERVANDA as *Mammillaria*.

For cactus growers it may be a nuisance to have to put two "m's" on a small label, but in the interests of scientific accuracy this should be done, since it is only by a universal following of some definite method, in this case the International Rules, that the nomenclature of plants can be saved from falling back into the chaos of earlier times.

EDITOR.

Library

IT was reported in the last number that the Council of the Society had authorised the purchase of books for the Library, and two have now been obtained. These are: *The Cactus Book*, by Arthur D. Houghton, A.M., M.D., Ph.D., President Emeritus of the American Cactus and Succulent Society, and *Kakteen*, by Alwin Berger, who was for many years in charge of the gardens at La Mortola. An opportunity occurred to acquire C. Engelmann's *Cactaceae of the Boundary* (U.S. and Mexican Boundary Survey), 1858, and Engelman and Bigelow's *Survey of the 35th Parallel*; these books are scarce, and the Council decided to purchase them as they are of historic interest, many of the plants being here described for the first time.

The exchange of Journals with the Dutch, Belgian, German and American Societies continues.

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|--|-------|
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| Howard E. Gates, 119 South Illinois
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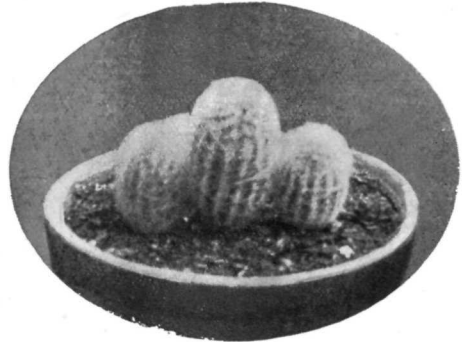
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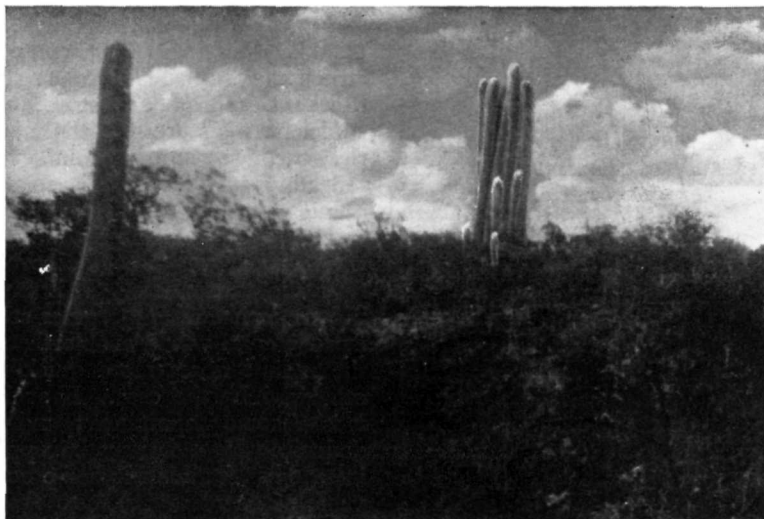
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Cephalocereus senilis.

The Discovery of *Cephalocereus senilis*

By A. V. Frič

AFTER the war, the favourite "Old Man" cactus was thought to have died out. I did not believe this and, in 1923, I followed in the tracks of my countryman, Benedikt Roetzl, hoping to find it again. And I have got all I set out to get. Above the little mining town of Cardonal, which had been destroyed by the revolution and vacated by the inhabitants, we came to a "mesa" at the entrance to the ravine where Roetzl more than 80 years ago, had collected *Cephalocereus senilis*. We climbed up through rain and thick mist, unfavourable for photography. A decade ago the ravine had been plundered. One Yankee alone removed from here 200,000 plants. Still on the opposite slopes one could

see from afar several forgotten giants; many appeared to be nearer and others almost within reach, but deep ravines (60-80 m.) separated us from them. The way went up into the mist and then down again to a stream, which had eaten through the deep valley in the "mesa" through the work of ages and uncovered the "barranca de los libros" (Library Bank) in the vertical schist. Capillarity draws the moisture through the layer of schist up to where, amongst damp moss and ferns, the *senilis* grows. But darkness closed in, in the valleys around us and we were obliged to spend the night at the gate of the kingdom of my dreams. The first rays of the sun found me already climbing, clinging to the steep walls and searching for

small seedlings. The first plant that could be collected was reached. It was small and crooked, but I could touch it with my hand! Once again, after how many years! Soon my friend, Don Octavio Solis, could also admire the beautiful giant, not yet of flowering size. The specimen, over 6 metres high, wore on its head the first bridal veil, the so-called cephalium, and promised a rich harvest of seeds in the next decade. But the real seed-bearers were so tall that one had to cut them down with a hatchet. The gigantic columns plunged into the valley below, broken into pieces, still I found viable seed in cephalia covered with the dust of centuries. "What a shame! What vandalism" the cactus lover will say. My Indians said the same. But the cut stem produces new snow-white heads, more beautiful than before. Soon, after another 50 years perhaps, they will be dirty again. Not only man, but lightning also often splits up many stems which tower too boldly to the skies. The enthusiastic forgets how far behind him the camp lies and does not mind if the cold, damp night overtakes him. His teeth chatter with the cold. But soon the sun rises again over the opposite side of the valley and the further he presses forward, the closer together are the Organ pipes. Omniscient Nature has brought her majesty to culmination; she has set the sober senile old man in the valley of eternal snow, from which the explorer and his companion have returned with baskets full of booty, and with impressions that will never be forgotten. There stands the splendid temple of nature, the valleys which no robber visits—and yet I robbed this holy place—in fact I did more; in the interests of science I have described the newly discovered valleys—and to-day these valleys are completely stripped—the jewels of nature have become worthless junk. We paid dearly for the wantonness. We felt the exhaustion on the homeward march; a sick comrade had to be carried. In these valleys, which have become too damp in the last decades, only the mist-loving, white-haired cacti can bear the excessive moisture.

The greater part of the plunder was frozen through the neglect of a customs house officer. Still the collector could, after his return home, watch the buds developing on a rescued and grafted cephalium. And when I see the seedlings, the young "Old Men" in my collection, my thoughts go back to the Senilis valley.

(TRANSLATED)

Burnt Clay

(From "The Gardener's Chronicle," Ninety Years Ago.)

Value of Burnt Clay for striking Cuttings.—A short time since, a correspondent in the *Chronicle* recommended powdered soft bricks as an excellent compost in which to strike cuttings. The same idea occurred to me last summer; but being from home at the time, I had not the opportunity of trying it. I, however, recommended my son, at whose house I was, to try burnt clay from the anthracite fires, which in S. Wales are supplied by a mixture of anthracite and clay. It struck me that the burnt clay would afford excellent drainage, and at the same time give sufficient moisture for the nourishment of the cuttings, and not in excess. Upon reflecting further on this matter, I am of opinion that another and a greater advantage to the cuttings is afforded by the property which burnt clay has of absorbing ammonia from the atmosphere. This ammonia would prove a constant and regular stimulus to the cuttings, and would enable them to send out the radical fibres more quickly than would otherwise be the case. If such is the fact, it is of some importance; and the reasoning deducible from it may be applied in other instances. It adds another proof of the great value of chemistry to facts made known by practical men; for which in many cases a satisfactory reason has not been given.—JOHN WEDGWOOD, Seabridge.

(Reprinted from "The Gardener's Chronicle," December 3rd, 1842, by kind permission of the Editors.—EDITOR.)

Library

THE following books have been added to the Library:—

Plant Names Simplified, by A. T. Johnson.
Dictionary of Botanical Names and Terms,
by C. F. Zimmer.

