Although the genus Lesemium contains several hundred species, many of which have showy flowers, it does not seem to find much favor with the horticulturists of the present day, for there are comparatively few who cultivate them, and they are not to be found in many gardens. Yet where they can be fully exposed to the sun they make a grand display of flowers, and require much less attention than many other plants.

The members of this genus undoubtedly merit more recognition and appreciation by the gardener than they usually get in this country, for none can deny the beauty of the flowers, their only fault being that they love sunshine, and many kinds will only expand their flowers when the sun shines upon them, others only at certain hours of the day, and others at night. Lastly they are cultivated under glass, but they thrive best when exposed as much as possible to air and sunshine.

It may not, perhaps, be generally known that in the south of England and Wales, and even on the cliffs of the east coast at Bawdsey Manor, near Felixstowe, I am informed by Mr. Irving that many species are grown in the open air and are quite hardy, for they withstand the average winter, and flower in great profusion in the summer, making a grand display in such places. Whilst admiring a fine clump of M. falciforme growing out-of-doors in this way at Tenby, and so densely covered with flowers that they touched one another so as to nearly conceal the plant, I was told by the lady who owned it that, although it flowered in this profuse way when treated as a hardy plant, yet when grown in her greenhouse, it produced only a few flowers, thus demonstrating the preference of these plants for open-air treatment.

Among those that I think could be grown in the open air successfully, especially near the coast, or treated as bedding plants, are M. falciforme, M. falcatum, M. hispidum, M. coccineum, M. Brownii (which is probably a garden hybrid), M. luteum, M. aureum, M. volvatum, M. multiflorum, M. deltoides, M. Heworthii, M. heterocetalum, and M. multiradiatum (syn. M. blendum).

Unless the season were unusually wet and cold, I believe most, if not all, of these would thrive and make a good display if thus treated, but they would require to be grown in porous well-drained soil. Fig. 40 illustrates the kind of display these plants make under favorable conditions. It represents a clump of M. lineare, Thunb. (better known as M. tricolor and M. pyropeum), a very pretty annual, with linear channelled leaves, and daisy-like flowers that vary in color being white or purple, or purple with a white eye. Yet all cannot be grown in this manner, many being impatient of too much water or great humidity of the air when they require to rest, but during the warmer part of the year, if they could be placed in the open air, fully exposed to the sun, and protected by a glass roof (without sides) to shelter them from rain, and carefully watered, I believe all the species would thrive much better than they do as grown in a greenhouse.

During a lengthy experience in the cultivation of the stemless species of this genus, I have found it preferable to water these plants either by standing the pots containing them in a shallow tray of water and allow the water to soak upwards, or by plunging the pots in earth and keeping that earth damp, without watering on the top of the soil in which the plant is growing, although during
hot weather the latter method answers very well and does no harm, provided that it is not overdone, and at the same time sufficient water is given to soak down to the region of the root-tips. For, if the latter are allowed to get too dry, so that they die, then when water does reach them they rot and often cause the death of the plants. The watering of the more delicate species is an art that cannot be explained by words, and can only be acquired by experience.

This genus, as at present understood, is so vast and contains so many species that are undescribed although already under cultivation, besides a large number that can certain yet remain to be discovered, that the monographs of the present day are quite useless for distinguishing closely allied species, for many are so similar in general appearance that, when seen separately, two species are liable to be (and often are) mistakenly supposed to be identical. So that names under which some of these plants are found in gardens are often entirely wrong. As an instance I may cite a plant cultivated in gardens and also described in Berger's monograph of this genus as being M. crinums. It is not that plant, however, but a smaller species allied to it, which I last year described in the Journal of the Linnean Society, Vol. XLIV, p. 36, under the name of M. cramulatum. Sometimes, also, synonyms are manufactured by nurserymen, especially those on the Continent, who seem only concerned in the selling of their plants, without taking the trouble of identifying them. As an instance of this, M. concinnum (Fig. 49) may be quoted. This is one of the prettiest and neatest of the stemless group that I have seen, and forms an excellent contrast to its equally charming ally, M. calcareum. It has a rosette of short, blunt, somewhat clavate leaves, beautifully marked with slightly raised, white, wart-like spots. It was described by myself in the Gard. Chron. for 1916, Vol. LX, p. 204, from a plant formerly in the collection of Mr. G. Elisha and now in my possession, of which Fig. 49 is a life-size representation that, unfortunately, does not give a good idea of the beauty of the plant, colour being absent. Afterwards I learnt that it had been figured by Dinter in his Neue und wenig bekante Pflanzen Deutsch Südwest Africa, p. 58, t. 56 (1914), as being M. calcareum, from which it is very distinct; and now it is being sold by Continental nurserymen under the name of M. Schwaanesis. From some cause quite unknown to me, I find that during some years the coloration of the leaves is much brighter and more pleasing than in others. Possibly a difference of sunlight may produce this effect. M. calcareum also varies, but with me its leaves are usually of a beautiful murrish tint. This confusion of names is not to be wondered at in the present state of our knowledge, and only when the undiscovered species of this genus have nearly been exhausted, and a really workable monograph of it made, can we hope to remedy it.

N. E. Brown

(To be continued.)

Mesembryanthemum and some new genera separated from it.

(Continued from page 126.)

Whilst writing this, I have in flower two distinct species from the Transvaal, so much alike in foliage that, if seen separately in different collections, when out of flower, would
almost certainly be mistakenly thought to belong to the same species, and, moreover, I feel sure that South African botanists have mistaken one or the other of them for the Rhodesian N. Mahoni, because Dr. Harloth has stated in his Flora of South Africa, Vol. 1, p. 198, that the latter is a Transvaal plant. One of these transvaal plants is N. herberum, which I described and figured in the Journal of the Linnean Society, Vol. XLV, p. 108, t. 10, f. 43, and of which Fig. 55 is from a photograph, and of about half natural size, taken by my daughter from my type plant. The other is N. macellum, a new species described below, of which Fig. 56 is also

* Mesembryanthemum macellum, N. E. Brown. Rootstock, a fleshy cylindric tuber about 1½-2 in. long and 4-5 lines thick, with a brown skin, producing a cluster of stems at its apex. Stems 2½-5 in. long, 1/3-3/4 line thick, slender, weak and often bending down with the weight of the capsule, terete, glabrous but minutely papillate, with the corollae arranged in crowded irregular transverse bands or lines. Leaves 1½-1 in long, 1½-1½ lines broad, and about 1 line thick, more or less spreading and scarcely connate at the base, serpiterete, tapering to an acute apex and channelled down the inner surface, glabrous, densely and minutely papillate in crowded longitudinal rows, dull greyish-green. Flowers about 1-3 to a stem, distant, developing singly, without other flower-buds apparent on the same stem. Pedicels 7-20 lines long, erect, papillate like the stem, bractless. Calyx 5-lobed; tube (ovary) sub-hemispherical; lobes unequal, two of them 2½-4 lines long, leaf-like, without membranous margins, the others 1½-2 lines long, and broader than the other two, with membranous margins and a short dorsal acute point, all dull green and papillate like the leaves. Corolla 7½-10 lines in diameter, rather flat expanding in sunshine, not scented; petals about 2½-3½, in 1-2 series, most of them rather crowded and more or less over-lapping, widely spreading from the base, 3-4½ lines long, 1/3-3/4 line broad, cuneately linear, flat, obtuse, entire, with 5-10 smaller linear or filiform petals 1½-3 lines long, irregularly placed inside the outer series; all uniformly bright deep rosy-purple. Stamens numerous, erect, becoming lax with age, about 1 line long, scarcely or not at all raised above the general level of the corolla; filaments filiform, with a tuft of hairs at their base, whitish, the outer without anthers and reddish; anthers deep yellow. Style, none; stigmas 5, arising from the flat top of the ovary, 3/4-line long, stout, tapering to a fine point, all erect and connivent into a cone, never spreading, pale greenish-yellow. Capsule about 3 lines in diameter, flat-topped, 5-valved; valves winged at their margins and with one central expanding keel, entirely whitish; cells entirely wingless, with the seeds uncovered. A native of the Transvaal. Described from living plants collected by Dr. T. N. Leslie and sent to England in February, 1921.

from a photograph of my type plant, about one-third natural size. These two plants and N. Mahoni (described by me in the Gard. Chron., 1922, Vol. XXXIII, p. 190) are so very similar in appearance when out of flower as to easily be mistaken for one another when seen separately, that the following diagnostic characters may prove useful for distinguishing them. All three have their somewhat
138 Arevish-green leaves densely covered with minute, dull papillae.

Stems 1-1 1/2 lines thick; flowers in more or less compact cymes, quickly succeeded one another, each with a flower bud formed on one or both sides of it before the flower fades; petals lax, not touching one another; stigmas always spreading.

Pedicels 4-6 lines long; petals entirely bright violet-purple.

M. lehoni

Pedicels 1-3 lines long; petals white, or white with pale purple tips. Transvaal.

M. herbeum.

Stems 1-2 1/2 lines thick; flowers solitary at distant intervals, not forming distinct cymes, nor with a flower bud forming beside each flower while the flower is open.

Pedicels 2-20 lines long; petals touching or overlapping one another, bright rosy-purple; stigmas collected into an erect cone, never spreading.

M. macellum is evidently self-fertilised, as each of my three plants of this species has expanded its first flower (the only one then on my plants) at a time when no other plant of any species of the genus had a single flower (even in bud) upon it, yet that flower in each case produced and ripened a capsule containing good seed, that has germinated, and since then I have several times had each of these plants in flower separately, so that they had no chance of being pollinated by each others' pollen, yet all the flowers seem to be fertile. On the other hand, M. lehoni and M. herbeum seem to require to be cross-fertilised, otherwise neither produce capsules, and the flowers of M. lehoni often fell off the pedicels, leaving the latter to wither and harden. I have not observed this falling of the flower from the pedicel to be the case either in M. herbeum or M. macellum.

The three above species form a little group that appears to me to be best placed under the section Diciflora, but seem also to have connection with such species as M. hirtum and M. Cooperi.

From the gardener's point of view, the merits of the genus Heseembryanthemum rest upon the attractiveness of its flowers. Yet, apart from their floral merits, there are many species that have hitherto been included in the genus Heseembryanthemum that appeal strongly to those who are interested in plant life, on account of marked peculiarities they have in appearance, habit, mode of growth, or structure. For it is not generally known that this genus, as at present constituted, contains some of the most remarkable plants that exist. Certain of them well deserve a place in the collections of those who have a liking for curiosities of the plant world, for, besides being remarkable, some of them produce very charming flowers. It is to some of these extraordinary plants that I wish to direct attention, because I think the time has now come when they should be generically separated from Heseembryanthemum.

N. E. Brown

(To be continued.)

Heseembryanthemum and some new genera separated from it.


(Continued from page 138.)
151 species of *Lesemibryanthemum*, which he grouped under 69 different sections. Some of these sections are so utterly different in appearance from others in their vegetative characters that many would not recognise them as belonging to the same genus. Yet not only are the vegetative characters of many different groups found to merge into one another through intermediate groups, when a sufficient number of species are studied, but the floral characters are very similar or practically identical in utterly dissimilar groups, so that it has hitherto been found impracticable to separate the groups generically by any absolute characters.

This was evidently the experience of Harworth, who was the first to properly monograph this genus, for on p. 79-80 of the work above mentioned he writes, concerning the groups he has characterised, as follows:— "It is to be believed that the above numerous and natural groups comprise amongst them several true and natural genera. Nevertheless their actual limits and essential characteristics (except in *H. glabrum* hereunder detached) lie veiled in difficulties which (thus far, at least) escape development and defy research; they will not be fettered. And yet the author once had vainly hoped that the *Minima*, from the tubular corolla of some of them; the *Linelliformis*, from their quadrifid calyces and multilocular capsules; the *Articulata*, from their hard coloured internal reticuloid fimbriolee (and their small number of abbreviated true filaments), keeping even continually their lovely flowers; the *Sesamochila* and the *Pterfoliata*, etc., etc., might each have constituted a distinct genus (and they probably are such). But he has hitherto been so effectively foiled by such insensible shades and intermediate gradations of character amongst species even of the same section (the *Minima* not excepted) that he has not yet been able to reconcile their discrepancies."

For many years past I have cultivated and studied the groups to which Harworth gave the sectional name of *Minima*, now known as the sectional name of *Minima*, now known as the Schizoid group, and also others allied to that group, very many of them quite unknown to Harworth. In the course of that study I have noted characters associated with their odd appearance not shared by other groups. So that by taking their habit, peculiar mode of growth, floral characters, and certain vegetative peculiarities into consideration, we now have sufficient distinctive characters to separate them generically from *Lesembryanthemum*, as I here propose to do.

But before dealing with them systematically it may be of interest if I give particulars concerning this genus as a whole that are not known to the average plant-lover. Some of the details to be mentioned, however, were published last year in the "Journal of the Linnean Society."

Starting work with the seed-vessel, we find that *Lesembryanthemum* has capsules of more complicated structure than any other genus, some of them being of such a remarkable character that at first sight they would seem to be specially designed to prevent the seed from escaping. The structure of the capsules, dispersal of the seeds, and the development of the seedlings of this perfectly unique genus form a most interesting study, so that it is surprising that no one appears to have paid any particular attention to the peculiarities of structure of the capsules of *Lesembryanthemum* and the mode of its seed-dispersal. In descriptions of the specie the capsule is practically ignored, the only detail mentioned being the number of its valves. Yet from the large number of capsules I have
examined during the last two years, belonging to several sections of the genus, it is evident that the structure of the capsule when seen in an expanded condition offers, affords excellent characters for specific distinction. Therefore, the following brief account may be of some interest and bring to the notice of South African students what a field for research they have in this extraordinary genus, which for several decades past seems to have been practically tabooed, perhaps because they are "succulent plants."

The capsules of all the species of *Mesembryanthemum* open by valves, which vary from four to twenty or more, according to the species, and are well known to be very hygroscopic, so that the valves automatically open during wet weather and shut up tightly during dry weather. When fully expanded the capsule has a very pretty star-like or "flower-like" appearance, and it is often differently coloured at different parts, and is then quite attractive. This property of opening when wetted and closing as they dry, and their prettiness, has caused them to be occasionally sold in London as the "Rose of Jericho," a name that belongs of right to one of the Compositae from the Orient, but is also shared by a Cruciferous plant, also from the Orient, and by *Selaginella* from Mexico. Fig. 61 represents the capsules of eight different species when closed in dry weather, exactly as they would be when viewed from above upon the plant. They are always stiffly erect or in those that lie upon the ground the valves are directed upwards, so that when closed in this manner no amount of shaking by the wind or other disturbance can possibly cause the seed to be liberated from the capsule.

![Fig. 61. -- Capsules of *Mesembryanthemum*: (A) *K. Heathii*; (B) *K. pilosum*; (C) *K. Sondii*; (D) *K. lonsum* (?); (E) *K. romeridium*; (F) *K. sp.; (G) A new species of the spheroid group; (H) *K. species allied to K. heathii*. All natural size.](image)

![Fig. 62. -- The same capsules as in Fig. 61 when expanded by wetting; Natural size.](image)

Fig. 62 represents (after removing the six-valved capsule from A) the same eight capsules as they appear when fully expanded after being wetted, and as they would appear upon the plant after rain has fallen upon them. A few hours after the rain has ceased they dry up and the valves close up tightly again until the next fall of rain comes. This opening and closing may be repeated several times, as the capsules remain on the plant of perennial species for months or for two or more years. It is during the time that the capsule is expanded that the seeds escape from it or are dispersed, yet how this is effected in some cases I am unable to state, for as far as known to me it is at present an unsolved problem. In other cases, however, the method is simple, as will appear when the structure is understood. Certain it is, however, that the seeds require to be dispersed during wet weather in order to give them a chance to germinate and grow, which they could not do during dry weather.

If a capsule of the very complicated type represented by D in Fig. 62 be examined when expanded, it will be noted that upon the inner surface of each valve or lobe there are two keels ending in free membraneous wings (marked o). In this specimen the wings had
dried and curled up whilst being photographed, but can be seen on
one of the lower lobes, and similar wings are better seen on the
specimens A, B, C, H (Fig. 62). These keels are freely of a
darker colour than the rest of the capsule, and consist of a horny
water-absorbing tissue that forms the mechanism by which the valves
are opened and closed. As no designating term has yet been ap-
plied to them they may be called extending keels. In some species,
as in D, the keels are quite separate, in others, as in A, B, C,
E, they are closely continuous or united at their basal part and
more or less separate or divergent at the apical part, or occasion-
ally are fused into a single central keel. Sometimes the expan-
ding keels are entirely without wings or arms, but more often they
are winced at the upper part on their outer surface of the valve, as in
F, where they are infolded and do not appear very clearly in the
figure.

but under two of them a seed has become lodged, each represented
in the figure by a black spot. The central part of the capsule is
occupied by the cells containing the seeds. The cells are of the
same number as the lobes and alternate with the latter. Usually
they are completely covered or roofed over by two wings (marked b),
which arise from the partitions separating the cells. These may
be termed cell-wings, although often semi-transparent, are of a
somewhat horney nature and slightly stiff; in others they are more
membranous and more flexible, as in A, B, C, G, H. Their inner
epidermal edges are usually closely contiguous or overlap, and their outer
margins either leave a small gap between them and the outer bound-
ary of each cell, as in all the figures except D, E, F; or the gap
is nearly filled by a hard boss as at c (D) in Fig. 62; or they are
somewhat pinched together as at the "seed" mark in D in Fig. 62.
But in this comparatively small number of species the cell-wings are
entirely absent, as in F, or are very rudimentary so that the seeds
are entirely uncovered.

N. E. Brown
(To be continued.)

Mesembryanthemum and some new genera separated from it.
(Continued from page 152.)

When the dispersion of the seeds of Mesembryanthemum is inves-
tigated, we find it stated in books that they are washed out by
the rain, and this is the only information given concerning their
disperal. In the case of the F type of capsule (see Figs. 61,
62, p. 151) it is obvious that the seeds after the expansion of
the lobes, would either be washed out of the capsule by the rain,
or, after the rain has ceased and whilst the capsule is drying
up and closing, might be shaken or blown out by wind. But in the
case of such extraordinarily complicated structures of the types
D and E, this explanation is anything but convincing or satisfac-
tory, for although it is evident that rain has something to do
with the release of the seeds from the capsules, I have as yet
quite failed to discover how this is effected. For in the D type
the entrance to the cells containing seeds is so nearly blocked
up by the boss (c) that there is only quite a narrow space left
between the boss and the cell-wings and the sides of the cells,
which is not wide enough to permit the seeds to pass through it
without force being used. And the wings that cover the cell like
a roof, are, in this type, rather to separate their contiguous
172 margins. The cell-wings are also stiff in type B, and although the closing bors is absent the cell-wings are so arranged that the opening they leave between them at the outer side of the cell is too narrow for the seeds to pass through without force being used, as may easily be ascertained by experimenting with a needle and trying to rush them through the opening either from within or without the cell.