The catalogues received include:—

R. Blossfeld, Neue Königstrasse, P. S.
94, Potsdam, Germany.
F. A. Haage, Jun., Erfurt, Germany. P. S.
Mrs. A. F. Moeller, Ave Rayon
No. 603, San Pedro, Coahuila,
Mexico. S.

We have also received a catalogue of Botanical and Horticultural Books from J. H. Knowles, 23a, Beulah Hill, London, S.E.19. Mr. Knowles was a member of the earlier Cactus Society and still maintains his interest in the subject.

P = Plants. S = Seeds.

The Darrah Collection

By A. Cobbold

THIRTY-FIVE years ago, Manchester was noted for its extensive private collections of orchids. Several of its wealthy business men owned collections of these plants, the value of which in most instances ran well into five figures. They used to have what were called "duplicate sales" and rare specimens sometimes fetched as much as three or four hundred guineas. A few years after our collection had been removed to its new home, one of the gentlemen—a rather eccentric little man—called at the Cactus House and, taking a cursory look round exclaimed,—“I can't understand Darrah going in for these d—— prickly things, I grow orchids; I make ten per cent. out of my orchids!” In mentioning this I cast no reflection on orchid fanciers generally.

When I went to Mr. Darrah in 1898, he had a span-roof glasshouse, in five divisions, four of which ran from east to west, and the other at right angles to them. The first was a vinery; the second contained the nucleus of a collection of orchids; in the other three (newly built) was the nucleus of a collection of cacti and succulents. The orchids were soon tried out and found wanting! Mr. Darrah agreed the orchid flowers were very beautiful. When not in bloom, he remarked, they were of no more interest to him than bundles of sticks. Shortly afterwards he decided to form a collection of cacti, and we went ahead. In the course of the next five years over three thousand specimens of the *Cactaceae* were added to the collection. Of the other succulents, apart, from some arborescent *Euphorbias*, and a few *Agaves* and *Aloes* room was found for only the smaller species.

The first year I took charge, a well-matched pair of *Agave americana* was purchased. These plants were probably twenty-five to thirty years old. Our specimens were planted out in the rockery at Alexandra Park when the collection was removed. This plant flowered last year; a pane of glass was taken out of the roof and the inflorescence grew through to a height of twenty feet. The flower stem appeared on May 23rd. began blooming in August, and finished in October, having borne, approximately, one thousand five hundred of its small greenish-white flowers. The other plant remains in the same pot it was put into twenty-eight years ago; it is quite healthy, but is less

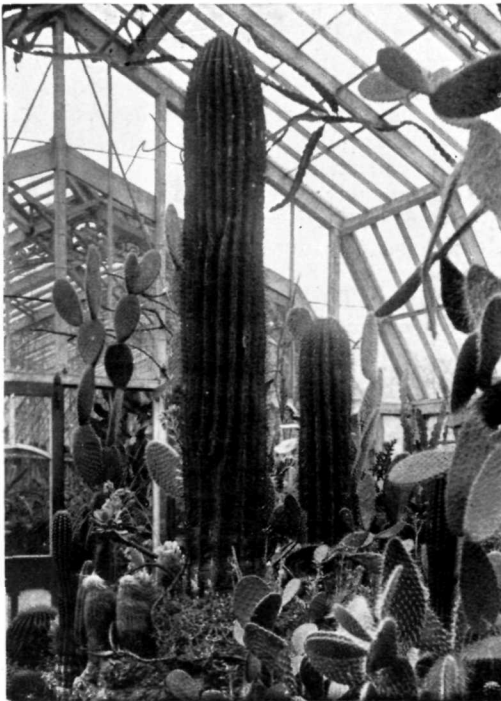
than half the size its fellow was when it flowered.

In the summer of '98 I visited Mr. Thomas Cooper of Redhill, from whom I obtained *Conophytum ficiforme*, *C. minimum* and *C. orbicordellum*—about the only species in cultivation in this country at that time. Mr. Chalwin of the Cape Town Municipal Gardens sent us, subsequently, several unnamed species of these fascinating plants, as well as many other small succulents, including *Pleiospilos Bolusii*—a rarity in those days. Two distinct specimens were submitted to Dr. N. E. Brown, who pronounced them new to science. They were described by him in the *Gardener's Chronicle* under the name of *Crassula decipiens* and *Cotyledon turgida*. Both, I believe, are still rare in collections.

The following year brought some fine specimens of Cacti from California, including *Cereus giganteus* (our collection is still named according to Schumann's classification), *Echinocactus Wislizenii*, *E. cylindraceus*, and *Mammillaria compacta*. These were grouped in the central bed of one of the houses. Photographs of this fine group were sent out by Mr. Darrah. One was used by Mr. W. Watson when revising Thompson's *Gardener's Assistant*, Vol. I, p. 616; another was published in the *Monatschrift für Kakteen Kunde*, 1900, p. 187. The acquisition of these monsters necessitated more space and two new houses were added to the range. These houses were soon filled, mostly with *Echinocacti*, *Mammillarias* and *Echinopses* and presently two more houses were built for *Opuntias*, *Cerei*, *Pilocerei* and the ordinary succulents. The most important cactus in point of size was a three-branched specimen, direct from Santiago, of *Cereus chilensis*, very much like, although somewhat taller—judging by the diameter of the flower—than the specimen figured in Mr. Blossfeld's recent catalogue.

The *Rhipsalis* were mostly grown in teak orchid baskets suspended from the span-roof of a house, about 25 ft. by 12 ft., belonging to a separate range which had been erected. The garden varieties of *Phyllocactus* occupied the stages beneath. One of the original five houses had by this time been converted into a stove or tropical house, in which Pitcher Plants (*Nepenthes*) and other interesting plants were grown. This house

was very useful for wintering *Melocacti*, and other species like *Phyllocactus Thomasianus*, *P. Hookeri*, and certain species of *Rhipsalis*, which require humidity and a temperature above the average for cacti during winter. I may say here, in justice to the climate of Manchester, that it was owing to the loss of these cultural facilities that certain genera died out of the collection in its new home. Moreover, in this connection, Mr. Darrah's garden was situated five miles further out of Manchester on a breezy plateau about 250-300 ft. higher above sea level than Alexandra Park, thus it often escaped the fogs when the plain below was thickly enveloped.



Opuntia pilifera. *Cereus giganteus.* *Opuntia leucotricha.*
No. 4 House.

Adverting to the "group of Mexican cacti" (Watson) it may be as well to state, in the interest of members, who may desire to import large specimens, what became of those figured; the *Mammillaria* and *Echinocactus Wislizenii* lived for ten years; and all the *Cereus giganteus* for twenty-five years. Although the shorter plants of the latter species never made any stem growth whatsoever, the tallest one, which was 7 ft. 6 in. high when received, increased in height by 9 in., and flowered on several occasions. The flowers were about 4 in. long, funnel-

shaped, white, of a waxy texture after *Lapageria alba* and were borne near the top. This experience goes to show that large *Echinocacti*, for the most part, cannot be established, or they do not live long in this country. This remark also applies to large, many-headed specimens of *Mammillaria compacta* and *Echinocerei* such as *E. Engelmannii* and *E. mojavensis*, which often grow as big as a cartwheel. It is evidently very difficult for the exporter to lift such plants without breaking off the entire root system. Seldom is there anything left but short stumps; these decay in time, the decay ascends the fibrous axis, ultimately causing the fleshy, water-storing tissue to become a mass of putrid pulp. Besides these examples, there are species which, it seems, are impossible to establish in this country. They include the genera *Malacocarpus* and *Melocactus* and the species *Echinocactus polyancistrus*, *E. Hartmannii*, *E. Simpsonii*, *Cereus Schwartzii* and *Opuntia tessellata*.

I think I am safe in saying that Mr. Darrah obtained material from all the Cactus regions with the exception of the Galapagos Islands. In 1902 he made arrangements with Mr. R. H. Beck of California, who was then in this country, to send him examples of the species indigenous to those remote islands. This gentleman was the following year going to collect birds for Lord Rothschild. His intention was to go down to Guayaquil and wait there, it might be for some weeks or months so he said, for a boat to take him across. Sad to relate, Charles Darrah passed over to the Great Beyond, probably before Mr. Beck reached—if he ever did—the Land of the Big Tortoise.

It was not till April 1906 that I began the task of removing the collection. In the meantime a glass house had been built by the Manchester Corporation to receive it. It is a fine house, from an architectural view point—250 ft. long, with an average width of 20 ft.; there are five divisions or compartments of equal length, each with a central bed and narrow side stages; the height of the central portion is 23 ft. that of the others on either side diminishes by a few feet successively. The plan is in the form of a crescent, the horns of which point, roughly, north-east and west, respectively. The floor, which is made of concrete supported by girders, has a space beneath, and is 3 ft above the ordinary soil level. Provision was made for a central bed below the floor in the principal division only; the other beds of soil rest on the floor surface. The rock-

work is made of tufa from Matlock ; the best material for the purpose, being light in weight, easily worked and of picturesque appearance.

Entering the house (No. 1.) at the northern end, on the right, at the end of the stage, is seen a group of *Pilocereus Celsianus* ; this is a variable species, a native of Bolivia. The variety *lanuginosior* is one of the stouter forms whose stem is almost covered with long white, silky hair. Some varieties have stout spines, three or four inches long when imported, but they fail to produce spines anything like that length under cultivation, at any rate here in the north. Given a stony soil and a sheltered position, I have reason to believe this species would stand the winter out of doors in the South-west of England. Next to these woolly fellows are some of the smaller *Crassulas*, *C. Bolusii*, *C. Cooperi*, *C. impressa*, *C. pseudolycopodioides*. The rest of the stage is mostly filled with *Haworthias* ; these belonging to the *Margaretifera* section whose leaves suggest the feathers of the guinea fowl (Is this protective mimicry ?) being great favourites with the public. Other interesting species to be seen are :—*H. limifolia*, *H. setata*, *H. Bolusii*, *H. pilifera*, *H. minima*, *H. retusa*, and *H. tessellata*. On the sectional shelves above—which are really shallow troughs—are grown most of the spheroid *Mesembryanthema*. The genus *Lithops* is represented fairly exhaustively by :—*L. turbiniiformis*, *L. terricolor*, *L. Leslei*, *L. bella*, *L. opalina*, *L. Karasmontana*, *L. optica*, *L. olivacea*, and *L. pseudotruncatellum* ; among the *Conophytum* species are :—*C. Meyeri*, *C. Marlothii*, *C. Friederichiae*, *C. globosum*, *C. gratum*, *C. Schickianum* and *C. parvipetalum* ; the last is a rare species which has been in the collection for over thirty years. It is distinct from all the others I know in that the orifice is thickly covered on either side with minute pink hairs. I recognised it from Dr. N. E. Brown's description in *Mesembryanthema* ! Next on the shelves are *Argyroderma testiculare*, *Rimaria Heathii*, *Fenestraria rhopalophylla*, *Lapidaria Margaretae*, etc. On the opposite shelf are other succulents, and South American cacti comprising *Echinocactus Cumingii*, *Cereus areolatus*, *C. thelogonus*, *Opuntia Miquelii* and various *Echinopses*. On the shelves are Andean *Opuntias* (*Tephrocacti*). *Aloe Salm-Dyckii*, *A. succotrina* and *A. arborescens* were recently passed out of flower in the central bed.

The occupants of No. 2. figure largely in the report of Mr. W. W. Pettigrew's lecture in the *Journal of the Royal Horticultural Society*, Part 2, 1932, see figs. 94 and 96. In

a part of the bed not shown in the photographs is a specimen of the Bottle Brush Cactus, *Pilocereus Schottii*, the apex and ridges of whose stems are thickly beset with a continuous fringe of stiffish, brown bristles, 3-4 in long. This plant flowered in 1901 and was figured in *Monatschrift fur Kakteen Kunde* of that year, page 11. The flower was a dull pinkish white, about one inch across. Since then the stem has increased considerably in length, but the new part is devoid of bristles like the same species shown in fig 96, whose bristly base is obscured. Immediately in front of the latter is *Cereus Beneckii*, with a smaller plant indicated by a label. This interesting species appears to be rare in collections. *Cereus bavirus* is another handsome species in the same bed ; the stem is thickly covered with greyish spines, the central ones being deflected downwards. Nearby are two specimens 15 ft. high of *Pilocereus Houlettii*, the flowers of which are freely produced in summer from beneath the dense, woolly locks towards the top of the branches. The flowers are nocturnal, blush pink, about 3 in. across. The fruits when ripe, generally split into three portions, which recurve, showing the rich, purple pulp interspersed with black seeds, and, on account of the colouring, are often thought to be flowers by visitors. At the shady end of the house the high rock work is draped by the branches of *Rhipsalis paradoxa*. Here, embowered by the "leafy" branches of *Phyllocactus Thomasianus* are several *Bromeliads*, including *Bilbergia zebrina*, *B. nutans*, *Tillandsia Lindenii*, now bearing the last of its incomparably blue flowers, having been in bloom since Christmas. Amongst several species of *Ceropegia* may be seen :—*C. Rothii*, *C. stapeliæformis*, *C. Randallii*, a twining, slender-stemmed plant with pretty, bluish-green flowers about half-an-inch across. *Cereus grandiflorus*, *C. Ocamponis*, *C. (Hylocereus) guatemalensis*, *C. triangularis* and its variegated form, *C. nycticalus*, and other climbers are trained on wires up the roof.

Leaving No. 2—which contains other rare specimens, not mentioned above, of *Cereus* and *Pilocereus* probably unrivalled in Europe—No. 3 is entered. Beneath the central span, which runs athwart the main ridge, is a dense group of candelabriform *Cerei* :—*C. Jamacaru*, *C. peruvianus*, etc. These have long since reached the roof and have to be topped almost annually. The ends of this span are vertical. On the gable end immediately above the main entrance are trained the serpentine stems of *Cereus macrogonus*,

some of which have been allowed to grow inwards, rambling among the branches of *C. peruvianus*; others almost reach the ridge and then hang downwards for several feet like a huge snake from the branches of a tree. The diameter of these stems is 3-4 inches, and some unbranched ones reach a length of 30 ft. To the right of the main entrance, and growing in the central bed, *Cereus Forbesii* var. *haematuricus* overshadows an area equal to quite one fifth of that of the whole house. The branches have a spread of 16 ft., and are supported above the path on both sides by a sort of pergola; in the centre they form almost a solid, entangled mass, 5 ft. thick, having been allowed to bend downwards upon one another for many years in a natural way. The whole specimen is estimated to weigh 2 to 2½ tons; its height is 12 ft. The flowers are white, with reddish outer segments, and are nocturnal. The fruit is about the size of a hen's egg, bright red throughout, edible. Both right and left of the door are *Phyllocacti* and *Rhipsales*, the former growing on the rockery, the latter mostly in teak orchid baskets. *Rhipsalis chrysoarpa* is quite a feature, growing as it does, on an almost horizontal tree-fern trunk, which is supported about 6 ft. from the floor. Its long, pendant, terete stems flower freely during summer. The flowers are white, sweetly scented, and are succeeded by golden yellow berries, as the name implies. *R. pilocarpa* is another notable species, it being the only one I know that has hairy fruits. *R. madagascariensis* var. *dasyerca* is interesting in being one of the few species of cacti which are supposed to be indigenous to the Old World. Its flowers are very small, white; the fruits are like mistletoe berries. Taken as a whole, the occupants of this house, owing to their fantastic shapes, make a great impression on the average visitor as he or she enters the door for the first time. Sometimes small children cling to their mother's skirts; some refuse to go beyond the doorway. Seen under the diffused light of the arc lamps in the adjacent road the effect is somewhat eerie, and, really there are "things that go bump in the night"—a piece of, say, *Cereus macrogonus* weighing several pounds is sometimes found lying on the floor in the morning. One cannot very well support every yard of these monsters!