Now it is certain that this complicated structure is somehow arranged for the dispersal of the seeds. Nature does not waste her energy for nothing. It is also certain that the seeds do get out of these complicated structures, as I have found old capsules often to be quite empty. The capsules remain upon the plant often for two, three or more years, and open and close with every fall of rain, and it is only at that time the seeds are released. But how? During one of our wet summers I fixed some ripe capsules of the D type over a rain and placed them in the garden, where they remained for many days fully exposed to rain and wind. The result was that I found fewer seeds washed out of the capsules into the rain than there were capsules, an average of less than one seed per capsule. This does not agree with what I think must take place when the capsule is on the plant in South Africa. Also I should explain that I have only experimented with capsules belonging to the sterile

173 species, in which the capsule would not be raised more than from half-an-inch to four inches above the ground, so that shaking by wind would not have much effect in dispersing them.

I have noticed, however, that often when capsules of different types have been re-arranged by setting after a previous extraction, a few (one to six) seeds may fall out of them into the saucer or basin in which I have placed them. So that it is possible that at each opening of the capsule only a few seeds are liberated at a time, the chance of their being able to germinate and obtain sufficient moisture to grow to a size that would enable them to withstand the dry season, being a varying one; for if all the seeds were shed at once and the subsequent rainfall insufficient to enable the seedlings to establish themselves, the efforts of the plant would be wasted for that year. In the case of the type of capsule A, B, C, where the cell-wings are thin and membranous, the liberation of the seeds seems to be effected by the rain beating upon the roofing cell-wings so as to cause them to flap upon the seeds and dislodge them from their stalks so that they can afterwards be washed out of the capsule. But even in this type I do not find that all the seeds in a capsule are washed out at once in the experiments I have made. It would be interesting if some South African botanist, having the opportunity, would observe and give an account of what takes place under natural conditions with the various types of capsule.

In the extract I have made from Haworth's book he mentions the capsule as possibly forming a character by which the sections of this genus might be separated to form new genera. This may be the case in some instances, yet as I find the same type of capsule is sometimes found in two totally different sections, and two types of capsule sometimes found in the very same section, the character of the capsule does not seem to be reliable or a promising one for distinguishing genera or sections. For example, B in figs. 61, 62 represents the capsules of one of the sterile suberosoid group, and they possess distinct well-developed cell-wings, whilst the capsule of another species of the same group (P. piluliforme) is quite destitute of cell-wings, and in this character quite agrees
178 with the capsule of a tall shrubby unarmed species that I have examined, which also has no cell-tubes. Future investigator should also note that the position of the placenta varies, being sometimes confined to the central axis, at others more or less on the outer wall of the cell.

The study of the germination of the seeds and subsequent development of the seedlings of various species of this genus is of great interest and fascinating one to the biologist, and will, I believe, provide better and more complete evidence of evolution than can be found in any other genus of plants. In the animal kingdom the evolution of different groups from one another can be readily traced by the development of the embryo, and among plants I do not know of any genus or group of genera in which the evolution of one group of species from another and very dissimilar group can be so well shown as by the study of the development of seedlings of various species of different sections of Mesembryanthemum.

N. D. Brown

(To be continued.)

Mesembryanthemum and some new genera separated from it.
(Continued from page 173.)

207

Having raised from seeds sent to me from L. Hortola and by several South African botanists and friends numerous species belonging to many widely different sections of the genus, I find that so far as my observations have yet extended, when the seedlings have developed their cotyledons to the fullest extent (for they continue to grow until just before the first pair of true leaves appear), or rather when they have produced the first pair of leaves, the seedlings can readily be grouped under three distinct types, as follows:

1. In this type the cotyledons resemble those of most dicotyledonous seedlings, spreading widely, and are rather thin or thickened beneath, so that viewed sideways they form a very short and broad obconic body. From between them arises a pair of distinct leaves that are quite different in shape and appearance from the cotyledons, as are also the leaves of the adult plants, which usually produce more than one pair annually. This type is represented by Fig. 84, A-E, and to it belong the majority of the known species of Mesembryanthemum.

II. In this type the two cotyledons are combined into a half-clobose body slightly depressed across the flattened top. From this body arises a pair of half-clobose distinct leaves, quite unlike the cotyledonal body in appearance, as are also the subsequent leaves made by the plants of which normally only a pair is produced each year. This type is represented by Fig. 84 G-H.

III. The cotyledons of this type are the same as in type II, but the new growth that succeeds them and all subsequent growths of the plant consist of a single ovoid body with a tiny orifice like a closed mouth at its apex, and is quite unlike the cotyledonal body. Fig. 84, I-L represents this curious type, which is intermediate between types II and IV. When in the stage shown by J, the seedling has much resemblance to an acorn in its cup, the acorn-like part being of a pale translucent green and finely tuberculate; viewed under a lens it is really quite attractive. The adult plant is represented of natural size of K, from a rough sketch I made of a
plant sent to me by Dr. R. Herlofth, upon which was one dead flower. The stigmas are as shown at L. This plant (L. oviforme, "L. var.) is an anomalous one, the mode of growth is as in type IV., but the cotyledons have little resemblance to the growths of the adult plant, and the stigmas arise directly from the top of the ovary, without a style.

IV. In this type the cotyledonary body and the growth that succeeds it (consisting of a single body resembling the cotyledonary body) and the growths of the adult plant, differ but slightly in general appearance, except as to size. Fig. 94, K-N represent this type, whose peculiar mode of growth will be explained hereafter; to it belong the species constituting what is known as the *emergent* group.

Possibly there may be other types, but I have not yet seen them.

![Diagram](attachment://diagram.jpg)

Fig. 94. A, B-H. longum; C, D-M. calcariforme; E, F-M. dolabriforme; G, H-M. testiculare; of each of the above a fully-grown seedling in the cotyledonary stage, and when it is producing its first pair of leaves, is represented. I, J-M. oviforme; I, the cotyledonary stage, and J, the same when producing its first growth, enlarged four diameters; K, an adult plant, natural size, and L, the stigmas, enlarged. M, N-M. piluliforme. P, Q-M. pseudotruncatellum. K and L represent seedlings one day old, enlarged; M and N the same seedlings in the full-grown cotyledonary stage, just before the skin dries up, natural size; Q is an adult seedling, natural size; R, a young plant after it has cast the skin of the cotyledons, natural size.

We thus have in the different manner of development of the seedlings an indication of a difference of generic importance, which in some cases is combined with structural differences in the flowers that are easily seen, so as to render the generic separation of some of these plants from *Resembryanthemum* not only warrantable, but desirable, on account of the unwieldy size of that genus.

Turning now to their vegetative characteristics and mode of flowering we find among these plants one of the most extraordinary that exist, for they are absolutely unique, there being nothing else like them in the vegetable kingdom. The shrubby species and those with prostrate stems usually develop more than two or three pairs of distinct leaves annually, and there is nothing remarkable about their mode of growth. But the densely tufted or stemless species seldom develop more than 2-3 pairs annually and also are not remarkable. In the curious group to which *A. rostratum, A. hifidum, H. vescum*, etc., belong, each vegetative growth develops two dissimilar pairs annually; one pair being united for a greater length of the base than the other pair which protrudes from the sheath thus formed by the first pair. Sometimes also the alternating pairs are dissimilar in shape, one pair being toothed on the back at the apex and the alternating pair without teeth. Most of this group have their leaves of a very glaucous-green or even whitish colour and usually plentifully dotted. This whitish or glaucous appearance is common to many kinds of *Resembryanthemum* and is not caused by a waxy deposit or "bloom" on the surface that will rub off, but by a deposit of lime crystals in the substance of the outer wall of the epidermal cells, which act as a screen to protect the chlorophyll from being injured by intense light. Under cultivate-
tion in this country during winter, light being less intense, the lime crystals are more or less dissolved and the plant becomes much greener in colour, but with the advent of spring the crystals are deposited again on the light-screen being denser, the plant gradually resumes its whiter appearance. I have never seen any species of this group in clover; they commence to grow in autumn and I think want to flower in winter, when sunlight and heat are insufficient.

N. E. Brown

(To be continued.)

Resembrittenium and some new genera separated from it.


(Continued from page 207.)

207

Some species like \( V. \) lanidiiforme, \( V. \) bolusii, \( V. \) simulans (Fig. 84) and a few others, normally develop only one pair of leaves annually, but while the new pair is forming the old pair remains clumped, and so two pairs are seen on the same growth at that time, the old pair afterwards shrivelling (during our spring) and disappearing. When, however, more than one pair persists throughout the summer, it is due to bad cultivation in the share of overwatering, possibly resulting in the plant not flowering that year. The flowers of \( V. \) simulans are very handsome, two inches or more in diameter, and usually bright yellow in colour, but seedlings of it have been raised by Dr. Dodier Heath that have pure white flowers, and another with orange flowers, which are very charming by contrast; all varieties are strongly and deliciously scented, the colour being something like that of a freshly-opened Cocoanut. The flowers of \( V. \) bolusii are very similar to those of \( V. \) simulans, but the petals are fewer and not in so many series and lack the more graceful rose that the latter have.

These species, however, do not show any marked peculiarity of growth different from that of other plants, but if the mode of growth is examined of the remarkable little group to which \( V. \) mitratum, \( V. \) proximum and allies belong, it will be found to be quite different from that of all ordinary plants. Fig. 93, A represents a growth of \( V. \) proximum in June, when its growth seems to be finished and the apparent resting period begun. It remains in this condition until late in September or beginning of October or even later, apparently without any other change than that the two leaves at the top of the solid-looking cone wither and shrivel to very small remains. This cone consists of two leaves fused into a solid body for the greater part of their length with only their tips free. Inside the cone at the bottom, in the centre, is a bud, which, while the plant appears to be at rest, develops inside the cone into two leaves that are free to their base. Their development is quite undetectable and unsuspected from the outside and they grow at the expense of the substance of the cone, which is finally completely absorbed and replaced by the new leaves inside it, so that only the skin remains to cover and conceal them, which changes to a greyish colour. In autumn or early winter the skin is burst and the two free leaves inside it spread apart, bearing fragments of the old skin on their backs. So other leaves are apparent at first, but soon the second pair is seen protruding from between them. Fig. 93, B, represents the same growth in January of the following year, showing the expanded free leaves with fragments of the skin of the old cone adhering to their backs, and the formation of a young cone by the second pair of leaves, raised upon a short interval of stem. This young cone repeats the process.
A similar remarkable mode of growth occurs in *H. pygmaeum*, and the peculiar and very charming *H. evolutum* (Fig. 96, from a photograph by Dr. Sower Heath), whose beautiful purple flowers are three or four times the diameter of the tiny growths producing them, when resting shrivels its leaves to a white papery consistence completely concealing the young leaves under them. Both these latter plants have the appearance of being dead during the summer time, and cultivators who are unaware of their peculiar mode of growth would be apt to throw them away as dead or dying. In autumn, their period of growth commences and they assume a totally different appearance. I have never seen a cultivated specimen of *H. pygmaeum* in flower, and judging from the very few indications of flowers I have seen upon dried specimens, it would appear that it flowers very sparingly in wild state.

The sphaeroid group have no free leaves, yet their mode of growth is somewhat similar to that of the cones of the *H. proximum* group and quite unlike that of any other plants. When describing the seedlings of this group (type IV., Fig. 24, A-R) I stated that the full-grown cotyledony stage and the growth of the adult plant differed very little except in size. Their peculiar mode of growth explains how this is brought about. Fig. 97 represents one of these plants, which I am separating from *Hesperophyton* under the generic name of *Conophyton* (cone-shaped plants).

---

1. A, cotyledony stage one week old; 2. the same seedling just after it had cast off the skin of the cotyledons; 3, a group of four adult growths; 4, flowering growth in section, showing the flower arising from the bottom of the growth, with a minute bud at its base; 5-7, sections showing the manner in which the bud inside the growth enlarges and gradually absorbs all the substance of the older growth until only its skin is left, which, after a rest, the new growth bursts and it is blown away by the wind. *All* natural size, except 1.

---

1 is a seedling one week old, in the cotyledony stage, enlarged three diameters; 2 is the same seedling some months later just after it had cast off the dried-up skin of the cotyledons, natural size. From these figures it will be seen that 2 differs very little from 1, except in size. This seedling developed inside the cotyledony body in a quite invisible manner, just as is diagrammatically represented in the sectional views of adult full-sized growths at 3, 4, 5; the young internal growth gradually absorbs the substance of the older growth until nothing is left but a small and often wrinkled white or brown skin of papery-like consistence, covering and entirely concealing the new growth inside. In this condition the plant rests during the dry, hot weather, then, when rain falls, growth again takes place, the dried skin is burst asunder and cast off or blown away by the wind, and flowers are afterwards developed. Each of these conical bodies or growths is in reality a huge lot of the plant terminated by two leafy leaves fused into an oblong or oblong-oval, with a small flattened tube bearing from the small mouth-like orifice at the centre of the top through the centre of the neck to its base. At the bottom of this tube is a minute bud, which either develops into a flower that bursts its way through the tube as represented at 5, or into a vegetative growth as shown at 2-7. If it develops into a flower, a vegetative bud is always formed on one or both
The small group of which *L. Lesliei* (Fig. 110) and *K. pseudotruncatellum* (why do the Germans devise such horrible names?) are typical representatives contains some of the most remarkable of all flowering plants, for they are not only "Mimicry-plants," but also belong to the very small group known as "Windowed-plants," which are all exclusively South African. In the seedling stage they are externally indistinguishable from the Sphaeroids, compare for example in Fig. 84 on p. 207 the seedling stage of *L. Lesliei* represented by Q, R, with the adult Sphaeroid represented by L-O; both have a central orifice; but at a later stage that orifice in *L. Lesliei* changes into a transverse fissure across the flattened or convex tor of the plant, dividing it into two short contiguous or slightly curving lobes. The mode of growth is just the same as that described for the Sphaeroids, but the flowers differ by having no tube.

As Mimicry-plants, few can beat them, for in colour they are brown, rust-coloured, grey, buff, reddish or whitish, with or without mottling on the tor, so as to closely resemble the soil, stones and pebbles among which they grow, buried in the ground with their tops nearly or quite level with the surface of the soil. The first discovery of one of these curious plants was made by Burchell, who, while travelling in South Africa, at a place called Sand Vlei, fer in the interior, on September 14, 1811, stooped to pick up what he thought was a pebble, but when he got it in his hand he found, to his astonishment, that he had picked up a living plant that very closely resembled the stones it was growing among. Burchell made a drawing of the plant, and from that drawing Haworth described the plant as *K. turbiniforme*, in 1821. Nothing more then this description was known of the plant for over 100 years after its discovery, as the drawing appears to have been lost or destroyed and I had tried in vain to get the plant refound, but the shot was too out of the way to be got at easily. Having asked Dr. J. B. Pole-Evans to look out for it if he had the opportunity, he being in the region in 1918, was fortunate enough to find that after searching a whole week for it—a few specimens of the plant at or near the place where Burchell discovered it. Fig. 111 is a view of the plant as he found it growing, taken on the shot by Dr. Pole-Evans, who has kindly given me permission to make use of it, but reserving to himself the copyright. This view shows the plant growing among the stones near the centre of the picture and demonstrates how easily a person might walk over the ground where these plants grow without detecting their presence when out of flower. Indeed, Dr. Harloth and Mr. Burtt Davy have both told me that they have walked for a long time over ground where *L. Lesliei* was known to grow without finding it, so closely does it resemble the rust-coloured soil and stones where it grows, as may be perceived from Fig. 110, copied from a photograph of *L. Lesliei* kindly sent to me by Mr. Leslie (its discoverer), which shows two growths that
have expanded their flowers and two others above them not in
flower, of natural size viewed from above, showing the exact ap-
nearance of these plants as they grow in their own locality. From
this figure it can easily be understood from the appearance of the
two flowerless growths that the plant would not easily be detected
when out of bloom. K. pseudotruncatillum and K. marmoratum are
greyish and mottled on the top somewhat like the mottling often
seen on stones, and as they grow among greyish stones and pebbles
buried nearly level with the ground, are also very difficult to
detect when out of flower. Yet under cultivation in this country
it is better not to plant them buried in the soil as they grow
naturally, because our climate is more humid than their own and
there is risk of them rotting.

I have said that these plants also form part, and the greater
part, of the very small number (less than 20 I believe) known as
Windowed (or window) plants. This is due to their remarkable
structural peculiarities. It is usual to find that the green col-
ouring matter (chlorophyll) of plants forms a layer over the sur-
face of leaves and other green parts where exposed to light, but
in these particular plants it does not, for the exposed surface
shows no evidence of being green. Fig. 112, 1, represents a plant
of K. Lesliei as it grows in the ground, natural size. Fig. 112,
2, is a sectional view of the same plant: A being the body of the
plant, composed of clear, watery, colourless tissue, through which
light can easily pass; B is a flower-bud at the bottom of the cen-
tral tube through the plant, up which it pushes its way to the sur-
face; C, C, are the layers of green chlorophyll, one layer cover-
ing the sides of the plant and most of it buried under the ground,
and two narrow strips of it lining the mouth of the fissure, all
the remainder of the top of the plant being quite destitute of
green colouring matter; but externally, where exposed to the light,
these layers are covered with a coloured pigment that acts as a
screen and protects the green chlorophyll from being injured by
the intense light of South Africa; D is the thin epidermis cover-
ing the top of the plant, which in K. Lesliei and most of the
other species of this group is mottled or dotted. Under this
part of the plant the chlorophyll layer is quite absent, and the
epidermis serves exactly the same purpose as a window does, al-
lowing light to pass downward into the interior under ground por-
tion of the plant and thus reach the chlorophyll layer, E being
the ground-level. This window is not transparent like clear glass
but more nearly resembles semi-transparent glass than anything
else, for the whole of the outer walls of the cells composing it
have imbedded in them minute crystals of lime, which act as a
screen and modify the intensity of light in the same way that fro-
sted glass does. There are no crystals in the cells themselves,
only in their outer cell walls. A portion of this epidermis
magnified 130 diameters is represented in 3 (Fig. 112). The in-
tensity of light is also further reduced by the top or window
being coloured all over or mottled with a brown, rust-coloured,
dull orange, grey or cream-coloured pigment; only in K. opticum
and K. Friedrichiae is the window without pigment. K. Lesliei is
mottled with dull orange or rust colour, and it is only where
these coloured markings occur that stomata are found on the window
part; all the spaces between the markings are destitute of stomata,
which are very minute, and are plentiful on the underground sides
of the plant and along the fissure where the chlorophyll layer is;
two of them represented in Fig. 112 some distance from the margin,
There is one other species of Mesembryanthemum, the curious
M. rhombolorrhylum, which, although having nothing in common with
the M. Leelieii groups, nor any resemblance to the, also belongs
to the "Windowed plants," and the few others that are at present
known belong to the order Liliaceae.

One of the most odd-looking groups placed under Mesembryanthemum
is that to which M. rubescens and its allies belong. Of these
plants very little is known in this country. They are dwarf tufted
plants, whose growths are obliquely elongated, ovoid, or nearly
cylindric, and composed of two leaves very unequal in size, one
being half or less than half as long as the other and combined
with it into a single body, except a very short, free portion,
which (except when a new growth is being formed) is so closely
pressed against (or apparently into the side of) the larger leaf
as to be only distinguishable by a mere crack. This gives to each
growth the appearance of having an oblique, closed mouth on one
side of it, so that the growths of these plants as nearly resemble
a shark's head as I think it possible for any plant to do. This
group is so distinct in appearance from all others placed under
Mesembryanthemum that although I have not yet seen a flower of any
species belonging to it, I feel sure that Mr. Storrs was right in
considering it to be a distinct genus. I therefore adopt the gen-
eric name Gibbaeum for it in 1921 (Revisiones Plantaearum
Succulentarum, p. 104), which, like some other genera he proposed
in the same book, has never been taken up nor even noticed by any
author. The curious resemblance to a shark's head is well shown in
Mr. 181, which represents a new species of this group,
Gibbaeum arcuante, described below, of rather more than half

* Gibbaeum arcuante, M. E. Brown. Tufted, with numerous
growths forming clumps up to 1 or 4 inches in diameter, and 1 to
1 1/2 inch high. Growth, about 1 inch long, and 5 to 6 lines thick,
cylindric-ovoid, slightly bulging on one side at the lower part,
narrowing upward to the slightly compressed, very obtuse apex,
obscurly or scarcely keeled, with an oblique arched fissure 2 to 4
lines deep, and 4 to 5 lines broad, resembling a mouth a little
below the middle, each growth thus somewhat resembling a shark's
head, with the whole surface silvery-white (becoming greener under
cultivation) from being densely covered with short, fine, oppressed
hairs, all pointing downwards. Flowers unknown. Fruiting pedicels,
1 to 2 inch long. Capsule, 1 inch in diameter, 3-valved, white.
South Africa, Ladysmith Prov., on stony ground, a few miles from
Ladysmith, Fole Evans, 1872.
Pole Evans, who has very kindly allowed me to make use of some of his photographs for illustrating this article on the condition that they remain his copyright.

This curious plant is covered with a silvery white pubescence of fine, short hairs all pointing downwards and closely pressed to the surface. When at rest the oblique mouth formed by the shorter leaf-tine is closed, but when the new growth develops, that leaf-tine separates from the larger leaf, thus resembling the lower jaw of a shark's mouth, and revealing the tine of the young growth inside, which, thus seen, somewhat resembles a tongue. The old growth does not appear to be absorbed by the new one in the same manner as it is by the sphaerocids, but withers and dries up after the new growth has grown out of it. I have never seen a flower of this genus. Under cultivation, in the seedling stage, the growths of these plants are quite different from those of the adult plant, for the two leaves composing each growth are then about equal in length, and their free tines are not pressed together in the same way as they are in the adult plant. The successive pairs that are developed become more and more unequal, and finally, the adult form, as shown in Fig. 121, is assumed. This seems to indicate that these curious plants have evolved from some species with a pair of leaves of equal length. I understand that these white pubescent plants only grow where the surface of the ground is covered with white stones, so that at a distance they are not easily seen. Whether this is a case of what is known as protective mimicry I know not, but I have a suspicion that it may be. For the same kind of concealment from observation is adopted by the species of which \textit{C. testiculare} is typical. These plants have only one pair (or, when making new growth, two pairs) of leaves, which are very firm in texture and covered with a very smooth, white skin, without dots or other markings, giving them a very distinct appearance from all others placed under this genus. When seen growing in a collection with other species they are very conspicuous from their smooth, white appearance, and I have been informed by Dr. R. Kroth, concerning \textit{C. testiculare}, that "It is simply amazing to find this species only among the white quartz I have several times walked on purpose several hundred yards towards a patch of such white quartz which I noticed from the road in order to test it, and the plant was there, flush with the gravel and white stones. Some of these patches are only a few yards in diameter, others a hundred yards long, and there may be half a mile or a mile of shaly or loamy ground in between without the plant. Why?"

As this plant will grow in loamy or other soil under cultivation, it would appear safe to assume that in some way its white colour protects it when growing among the white stones from the observation of ostriches or animals that would eat it, but that when its seeds fall and germinate (as they must surely sometimes do) upon the other kind of soil, they are easily detected and devoured.

Such species of this group as I have seen in flower have a circular, sessile stigma, quite different from that of all others, which, taken in conjunction with other character, warrant its separation from \textit{Resembryanthemum}.

N. E. Brown

(To be continued.)
Turning now to the floral peculiarities, we find that there is such a general resemblance of the flowers to one another of different species of this genus that it would at first appear there is little to note. This similarity is, however, more apparent than real, and comparable with the -aisy-like appearance of the flowers of many genera of Compositae that differ considerably in structure; for the flowers of Mesembryanthemum are also found to differ very considerably in structure when carefully examined. The calyx is sometimes produced into a tube above the ovary, sometimes lobed down to the top of the ovary, and the number of lobes sometimes vary in different species. The petals are usually free nearly or quite to the base, but in the Sphaeroids are united into a distinct tube. Some German botanists consider the petals to be staminodes, and they have been described as such. But there is no more reason for calling the petals of a -emanthemen steminodes than for applying the same term to the petals of a Rose, Buttercup, Wallflower, or Tulip, for it is well known that stamens are convertible into petals as a flower becomes double, and in the Water Lily all stamens from one to the other may be seen, as is sometimes the case in -emanthemen. The stamens vary much in number and arrangement. In books the elongated stigmas are termed styles, but this is incorrect, as they are stigmatic to their base. The Sphaeroids have a distinct style, in other species it is absent, the stigma arising from the top of the ovary, and vary in form and character, and may be used for generic distinction.

In L. lepidiforme the flowers are really axillary, arising from the axils of the older leaves, one on each side of the new terminal growth and remain dormant for some time before developing. But I think that in most if not all others the flowers are terminal, even though they do not appear to be so, as is not infrequently the case. This is particularly well seen in the case of the group to which L. lineiforme belongs, where the flower arises from the second or third pair of leaves behind the terminal pair. In reality, I believe, the flower, when in bud, terminates the stem bearing that pair of leaves, but remains dormant, while a bud in the axil of one of these leaves develops one or two pairs of leaves; after these leaves are developed and the flower-bud pushes its way out from the leaf-sheath and develops.

A peculiarity about the flowers of many species that I do not remember to have seen mentioned in books is that they increase in size daily for a few days after their first extension, sometimes attaining nearly twice the diameter they had on the first day. Another point of interest is that they are excellent time-keepers, for, provided the temperature is sufficient, many species open and close their flowers at certain periods of the day with great regularity. For example, L. simulans begins to open its lovely flowers with me at about 4:30 p.m. and closes them at about 6:30 p.m., Greenwich time. I have a new species of which I have as yet seen only one flower, which did not attempt to expand until about 9 p.m., and several Sphaeroids do not expand their flowers until after 5 p.m.

Colour of the flower does not seem to be of specific value,
although it has long been considered to be so in the case of the yellow-flowered *M. edule* and the purple-flowered *M. aequilaterale*, which are otherwise identical, but from a careful examination of the two plants growing side by side in Cornwall, where they have become naturalised, and from information received from South Africa, I am convinced that these two supposed species are but colour variations of one species. A proof of this colour variation is afforded in the case of *M. testiculare*. Few years ago I sent to Dr. Rodier Benth a single seed-rod of *M. testiculare* and the plants he raised from it are now coming to flower, and he writes to inform me that some are of a very pale whitish-yellow, others of a much darker yellow, and others purplish. All these varieties being obtained from the same seed-rod demonstrates clearly that colour alone is not a specific character Dr. Rodier Benth has also raised seedlings of *M. simulans*, some with white, others with orange or yellow flowers. The most curious case of colour variation that has yet come under my notice is that of the plant I described as *M. fraternum* some years ago. A single plant of it, of which I had a portion, was sent to Kew. The first year after it was introduced it flowered and was figured; the flowers were of a rosy pink. The same plant has flowered several times since, and each time the flowers have been white; it has not again produced a pink flower. At the same time was also introduced a single plant from another locality of what I consider to be a white-flowered variety of *M. fraternum* which has remained white and shown no tendency to vary, and is always of a slightly larger size and less glaucous than the type.

The only other peculiarity of which I wish to direct the attention of the plant-studen and horticulturist alike, since it is closely connected with the cultivation of the Sphaeroid group, is that these curious plants have very short roots, rarely more than 1 to 1½ inch in length. Yet these plants thrive best in the driest and hottest parts of South Africa, some of them in places where the rainfall is only from three to six inches per annum. For months at a time the soil is thoroughly dry and parched. How do they exist under these conditions? They certainly do not thrive in this country if kept dry too long. This, however, may be due to the fact that they want to grow and flower during our autumn, which corresponds to spring in the parts of South Africa where these Sphaeroids grow.

K. E. Brown

*Hesperanthemum* and some new genera separated from it.


(Continued from page 290.)

I had one species sent to me in 1919, which began to grow well enough, but after a short time decayed. This spring the same plant was sent to me with the information that it grew upon flat rocks in about half an inch of soil. How does it exist under that condition? A plant growing in an inch of soil upon one of our peninsulas this year would have had a poor chance of surviving, I think, yet this plant thrives in a similar position in the drier and hotter climate of South Africa. But I found that this species would not submit to be dried up during this summer as its allies did, for again the plant began to die, and I have had considerable trouble to save it. Its behaviour probably indicates that it does not like the reversal of the seasons, and that, having passed safe-
A South African summer was not prepared to endure an English summer in addition without first relishing its store of food.

I have now given details concerning the vegetative and other characteristics of some of the very remarkable plants at present placed under the genus Resembranthemum, in order to explain and justify my reason for separating some of them from that genus and raising them to the rank of distinct genera. For the more I study Resembranthemum the more do I become convinced that, as at present constituted, it is rather of the nature of a natural order than of a single genus. The great difference in the vegetative characters of various groups as above described, is evident to everyone when the plants are seen together in a collection. It is the general similarity of the flowers of various groups that has caused them to be united into one genus. Yet this similarity, as I have previously stated, is often more apparent than real, for when the structure is carefully examined small distinctive characters may often be found, in fact, I think we may liken Resembranthemum to such orders as Cruciferae, Carvorthyllaceae and Umbelliferae, where there is often little evident difference to be found in the appearance of the flowers of different genera of those orders, therefore small structural differences in the flower are combined with other characters for separating those plants into genera. I propose to do the same with some of the groups at present placed under Resembranthemum, dealing only with the few groups I have cultivated, as the total number is too vast for me to attempt to classify without a prolonged study of all the groups in a living state, for the whole genus requires thorough revision, and that revision, I think, could be better done in South Africa than here, provided that the nomenclature be first carefully corrected by a competent person from a comparison of the plants with the drawings at Key of 2evorth's type plants; the nomenclature in the monographs of Salm Bück, Perrier, and the Flor Cereaisis is by no means trustworthy in many instances.

It may be asked, what characters are to be taken to distinguish the plants that are to remain under Resembranthemum since Linne evidently included several distinct types under that genus. Taking the generic characters in combination with the species placed in the genus by him, it could seem that the only definite characters that can be found are that the plants should have: (1) on each branch or growth two or more pairs of distinct leaves, connate only at their base; (2) a "monophyllous half five-lobed" calyx, by which I understand him to mean that the calyx is lobed down to the top of the ovary and not produced into a tube above the ovary; (3) a corolla with the claws of the petals but slightly united at the base, i.e., free nearly to the base, not united into a distinct tube; and (4) stigmas 4-5, subulate, exactly recurved. Linne and others describe the stigmas as styles, but I think that none of the species known to Linne have a true style, as the so-called styles of all his species are stigmatic all along to their base.

This of the species best correspond to those characters is the problem that has to be solved, and when the genus is revised it will become a question whether plants differing so much in habit and appearance from the well-known "Ice plant" (... cristallinum) or from such shrubby species as ..., coccineum and ..., inclaudens, as do the two new species here figured, ...
Mesembryanthemum Orrenii, N. E. Brown. Plant tufted, about 1½ inch high, including the flower. Leaves in about four pairs to a growth, crowded, ascending-spreeding, 6-14 lines long, 2½-3½ lines broad and 3-4½ lines thick, flat above, keeled down the back, being convex at the basal part and compressed at the apex, acute, with a minute point at the apex, glabrous, smooth, purplish or pubescent-green, with red margins and keel at the apical part, and thickly dotted with dark green. Peduncle 1-flowered, 4-5 lines long, 1½ line thick, terete, glabrous, reddish-tinted. Calyx 3-lobed to the tor of the ovary; lobes subequal, 5-6½ lines long, 2½ lines broad, ovate, obtuse or subacute, and the two outer with a short dorsal point, 2-3 of them with membranous margins, glabrous, rather dull dark green or purplish-tinted and dotted with darker green. Corolla 1½ inch or more in diameter, expanding about 3 p.m. and closing about 6-6:30 p.m. (Greenwich time). Petals numerous, free almost to the base, in about four series, the outer reflexed, the inner slightly ascending-spreeding, and the others spreeding at different levels, 7-9 lines long, and 1½ line broad, linear-acute, entire, bright clear yellow above whitish-yellow on the back, shining. Stamens numerous all with anthers, collected into a cylindrical column four lines long; filaments light yellow, anthers of a darker yellow. Top of the ovary very convex, six-grooved. Style none; stigmas 6, about 4 lines long as long as the stamens filiform, with revolute tins, light yellow. A native of Trigeland West, discovered by Mr. Redmond Orren at Campbell (Tule Evans, 6910). Then in flower this is a very elegant species.

(Fig. 129) and M. recumbens† (Fig. 130) and described below, both

† Mesembryanthemum recumbens, N. E. Brown. Plant branching at ground level, forming a tuft of prostrate branches 2-3 inches long. Leaves in about five pairs to a branchlet, not separated by distinct internodes, slightly ascending-spreeding, recurved at the apical part and also usually curved to one side, 4-14 inch parallel sides to about the middle, then tapering to an acute point, convex on the back with one tooth (rarely 2-3 teeth) on the keel below the apex, glabrous, greenish-green, prominently and densely covered with rather large and slightly prominent pellucid dots. Peduncle 1-flowered, bractless, erect, terete, green, faintly-dotted. Calyx 3-lobed down to the ovary; lobes all reflexed, the 2 outer about 4 lines long, compressed and keeled at the apex with 1-3 teeth on the keel; the inner shorter 2 lines broad, ovate, obtuse, all with narrow membranous margins, green, pellucid-dotted. Corolla 1 inch in diameter, expanding about 8 p.m. and closing between 8 and 7 a.m. (Greenwich time), scentless or nearly so; petals 54-60, free nearly to the base, in 2 series, the inner series ascending-spreeding, forming a sort of cup, the other 2 series spreading more widely or deflexed at different levels. Stamens numerous, all with anthers, collected into a cone 5-6 lines long; filaments light yellow, anthers darker yellow. Top of the ovary flat. Style none; stigmas 6, about 4½ lines long, filiform, finally spreeding out from between the stamens, with
of them very elegant plants when in flower, should belong to the same genus or not. The leaves of E. recumbens, with the curious tooth on the back, are similar to those of E. uniforiforme, yet the glaucous and not relucid dotted foliage and rosy flowers of the latter render it quite distinct. 

K. E. Brown

(To be continued.)

Mesembryanthemum and some new genera separated from it.


(Continued from page 303.)

Most of the plants I am separating from the genus were totally unknown to Linne, so that they cannot be considered as having been included in it by him. But the plants of the E. linuiforme and E. difforme type, which I am also separating, were included in the genus by Linne, although from his remark under E. linuiforme "this is 10-styled," he evidently knew that it differed from the rest of the genus in that character, but appears not to have noted that it also differed by the stigmas being very stout and plumose, and therefore not conforming to his character of stigmas "subulate."

I now give the characters of some generic names proposed by Haworth that have been overlooked and the new genera I propose to establish, together with a list of the species that I consider should be placed under each.

Glottinhyllum, Haw.

This generic name was proposed by Haworth in 1821 in his Revisiones Plantarum Succulentarum, p. 103, under E. semicylindricum at the bottom of the page, where he states that the section "Linuiformie constitutes a good genus, (for which) I propose the name Glottinhyllum." This name seems to have hitherto escaped the notice of all authors, but as I consider Haworth to be correct in regarding these plants as forming a distinct genus, and one that can be recognised at sight, I accept his generic name and characterise the genus as follows:—Very dwarf, succulent plants branching close to the ground. Leaves 4 or more to each branch, long, narrowly tongue-shaped, half cylindrical or subcylindrical, soft and pulpy, uniformly green, never glaucous-green. Flowers large, yellow. Calyx 4-lobed to the top of the ovary. Petals in one or two series. Style none; stigmas 8-10 radiating, stout and plumose; capsule 8-10-celled; cells roofed by cell-wings, and the opening at the outer end of the wings more or less closed by a large tubercle, as shown in type D of Fig. 62 on p. 151.

This genus includes the sections Linuiformie and Difforme of Mesembryanthemum, which only differ from one another by the shape of their leaves, and in this character they grade into each other. The nomenclature of the species belonging to it is in very great confusion, mainly caused by modern monographers of the genus (Sonder and Berger) assuming that the names applied by Salm Dyer to his excellent figures are correct, whereas they are often entirely wrong, for Salm Dyer seems rarely to have taken the trouble to verify the names under which he cultivated the plants,
but to have accepted them as unimpeachable, so that his determina-
tions are often very untrustworthy. Another cause of the diffi-
culty in correctly defining the species is that in this country we have no means of knowing to what extent the same species rea-
illy varies under natural conditions in South Africa, nor have we any knowledge of the localities in which the species grow.