No. 4. contains Mexican and North American species for the most part, *Opuntias*, *Echinocacti*, and *Mammillarias*. The *Echinocacti* are, with a few exceptions, comparatively small. The largest, *E. Grusonii*, measures

18 in. in diameter, and 2 ft. in height. It came with four or five others, about equal in size, direct from Mexico; one passed into the hands of the late Henry Cannell of Swanley and was for several years an outstanding feature in his exhibits of succulents at the Temple Show. (I wonder who possesses it now.) This plant and a giant *Cereus* were the only cacti Mr. Darrah ever sold. In a sunny part of the rockery is a rare Euphorbiaceous plant, *Pedilanthus macrocarpus*. It has flowered three times in thirty years, the last occasion being during the hot spell last August. The flowers are red, inclined to orange, one inch long, and in shape somewhat resembling a slipper; the stems are erect or pendulous, cylindrical and covered with white down; the folioles are ovate, about an eighth of an inch across; the plant is a native of Lower California. A little further along the bed, is another curious plant; I understand there are besides this only two specimens in Great Britain, one in the Royal Gardens, Kew, and the other in the collection of Thomas Sharp, Esq., Westbury, Wilts. An idea of its shape and colouring is perhaps best conveyed by likening the succulent stem to a swede turnip that has run to seed, divested of its leaves. It is said this strange plant has a fresh crop of leaves after every shower of rain! The stem, which is 15 in. high, is furnished with numerous, slender, outward-straggling branches; the ovate pointed leaves are solitary on the young branches; later the leaf blades disappear, the petiole and midrib persisting and forming spines. After this the leaves that grow on the branch are sessile and always appear in tufts in the axils of the spines. The name of the plant is *Fouquieria columnaris*. Trained on the roof are several plants of *Cereus Macdonaldiae*. This night-flowering species, whose blooms are 12-14 inches across, thrives in a lower temperature than most of the other climbing nocturnal *Cerei*. Some many-headed specimens in pans of *Mammillaria plumosa*, *M. angularis* and *M. bicolor* find a place on the shelves and stages, together with *M. macrothelae*, *M. clava* and *M. erecta*, columnar species having distinct glands situated in the axils of the tubercles.

In No. 5. are *Cotyledons*, Old World Species mostly. Among the more interesting are:—*C. carunculata*, whose beautiful waxy leaves develop a peculiar intumescence in the course of the summer, the leaves that form early being usually quite normal, *C. Hoveyi*, *C. pulvinata*, *C. leucotricha*, *C. (Dudleya) farinosa*, *C. Derenbergii*, *C. edulis* and *C. nodulosa*.

Opuntia robusta, reaching nearly to the roof, is a striking feature opposite the end door. The side stages on the one side contain *Mammillarias*, *Echinocerei* and other small cacti; on the other are *Cotyledons*, a few *Agaves* and other things. The shelves above contain *Stapelias*:—*S. glabricaulis*, *S. sororia*, *S. Pillansii*, *S. Desmetiana* and some others; also *Pleiospilos Bolusii*—one old specimen with six pairs of leaves or branches—*Nan-anthus Peersii*, *Punctillaria Fergusonii*, *Mentocalyx velutina*, *Anacampseros papyracea* and a few other Karroo plants. *Sarcostemma dammaniana* hangs from the roof, Japanese bead-blind fashion, on either side of the path. This plant was known as *Euphorbia pendula* till it flowered for the first and only time, during the hot summer of 1911, when I saw at once it was an asclepiad. Although several buds formed, only one expanded. The flower was star-shaped, yellow, about half-an-inch across.

[Mr. Cobbold, who has kindly written the above account, has been Curator of the Darrah Collection since it was presented to the Manchester Corporation in 1903 by the late Mr. Darrah's family.—Ed.]

Editorial

WITH this, the fourth number, the CACTUS JOURNAL completes its first year. We are encouraged by the welcome accorded to it, and by the enquiries received from all over the world, to hope that we are offering the sort of information and news that is wanted. Contributions are already being received almost faster than they can be dealt with and the Editor apologises to those people who have kindly sent in articles or photographs that have not yet appeared.

The Journal may be considered to be the most important of the Society's activities, since by this means it is possible to keep in touch with all our members wherever they may be. But the meetings are also important, for the interchange of ideas thus rendered possible increases interest and is often the means of solving doubts and difficulties. But, unfortunately, distance makes it impossible for many members to attend

these meetings, which so far have been held in London, as being the most convenient centre for the greatest number of people. There are several other parts of the country where a number of members live within reach of each other, and where local meetings might be arranged, even if these were small at first. The Council have discussed the question and are prepared to offer any assistance they can; but it is best if the first move comes from some one in the locality, who knows the conditions there. If any one feels sufficiently energetic to convene a meeting of such members as live near, he can feel assured of the support of the parent body. The more local centres we have the better; if one has a hobby, one can take great pleasure in it by oneself; there is also pleasure in showing it to friends, ignorant though they may be on the subject; but the greatest pleasure—and profit—comes when there is an opportunity for discussion with some one with similar interests.

Exchanges

Major G. Nottidge, of River House, Earls Colne, Essex, going permanently abroad after Michaelmas, wishes to dispose of his Collection at moderate cash prices. Three hundred varieties, mixed Cacti and Succulents. Immediate preliminary enquiries invited.

Dr. H. T. Marrable, St. Matthew's Vicarage, Croydon, would like to exchange other *Euphorbias* for the following, which are small rooted cuttings:—

Euphorbia mammillaris.
 „ „ *spiniosior*.
 „ *pentagona*.
 „ *procumbens*.
 „ *splendens*.
 „ *viperina*.

Copies of No. 1 of THE CACTUS JOURNAL (September 1932) are now very scarce, and the Editor would therefore be obliged if any readers holding spare copies would communicate with her, as new members of the Society cannot be supplied except by means of present readers' unwanted copies.

Backeberg Expedition

THE following letter has been received from Herr Curt Backeberg written to us from Lima, during his present collecting expedition.

Central Peru,
March 1933.

DEAR CACTUS FRIENDS,

Many of you will perhaps be surprised to hear that I have so suddenly and secretly vanished into South America. But there were good reasons. For the last two years various ideas have been going round in my head concerning the distribution of Cacti, regarding the correctness of which I cannot yet make any definite statement. The only one I have so far confirmed is that the *Binghamias* described by Dr. Rose are nothing of the kind, but have spread from Ecuador to Central Peru; (on account of their rotate flowers which do not arise from areoles furnished with a true cephalium, I have designated them *Haageocereus* g.n or subg.n). Further, that Peru harbours at least three different species of *Melocactus* and these together with *Haageocereus*, inhabit the low Cordilleras of the western coast. Also it should be mentioned that the true *Espostoa* (*C. lanatus* and *sericatus*) extend far to the south and that the Central Peruvian species, *C. melanosteale*, (the fleecy, white species) is rather local and must be separated off as *Pseudoespostoa* (on account of its more lateral cephalium). It is no *Cephalocereus*, as Dr. Werdermann calls it in my book, but on account of its flowers, fruit, seeds and habit, a species closely related to *Espostoa*, which has been further evolved by change of climate and restricted occurrence, but which has originated from the species of the High Cordilleras.