That there are several distinct species among them, I feel
sure, but they are not the species that are usually found in gar-
dens, which are mostly forms or hybrids of one species (G. longum,
I think) grown under different specific names. At the same time I
believe that some of the plants that have been described as distinc-
tive species are merely forms of other species, for there can be no
question that some of these plants very so greatly that it is very
difficult to find absolute characters for distinguishing them.
As an illustration of this, I may mention that one of the most
prominent distinctive characters is whether the leaves are all
arranged in two ranks spreading right and left, or whether the suc-
cessive pairs cross one another. This is a well marked and easily
recognised distinction.

(To be continued.)

N. E. Brown

Mesembryanthemum and some new genera separated from it.

(Continued from page 311.)

Fig. 146 -- Glottinhyllum punctulatum?
Two plants raised from seeds taken from the same seed pod and grown
in the same 6-inch pot under similar conditions. About one-fourth
natural size.

have in common being the roll of swelling (or so-called pustule)
at the base of each leaf on the upper side, which is so rarely evi-
dent in the much reduced photorrhach. Yet these two plants were
raised by myself from seeds taken by my own hand out of one seed-
pod. This seed-pod was upon a living plant collected at Alice, in
South Africa, and sent to me last year by Mr. T. W. Leslie. The
two seedlings figured are of the same age and have been grown
in the same pot, out of doors, and exposed to the full sunlight
of this summer from May to October 24th. Most of the seedlings
are like the small plant, and three like the long-leaved one.
Their distinct appearance is one of the greatest surprises I have
had, an' clearly demonstrates that the proper defining of the
species belonging to this genus cannot be done in this country.
In connection with the two-ranked arrangement of the leaves com-
mon to many of the species of this genus, it may be of interest to
say that in the seedling stage the first few pairs of leaves that
are formed are always developed in a cruciate manner, the alter-
ating pairs being placed at right angles to each other; the change
to a two-ranked arrangement takes place when the seedlings are a
few months old. This would seem to indicate that this genus has
evolved from plants having a cruciate arrangement of the leaf.

In consequence of my ignorance of the amount of variability and the native localities (which are important) of these plants, the following list must be accepted as provisional. In it I have omitted all reference to the work of Sonder in the Flora Capensis, and that of Benger, as these authors have often ignored the original descriptions of Haworth and replaced them by the erroneously named descriptions of Salm Dyck, so that the names as given in those works do not always belong to the plants that Haworth intended should bear them. As Haworth's works are rare and very difficult to obtain, I have added to the names of the chief characters taken direct from his descriptions or from the original figures he quotes, and I have quoted the figures that I think belong to each species as I understand it.

To save space the letter M. is used for "embryon anthemum in the synonymy of each species.

A. Leaves distinctly arranged in two ranks.

1. Flowers sessile or sub sessile. See also note under G. longum.

1. G. angustum H. E. Br. Leaves 3-5 m. long and 1-2 in. broad, half-cylindric, flattened above, convex beneath, of nearly equal thickness throughout, obtuse. Flowers sub sessile, 3-4 in. in diameter; petals broader than any other (except G. grandiflorum), and united for more than 4 in. at the base. Haworth states that his species is recognised at first sight by its semicylindrical leaves.

G. angustum, Haw. Obs., p. 176 (1792), and Misc. Nat. p. 34, not of other authors.

2. G. depressum H. E. Br. Leaves 2-ranked, pressed to the ground, 2-7 in. long, 1-2 in. broad, narrowly tongue-shaped, obtuse, with the apex variously incurved. Flowers sub sessile or sessile, 2-3½ in. in diameter. Capsule depressed.


G. rufescens Haw. Synon. p. 221 (1819), and Surpl. p. 29.

Under this species, I think, should also be placed M. grandis. Salm Dyck, Obs. Bot. p. 8 (1820), and Des. 8, f. 2; Link and Otto, Jr. Pl. Sel. p. 93, t. 43, which have sessile flowers of 3 in. or more in diameter, that are very fragrant.

3. G. grandiflorum, H. E. Br. Leaves 2-ranked, pressed to the ground, about 5½ in. long and 1½ in. broad, very thick, tongue-shaped, with a large rustle at the base on the upper side. Flower usually sessile, 3-4 in. in diameter, somewhat inodorous; petals in two series, 3-4 lines broad, obtuse. Capsule somewhat conical.

G. grandiflorum, Haw., in Phil. Soc. v. 68, p. 317 (1828); Salm Dyck, Des. 8, f. 3.

4. G. linuiforme, H. E. Br. Leaves 2-ranked, pressed to the ground, 2-4 in. long, 1½-2½ in. broad, straight, tongue-shaped, often with a slight notch on the upper edge, and
"white cartilaginous ridge at the inner bases of most, especially the young ones." Flower sessile, -4 in. in diameter.


T. scalptum Haw. Obs., t. 167; Salis. Lyck, mes. § 8, f. 1.

Probably M. lucidum, Hill. Gard. Dict. ed. 8, no. 42, belongs to this species.

II. Flowers on pedicels 1-3 inches long.

5. C. rustulatum, N. E. Br. Leaves tongue-shaped, ascending, 5-6 in. long, 3-11 lines broad, with a large rustule at the base on the inner (upper) side. Flower about -2 in. in diameter.


I believe that the plants represented in Fig. 146 belong to this species but I have not yet seen the flowers. C. rustulatum was introduced by Burchell, who collected it near Fort Elisabeth, whilst my plant was collected by M. T. H. Leslie, at Alice, about 100 miles to the north-east of that locality. The so-called rustule is a very slight swelling of a pink colour than the rest of the leaf, and is absent from all the following:

6. C. latum, N. E. Br. Leaves 2-ranked, pressed to the ground, about 2-3 in. long and 2-1 in. broad, without a boss at the base, straight, linear-oblong, obtuse. Pedicels 1-1 in. long. Flower up to 2¾ in. in diameter. Capsule 7-8 lines in diameter, with a raised dome-shaped tor, 10-11 celled.


M. linguiforme var. latum, Salis. Lyck, mes. § 8, f. 8a.

M. ascendens, Salis. Lyck, mes. § 8, f. 4, not of Haworth.

M. medium, Haw. Surri., p. 88 (1819); N. E. Br. in Journ. Linn. Soc. Bot., v. 45, p. 132. This species was collected by Burchell by the Little Big Horn in Bossel Bay Division.

Haworth (Rev., p. 88) states that this ancient species was sent to him with others in 1819) from Oxford Botanic Garden, and that there is every reason to suppose that the plants are legitimate descendants of the Sherardian stock at Eltham (i.e., the plants figured by Dillenius). Of all the plants Dillenius figured, "M. serratum alone is lost; all the others are now alive before the author." From this statement it may be assumed that his Miscellaneis, p. 72, however, he described the flowers of this species as "mostly sessile," and those of a variety (to which he does not give a name) as having a "short trigonous pedicel." So, perhaps, they vary in this character, but Dillenius figured them with distinct pedicels. The variety breve, Haw., I believe belongs to C. oblincum.

(To be continued.)
7. G. obliquum, N. E. Br.—This seems very similar to G. latum; the leaves are represented as of the same shape and arrangement, but rather narrower, and the capsule is much smaller and less raised at the tor. Dillenius and Haworth considered it different, and the latter (under G. linguiforme) states that it differs from G. latum in the youngest leaves being ascending, more unequal and more hooked-incurved at the apex. The pedicels are about 1 in. long, thinned upwards, angular, carpellate ciliate on the keel. Corolla 2 to nearly 3 in. in diameter, with the petals bright yellow inside, whitish-yellow on the back. The capsule, according to Dillenius’s figure, is about 5 lines in diameter, and flattish at the tip.


G. linguiforme, Haw. Obs., p. 182 (1794), and Bp., p. 97, with several varieties, not of Linne; Haworth renamed the typical G. linguiforme of Linne, and used that name for this plant, which Linne had recorded as a variety of it (var. y.) Willdenow corrected this mistake, but modern authors have fallen into a further error of applying the name “linguiforme” chiefly to forms of G. Oligum. I believe that G. latum var. breve, Haw. & Bp., p. 97, which he distinguishes from typical G. latum as having the “leaves more depressed, capsule smaller,” belongs to G. obliquum.

8. G. uncatum, N. E. Br.—Leaves 2-ranked, about 2½ in. long and about 2½ lines broad, strap-shaped, flat above, obliquely convex beneath, variously incurved-hooked and incurved at the thickened apex, pedicels 1-1½ in. long, corolla about 2½ in. in diameter, petals in two series. Stigmas 10, short. Capsule large, depressed.


G. longum var. uncatum, Haw. Suppl., p. 97 (1819).

9. G. cultratum, N. E. Br.—Leaves 2-ranked tongue or strap-shaped, 2-4 in. long and about 1 in. broad, pressed to the ground, more or less sigmoid-curved, obtuse, with the upper margin incurved or slightly hooked at the tor. Pedicels 1-1½ in. long. Flower to 2½ in. in diameter.


G. longum var. decline, Salm. Dyck, Res., §8, p. 95.

(W. E. Brown)

(To be continued.)
G. longum, W. E. Br. -- Leaves 2-ranked, tongue or strap-shaped, 3-5 in. long and about 1 in. broad, ascending or spreading, moderately straight, variable obtuse or more or less hooked at the apex. Pedicels up to 2 in. or more long. Flower 2-2½ in. in diameter. Capsule 6-7 lines in diameter, slightly domed at the top.

Mesembryanthemum and some new genera separated from it.

10. G. longum, W. E. Br. -- Leaves 2-ranked, tongue or strap-shaped, 3-5 in. long and about 1 in. broad, ascending or spreading, moderately straight, variable obtuse or more or less hooked at the apex. Pedicels up to 2 in. or more long. Flower 2-2½ in. in diameter. Capsule 6-7 lines in diameter, slightly domed at the top.

This species is distinguished from the others that have 2-ranked leaves, by the ascending leaves and long pedicels. But in his Revisiones, p. 98, Haworth seems to have substituted a different plant, with several varieties to it, having sessile or subsessile flowers. With the exception of the variety uncuratum quoted under G. uncuratum (p. 535, 1922), I can find no clue to what plants these may have been, but think it quite possible they may have been hybrid forms raised from seeds produced in Europe, and I feel sure that several of the forms now cultivated under this and various other names are also of hybrid origin.

The plant figured as G. heterophyllum, Jackson in Andrews Bot. Rev., v. 8, t. 540 (not of Haworth), I suspect to have been one of these semilanceolate forms. It has very long leaves irregularly incurved-hooked at the apex, pressed to the ground and flowers about 2½ in. in diameter on pedicels an inch or more long. Haworth (Rev., p. 102) names this plant G. angustum var. heterophyllum, but according to his original description of G. angustum, it has nothing in common with that species. It may be the same as G. longum var. floccidum, Haw., Synor., p. 22.

A. A. -- Leaves not in two regular ranks, but pointing in various directions, the pairs crossing one another obliquely or rarely at right angles.

A. A. -- Leaves not in two regular ranks, but pointing in various directions, the pairs crossing one another obliquely or rarely at right angles.

* Leaves usually broader than thick, flat above, without a hump or teeth on the flat face.

11. G. taurinum, W. E. Br. Leaves obliquely cruciate, half-cylindric, obtuse, very thick, incurved, "less cruciate than G. cruciatum, usually somewhat finger-like and nearly the size of a finger, the younger incurved like the horns of a bull."

Flowers sessile; stigmas 3.

G. taurinum, Haw., Synor., p. 224 (1884). I think it probable that to this species should be referred G. angustum, Dalm. Dyck., Hort. Dyck., 1819, p. 17, and Rev., § 7, f. 6 and 69 (not of Haworth, but named by the latter G. angustum var. pallidum, Rev., p. 101, with the statement that it is "perhaps a distinct species or variety of another species"). Its flowers are 2-2½ in. in diameter.
12. G. praepingue, N. E. Br. Leaves obliquely cruciate, not degressed, up to 3 in. long, some tongue-shaped with the points obliquely curving, others narrower without any oblique curve or ridge near the point, others with subulate triangular or broad compressed points, bent and ending in a soft white bristle, whitish or shining near their bases, or as if frosted over with exceedingly minute parallae, when young minutely ciliate. Flower about 2 in. in diameter, nearly sessile, or according to Salm. Duck with a pedicel 8-10 lines long. Stigmas 8.

13. G. cruciatum N. E. Br. Leaves exactly cruciate (but the pair as figured by Salm. Duck are obliquely crossing each other), 7-8 in. long, 1 in. broad at the base; all old leaves appear swollen (? convex) on the upper side, particularly near the somewhat dilated base. Pedicels stout, 1-2 in. long, of equal thickness to the very calyx. Flower large. Petals not so long as those of G. difforme, but broader. Stigmas 8-9.

14. G. salmii, N. E. Br. Leaf-pairs crossing one another, variously curved, 2-4 in. long, 8-9 lines broad at the base, thence tapering to an acute point, flat above, convex beneath, with the apical part sometimes obliquely prolonged beyond the flat surface and laterally compressed or keeled. Flowers sessile, 2-3 in. in diameter. Cerasule depressed, half included.

15. G. arrectum, N. E. Br. (new species, Fig. 5). Leaves 2-3 (rarely 4) pair to each branch or shoot, suberect or ascending-spread usually one or less curved, on the upper...
o obliquely to one another. 2-3 inches long, 2½ lines broad near the base and 3-4 lines thick somewhat cylindric, but with the inner face more or less flattened, not at all keeled on the back, acute or subobtuse, smooth, leathery, light green, not at all glaucous nor dotted. Flowers subsessile or on pedicels 1-2 lines long and ½ line thick. Calyx 4-lobes; "obes 3-4½ lines long and as much in breadth, broadly ovate, obtuse, green, all with membranous margins. Corolla 2-3 inches in diameter, cup-shaped, expanding in sunshine, scentless; petals about 50, in 1 series, lax, 12-16 lines long and about 1 line broad, linear, very obtuse or subtruncate and notched at the apex, bright yellow on both sides. Stevens numerous, erectly spreading in a ring around the stigmas; filaments pale-yellow; anthers darker yellow. Stigmas 7-9, widely spreading, about 2 lines long, lanceolate, acute, glaucous, pale yellowish-green. Capsule sub家务ose, with a high dome-like top, 8-10 lines in diameter, 7-8 velvety.

Sent to me from Sevenfontein in Swellendam Division, by Dr. T. B. Pole Evans, 1889. It flowered in September, 1921.

This species is easily distinguished from all the others by its ascending, nearly cylindric-leaves.

N. E. Brown (To be continued.)

Nesembranthes are and some new genera separated from it.

Gard. Chron. Ill. 71: 22. 1922. (Continued from page 9.)

*** Leaves with a hum or food teeth on the flattened base.

16. G. difforme, N. E. Br. Leaves as described by Haworth obliquely cruciate, 1½ in. long and 2½ in. broad, some semicylindric from the base upward with a kind of half-crest at about the middle, with a sort of lobe-like tooth near the compressed-triangular or somewhat dolabriform tips, which often ends in a straight curved or hooked harmless bristle; other leaves without either a tooth or lobe-like rising, but hooked or gibbous near the point, or with a concavity above, one side of which forms a ridge. Some leaves microscopically ciliate towards the tips. Peduncle or plants flowering in the open air very short or scarcely any except the quadrangular base of the calyx. Flower 2-2½ in. in diameter with fewer, longer and more lax petals than in G. semicylindricus, according to a drawing at Kew.

G. difforme, Linn., Sp. Fl., ed. 1, r. 487 partly, as to A. foliis difformibus, Dillen., Hort. Elth., r. 252, t. 194, f. 442 (not 241), and Haw., Obs., r. 169 (1795) not of other authors.

The two figures of Dillenius were considered to represent one species by Linne, but Haworth retained the name G. difforme for the plant represented by Dir. 242, and separated that figured at 241 under the name G. semicylindricus, and he was probably right, for I have not seen any among the plants I have raised of the latter species at all like the Dillenian figure 242, which represents the pedicel as being about 1 in. long and distinctly angular, and there is drawing at Kew, made in 1826, of what was doubtless the plant Haworth described, which has the pedicel about an inch long, much thickened upwards and almost winged-angular (Haworth states under G. cruciatum, Obs., r. 175, that it is "not at equal thickwise"). But probably both these figures were
17. G. semicylindricum, N. E. Br. Leaf-pairs obliquely crossing each other, variable in size, 2-4 in. long and 3-4 lines broad and nearly as thick, half-cylindrical, but the flat face not nearly extending to the variably formed compressed tip, with two blunt teeth on the upper side beyond the middle. The leaves are sometimes turned or hooked, with a short soft bristle. Pedicel 6-9 lines long, very slightly thickened at the apex and slightly angular. Corolla 1½-1½ in. in diameter; petals more numerous and more crowded than those of G. difforme, according to the few drawings of these species.

I. semicylindricum, Haw., Observ. p. 238 (1794), founded upon M. folias difformibus, Dillen Hort. Elth. p. 252, t. 194, f. 541, which is a much reduced figure of the plant.

M. bidentatum, Haw., Surinam, p. 89 (1819); Salm. Dyck, illus., 87, f. 1; N. E. Fr. in Journ. Linn. Soc. Bot., v. 23, p. 125.

M. bigibberatum, Haw., in Phil. Mag., v. 68, p. 238 (1826) not of Salm. Dyck.

I have this plant in cultivation, raised from seeds from Mount Stewart, Pensacola Division, sent to me by Dr. I. B. Tole Evans, 5579, and find that it varies very much in size and appearance. Heworth seems not to have realized that Dillenius' fig. 241 is a much reduced representation of the plant, and considered size of specific value. There is no difference whatever between his three supposed species.

I. F.-J. semicylindricum, Salm. Dyck, illus., 87, f. 2, not of Heworth; M. difforme, Salm. Dyck, illus., 87, f. 3, not of Linne nor Heworth; and M. bigibberatum, Salm. Dyck, illus., 87, f. 4, not of Heworth; M. difforme, Salm. Dyck, illus., 87, f. 5, not of Linne nor Heworth; and M. bigibberatum, Salm. Dyck, illus., 87, f. 4, not of Heworth are three differently named plates all representing the same species, and might even have been drawn from the same individual in different years. All the names given to the plant represented are wrong, but I have not seen any plant like it, so refrain from giving it a name.