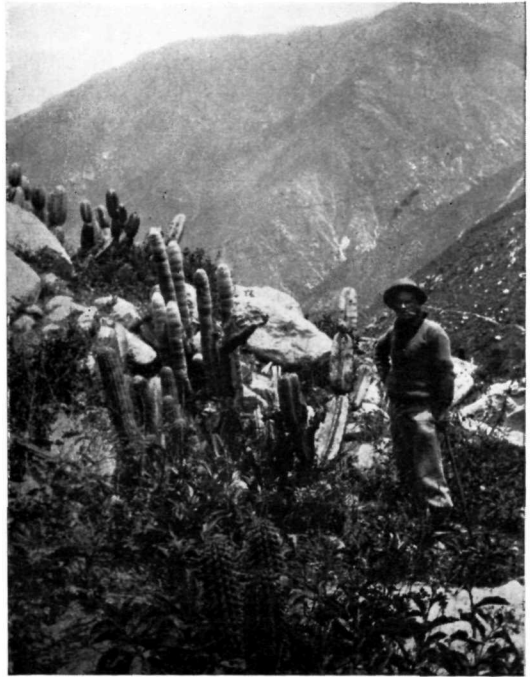
As you know, it is my hobby to study the wanderings of the Cacti and in this case, where the *Cephalocereus* cannot possibly have migrated up the valleys of the Cordilleras the establishment of the relationship of *C. melanosteale* is of great interest to me. And now what next? I myself must also wait for that.

Perhaps I shall see many new things and perhaps we can then get a clear picture. Perhaps one day it will be clear too, whether the submerging of the land in the Gulf of Mexico was not a "flood" for the Cacti, which annihilated many old traces, as the invasion of the waters of the Mediterranean did earlier for neolithic and heliolithic Man.

All this is still castles in the air, and the

further pursuit thereof is the aim of my journey. Since I know nothing for certain, I have not alluded to it. . . . I will do that when I can really confirm something interesting. All this does not matter so much to you as to hear what I can tell of my trip up to now.

Well, it was full of variety! At one time I was hunting over the coastal Cordilleras in northern Peru and found three new species and one new variety (it appears) and also a rare *Melocactus* which in old age becomes spherical without ribs and has a cephalium like a lamp chimney. A very peculiar gentleman.



Pseudoespostoa melanosteale.

In Central Peru in the higher districts it was the rainy period. What that means, I had the pleasure of experiencing to the full for the first time. On the shore it was the hottest summer weather, when I started upwards; at 2,000 m. it began to rain really hard and when I had reached about 5,000 m., seven hours later, a snow storm howled through the high valleys, together with thunder and lightning, so that I only ventured into the open with the greatest hesitation. It so happened that, because of the necessity of saving time, I got up to 5,000 m. in the course of six hours, without being able to acclimatise myself, and next day, was back

at 2,000 m. This means a very considerable strain on the body, when one cannot sit still, but must go out collecting. And on this occasion we had to work quickly. Hardly half an hour after arrival, I was already starting down again; after an hour and a half, the snowstorm stopped, thank goodness, and then the snow began to melt. Really not very pleasant!

And just think, *Opuntia floccosa* grows in such a site, damp with snow and water, and at this time of the year is shining a beautiful snow-white like its surroundings; it grows its purest and most splendid new coat of hair at this period. The large groups look marvellous. But one had to consider the packing very carefully. Would they arrive sound or rotten? I had no time to think about it, the most important thing was that the seeds were full ripe. It must be left to the ventilation holes to do their duty properly.

A few days later we sat amongst the red hot rocks of the lower Cordilleras and took films. This will also be of interest to you. This time I am taking a film of my whole collecting expedition, and if all the strips turn out well and I return home in good health, I hope to give you the opportunity of repeating the journey by means of the film, and to show in moving pictures the beauty and the thrill of such a cactus hunt. We pulled ourselves across a rushing torrent by means of a wire rope, searched the wildest fissures of the mountains with the rope, and like the Guachos drove our asses and mules back home again.

But all this is only the prelude. The majestic beauty which calls me ever onwards to yet more distant Cordilleras, I hope to capture in even larger measure, so that you, too, may fully appreciate what I have hardly had a chance yet of realising. The work and the continual necessity of altering arrangements prevents me. Really to appreciate all the new and beautiful things that I keep meeting out here will only be possible for me when I can see the finished film in peace from an armchair.

I have photographed old Inca towns and in many places I was astonished to find behind the dead landscape of the sandy coastal strip and the foothills, where there is little water, a fertile land with innumerable flowers, cattle and pasture grounds.

And yet one thing more. Above in the Sierra I found a series of new succulents. I must study them further. Little alpine creatures of the plant world, with round leaves, sometimes beautifully striped, others

again decorated with diminutive sprays of flowers like little garnets. Then again, hairy cushions of little flat green groups with comparatively large purple flowers, plantlets with small bulbs and beautiful mallow-like flowers, in fact, the stony High Cordillera is a rock garden, and a more beautiful one cannot be imagined. Previously I had paid little attention to this, because my chief thought had been to establish many species of cacti. This time I already knew the country. I reached my collecting sites more rapidly and with greater certainty and could therefore turn my attention to the many little floral treasures which Nature has strewn amongst the wonderful cacti across this beautiful mountain world.



Haageocereus acranthus.

But, nevertheless, we found something new. A new *Mila*, with straw-yellow spines, which makes large free-flowering groups and then—yes, the new *Cereus (Borzicactus) Faustianus* which must have managed very cleverly to have escaped discovery till now. I, myself, went once down through the great Quebrade, amongst whose higher rocks it grows. It was only because I wanted to take films amongst the romantic rock walls with my boys, that we found it. It grows in coils like a snake,

has fierce, dark yellow spines, sometimes reddish, and flowers from the old areoles, often on young growths, a bright cinnabar red. It is a most gorgeous sight, since it opens its flowers by day, in contrast to *Haageocereus*, which then has its flowers half-closed, to open again towards evening. Unfortunately, on account of the heat and because the plant grows in unattainable rock crevices, I could not collect much seed, but I hope that the two mother plants I have will set seed during the coming summer.

Now I am cleaning seeds and thinking of my next journey. Much must be considered and arranged. So far I have only been able to develop a couple of pictures, so the supply is meagre, but I hope to bring back a good collection of them. And probably I shall be able to report again shortly if the Editor of the Journal will allow me further space.

In the meantime, many greetings,

Yours truly,

CURT BACKEBERG.

[A provisional list of plants already collected on this trip may be obtained from Messrs. W. T. and H. E. Neale, Newhaven, or from C. Backeberg, Im Sorenfelde 15, Volksdorf, Bz. Hamburg.]

Meetings

THERE was no special subject arranged for the Meeting held on March 7th, members having been asked to bring plants for exhibition, naming, etc., and a number of interesting specimens were shown. Some of these aroused considerable discussion, but it was possible to name quite a number of those exhibited. It is felt that such a meeting affords an opportunity for members to get to know each other's tastes and interests; regular attendants at the Meetings will remember an earlier occasion, in June last, when Mr. H. G. Harrison initiated the first discussion meeting by telling in a most interesting manner why he grew Cacti, and inviting other people to give their experiences. The Meetings in London are always well attended, which makes it the more regrettable that distance prevents many of our members from taking part; the Council is ready to assist in the formation of local branches, wherever there are a few members who could meet together, and are glad to say that one such branch, the Liverpool and District Branch, has already been formed.

Page Fifty-four

Mammillaria Hahniana, Werdermann



This beautiful *Mammillaria* comes from Queretaro, Mexico, and was only discovered in 1928. The plant body is almost entirely hidden by the long white spines and by the bristles in the axils of the tubercles, these bristles sometimes reaching a length of 4 cm. It grows easily, sending out side-shoots from the base, so that large groups are formed. The flowers are small, crimson, and borne in a circle round the top of the plant. *M. Hahniana* was described in the *Monatschr. d. D.K.*, 1929, p. 77. We are indebted to H. Winter, Frankfurt a.M.-Fechenheim, for permission to use this photograph.