18. G. ochraceum, P. B. Br. Leaves 2-4 in. long, triangular of semiterete, obtusely pointed, slightly thickened upwards, one of each pair broader than the other towards the apex and slightly recurved, the other narrower and straight. Flat above, one side convex, the other flat or even concave: the younger leaves finely ciliate. Pedicels 2-4 in. long, slightly compressed, thickened above. Calyx compressed to-spherical, 5-edged, 5-lobed, two of the lobes much elongated, leaf-like, 3-angled, ciliate. Corolla 1½ in. or more in diameter; petals 6 lines long, in two series, recurved-spreading and oblique, brownish-yellow, rarer on the back. Stamens numerous, erect, scarcely half as long as the petals; filaments, white. Very flattish "lumose, greenish-yellow."

M. ochraceum, Berger, Lesen, and Fortun., p. 254.

Doubtful Species.

M. heterophylum, Haw., Observ. p. 420 (1794). This is quite
an unknown plant whose position is doubtful. It is not at all the same as  A. angustum var. heterorrhylum, Haw., with which it has been confused by Sonder. It is described by Haworth as a singular and very distinct species having robust green leaves that are not dotted, the lower being somewhat like those of A. angustum, Haw. (not of Berger), and the upper somewhat like, but not quite so large as those of A. diffusum, Linn. Nothing more is known of this species. Haworth (Misc., p. 36) states: "I once saw two plants of this fine species alive in the collection of Messrs. Falconer, nurserymen, at Pennington." Although placed under the Diffusum group by Haworth, I do not think it can be a species of Glottiphyllum.

H. surrectum, Haw., Rev., p. 101 (1821). This species also does not appear to be a Glottiphyllum, although placed in the same group by Haworth. According to a drawing of it at Kew it was raised in 1817 from seeds collected by Bowie. It is a very distinct species, with three pairs of ascending-splaying semi-terete or nearly terete obtuse leaves about 2½ in. long, ½ in. broad, and nearly as thick, placed at right-angles to each other, and not at all tongue-shaped, of a dark green colour and not dotted. I have not seen anything like it.

N. E. Brown

Resembryanthemum and some new genera separated from it.

Gard. Chron. III. 71: 44. 1922.

(Continued from page 22.)

LITHONS, N. E. BROWN.

Very dwarf succulent plants, in nature growing buried in the ground with their tops scarcely, or not at all, rising above the level of the surface, consisting of a single growth or of two to many growths in a clump. Each growth a more or less obconic or nearly compressed cylindrical body with a transverse fissure across the top dividing it into two short lobes, flat or convex on the top dividing it into two short lobes, flat or convex on the top when adult, but in a juvenile state with only a central orifice at the top, as in the genus Conophytum. Flowers solitary, from the centre of the fissure. Calyx exserted from or partly included in the fissure, more or less compressed, without a tube above the ovary, 4-7 (usually 5-6) lobed. Corolla without a tube; petals numerous, widely spreading. Stamens numerous, collected into an erect column. Style short, sometimes almost absent; stigmas 4-7, bilabellum.

The above generic name which I give to the plants I now separate from Resembryanthemum is formed from the Greek words lithos, a stone, and ons, the face, on account of their resemblance in colour and appearance to the stones and pebbles they grow among. The remarkable resemblance of these plants to pebbles is well demonstrated by an account given by Dr. A. Garloth in the Transactions of the South African Philosophical Society, Vol. 18, p. 100, in an interesting description of the manner in which plants imitate the ground and stones they grow among. Dr. Garloth states that Mr. Hammond Hook ("J.

H. T. Tooke), during a stay in the Karroo had often seen a certain footpath which crossed for some distance over bare ground merely covered with pebbles. One day, however, he saw some of these pebbles bearing bright yellow flowers,
one on the tor of each stonelet. The number of these flowering pebbles increased every day until there were hundreds of them on the otherwise bare vel. It was "esserbarbantendrum truncatellum," Howell, which occurred rather plentifully in this locality. The resemblance to pebbles must be very great for anyone to frequently walk over the ground on which they grow without discovering that they were not stones until flowers appeared. But Karlott is quite wrong in his identification of the plant, which—have no doubt whatever—is a species of Lithops unknown to me at present. For "t. truncatellum" grows in tuft, does not resemble pebbles, but is colourless-green and dotted, and has light straw-yellow flowers that only open in the evening. I have been on account of the resemblance of these plants to stones of r. 25 of Volume LXX, and have also there stated an explained that they all belong to the the small group known as "lichen-like plants." The indes, however, is sometimes quite obscured by coloured vesture, which acts as a screen to soften the light, yet does not prevent it from penetrating into the interior of the plant and reaching the chlorophyll layer (see Fig. 112, r. 251, Vol. LXX.

When these plants are very young and have only a central orifice, there is nothing in their external appearance to distinguish any of them from the genus Conophytum; compare, for example, Fig. 24, with 24, 0, on p. 297, and with Fig. 97 on p. 223, Vol. LXXI. But when the adult condition with fissure all across the tor is assumed, or the plant flowers, the distinction between the two genera is very obvious. While, in any one stage, if a longitudinal section through a plant is made, the peculiar disposition of the chlorophyll layer, as shown in Fig. 112, r. 251, Vol. LXXI, will at once serve to distinguish this genus from Conophytum, in which the chlorophyll layer covers the whole surface.

Although in nature these plants are buried in the soil with the tor level with or just rising above the surface, they often refuse to grow in that way in this country. For if planted with their torsi above or level with the soil, I have found that the first new growth that is made in most cases rises far above the ground level, doubtless due to the absence of such intense light as they get in their own country. On the contrary, I have one plant of L. leslylii that I planted over two years ago with its tor level with the earth in the rot, that has in no way changed or made any attempt to develop a new growth since it was planted, but has remained plump and healthy all that time, and has not flowered. But planting them level with the earth in this country is to risk their loss by rot, as I have found from experiment, for it is very difficult to know when the moisture in the soil is greater than the plant will endure during particular season. For, as I have previously stated, the watering of these plants is art requiring special knowledge. If sufficiently watered at the proper season they do not flower, and if over watered they rot. The thermometer and drunkenness of the atmosphere should also be consulted as guides to the amount of water that should be given and how often it should be supplied; for a tablespoonful may be enough for three weeks in June or December, yet not more than enough for two or three days in August. I have found L. fulviceps and L. orticei to be especially sensitive to a little too much water at the wrong season.

The plant I described in the Journal of the Linnean Society, Vol. 45, r. 32, as "esserbarbantendrum locale", and associated with species of this genus, may belong here, but it only known from an imperfect dried specimen, and cannot be properly placed until
the living plant from near the Gams River is obtained, for after examining the specimen I am now inclined to think that what I supposed to be a transverse fissure may be only a furrow due to shriveling.

(To be continued.)

Mesembryanthemum and some new genera separated from it.

Gard., Chron. III. 71: 55. 1922.

(Continued from page 44.)

The following are all the species at present known to me, of which I have all but two in cultivation. For brevity in the synonymy the generic name Mesembryanthemum is indicated by the letter A.

A. -- Surface minutely tuberulous, smooth and velvety to the touch.

(1) Lithos Friedrichiae, N. E. Br.--Growths up to 1 in. high, 10 lines broad, and 8 lines thick, dull red, or brownish-green, with the convex top of the lobes greener, without spots, and reflecting light like a looking-glass, although tuberulous. Flower not seen, stated to be yellow. -- Friedrichse, Pinter, Neue und werris bekahne il. Deutsch-Sudwest Ahr., p. 41. Great Namacualand, near Wembad.

--------------

AA.--Surface glabrous, opaque, not reflecting light (to the end).

--------------

3. -- Flowers yellow.

--------------

C. -- Top of the lobes tuberulate or with a more or less evident network of slight furrows or with slightly raised dots.

(2) L. turbiniformis, N. E. Br. (Fig. 28).--Growths solitary or 2-4 in a clump, up to about 1 in. high, 14 in. broad, and 1 in. thick, flat at the tor, which is either distinctly tuberulate or marked with a sort of network of slight furrows varying from light rusty-ochreous to a dark ironstone colour, with the furrows of a darker tint, not spotted. Calyx unequally 8-lobes, stout, compressed; lobes 5-10 mm. long, 4-5 mm. broad, oblong or ovate-oblong, obtuse, green with reddish tips. Scrobus about 1/14 in. in diameter; retels 50-60 in about 2 closely overlapping series, widely spreading, 6-8 lines long, about 1 line broad, linear, tapering towards the base, bright yellow on the inner face, whitish on the back. Stigmas collected into a column about 6 lines long; filaments yellow, fading into white at the base; anthers orange-yellow. Ovary slightly convex at the tor. Stigmas usually 6-7 (sometimes 5), finally 6-7 lines long and exceeding each other over the stamens, filiform, yellowish. Capsule somewhat compressed, 4-6 lines in diameter, 6-7 valved. Seeds smooth, brown. -- N. turbiniforme, Rev. Rev. n. 84 (1821); Burchell, Travels, Vol. 1, p. 310; P. J., Frodr. Vol. 3, p. 417;
Prieska Division, at Sand Vlei, Durnell, Pole Evans. This species was the first that was discovered of these very remarkable "miniature" and "windowed" plants, but as I have already given some account of its discovery and rediscovery on p. 285, Vol. LXX., I need only add here that the above description was made from the living plants that were so generously sent to me by Dr. T. B. Pole Evans, and the figure is reproduced from a photograph kindly sent to me by Dr. T. C. Leslie. This figure represents the tuberculate form, but I also have other forms that are very much smoother with only a coarse meshwork of slightly impressed lines upon the top of the plant.

In this very interesting account of plant miniatures, Dr. Karloth (Trans. 3d Afr. Phil. Soc., Vol. 15, p. 99), remarks that Durnell, "in his travels through the Karroo found a species of Lithops truncatum which he named L. truncatum, thinking it to be undescribed. As a matter of fact it had been found by Thunberg, who had named it L. truncatum from the shape of its leaves. Dr. Karloth has in this been misled by Sonder's union of these two species in the genus Eriophyllum. If not only are they two utterly different species, but one is a Lithops and the other a Conophytum, and grow about two hundred miles away from each other.

(3) L. fulviceras, M. B. & r. -- Growth solitary or 2-4 in a clump, up to 1 in. high, 14 in. broad, and 1 in. thick, nearly flat or slightly convex at the top, which varies from bright fulvous to dingy cinnamon-rust colour, thickly sprinkled with rather large, round, dark green dots, which are usually slightly raised, but sometimes almost even with the surface, and scattered among the dots are few or several inconspicuous slender dark orange-red irregular lines or dots, usually placed in slight depressions of the surface, so that the latter is usually very slightly tuberculate-pauculo to the touch. Calyx 4-6 lobed; lobes 2-4 lines long, 14-7 lines broad, linear-oblong, obtuse, brownish or brownish-fulvous, sometimes tinted with pale violaceous, dotted. Corolla 10-14 lines in diameter, expanding between 6 and 4 p.m. (Greenwich time), and closing at night, lasting about a week, odourless; petals 40-45, in about 2 series, 4-5 lines long, and less than 1 line broad, linear, subacute, the inner bright yellow on both sides, the outer whitish with a faint rink tinge on the back, with the tips often becoming more or less red on both sides. Stamens about 3 lines long; filaments deep yellow ochreous fading to pale yellow at the base; anthers yellow. Style short, up to 1 line long, stigmas 4-6, about 3 lines long, slightly exceeding the stamens, olliform, rich ochreous yellow. -- H. fulviceras, M. B. Brown., in Kew Bull., 1914, p. 167; Bot. Mag. t. 4776a, an extremely bad figure of the plant. Great Karasburg, Great Karasburg Range, on sandy cliffs at South Karasburg, 4,500 ft. above sea level, Pearson 7618.

Described from living plants sent to England by Prof. M. W. Pearson. In my original description I stated that this plant is smooth on the top; that statement was based upon a single specimen which probably was nearly smooth, but numbers of others examined since were as above described.

R. E. Brown

(To be continued.)
65

CC.--Top of the lobes entirely without tubercles or slight furrows or raised dots when in a plum-growing condition, smooth except sometimes in L. Lesliei.

(4) L. pseudotruncatellum, K. E. Br. (Fig. 73).--Grows solitary to many in a clump, up to 1 in. high and 1 in. in diameter, flat or the lobes slightly convex on the tor, varying from pale grey to brownish-grey with a slight pinkish tint, covered with numerous branching lines or dendritic markings of a darker colour formed of confluent dots, mingled with some separate dots. Calyx 6-7-lobed; lobes 3-5 lines long, 1½-2 lines broad, oblong or ovolanceolate, obtuse, pale greenish-grey with a brownish tint. Corolla 1½-2 in. in diameter, opening soon after mid-day and closing between 6 and 7 p.m. for 6 or 7 successive days, odourless; petals 50-60, in 2-3 series, ½-1 in. long, and about 1 line broad, linear, narrowing to the base, obtuse, bright yellow, with a white base on the inner face, faintly pinkish-white on the back. Stamens 6-4 lines long; anthers and upper part of the filaments pale orange-yellow, lower part of the filaments white. Ovaries 5-7, free almost or quite to the base, equal in size or slightly exceeding the stamens, filiform, pale orange-yellow.--L. pseudotruncatellum, Berger, Resemb. p. 229 and 263, Fig. 4 (1903); L. truncatellum, W. Watson, in Gard. Chron., 1902, Vol. 27, p. 311, with Fig., not of Keverw; L. truncatellum, Eyre, in Ann. of Bot., Vol. 20, p. 190, t. 7 (1912), not of Thunberg.

Demaraland, near Jekelwater, Koessing, Farm Hoffnung and Ausfontaine, Winter.

Described from living plants raised from seeds sent to Lew in 1907, by Dr. L. S. Illens, who informs me that the locality "Heinsberg District" quoted for it by Eyre in the "Annals of Botany" is entirely wrong, and that when he sent the plant to Lew on January 11, 1907 (by error dating his letter 1906), he wrote that he was "restoring a piece of the plant together with some seeds of Resemb. truncatellum from German South-West Africa," which were given to him by Prof. Leckow, who probably received them from Dinter. The letter, in writing of this plant (without a name) in the Gardener's Chronicle, 1900, Vol. 27, p. 115, states that "this plant so closely resembles, when not in bloom, the form and colour of the cebbles among which it grows, and it can only be detected by an experienced eye."

The beautiful flowers of this species afford an excellent example of their daily increase in size which I alluded to on p. 290 of Vol. LXX. One that I measured on the first day of its opening was 1 1/3 in. in diameter, on the third day it was 1½ in., and on the sixth day 2½ in. in diameter. The time of expansion and closing above mentioned seems rigidly adhered to, but only if the sun is shining and the temperature high enough, otherwise the flower will not open.

(5) L. Lesliei, K. E. Br. --Grows solitary or 3-4 in a clump, up to 1½ in. high, ½ in. broad and ½ in. thick, flat on the tor, smooth or slightly harsh or irregular to the touch, but without an impressed reticulation, dark green or olive-green, densely or sparsely covered with dull orange or rust-coloured irregular spots or dendritic markings. Calyx 5-7 lobed; lobes 2½-4
65 lines long, 1-2 lines broad, oblong or ovate, obtuse, green or brownish-tinted. Corolla 1-1 1/2 in. in diameter, expanding in the latter part of the afternoon (at Pretoria about 5 p.m., according to Dr. Pole Evans) in bright sunshine only, scentless; petals 50-60, in about 3 series, rather lax, 5-7 lines long and nearly 1 line broad, linear, acute, obtuse or slightly notched at the apex, bright yellow, whitish or pinkish-white on the back. Column of stamens about 1 in. long, whitish or pale yellow anterior, yellow. Style short; stigmas 4-5, about 4 1/2-5 1/2 lines long, as long as the stamens, pale greenish-yellow.---L. Lesliei, E. E. Br. in Trans. Roy. Soc. S. Afr., v. 2, p. 369, with fig. (1812).


The biological peculiarities of this plant are detailed on p. 250, volume LII, but I would add that this appears to be one of the hardest species of this type of plant, for in its native locality during winter it is sometimes subjected to 20 degrees of frost at night only, not continuously, the days being warm, and the air and ground are both very dry at that period, the rainfall varying from 20 to 40 inches, taking place during the summer, which corresponds to our winter, when these plants often went to seed.

(6) L. terricolus, E. E. Br.---Grows solitary or few to a plant, two only on each of the four plants seen, 1-1 1/2 in. high, 8-11 lines broad, and 6-8 lines thick, with the top of the lobes convex and rounded into the sides, on the colour of dried earth or grey-brown, marked with dark fuscous dots all over or on the central area with a dark fuscous patch covering green of crowded or confluent dots, and some separate dots on the marginal part. Calyx 5-lobed; lobes about 2 1/2 lines long, ovate, obtuse. Corolla about 1 1/2 in. in diameter, not seen in a fresh state. Stamens, about 1 in. long, style very short, stigmas 5, overtopping the stamens, filiform, bright yellow.

Knysna Division: near Crootfontein, Frith. Living plants of this species were kindly sent to me by Mr. J. Frith, who informs me that the plant grows on black shale and in crevices, and is very difficult to find. I have only seen withered flowers that were on the plants upon arrival.

N. E. Brown

(To be continued.)

Mesembryanthemum and some new genera separated from it.
(Continued from page 65.)

BB, Flowers White.

(7) L. mariscata, E. E. Br.---Grows solitary or few in a clump, increasing very slowly, up to 1 1/2 in. high, 1-1 1/2 in. broad, and 1 in. thick, with the top of the lobes slightly convex, grey-green, mottled with pale grey or creamy-grey. Calyx 5-lobed; lobes 2 1/2 lines long and about 2 lines broad, ovate or oblong, obtuse. Corolla about 1 1/2 in. in diameter, expanding after midday...
in full sunshine and closing at dusk, scented; petals about 40, of about 2 closely overlapping series, 6-7 lines long and 1-1 1/2 line broad, obtuse, rare white on both sides, very shining. Column of stamens 2 in. long, white, with yellow anthers. Top of the ovary flat; style very short; stigmas 6, finally about 5 lines long, at first erect, but when the petals fade they spread widely from the base, rushing the stamens away so that the latter form a sort of ring around them, and they are revolute at the tips. -- H. marmoratum, N.E. Br., in Journ. Linn. Soc. Bot., v. 45, p. 69.

South Africa: locality unknown, Hillens

(g) L. optica, N.E. Br.--Growthes forming clumps of 4-15 to a plant, each 6-8 lines high and 6-7 lines in their greater diameter, with the top of the lobes slightly convex, with narrow whitish or whitish-brown margins, and the central part greenish-white or rale crevish-white sometimes tinged with pink, without or occasionally with 1 or 2 whitish spot. Calyx 5-lobed; lobes, 2 lines long, 1/2 in. in diameter, expanding only in bright sunshine; petals numerous, 2-4 lines long, rare white or tinged with pink. Stamens white, with yellow anthers. Stigmas 5, filiform greenish. -- H. marginatum, Marloth in a note under H. rhopalophyllum Schlechter, on p. 406 of the same work.


I have not seen fresh flowers of this species, as my plants of it have not yet flowered.

(g) L. bella, N.E. Br.--Growthes at first solitary, forming clumps with age, increasing slowly, each up to about 1 in. high and 1 in. in their greater diameter, with the top of the lobes convex, having a rather broad, light brown or buff-brown border, enclosing an irregularly lobed fuscous or greenish central area with or without 1 or 2 brown spots upon it. Flowers not seen, stated to be white and shining.

Great Namaqualand; near Aus, Phillips.

When sufficiently supplied with water the top of the lobes is even and smooth all over, but under very dry conditions the central part becomes slightly sunk below the level of the marginal part. I am indebted for this pretty species to Lieut. Sergeant J. C. Phillips, who informs me that it grows on the top of small korias in sandy, gravelly soil and is so similar in colour to the soil that it is difficult to detect. It has not yet flowered with me.

(10) L. demerana, N.E. Br.--Plant solitary or of few growths in a clump, increasing slowly under cultivation. Each growth 1 in. high and up to 1 1/3 in. in its greater diameter; lobes flat or very slightly convex on the top, very pale brown or fawn-colour, marked with distinctly impressed branching lines and spots forming a sort of pattern of a rich, dark brown or dark grey colour. Calyx 5-6-lobed, much compressed and about 5 lines broad; lobes 2-7 lines long, 2-3 lines broad, ovate or oblong, obtuse, some with membranous edges, dull reddish-brown. Corolla 4-1 in. in diameter, opening about 1 p.m. and closing between 4 and 5 p.m. and lasting for about a week, not scented; petals 9-36, in about 2 closely overlapping series, 5-9 lines long and about 1 line broad, linear, obtuse, rare white on both sides, slightly shining. Col-
Damaraland, locality and collector unknown.

I received specimens of this plant some years ago without information, except that they came from Damaraland. Subsequently some plants were sent to me from Onaruru and Aus and arrived in a very shrivelled condition, so that I mistook them for the same species as the above, and, therefore, wrongly mentioned those places as localities for \( L. \) damarana, in the journal above quoted. The \( Onaruru \) plant died without rooting, but I believe it to have been the same as that from Aus, which, now that I have it in plumper condition, proves to be quite distinct from \( L. \) damarana, and is described above as \( L. \) bella. I am under the impression that Prof. Pearson sent \( L. \) damarana to Kew among the plants he collected on the Great Karasberg Range, and that it died, but I have no note to that effect and may be mistaken.

N. E. Brown

(To be continued.)

Mesembryanthemum and some new genera separated from it.


(Continued from page 80.)

Arcyrodema, N. E. Br.

Sterile succulent plants; each plant or growth with two or (when a new pair is forming) four (rarely six) short, thick, ascending spreading leaves, united for about half their length at the base, flat above, very convex on the back, and sometimes with the dorsal part prolonged beyond the flat face and very obtusely rounded; with or without a faint keel; very firm or hard in substance, with a very smooth white or greenish-white (or rarely rosy-tinted) skin, without dots or markings. Calyx produced above the ovary into a short tube, 6-lobed. Petals numerous, free.

Sterens very numerous, erect, arranged in a dense ring, at the base of the petals. Stigmas sessile on the top of the ovary, circular, entire or faintly crenate. Ovary inferior, 10-24 celled. Capsule 10-24 valve. Seeds numerous in each cell.

This genus is distinguished from all its allies by its sessile entire stigmas, and the very smooth white skin of the short broad leaves, the latter characters serving to distinguish these plants at a glance when out of flower. The generic name is derived from the words arcuus, silver, and derma, skin.

Perser associates the type of this genus (\( A. \) testiculare) with \( Mesembryanthemum \) Bolusii, but in the nature of the leaves and structure 93 of the flowers the two plants are entirely different.

The species of this genus are easy to discriminate at sight when seen growing together, yet I find it very difficult to define them in words so that they can be determined from description, especially as I have seen flowers of only two species. They are not difficult to cultivate if properly attended to and not over-watered. Like most of their allies they attempt to grow and flower between October and March, which is their summer season in their native country; during this period the rainfall of that region takes place, so that under cultivation it is necessary to
give them just sufficient water to enable them to develop their flowers and new growth during that period. At the same time their roots should be kept fairly warm, for in their native country the ground gets much more heated during the day and keeps them from being harmed by the rain. A cold, moist soil does not suit these plants. The following are all the species known to me. For brevity in the synonymy the letter V is used to indicate the genus *Gesneranthus*.

Leaf from nearly as broad as, to broader than long, white, with the edge of the flat face sharp and outlined by a very slender, slightly raised line or ridge that is not cartilaginous.

1. *A. testiculare*, N.E.Br. Plant usually of only a single growth. Leaves with the flat face 1/2-in. long, 1-1/2 in. broad, and 1/2-in. thick, broadly ovate or somewhat oblong, pointed like a Gothic arch or broadly rounded at the apex, with the dorsal part often prolonged beyond that apex. Flower sessile between the leaves, with two bracts under it. Calyx-lobes 2-3/5 lines long, deltoid-ovate, obtuse. Corolla 1-2 in. in diameter; petals numerous in about 4 series, white or whitish. Stevens in a dense ring, with yellow anthers. Top of the ovary flat. Stigma 1-2 lines in diameter, circular or elliptic, concave, entire or faintly crenate. Capsule 6-7 lines in diameter,椭状ish or very slightly convex on the top, 12-24-valved and 13-24-celled.


4. *A. pearsonii*, N.E.Br. Flower with a distinct pedicel up to about 2 in. long. Corolla with the outer petals magenta-purple and the inner ochraceous yellow more or less striped with purple. *A. pearsonii*, N.E.Br. in Newtull. 1912, p. 277, and Bot. Mag. t. 9467.

A native of Van Rhynsdorp Division; originally introduced by Messon, who discovered it in company with Thunberg, whose type specimen I have seen. This species offers an excellent example of the manner in which some of these plants vary in colour of their flowers, as stated on p. 290 of vol. LIX. Br. sodier Heath has raised from seeds taken out of one capsule some plants with yellowish-white, others with yellow, and others with purple flowers. I now think it probable that the variety Pearsonii may be a hybrid between a purule-flowered and a yellow-flowered form. Its flower is exceedingly beautiful.
3. A. roseum, N.E. Br. (Fig. 52). Plant solitary, or perhaps tufted with age. Leaves 2-6, to a plant or growth, but probably in nature only 2-4, with the inner pair sub-erect, united below for nearly half their length and but slightly separated above, with the inner lower part; 2-5 lines long, 0-6 lines broad, broadly ovate, sub-acute, with short edges, or the back, very rounded and distinctly keeled at the apical part, which is not prolonged beyond the flat face, about 5-6 lines thick; surface very smooth, white, prettily tinted with rose, especially at the margins and heel. Flower and capsule unknown.

Little information: Locality and collector unknown, possibly from the vicinity of Grand Ecart.

I obtained this distinct and very pretty species from the late Mr. W. F. Boree, but have no other information concerning it. In size and form it somewhat resembles A. subtilissum, but the rosy tint of its leaves at once distinguishes it from that and all known species.

4. A. necorinum, N.E. Br. Plant tufted with age. Leaves 6-12 lines long, 2-6 lines broad on the flat face, and 0-6 lines thick, deltoid-ovate, obtuse, the dorsal part not or but shortly produced beyond the flat face, obtuse, faintly keeled. Flower sessile between the leaves, with two compressed bracts under it. Calyx 0-lobed; tube obconically campanulate about 2 lines long and 2 lines in diameter; lobes 1-2 lines long, ovate or oblong, obtuse, green with membranous margins. Corolla 5-7 lines in diameter; petals numerous, in 2-7 series, widely spreading, 2-5 lines long, linear, bright yellow. Stamens very numerous in a dense ring at the tor of the calyx-tube. Stigma less than 1 line in diameter. A. necorinum, N.E. Br. in Journ. Linn. Soc. Bot. v. 42, p. 96.
Locality unknown. Introduced by Hasson, and by Fillans.

** Less distinctly much longer than broad, with the edge of the flat face blunt or somewhat rounded and somewhat cartilaginous, and when decaying often becoming reddish-tinted.

5. A. dule, N.E. Br. Plant tufted with age. Leaves with the flat or slightly convex face 4-10 lines long and 0-6 lines broad at the base, thence tapering to a more or less acute point or narrowly oblong and obtuse, with the dorsal apex sometimes produced shortly beyond it, slightly keeled, up to 4 lines thick. Flowers unknown. A. dule, N.E. Br. in Journ. Linn. Soc. Bot. v. 45, p. 29. Van Rhynsdorp Division: on ridges near Akhuis, Pearson and Fillans, 547.

This species is very similar to A. necorinum in general appearance, but readily distinguished by the blunt, somewhat cartilaginous edges and keel of the leaves. It has not yet flowered with me.
Doubtful Species.

Possibly the plant I described as L. socium (Journ. Linn. Soc. Bot. vol. 45, p. 91) may belong to the genus Argyroderma, but I have not yet seen its flowers, and the skin of the leaves does not appear to be of quite the same texture. It is a small species, quickly forming a tuft, with half-cylindric, suberect leaves 3-10 lines long, 3-4½ lines broad, and 2½-4 lines thick, obtusely rounded and faintly keeled at the apex, whitish-green tinted with rose when exposed to the sun.

Another plant that may also prove to belong to this genus is L. octonyllum, Haw. (Rev., p. 85, excluding the reference to the figure of L. testiculare in the Botanical Magazine, t. 1873, and all varieties). From Haworth's description of this plant (which is as follows, "Leaves on the living plant 6-8, oblong-ovate, half-erect, more erect than those of L. testiculare") it is impossible to form an opinion of it, especially as he quotes the Bot. Mag. figure as belonging to it which is most certainly due to some error. I think probably by Haworth entering the reference by mistake in the wrong place in his manuscript. Fortunately there is a drawing of it preserved at Kew, which is labelled "L. octonyllum, Haw., Nov 7, 1873. Received in 1826 from H. Haworth Esc." This drawing, therefore, represents the typical plant of Haworth, and is all that is really known of it. For the only plant I have ever seen of it was in the rich collection of Mr. W. Wilson Saunders at Reigate, about the year 1885, when Mr. F. W. Cooper called my attention to it and said it was believed to be a descendant of Haworth's original plant. That plant, to the best of my recollection, was the same as in 1873 I found to be represented in the Kew figure. It is a tufted species, each shoot with three or four pairs of smooth, whitish-green or whitish leaves about 7-12 lines long, 3-4 lines broad, and 2½-4 lines thick at the much thickened or dilated apical part, which is twice as thick as at the base, flat on the face, very convex on the back, and keeled at the apical part. Flowers sessile and yellow, according to Haworth. Locality unknown. 

N.E. Brown

(To be continued.)

Hesperobryanthemum and some new genera separated from it.


(Continued from page 105.)

Sibreeum, Haw.

Very dwarf-tufted succulent plants, sometimes with short prostrate stems. Each shoot consisting of two or more unusual leaves united into an obliquely ovoid, oblong-ovoid, or sub-cylindric body, with an oblique fissure on one side of it, at or below the middle, resembling a closed or slightly open mouth, formed by the free part of the smaller leaf being closely pressed against or slightly separated from the larger one, with the body often more or less swollen or silhouetted below the top of the fissure. Flower solitary, pedicellate, without bracts. Calyx 5-lobed; two of the lobes longer than the others, acutely keeled, and the keel continued from the radical. Corolla rather small, petal-like, numerous. Stamens numerous, erect or spreading. Stigmas 2, more or less plumose. Capsule small, 3-valved and 3-celled; valves
139 winged; cells rooted with thin membranous cell-lining with the outer end of the cell open.

This is another genus proposed by Haworth in 1821 that has remained unnoticed by all subsequent authors. Under his definition of the characters of the section, Gibbos or Resembranthemum (Rev. Plant, Succ. v. 104) he remarks: "A good genus, I propose the name Gibbseum for it." Although in that work he enumerates the species under the genus Resembranthemum, Haworth was undoubtedly right in considering that the plants forming his section Gibbos should be generically separated from that genus, for they are distinguishable from all others included in it at a glance. I have, therefore, compiled the above characters for it, partly from the account given by Haworth, partly from living plant.

Unfortunately, I have not yet seen flowers of any species of this genus, as the conditions under which I am obliged to cultivate these plants are not conducive to their flowering, for I am surrounded by houses, and during three winter months, at the very period when under natural conditions, they get the brightest sunshine, no direct sunlight falls upon them, and the glass gets be-rimed with falling soot, tending further to decrease the light.

I.

Growth somewhat velvety to the touch from being covered with some kind of rubescence, visible under a lens, quite smooth, silvery-white, greyish-white or greyish, but under cultivation becoming greyish or whitish-green.

1. **G. rubescens**, N. 1. Jr. (Fig. 64, A, B, and C.) Plant under natural conditions, nearly stemless, with the growths crowded into a tuft upon a woody, shortly-branched rootstock, but under cultivation developing short branches up to 2-3 inches long with age. Growth 1-2 (or under cultivation up to 12) inches long, and 5-7 lines thick, or stouter under cultivation, obliquely ovoid or cylindric-ovoid, or, under cultivation, oblong-ovoid, obtusely rounded and often slightly compressed and more or less keeled at the apex, with the fissure usually at or just below the middle of perfectly developed growths, which much resemble a shrub's head in appearance, silvery-white or greyish-white, from a dense rubescence of minute simple hairs pointing downwards and closely pressed to the surface, as presented by Fig. 64, C, greatly magnified. Flower not seen, but, according to the description and figure, the calyx-lobes are about 2 lines long, deltoid-ovate, acute, and the petals about 3 lines long, narrowly linear, pale purple. Fruiting pedicels 6-9 lines long, rubescent, with reflexed hairs like the growths; capsule about 3 lines in diameter, 6-valved, whitish.—**G. arrectenum**, N. 2. Jr. in Gard. Chron., 1921, v. 70, f. 278, s. 121. **G. rubescens**, Haw. Obs. p. 138 (1794) and Rev. r. 104; Sea in Gardenflora, 1910, p. 1-14, t. 1579bis; Berger, Resemb. r. 230 and 229, f. 48; Marloth in Trans. S. Afr. Phal. Soc. v. 18, p. 44.

Ladysmith Div., near Ladysmith, Illans, Marloth 3300, Pole Evans 6932.

The plant figured and described as **G. arrectenum** is so different in appearance from the figure of **G. rubescens** in the Gardenflora, as may be seen by comparing the growths represented by A and B in Fig. 64, that I had no suspicion that they could be the same species until I found upon looking up the literature of this species that both came from the same locality, and then suspected
2. *G. shandii* H.E. Br. (Fig. 64, D and E).—Habit and general appearance of the plant almost the same as that of *G. rubescens*, but in the only specimens seen the growths were rather shorter and stouter, being 10-12 lines long and 6-8 lines thick at the basal part, the apical part they are slightly compressed and faintly keeled down the front. The smooth surface is velvety to the touch from hairs covered with a very minute pubescence of very short irregularly stellately branched hairs that are totally different from those of *G. rubescens*, as represented, highly magnified, in Fig. 64, E, and are only distinguishable under a strong lens, greyish-green or hoary-green, not so silvery as in *G. rubescens*. Flower not seen. Fruiting pedicels 3-4 lines long, compressed, ruberulous like the growths at the upper part only. —H. Shand, H.E. Br. in Gard. Chron. 921, v. 70, p. 181, fig. 62, capsule only.


I have much pleasure in naming this species after Mr. John Shand, Resident of Ladysmith, who is interested in the flora of South Africa, and assisted in the collecting of some of the species of this genus.

Although so similar to *G. rubescens* in general appearance, the character of the minute pubescence is so very different that it is at once distinguishable from that species by it, when examined under a lens. I have raised seedlings of both species, and the pubescence on the seedlings of each kind remains distinct and constant, exactly like that of their parents. The peculiar stellately branched hairs of *G. shandii* are not deflexed and not half so long as those of *G. rubescens*.

3. *G. semenum*, H.E. Br. (Fig. 64, F).—Plant developing prostrate branches 3-7 inches long in the specimen seen, and 1-2 lines thick, with internodes 3-7 lines long, being 3-4 or sometimes only one growth at each node. Growth 3-8 lines long and about 7 lines thick, or larger under cultivation, erect, cylindrical or slightly compressed at the upper part and more or less keeled on the front and back, obtusely rounded at the apex, which is often slightly incurved with the young-like closure above below the middle, on the low slightly bulging on the side below it, smooth, velvety to the touch, glabrous to the eye, but under a strong lens seem to be covered with a pubescence of very minute branched hairs like those shown in Fig. 64, E, whitish-green. Flowers unknown. Fruiting pedicels up to 3 lines long. Capsule 2-3 lines in diameter, 6-valved, white; valves incised; cells roofed over by membranous line, and the outer end of each cell open.

This singular species is readily distinguished from its allies by the more slender and less conical form of its growths. The rubescence on this species is just the same in character as that upon G. blandii, represented by Fl. 64, 2.,

H. L. Brown

(To be continued.)

Mesemb. atherum, one of some new genera separated from it.


(Continued from page 129.)

II. Growths, Glabrous and Smooth.

4. G. nerviride, M. & E. Br. (Fig. 74.) Plant with age, forming short, branching, woody stems 1-3 inches long and 4-5 inch thick, spreading upon or partly buried in the ground; each branch bearing one root or a small cluster of growths. Each growth 1-1 1/2 inch long, 3-5 lines broad across the two component leaves when resting and closed together, and 6-7 lines thick, with the apical part of the larger leaf more or less compressed, with a slight keel down the front and over the obtusely rounded apex, and the smaller leaf ovate or ovate-oblong, flattish on the inner or upper side, and rounded on th back, deep grass-green, not at all glaucous, shining when in a plump growing condition, and then with the two leaves widely separated. Flowers not seen, described by Haworth as having a "small unequally 6-lobed calyx, as in G. gibbosum," and a corolla "a little larger and paler than in G. gibbosum." Petals uniformly red, very obtuse. Stamens short, spreading, with 1-1/2 white filaments and yellowish anthers. Styles 6, very spreading, as long as the filaments, with subulate subvillose recurved tips." G. nerviride, Haw. Obs. Mesemb., p. 136 and 451 (1794) and Misc. Nat., r. 37.