Correction

In the article by Mr. Boarder, on *Raising Cacti from Seed*, Vol. I, No. 3, p. 34, the size of *M. dioica* should have been "2 in. across," and not 4 in., as stated; we regret that this error was allowed to creep in. For the photograph illustrating the article, we are indebted to the courtesy of *The Middlesex Advertiser and County Gazette*.—EDITOR.

Cotyledons and Echeverias

By W. G. Theobald

(Read at the Meeting held on April 4th, 1933.)

I WANT to divide my paper up into two or three sections, at the same time apologising for very probably repeating what you have already been told here lots of times before, and long ago found out for yourselves. I have not been able to attend the lectures, so you must forgive me if I teach my grandmother to suck eggs, as the school-boy says.

My first heading is how and why did I start growing *Cotyledons* and *Echeverias*. Well, about five years ago, I went to live in Sussex and bought an old-fashioned house in an old-fashioned town. I saw the garden first, and promptly fell in love with the place. To my great interest, I found in the garden some succulent plants—about twenty or so—that the gardener called *Echeverias*, and half a dozen bigger brethren which he called *Cotyledons*. It took me quite a long time to remember those names, but I remembered seeing many years ago, when I was a child, flower borders edged with these same plants, and remembered feeling pleasure at seeing them. They always looked so neat and tidy. So I promptly started trying to get up a stock. Of course, the *Echeverias* were very simple and by summer we had raised a crowd. Not so the *Cotyledons*. We only slowly increased the stock from side-shoots.

Mind, this was in the days of my complete ignorance—the days when I was hardly fit to trust with anything that grows. During my second summer I began to think it would be nice to try and get some different kinds, and, seeing some growing in a garden, was given some flower shoots to try my luck on. It took a year to get any result, but when obtained, it was most satisfactory, for not only had I got hold of what I consider to be the best *Cotyledons* that I have yet seen, but it aroused my enthusiasm tremendously. So my collecting started seriously—and at the same time my troubles began.

Now, this is where our Society comes in. Had it been in existence in those days, it would have saved me an immense amount of effort, for I could have got in touch with collectors more or less at once. Not only collectors in England but also abroad. As it was, I wrote round to some of the big nursery-men, asking if they had any *Cotyledons* or *Echeverias* (other than the ordinary *glauca secunda*) and if not, could they tell me where

I could get any. In all cases the answer was in the negative. They did not stock any of these plants and did not know where I could get them.

I looked up Robinson's *English Flower Garden*, and found he only gave a short paragraph on *Cotyledons* and *Echeverias*. He mentioned *metallica* as being a noble species and when at last a nursery-man in Somersetshire sent me half a dozen of what he called *metallica* (incidentally they were not *metallica* but *gibbifolia*), I began to feel I was getting on. Also I found one or two odd plants, very dilapidated and unrecognisable, in Brighton, e.g. *Cotyledon Hoveyii variegata*. It was suggested to me in all seriousness that it was called *Hoveyii* because it came from Brighton or Hove!

Then I was more or less completely at a standstill, but a brain wave came and I wrote to Kew. After all, I thought, being a taxpayer I help to pay for Kew, and therefore it partly belongs to me as one of the general public. Why not ask them if they can help me, if they can tell me where I can get *Cotyledons*, and if there is any book or pamphlet on the subject. So I wrote there (that was in March, 1930). I had a very nice letter back from the Curator saying that there was no book or pamphlet published, but he gave me the names of two people from whom I might get plants. One of them has, I fancy, more or less given up and although, later on, I went down to see him once or twice, he was never in and seemed to take little or no interest.

The other, whom fortunately I went to see first, was Mr. Endean, and it would not be fair for me, if I have had any success in growing the plants, not to give nearly all the credit to Mr. Endean. This is not meant to be an advertisement for him, but merely a statement of facts. Mr. Endean met me with open arms and started me off with all sorts of new kinds, and told me all he could and helped me in every way, and still does so. He showed me how *he* grew them and what the result should be. I could not have had a better nor a kinder master.

Now this is a point I particularly want to put before beginners like myself. I don't know whether any of you are fond of old china, old prints, etc. I am, alas! and I have always been told that the best way to

learn to know a good bit of, say, blue and white china, is to have a really good piece always in front of you, on your writing desk or somewhere; the aura of it, if that is the correct word, sort of soaks in, and you thus learn to distinguish the good from the bad automatically. The same applies to *Cotyledons*. It is most essential, I think, especially for beginners and even for those much more experienced, to see plants really well grown, the best possible, and to let the sight sink in. It will give you a feeling of despair almost, but it will give you an idea what to aim at, what your plants should really look like—and that, to my mind, is all important. If you know what your plant *should* look like, the next thing is to make it look as it ought, and that is possibly not so hard if only you start right.

Now a few words about my method of treatment. Mind, I am not satisfied with it, but it is the best I can do at present, and I am not carrying out altogether the instructions I was originally so generously given.

May I start the year round from the beginning of April. In the greenhouse I have more or less three classes of plants; first the cuttings and seedlings, secondly the plants which have spent one or possibly two summers out of doors, and thirdly, those which are well established. The cuttings and seedlings are in ordinary potting soil and I leave my gardener (Mr. R. Baker who has become most enthusiastic) to see to them. He treats them more or less as he would any ordinary greenhouse plant. I mean by treating them, watering more than anything else, for except for an occasional repot (which I generally do), there is not much else to do with them until mid-June. Watering is the real key to the situation, of that I am convinced; once you have mastered that you can grow most *Cotyledons* and *Echeverias*.

The next lot of plants, those which have spent a summer or two out of doors and the older, well established plants are in burnt clay, and I look after these myself. At present, as the growing season is on, I water them about once in ten days or a fortnight, only it is apt to be a tedious job. My watering takes the best part of a couple of days with interruptions, for the best way to water is to take each individual plant down and dip it in a pail or bath of water. As much water as is good for the plant will be absorbed. I do most strongly recommend this method of watering, laborious as it is, for you can clean up each plant as you go (the bottom leaves of *Cotyledons* and *Echeverias* are always drying

off and want removing) and you can also fairly closely inspect the plant and see whether all goes well, or whether there are any noisome beasts about. This goes on to about the middle of June, when I plant out of doors as many as possible of the first two classes, plants that I want to grow on.

I only have a bed on the north side of the house under the kitchen window. However, there they have to go, for as yet, I have been quite unable to persuade my wife that a nice bed in the middle of the tennis lawn is the only place really fit for them. The other beds are not suitable for various reasons; one is used almost entirely, as far as I can make out, as a playground for our neighbour's cats.

Now, these young plants stay out of doors until about the middle of September. As a matter of fact, I generally begin to get nervous and start getting in some of the more precious ones somewhat earlier, because some disaster either has befallen them or is impending. This outdoor life does the plants a world of good, but there are two or three serious disadvantages; a wet or sunless summer, for at the best of times the sun does not reach the bed very much. Then there are the beasts of prey, such as slugs and snails and I was going to add puppy dogs' tails, for we have a puppy. I go round every evening to clear the slugs off, but it pays, as it prevents much damage. I am always particularly careful to place the more precious species in the most accessible spots. Last summer I suffered somewhat from a severe hail storm, which cut the leaves in many cases to ribbons and, of course, until those leaves have come off, the plants look very dilapidated. However, as I say, the outdoor life suits them and by the middle of September when I bring them in they have grown very considerably.

I think Mr. Edean rather recommends not potting them up for a month or so, and I daresay he is correct, but I do not like to have them lying about all over the place, and I am afraid they would soon get knocked about. I pot them straight up in burnt clay, dip them once to steady them and water them thereafter once a month, until the growing season starts again; say, about the middle of February or beginning of March, when I start watering more frequently, about once a fortnight, and getting it down to once in ten days. It rather depends on how busy I am. I keep on like this until bedding out time comes round again.