South Africa. Locality unknown, introduced in 1792; collector not stated.

Var. luteoviride, M. & E. Br. Leaves longer and longer than those of the type, yellowish-green. "Calyx 2-edged at the base, 6-lobed, the outer lobes longer than the others, obtuse, keeled, the remainder flattish, subovate, retuse, with purplish, membranous margins. Corolla almost as in G. nerviride; petals numerous, somewhat imbricate at the base, rather broad or cuneate-linear, often notched, pale reddish, with a darker mid-line, whitish at the sides at the base. Stamens nearly three times as short as the petals, spreading, white, with sulphur-coloured anthers. Styles 6, strongly plumose, at length spreading, but very short and much shorter than the stamens." G. nerviride, var. Haw. Misc. Nat., r. 37 (1803).


South Africa. Locality and collector unknown; introduced about 1795.

Although I have cultivated G. nerviride for many years, it has never attempted to flower. The variety luteoviride I have never seen.

5. G. gibbosum, M. & E. Br. Stem of old plants 1 inch long, densely furnished with very short, alternate, prostrate branches. Leaves variable, expanding, scarcely two of equal size on the whole plant, one of each pair always larger, longer and more gibbous than the other on the back, few of them more than 1 inch.
151 long, very thick, united at the base, all more or less blunt, compressed and gibbous on the back, dullish glaucous-green. In another place they are described as 'one short and gibbous, the other much enlarged and oblique at the apex, spreading, ovate, semicylindric, rarely keeled at the apex, yellowish-green.' Pedicel very short, compressed, 2-edged or almost winged. Calyx unequally 6-lobed; 4 lobes reflex, with more or less membranous sides; 2 larger, with an acute keel decurrent upon the pedicel. Corolla small, about half an inch in diameter. Petals linear, reddish, with roiled margins; stamens numerous, short, convergent; anthers yellowish-white. Styles 6, erect, very short, greenish-yellow. M. gibbosum, Haw. Obs. 'seemb.,' 137 and 451 (1794).

South Africa. Locality unknown.

The above description is compiled from that of Haworth, and represents all that is known of this species, for no plant at present in cultivation that is known to me corresponds to the above characters. But I have a plant, collected near Stellenbosch, and sent to me by Dr. Fole Evans under no. 962 that I strongly suspect to be M. gibbosum. It is reproduced in Fig. 73, and consists of a number of growths crowded upon a very shortly branched woody rootstock, forming a hemispherical tuft about 4 inches in diameter. Each growth is 1½-1⅓ inches long and 3-6 lines thick, the lower part, stoutly conical-ovoid, tapering from about the middle into a conical obtuse point, slightly keeled down the front, with the smaller less (measuring from the base of the fissure) about half as long as the larger one; at first they are closely pressed together, afterward more or less separating, smooth, quite glabrous, of a light and somewhat yellowish-green at the basal part, suffused with tinge on the upper part, and with a light glaucous tint. I have not seen a flower of it. If this proves to be Haworth's M. gibbosum, then Fig. 73 will represent its appearance as it grows under natural conditions.

N. E. Brown

Mesembriantherum and some new genera separated from it.

(Continued from page 151.)

Conophytum, N. E. Br.

Very small succulent plants, stemless or developing stems with age, with several or numerous growths in a clump. Roots very short. Each growth formed of two leaves fused into one fleshy body, globose, conical, ovoid, subcylinidric or oblong in shape, convex, flat, depressed, notched or two-lobed at the tor, with a small orifice resembling a closed mouth at the centre of the tor or between the lobes. Flower solitary, coming up from the interior of the growth through the central orifice. Calyx with a distinct slender membranous tube above the ovary, 4-6-lobed at the tor, more or less included in or partly or entirely exserted from the body of the growth. Corolla with a distinct slender tube as long or longer than the calyx-tube, not numerous or occasionally few, spreading or recurved, in one to several series, the inner series at the mouth of the tube sometimes much smaller than the others and differently coloured. Stamens few or many, erect, not collected into a column, included in the corolla-tube or partly exserted from it. Ovary flat or convex at the tor, with a marginal,
The generic name is formed from the Greek words bonos, a cone, and phytum, a plant, in allusion to the form of the mouths, which in many species resemble an inverted cone in shape. I have adopted this name from Haworth's suggestion in his revision of Plantanum succulenterum, p. 92, where, under his section L. X., he writes, "I hope this section proves to be a genus, the name Conophyton could be aft.," but he does not himself actually propose to consider it generically distinct from Mesembryanthemum, as he does in the case of Clotiphyllum and Gibbium. Yet, as I consider that these plants are generically distinct from Mesembryanthemum, as he does in the case of Clotiphyllum and Gibbium, yet, as I consider that these plants are generically distinct from Mesembryanthemum, I have accepted his suggestion for a generic name for them by modifying it into the Latin form.

The plants included in this genus are all distinguishable at sight from Mesembryanthemum by their form, and technically by their calyx and corolla, each having a distinct tube, by the presence of a distinct style (in two or three species, however, this is almost absent), and by their peculiar mode of growth in both the seedling and adult stage, being, together with those of the genus Lithops, the only known plants that are almost alike in form in both the cotyledonary and adult stages, the only practical difference between the two stages being that of size, as I have described, and illustrated in the Gardener's Chronicle, 1921, vol. LXXI., fig. 49, and p. 223, fig. 97.

A peculiarity of these plants is (as stated in vol. LXXI., p. 290) that they have very short roots, rarely more than about an inch or an inch and a half long, and they often grow in a very shallow layer of soil (from half an inch to one inch thick) that has accumulated upon the surface on crevices of rocks. How they manage to exist in the dry, hot climate of South Africa in such situations is a mystery that cannot be solved in Europe.

The plants of this genus, together with those of the genus Lithops, are popularly known as the "Sphaeroid Mesembryanthemums," and of this group in the most recent monograph of the genus Mesembryanthemum, published by Scherrer in 1908, only 17 species are enumerated, of which he appears to have seen only six, yet at that date I had at least thirty species in cultivation. In the following enumeration 58 species are described, so that with the addition of the ten species of Lithops already described, the number of Sphaeroids at present known amounts to 68, and I have a few others that I expect to be new species that have not yet flowered. Over a hundred years ago Haworth (Synopsis, p. 236) records that he asked Lessen (who introduced a vast number of these plants) if he had sent home all the species there were "-0, nor half of them." And I very much doubt at this period if half the species of Sphaeroids have yet been discovered.

During my botanical career I have worked at a large number of genera of plants, and have generally been able to make some sort of key to the species, but this genus Conophyton defies all my efforts, for there are so few characters to make use of that can be defined by words. These plants do not possess the evident parts that other plants have; no stem, no leaves, no angles, no stipules, no prickles or spines from which differentiating char-
Neserhrytnthema and some new genera reported from it.

(Continued from page 192.)

In the descriptions which follow it will be necessary to take the smaller dimensions given in more nearly indicate the size of the flowers as they occur in South Africa. The time at which the flowers are stated to appear is incorrect, and in the so-called 'summer-time.' 

As in the case of the genera previously dealt with, the name Neserhrytnthema is indicated by the letters N. in the synonymy.

The groups under which I have arranged the species in most cases are purely artificial, and do not admit of a proper sequence of the nearest allied species.

In the descriptions the breadth of the growths is the greater diameter, and the thickness the lesser diameter across the top.
I. Growth globose, ovoid, obovoid, obconic, obcordate, or rarely subcylindric, not compressed as if pinched between the finger and thumb and two-lobed at the top. Types A to C of Fig. 112.

Species 1-49.

Surface pubescent, minutely puberulous or covered with minute points scarcely amounting to hairs, as viewed with a lens.

A, Species 1-5.

Surface glabrous except at the minutely puberulous orifice. C. oviforme is minutely tuberculate all over, and a few species have raised dots, all the others are quite smooth.

AA, Species 6-49.

Growths uniformly green or more or less tinted with purple, without dots or markings, except sometimes in 8, C. jucundum; 11, C. bettsteini; 12, C. minutum; 14, C. saxetanum; and 15, C. viridicatum (see also 13, C. translucens).

B, Species 6-15.

Flowers yellow

C, Species 6-7

Flowers of some shade of red or perhaps whitish in 14, C. saxetanum. Colour unknown in 10, C. subrisinum.

CC, Species 8-14.

Flowers white (see also 14, C. saxetanum, and 16, C. translucens).

CCC, Species 15.

Growths marked with dots or lines.

EB, Species 16-49.

Dots all scattered and separate (see also 14, C. saxetanum; 27, C. revillei; and 70, C. parviretalin)

D, Species 16-22.

Some or all of the dots confluent into lines or the growths marked with lines not formed of confluent dots.

DD, Species 23-49.

Top of the growths flattish or with a broad and shallow, rough-like transverse depression, or slightly excavated and shallowly cup-shaped (see also 33, C. leviculum, and 37, C. signatum).

E, Species 23-31.

Top of the growths more or less convex (flattish in species 33 and 37), or convex on each side of the central notch, which does not spread out over the whole of the top as in some of those under E.

EE, Species 32-44.
Tor of the growths obcordate, with or without a slight ridge or keel extending from the orifice to the top of the convex lobule on each side of it. Types E-E' of Fig. 112.

II. Growths two-lobed at the top, and the lobes or top of the growth compressed and keeled as if pinched between the finger and thumb, with flat sides to the notch separating the lobes, except in 57, C. turricerum, which has cylindric lobes, convex or subtruncated at the top. Types R to T of Fig. 112.

Surface covered with minute points viewed with a lens, slightly and harshly puberulous to the touch. F, Species 50-51.

Surface quite glabrous, smooth to the touch. FF, Species 52-57.

I.

Growth globose, ovoid, obovoid or obconic in form, circular, elliptic, or rarely slightly angular on outline, viewed from above, and not compressed as if pinched between the finger and thumb at the upper part, with the top convex, flat, depressed, obcordately notched so as to form two very short and broadly-rounded lobes, or with a broad V-shaped trough extending from margin to margin all across the top, as represented in the outlines Fig. 112. Types A-A' (Species 1-49).

A.

Surface either distinctly pubescent or (as seen under a lens) minutely puberulous or covered with minute points scarcely amounting to hairs. (Species 1-5.)

1. C. pilosulum, M.E. Br. Growth obcordately obovoid (type N) in nature, but under cultivation with me becoming elongated-ovoid and more or less pointed at the top (type E), 5-6 in. in diameter, softly pubescent with fine outstanding hairs, dull purple when exposed to the sun, uniformly light green on other parts, without spots or markings. Flowers not seen, but according to a photograph the flower is about eight lines in diameter with about thirty recurved-spreading petals, and stated to be bright purple. C. pilosulum, M.E. Br. in Journ. Linn. Soc. Bot., Vol. 45, p. 98. Laidlaw Div., near Touwsberg Mountains, in a clayey subsoil covered with sand, flowering in July, Pole Evans, 6927.

2. C. Leipoldtii, M.E. Br. (Fig. 117). Growth globose (type C), about a quarter of an inch in diameter, covered with an impressed pubescence of fine hairs all pointing downwards, pale brownish, tinted with reddish, not dotted. Flower not seen, stated to be magenta and not to close when once extended until it withers. Glenwilliam Div., near Glenwilliam, Leipoldt. I have much pleasure in naming this very distinct species after Dr. J. L. Leipoldt, who has discovered a considerable number of interesting South African plants. The flower is probably usually more symmetrical than represented in the figure, which is from a photograph sent to me by Mr. Leslie.

Locality unknown. Introduced by Rasson in 1795, but soon dies out of cultivation, and does not appear to have been rediscovered.

Booth states that it is of the size of *C. truncatellum* and resembles that species in form, but it is more depressed and more evenly truncated. The description given by Sonder (ibid. *S.*, Vol. 2, p. 262) is evidently partly based upon Booth's description and partly upon a plant collected by Eeyher. It is certainly a mixed description of two species, and must, therefore, be discredited.

The above account contains all that is known of the plant at present.


Near the Gams River in either Cape or West Div. or Prince Albert Div.; Surte, *Bot. Afr.,* 697.

The gland-dotted flowers distinguish this from every other species known to me. Sonder describes the species as globular, from specimens collected by Surte. I have not seen Surte's specimens, from which Sonder described, but as Burke and Surte travelled together, and in most cases collected the same species, the specimens collected by Burke at the same locality are probably identical with those of Surte, and are decidedly minutely ruberulous, as in Surte 697, which Sonder wrongly quotes as being a. minutum "Bot. Afr."

5. J. risinum, N. E. Br. Grows obconic or subglobose, 2½-3½ lines in diameter, convex on the top (type E), slightly velvety to the touch, from being covered with very minute points, scarcely amounting to rubescence, only visible under a lens and best seen on the old withered sheaths, of a slightly purplish-green, often more or less tinged with sulphur on the sides, and inconspicuously marked with scattered dots on the top. Flowers unknown.


Surface glabrous, except at the orifice, which is usually minutely tuberculous, minutely tuberculate all over in *J. oviforme*, and in a few species with the dots raised and tubercle-like, but in the others quite smooth. (*Species 5-40.)

B.

Grows uniformly green, or green with the sides or sometimes the tor or round the orifice murk, usually without dots or markings, but in *J. jucundum*, *J. minutum*, *J. saxetanum*, *J. viridiata* and *J. Wettsteinii* there are sometimes a few indistinct dots on
6. C. calculus, H. E. Br. Growths globose (type $b$), 7-10 lines in diameter, light glaucous-green or chalky-green; the old withered skin is very tough and of a dull brown, becoming blackish-brown with age. Calyx 5-6-lobed. Corolla 7-8 lines in diameter, expanding at night, closed during the day; tube 3½-4 lines long; petals 12-50 in 2-4 series, 3½-4 lines long; filiform—linear, yellow. Stereos exerted about 2 lines from the corolla-tube, whitish, with yellow anthers. Top of the ovary dome-like. Style very short; stigmas 6, filiform, greenish. — C. calculus, Berger, Vosemb. n. 999 (1908); Harloth, Fl. South Afri. v. 1, p. 201, t. 49, f. B. 231.


7. C. jagree, H. E. Br. Growths 4-6 lines high and 3-6 lines in diameter, obconic, lattish at the top (type $f$), with the orifice sometimes slightly depressed, sometimes (in the very same plant) uniformly bright green, at others bright apple-green, with the sides and around the orifice of a rich purple. Flowers not seen, but figured in a drawing as being 4-6 lines in diameter and yellow, with the tips of the petals tinted with red. — C. jagree, H. E. Br. in Journ. Linn. Soc. Bot., v. 42, p. 91.

Little Kanyeeland. Near Saries, Erbe.

The manner in which this species changes its colour in different years under cultivation (which with me it is very remarkable) when the rich purple colouring around the orifice is present, it is an exceedingly attractive plant, yet sometimes this is entirely absent; for example, in 1919 and 1920 the purple was present on my plant, yet during the hot sunny year of 1921 it was entirely absent on the very same plants.

22. Flower of some shade of red, or perhaps yellow in C. sanctumn, colour unknown in C. subrisum. (Species 6-14.)

8. C. globosum, H. E. Br. (fig. 121). Growths of introduced plants originally globose and not 3-5 lines in diameter (type $e$), becoming under cultivation slightly globoso-obconica (type $f$), and sometimes 1-1½ inch in diameter, or slightly bluish-green colour. Corolla of slightly bluish-green colour. Corolla 1½ inch in diameter, expanding in the morning, closing in the afternoon, entire, funnelform, with 10-20 petals in series, white at the lower part and light pink at the apical part. Anthers yellow. Style 3-5 lines long, slender, with 4 filiform stigmas. — C. globosum, H. E. Br. in Kew Bull., 1917, p. 119. Lycoperdisseum scleriformum calycinum radicans, etc., Pearson, Fl. Afr., Fl. p. 23, t. 10, t. 2, probably belongs here.

9. *C. jucundum*, L. E. Br. Plant forming branching stems with ere. Trunks near-rounded in side view (type D), sublobose seen from above, glaucous-green, occasionally with a few dots of darker green when young, which disappear with age. Calyx 3-5-lobed, corolla 8-11 lines in diameter, opening in the daytime; tube 4-7 lines long, oblong-coloured, petals 0-40 in S-series, bright rose-magenta, anthers yellow. Style 4-5 lines long; stigmas 4-5, about 1 line long, greenish, scowling or exceeding the stamens. — F. jucundum, L. E. Br. in Journ. Linn. Soc. Bot., v. 45, p. 67.


The formation of stems with ere is a marked character of this and the next species. Under cultivation the stems of *C. jucundum* spread over the ground, but under natural conditions are probably buried under drifting sand.

10. *C. subrisum*, L. E. Br. Plant developing branching stems with ere. Trunks 8-12 lines long, 8-9 lines in diameter, oblong, truncate at the top (type L), with the orifice depressed and somewhat resembling a smiling mouth, with a small dimple at each end, uniformly whitish-green. Flowers unknown. — *C. subrisum*, L. E. Br. in Journ. Linn. Soc. Bot., vol. 45, p. 100.

Van Rhynsdorp Div. (near Lutwy.), Pearson 5666.

Of this very rare species a single plant was sent to Rev in 1911 by Prof. H. Pearson, which under cultivation increases very slowly. It is readily recognised by its habit of forming stems, and the resemblance of the depressed orifice to a smiling mouth.

11. *C. Jettsteinii*, N.E. Br. Growth 6-10 lines long, 6-13 lines in diameter, very broadly oblong, with the flat circular top often overhanging the sides (type H.), uniformly light bluish-green or merely with a few scattered darker green dots. Calyx 3-5 lobed, whitish or pale reddish. Corolla 8-11 lines in diameter, remaining open irrespective of cloud or sunshine, scentless; tube longer than the calyx, dull orange-pink; petals of two kinds, the outer 17-22 in two series, widely spreading, bright rose-magenta, becoming white at the base, shining; the inner erect at the mouth of the tube, 18-2 lines long, linear-filiform, very acute, yellow or orange. Stamens all included in the corolla-tube below the inner petals. Style 1-1 line long; stigmas 4, erect, minute, about 2 line long. — *C. Jettsteinii*, Berger, Desh. p. 265 and fig. 21. (1902.). *C. truncatum*, Otten in Gartenbl. 1907 vol. 11, p. 361, with fig. not of this.