The well-established plants I do not put out of doors, as I dare not risk damage to them by slugs, cats, rain, hail, etc. Apart

from anything else, the rain deadens the bloom, which does not recover till the spring. Also, at the back of the bed the plants are inclined to grow coarse, the situation is too damp for them and they do not get sufficient sun. One has to be very careful in handling these plants, for the least touch will take the bloom off and once the bloom is off it will never come on again; but there is this comfort, one knows that in time the damaged leaf will come off and it is generally the bottom leaves that do get damaged and they are the first to die off. This, then, is my general procedure, but the treatment must, of necessity, vary somewhat with the different kinds, in fact, one should try and study all their fads and fancies and individual needs, just as you would children.

Now, my third heading is propagation. I was asked some time ago how to propagate a certain *Cotyledon* and I said there were at least five methods: (1) from offshoots; (2) from flower-shoots; (3) from leaves; (4) from seeds, (5) by going out into the garden, searching for and catching, the fattest slug, and inserting it in the centre of the plant. This last method I don't recommend, but I found the ordinary garden slug a most efficient propagator and it certainly taught me how to proceed (that is, cut the eye out); so you have a pretty wide choice, and where one method fails you have several others to fall back on.

Sometimes one finds a plant gets too leggy, so one has to cut it down and re-root it, which I generally do in ordinary soil, getting it into burnt clay later on.

Then I think I should say a few words about the enemies and pests in the greenhouse, and the first and greatest of these is the watering can. It is very apt to be used too much and overwatering is far, far worse than underwatering. Moreover, it is very difficult indeed to water with a watering can without sometimes touching some projecting leaf or sometimes dropping water where you don't intend. A drop of dirty water leaves a stain, and some *Cotyledons* (for instance, the true *metallica*) cannot bear a drop of water in the eye. It is fatal in most cases, and now I am very careful what plants I put under the light in the greenhouse, in case there is a drip. A syringe is not allowed in the greenhouse. The natural rain out of doors does no harm in this way.

Then there is a foul root bug, a white beast of sorts. I expect many, or most of you, know the gentleman in question. He is no gardener at all. He eats the stalk and bur-

rows right up it until one day you find the whole plant has collapsed. I don't think I should get him if I kept all my plants in burnt clay and did not plant any of them out of doors. There are also two kinds of beetles, one is possibly the descendant of the root bug (I don't know), but I don't encourage either of them as they eat the leaves. Greenfly one occasionally gets, but it is generally on the flower, and by cutting the flower off, one is free of this trouble.

In the summer time I have a small hospital ward out of doors for odd plants that I am not quite happy about, something seems wrong and I am afraid of them. At present, I am glad to say, I have no prospective patients. In the winter time I isolate doubtful plants by bringing them indoors, so that I can watch them more closely.

Can you put up with me for two minutes longer, because there is just one other point I should like to bring before you. I try and specialise in *Cotyledons* and *Echeverias*, and, except for about half a dozen *Aeoniums*, I allow nothing else in my greenhouse. I think it is probably very difficult in a small greenhouse to get really satisfactory results unless you do specialise to some extent. I have seen time and again *Cotyledons* huddled up with Cacti, etc., and all looking very miserable, whereas a collection of one or the other would probably have been far more satisfactory, and I think the same would apply if you have only a room to grow them in.

Exhibition

Schedules have been sent to all members and it is hoped that every one who can possibly do so, will bring plants and help to make the exhibition a great success. This is the first Cactus and Succulent Show that has been held in this country for many years, and we must make the most of this opportunity of impressing on a larger public, the interest and fascination of these plants. The classes have been designed to suit every one, whether they have a large collection or a small one. If any point is not clear, the Hon. Secretary will be glad to answer questions.

Remember June 20th, Cactus and Succulent Show.

THE CACTUS JOURNAL is published quarterly, in March, June, September and December. It is sent free to Full Members of the Cactus and Succulent Society of Great Britain, the annual subscription for Full Membership being 10/-, payable to the Hon. Treasurer.

Conophytum Lucipunctum,
N.E.Br.

Stemless. Growths 6-11 lines long, 4-7 lines broad and 4-6 lines thick, in side view oblong, but narrowed at the base, with a shallow notch $\frac{1}{2}$ -1 line deep at the very slightly compressed top, the very short lobule on each side of the notch is rounded in both side and dorsal view and viewed from above the outline is elliptic or circular; orifice $1\frac{1}{2}$ -2 lines long, with closed lips; surface glabrous, smooth, uniformly green all over or purplish on the basal part, somewhat thinly sprinkled with large darker green dots that are not very conspicuous (except in winter time) unless seen against the light, when they are very conspicuous and pellucid and the tops of the lobules are faintly semi-transparent. Flowers not seen.

Van Rhynsdorp Division; near Van Rhynsdorp, *Pillans*.

This distinct species belongs to the section *Biloba*, and would appear to be a connecting link between *C. cylindratum*, Schwant. and those species that have a more or less pellucid top like *C. Pillansii*. Although I have had it in cultivation for several years it has never flowered, so that it may be one of those that do not flower freely under cultivation.

Conophytum Miserum, N.E.Br.

Stemless. Growths small, 4-6 lines long, $3\frac{1}{2}$ -5 lines broad and $2\frac{1}{2}$ - $3\frac{1}{2}$ lines thick, compressed obcordate, sharply keeled at the top and with the shallow notch between the lobes not more than $\frac{3}{4}$ line deep, and the lobes in side view rounded at the top, but flat on the face in the notch; surface slightly harsh to the touch from being covered with microscopic points, light grass-green, with a row of confluent darker green (or perhaps in full sunlight purplish) dots along the keel and another outlining the gaping orifice in the notch, and a few dots scattered here and there over the surface, but usually all are more or less indistinct. Calyx entirely included in the body of the plant, 4-lobed; tube $1\frac{1}{4}$ line long, lobes $\frac{3}{4}$ -1 line long, oblong, rounded at the apex. Corolla very small and insignificant, only $2\frac{1}{2}$ -3 lines in diameter in one direction and $1\frac{1}{2}$ line in the other direction, being squeezed between the lobes, expanding in the evening at about 5 p.m., closed during the day, very faintly scented; tube $1-1\frac{1}{4}$ line long, included in the calyx-tube, whitish; petals about 16-18, in 1-2

series, $1\frac{1}{2}$ - $1\frac{3}{4}$ line long, $\frac{1}{6}$ - $\frac{1}{7}$ line broad, scarcely rising above the level of the top of the growth, linear, very acute, light yellow. Stamens about 12-14, in one series, arising from the bottom of the corolla-tube, 2 lines long; filaments white; anthers yellow, partly exerted. Glands in a crenated ring. Style none; stigmas 4, filiform, about $2\frac{1}{4}$ lines long, pale yellowish above, fading into whitish below.

Little Namaqualand: near Grootmist, *Maughan Brown* (Muir 4235).

This species must be regarded as one of the "poor relations" of the section *Biloba*, to which it belongs, because that group includes all the most striking species—the nobility—of the genus, while *C. miserum*, in its flowers, is perhaps the most insignificant and inconspicuous in the whole genus. This fact, anomalous as it may seem, lends an interest to it from the collector's point of view. It was sent to me in 1927 by Dr. J. Muir, with the information that it had been collected at the above mentioned locality by Dr. Maughan Brown. It has now flowered for the first time and is evidently nearly allied to *C. hians*, N.E.Br., of which I have not seen the flowers.

N. E. BROWN.

Letter to the Editor

Extract from a letter to the Editor from M. Maurice Damagnez, Bourg la Reine:—

"I should like to tell you of an accident which happened last year in the greenhouse of a friend of mine; it is most instructive with regard to the resistance of cacti. Through oversight, a box of sulphur was left near the stove heating the greenhouse; this caught fire and, on his return, the gardener was met by an appalling sight. The first thing to do was to open all the ventilators. The result of the accident was the loss of the soft plants such as Anthemis, Geraniums, Salvias, Ageratums, etc.; there remained alive only the Epiphyllums and Phyllocacti, the Clivias, and one or two Echinopses; in fact all the cacti that were there had escaped, no visible damage having resulted to these plants."

Growing Cacti Outdoors

By F. E. Cooper

HAVE you ever tried the experiment of making an outdoor bed of Cacti, or better still a small rockery? It is worth trying and if carried out properly as regards choice of position and a well drained bed, the plants will be much better for three or four months fresh air, rain and sunshine.

This is not an article on how or how not to do it, but simply the results of personal experience; possibly the climatic conditions in the Isle of Wight are more favourable, and what would flourish here might not do so well in other localities. My garden being well exposed to sunshine, I have not much difficulty in selecting a suitable spot; as long as it is not under trees, any warm corner will do. No special soil is used; plenty of broken brick is dug in and a lot of sand direct from the seashore is worked in as well, this being the only preparation as regards making up the bed. The bed is now ready to take practically any variety.

A start is usually made about the end of May or beginning of June, plants being put out as time and opportunity permit. The *Opuntias* are usually the first to be put out, and of this family I leave none in the greenhouse, but turn them all out, putting them right in the soil, the pots being put in a tank for washing later on. It is really wonderful the growth *Opuntias* make when treated this way. Varieties which at first I was very dubious about leaving out in rain and shine seem to do better than those which one would expect to rough it. For instance, *O. microdasys*, which most books tell you to give a dry treatment, seem like different plants after a few weeks, leaves much larger, thicker and healthier looking, and a positive abundance of new growth.

Two others which did not do at all well indoors are *O. Santa-Rita* and *O. Herrerii*, two fine varieties of the purple leaf kind; these did remarkably well and put out new leaves of a quantity and size that was very gratifying. The biggest surprise was *O. erinaca* and *O. ursina*, the popular Grizzly Bear types; these plants after a few weeks seemed full of the joy of life and, if appearances are

anything to go by, were full of thanks for this fresh air treatment.

The commoner varieties grew nearly as tall as myself; their size got rather embarrassing, so much so that I had to give about 20 or 30 large plants to our local authorities to make a cactus bed in the local Public Gardens this summer. When I have finished putting out the *Opuntias*, large stones are collected and placed indiscriminately around to give it a more natural appearance, and in the clefts and spaces between these stones plants of all sorts are put, *Cereus* especially, young plants being chiefly used. It is an eye-opener to see these *Cerei* after they have been out for a few weeks, fat, healthy and skins shining like children's faces when they use too much soap. Large *Cerei* in big pots, also large *Echinocacti* are placed out in their pots to form an avenue which looks very quaint. As to other varieties that go out in this bed, *Echinopsis* do well, the green *Echinocerei* make wonderful growth, but the *pectinatus* varieties do not do so well—rather too much rain for them. *Mammillaria* do well, especially the quick growing types, *centricirrha*, *durispina*, etc., but the white-haired varieties are safer under glass. *Phyllocacti* well repay putting out, either straight in the soil or in their pots, making rapid growth and storing up sufficient nourishment to keep them looking well until flowering time comes round. *Pilocerei* do well, but *Cephalocereus* do not stand the too frequent rains. In my outdoor beds *Opuntias* have flowered, also *Phyllocacti*, and one especially fine piece of *Echinocactus Ottonis* had six lovely blooms that opened each day for a much longer period than they would have done indoors.

There are drawbacks of course; the only serious one, however, is slugs: these pests will soon make an inroad into a nice specimen of *Opuntia* and make a leaf look like a sieve. I keep them down as much as possible by watering the beds with salt water, putting three or four bars of salt in the tank. This treatment seems to suit the plants well and keeps the slugs from getting too busy. Last year (1932) I had two large beds of cacti growing outdoors, and whilst it entails a certain extra labour in putting out and taking in again, the results are more than worth it.

Book Reviews

“DIE SUKKULENTEN,” by H. Jacobsen, published by Paul Parey, Berlin, 1933, price 14 R.M.

Although numerous monographs have been published on the various genera of succulent plants, a general handbook on the subject has hitherto been lacking. The appearance of *Die Sukkulenten*, by H. Jacobsen, will consequently be heartily welcomed, for this book gives brief descriptions of most of the succulents (excluding cacti) met with in cultivation at the present time, not excepting many of the rarer species and genera. Full botanical descriptions of the species are not given, but such characteristic features of each plant are enumerated as will enable the possessor to identify the plants in his collection. The excellent descriptions are enhanced by numerous photographs of the plants chiefly taken from cultivated specimens. The photographs are very clearly reproduced and by themselves will afford much assistance in naming a collection. The 219 illustrations include some 300 species, as in many cases two or three species are shown in one picture; this procedure is very helpful as it enables direct comparisons to be made of similar plants without uncertainty as to their relative size.

Without attempting to give a complete list of the genera dealt with, the following particulars will suffice to indicate the scope of the work. Eight species of *Adromischus* are described, 24 *Aeoniums*, 26 *Agaves*, 19 *Aloes*, 63 *Euphorbias*, etc.; the *Mesembryanthema* are subdivided into the genera proposed by Dr. N. E. Brown in his revision of the group and are alphabetically arranged under the general heading *Mesembryanthemum*, 330 species being described. The most frequently occurring synonyms are quoted and copious cross-references in the lists of species, which are arranged in alphabetical order, renders the finding of any particular description an easy matter.

The book is very well produced and the careful use of heavy-faced type and italics, greatly assists easy reference. All who read German will find this handbook of great value; others will regret that it is not also available in an English edition, as its scope so exactly fills the need for a general but not too exhaustive account, of the succulent plants now to be met with in so many collections.

EDITOR.

“THE STUDY OF CACTI,” by Vera Higgins, M.A., with a Foreword by Sir William Lawrence, Bt., V.M.H., published by the Blandford Press Ltd., price 7s. 6d.

This book supplies a very long-felt want, and will be of the greatest assistance to all cactophiles, whether highbrows or those who are just beginning to know the great interest and pleasure that can be got out of collecting cacti and succulents. The pleasure is enhanced, for beginners, by the fact that an extremely interesting and varied collection can be got into a very small greenhouse.

There seems to be an inclination amongst some collectors to wish to ignore Drs. Britton and Rose's new nomenclature of genera. This should not be. It is essential that we all follow it, as they do in the United States, and a collection becomes more interesting when we do follow it. Take the *Gymnocalyciums*, for instance; we find that all the flowers are similar in shape, with naked ovaries, as the name implies, and they are quite distinct from other *Echinocacti*. This book should arouse many people in Great Britain to take up this branch of horticulture. They will find in it everything they are likely to want to know. In other European countries, in Germany especially, there are many more enthusiasts than in Great Britain; there and also in Holland, one might almost say that every house has its array of small cacti placed in the windows. With a suitable book, in English, to help, there is no reason why we should not follow suit.

The book contains chapters on the History of Cactus Culture, on Classification with comparison of the systems in use, and on Geographical Distribution. In the chapter on Nomenclature the meaning of the generic names is given and there are seven pages of specific names in common use with their meanings. This is most useful in checking names. A General Description of the structure of cacti is given and the method of growing and propagating these plants is described. Brief descriptions of each of the Britton and Rose genera are appended, and there is a Bibliography. There are also illustrations of typical plants. The compilation is most thorough and valuable, and is the most important work in English, only excepting Britton and Rose's Monograph on the “*Cactaceae*” in four volumes; one might describe it in its Latin name as “*Vera multum in parvo et vade mecum cactorem Higginsiana.*”

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