Van Rhynsdorp Div. (near Bekhuis), Pearson 5,469.

12. *C. minutum*, N.E. Br. (fig. 132). Growth forming short branching stems with ere, clothed with old sheaths; each growth about 5-6 lines long and 21-5 lines in diameter, oblong or sub-lobose-oblong, slightly convex at the top (type L.), with the orifice in a slight central depression, light bluish-green or somewhat glaucous-green, with ere without a few inconspicuous scattered darker green dots. Calyx 4-lobed, whitish. Corolla 8-11 lines in diameter, expanding in the daytime irrespective of cloud or sunshine, scentless; tube slender, dull orange, or sometimes pale yellowish-white; petals of two kinds, the outer 3-5 lines long, widely spreading or recurved, bright rosy-magentla, shining, and the inner 1-4 line long, ascending or spreading from the mouth of the tube, yellow, or some with magenta tips. Stamens
231 included in the corolla-tube and hid from view by the inner petals. Style 1½ line long; stigmas 4, up to 1 line long, greenish. N. minutum, New, Linn. Cat., t. 21 (1805); Bot. Mag., t. 1376; Berger, Neemph., p. 235 and 233, f. 6, &., cori of from the Bot. Mag. N. thecatum, N. E. Br. in Bot. Mag., t. 8385 A.


Introduced by Benson in 1795.

Then I described N. thecatum I considered it to be distinct from N. minutum, because the tube of the corolla was not exerted from the calyx, in the manner represented in the figure of N. minutum, and in the case of the latter, the formation of sheath-clad stems is neither represented nor described; but my plants of N. thecatum have now produced flowers with a corolla-tube nearly or quite as long and as much exerted from the calyx as is represented in the Botanical Magazine, and when the plant is more deeply set in the soil the stem-formation is not evident. Other characters being apparently the same, I have now no doubt that N. thecatum is identical with N. minutum. The extent of the exertion of the corolla-tube probably depends upon the temperature and amount of moisture received during the formation of the flower, as I have found a variation in these conditions to produce similar results in other species.

17. C. oviforme, H. E. Br. (Fig. 123). Growth subcylindrical-ovoid or narrowly ovoid, 4-6 lines long and 2-3½ lines thick, very convex at the top (type A.), grass-green, minutely tuberculate or papillate all over, soft and pulpy, often enclosed in their old whitish or pale brownish skins. Calyx 6-7-lobed, included, or only the tips of the lobes exerted from the old skin. Corolla about 7 lines in diameter; petals about 30, stated to be pale purple, but not seen in a fresh state. Style none; stigmas 6, about 1 line long, filiform. Capsule 2-3 lines in diameter, 3-valved, 6-celled, with small cell-wings, and broad marginal valvule-wings. C. oviforme, H. E. Br. in Journ. Linn. Soc. Nat., v. 45, p. 95; and in Gard. Chron., vol. I.E., v. 207, fig. 34, 1-1.

Van Rhynsdorp Div. Hardeveld, nearcloth; Mrs. Acid, 2.35.

I think it quite probable that the flowers of this species are sometimes white. The minute papille-like tubercles on this plant readily distinguish it from all other species.

E. Brown

(To be continued.)


(Continued from page 261.)

261 14. — C. saxetanum, H. E. Br. Plant forming very dense hemispherical tufts of very small growths, each about 4-6 lines long and 1½-2½ lines thick, cylindric or cylindric-clavate, very convex at the apex (type A.), with a minute and very inconspicuous orifice, green or more or less tinted with purple there exposed to the sun, with or without a few inconspicuous darker green dots around the orifice. Often the growths are more or less included in their old skins. Flowers not seen alive, but on one dried specimen it appeared to be rosy, D. carrot, however, states that it is "bluish or cream-coloured." Possibly it varies.—N. saxetanum, H. E. Br. in Journ. Linn. Soc. Nat. v. 45, p. 99.
Calyx sometimes but short 4-5 lines, sometimes 5-6 lines in their greater diameter, obconic, with a shallow groove-like depression across the elliptic slightly convex or flattish tor (type I., but with a deeper notch), and often with a faint obtuse ridge on each side of the orifice, uniformly green, like young apples, without markings, or (on the same plant in different years) with some very small inconspicuous darker green dots. Calyx 5-lobed, whitish. Corolla about 9 lines in diameter, opening after sunset, scentless, with about 30 recurved spreading very narrow white petals. Stamens exerted; anthers yellow. Style very short; stigmas 3; about 1 line long, very pale yellowish.—H. viridicatum, H. E. Br., in Journ. Linn. Soc. Bot., v. 45, p. 101. South Africa. Locality and collector unknown.

Growth more or less marked with dots or lines (species 16-49). See also a few species mentioned under D.

Dots all scattered and separate (species 16-22) See also species noted under E, and 27 C. evillei, and 30 C. narvietetulam.

16. C. albertense, H. E. Br. Growth 4-7 lines in diameter, at the circular or broadly elliptic, slightly convex tor (type J.), Corolla 6-7 lines in diameter, opening late in the afternoon, scentless; petals 25-28, straw yellow. Anthers all shortly exerted. Style very short; stigmas not attaining to the mouth of the corolla-tube.—H. albertense, H. E. Br., in Journ. Linn. Soc. Bot., v. 45, p. 93. Sent to Kew by the late Prof. H. W. Pearson, as having been collected near Prince Albert, but as I have had what appears to be the same plant sent to me by Dr. J. Fillans from near Prince Albert Road, the latter locality may have been intended.

17. C. fraternum, H. E. Br. (fig. 138). Growth 4-7 lines long and 3-5 lines in diameter, obconic, flattish at the tor, with the centre often slightly depressed (somewhat as in type J.), pale greenish green, with scattered dark green or finally rurlish dots. Calyx usually exerted, 4-lobed, whitish or pale greenish, sometimes tinted with rurlish. Corolla 7-10 lines in diameter, opening in the morning and closing towards evening, scentless; tube very much longer than the calyx, dull
18. O. translucens, N. E. Br. Growth 3-6 lines long and 3-5 lines in their greater diameter, obconic, slightly convex at the top (type E), scarcely, or but slightly depressed at the orifice, "translucent green, with slightly darker distinct spots only showing under a lens, and a few yellowish spots, not confluent. Flowers open at night heahty scented. Calyx-tube much exserted, 2-3 lines long, 5-lobed. Corolla about half an inch in diameter, tube not exserted from the calyx; petals numerous, widely spreading, creamy-white. Anthers exserted, yellow.

Locality unknown, Solum Herb., 15, 183. This is evidently a very distinct species, but is only known to me from a coloured painting made by Miss Race, and sent to me by Mrs. L. Bolus. The translucent green colouring is unlike anything I have seen.

19. O. niluliflora, N. E. Br. Growth very small, 1-2 lines in diameter, obconic, convex on the top (type D, but very small), different plants varying from dull grayish-green to dingy dullish or dullish-green, marked with a few scattered dark purple or dark green dots, and often a line of confluent dots, transverse to the orifice, the orifice outlined with the same colour. Calyx 4-lobed, dull dark red. Corolla insufficient, night flowering, scentless (but stated to be slightly scented in type). About 4 lines in diameter, with 10-20 lines, irregularly arranged, very narrow petals of a peculiar reddish-ochreous colour or dull coppery-red. Anthers yellow, all shortly exserted. Style about half as long as the tube of the corolla, with a filiform stigma rising to the base of the anthers, reddish. Tor of the same home-shared.—1. niluliflora, — N. E. Br., in Journ. Linn. Soc., Bot., v. 4, p. 328.


20. O. gratus, N. E. Br. (type 189). Growth somewhat tor-shaped in side view, lobate view from above, convex at the top, with a broad and shallow V-shaped notch across it, pale bluish-green, sprinkled with dark green dots, and the orifice outlined with dark green, very conspicuous on the young growth, but becoming fainter with age, and later dark brown spots at the orifice. Calyx usually exserted, 4-5-lobed, white. Corolla 6-8 lines in diameter, exserted in the daytime, irrespective of sunshine; tube 3-4 lines long; at 1. 32-60 strongly recurved, rich yellow, shining. Stamens about 25-40, in 1-2 series, shortly exserted, yellow. Style 4-8 stigmatic (but usually not one line long; 1 line yellow), finally exceeding the stamens. — O. gratus, — N. E. Br., in Journ. Linn. Soc., Bot., v. 4, p. 328.


21. O. truncatum, N. E. Br. Plant with age forming a dense
261 just as crowded stem up to 1 inch long, densely covered with the remains of old sheaths, firm in substance, but of a tan-brown colour. Each branch terminated by an oblong growth about 4 lines long and 2-4 lines in diameter, as rosy or but slightly exceeding the old sheath, apparently flattened or slightly convex on the top, and of a light brown colour in the united state, but Thunberg describes them as being subtruncate and subretuse--truncate, green and dotted, and as having a 4-lobed calyx of varients. But the specimen is in fruit only, and I see no trace of calyx-lobes, although as it is 5-seeded it is doubtless 5-lobed. The capsule is but exposed from the orifice so as to rest on the top of the growth, and is distinctly 5-valved, and about 2½ lines in diameter.— C. truncatellum, Thunb., in -c2. Joesser. Icon. Carol. Act. Juriae. Thener., v. 8, — rend. r. 5 (1781), and Fl. Carp. p. 412, not by other authors.

Nardiaceae Lin. Abundant rocks in the Karroo.

The above description is made from— Thunberg's type specimen, which I have had the privilege of examining. This species has never been introduced into cultivation, although the name has been erroneously applied to various cultivated plants.

22. C. truncatellum, N. E. Br. (Fig. 140). Growth 5-10 lines high and 6-13 lines in diameter; very broadly obconic, circular in outline at the top, which is flat or more usually shallowly depressed at the centre (type b), with a slight but usually distinct blunt ridge on each side of the orifice, light yellow or pale green, sprinkled all over the top with small dark green dots, sometimes mingled with purple dots, calyx exerted or included, 5-lobed. Corolla 7-9 lines in diameter, opening at about 4 p.m., closed during the day, delicately scented; tube 2-5 lines long; petals 30-50, recurved-spreading, very narrow, pale straw-coloured or light yellow. Stamens numerous in 2 series; anthers yellow. Style 1-1½ line long; stigmas 5-6, about 1-1½ lines long, attaining to about half the length of the corolla-tube, pale greenish.— M. truncatellum, N. E. Brown in 1795.

Locality unknown. Introduced by Lessen in 1795.

N. E. Brown

(To be continued.)

Kessembryanthemum and some new genera separated from it.


(Continued from page 262.)

307

DD.

Some or all of the dots confluent or connected into lines, or the growths marked with lines not formed of dots, often forming a sort of pattern. (Species 25-49). See also 19 C. piluliforme.

E.

Stem of the growths flattish, or with a shallow, trough-like transverse depression nearly as broad as the top, or slightly excavated and shallowly gibbous. (Species 25-31). See also 33 C. leviculum, and 17 C. signatum.

25. C. minimum, N. E. Br. Growths very small, about six lines high obconic, truncate with each side rising a little higher
then the middle, causing the top to appear or i transversely chan-
neled, with a scarcely constricted central tuberulous orifice, 
spread, somewhat clavate-green, marked with several single and 
confluent spots, forming somewhat branches lines. Flower small, 
colour 5-lobe, orbicular, exserted, at least constricted, small- 
tubed, spotted with red. Ovary exerted have the top of the clint. 
Petals whitish-yellow or white. --- C. minimum, Harv., Obs. sessub. 
r. 126 and 171, under t. muciforme, and 450 (1795), and Des. Cpt. 
r. 31.

Locality unknown. Introduced by Jasson before 1776.

This has long been lost to cultivation, but have not seen any 
species that will agree with wealth's description as above 
given.

24. C. nueisillum, L. Fl. "Differ from 0. mini-
num by its included ovary and little in its numerous offsets 
en thick colour. Smooth, green, with stout confluent branches 
spots. Ovary included. --- C. nueisillum, L., Rev. Al. Succ., 
r. 85 (1794).

Locality unknown.

This species is also quite unknown to us. But there at 
least three species in cultivation under the name C. nueisillum, 
either of which in my view come with wealth's description of it. 
Possibly C. nueisillum is not specifically distinct from C. 
minimus, but this cannot be decided until the plants are discovered.

25. C. perpusillum, L. Fl. Growth 4-5 lines long, 3-4 
lines broad and 2-3 lines thick at the flattish tor, which is 
 elliptic-oblong in outline and not depressed at the orifice; the 
 sides are rurulous and the tor crevish-green, often tinged with 
rurulous, marked with dark purple (or probably sometimes dark 
green) rings formed of confluent spots per illl with and inside 
the orifice, and a very few scattered dots of the same colour. 
Corolla tube exserted, 4-lobed; ovary included. Corolla 4-5 lines 
in diameter, expanding in the evening, scented; tube 2-3 lines 
long, about as long as the calyx; petals recurved-spreading, pale 
creamy-coloured. Stamens slightly exserted, whitish. Style about 
1 line long; stigma 4, nearly 1 line long.

Locality unknown. Jasson, 1793.

This species is unknown to me, I have described it from an 
 excellent coloured dry herbage by me. I have a living 
plant, which I understand is now dead.

26. C. obmetale, L. Fl. Fr. from the 5-10 lines long, and 4-
7 lines in diameter, oblong, nearly circular in outline at the 
neatliest tor (type t. 8), greenish-green or dull green, marked 
with very distinct dull rurulous-brown or dark green branching 
lines formed of confluent dots, with a few separate dots scattered 
around them. Calyx 4-lobed. Corolla 5-6 lines in diameter, 
opening about sunset, closed during the day, scentless; tube 
about as long as the calyx; stamens 4-9, recurved-spreading, milkw 
white, very shining. Stevens 12-25. In two series, the upper 
series just exserted, yellow. Style about one line long; stig-
mas 4, oblong, filiform, 1 line long, whitish or yellowish-
45, r. 95 (1890).

South Africa. Locality and collector unknown.
27. C. revillei, B. L. (= Fig. 189). - Growth of newly-introduced plants 4-5 lines long and 4-6 lines in diameter, sometimes becoming under cultivation up to one inch long, and as much in their greater diameter, broadly obovate, usually flat the circular or broadly elliptic top, but different plants varying (types I and K.) sometimes being slightly obovate, or with the centre depressed in a slight cup-like manner, more or less purplish on the sides, but the top varying much in different individuals, being light green, dull green, grey-green, or rather bright rosy-carmine marked with dark green or dark purple dots, which are more or less connected or confluent into single or branching lines, or occasionally all, or nearly all, separate and are often faintly raised, varying on different plants in arrangement and size. Calyx-tube more or less exerted, 5-lobed, rarely included or exerted. Corolla finely 4-7 lines in diameter, opening after sunset, slightly scented; tube about as long as the calyx; petals 30-40, in 2-3 series, recurved-spread, white or creamy-white. Stamens with slightly exerted pale yellow anthers. Style very short or nearly obsolete; stigmas 4, less than 1 line long, filiform, white. -- C. revillei, B. L. in horti. Linn. Soc. Bot., Vol. 4, p. 92. *C. obcordellum, Sims, not. fr. L., t. 1647, not of Hey.


This is a very variable species in shape, colour and size, and I find that the plant figured in the Botanical Magazine as *C. obcordellum* is undoubtedly this species, for I have had some growths of my plants as large as or larger than that figure, and in every way like it. I have one plant of this species which in summer becomes entirely of a rosy-carmine tint, and is then a very pretty and distinct-looking plant.

28. *C. obcordellum, N. E. Br.* - Growth usually about 4-5 lines long, 4-6 lines broad and 2-3 lines thick, but sometimes much larger, obovate-obconical, from a transverse notch across the top (type L), green or more or less glaucous-green, usually tinted with purplish when exposed to full sunshine, marked on the top with raised or tubercle-like dots, mostly confluent into irregular lines, of a dark purplish or dark green colour, according to sunshine. Calyx 4-5-lobed. Corolla 5-10 lines in diameter, sometimes both sizes on the same plant at the same time, expanding between 4 and 5 p.m., closed during the day, faintly or scarcely scented; tube 2-3 lines long; petals 25-40, recurved-spread, less milk-white to very pale straw-colour, sometimes tinged with pink at the tips. The stamens slightly exerted, anthers pale yellow. Style 1 line long, whitish or greenish. *C. obcordellum, hort. Misc. nat. r. 21 (1803); Salma Dyck, Des. Entr. 1, t. 2. *C. obcordellum, hort. Misc. nat., r. 21 (1803); Salma Dyck, Des. Entr. 1, t. 3.


There is no character whatever to distinguish the two plants known in gardens and figured by Salma Dyck as *C. obcordellum.* and *F. obcordellum,* the distinction given by Salma Dyck and byayer being purely fictitious. As Murray's original descriptions are inaccessible to the majority, I have given a translation of them.

"*C. obcordellum.* Rose as large as the preceding (i.e., minutum) and more obovate, glaucous, with the spots more elevated or sub-tubercular, and more confluent and branched or nea-
like. Ovary included, not raised above the surface of the plant. In another place he describes the corolla as "slightly twisted."

O. obconicum. Greenish, with confluent tubercle-like dots. Ovary included. Calyx 4-lobed. Petals white. Very like the preceding (i.e., O. obconicum) and of the same size or a little larger, and apparently distinct. It differs by being less obcordate and less glaucous, and with the spots less branched, but more elevated, or tubercle-like."

From these descriptions it is clear that there is no real specific distinction between them, the only distinctions mentioned being that one is more glaucous than the other and the markings differently branched and differently elevated. These characters of colour and markings, however, I find, vary on different individuals of this (and also of other) species, when a sufficient number of different individuals are examined. By different individuals, I mean separate plants originating from separate seeds.

30. C. mundum, N. E. Br. (Fig. 179). Growth about 5-6 lines long, 4-8 lines broad and 4-7 lines thick, broadly obconic, with a shallow v-shaped depression across the full breadth of the ellipsoid or circular top (type 4), or sometimes the top is conic with a raised rim all around it, or occasionally almost flat, dull greenish-green or glaucous-green, tinted with purpure, marked with conspicuous blackish-green or blackish-purple, raised or tubercle-like dots that are mostly confluent into irregular lines or crenate. Calyx 4-5-lobed; in well nourished plants, the tube and ovary is entirely exserted from the orifice, but sometimes is partly or wholly included in the plant. Corolla, 3-5 lines in diameter, expanding between 4 and 5 p.m., closed during the day, fairly scented; tube conical to longer than the calyx; petals 70-40, spirally arranged, recurved, white, pale straw-coloured, or pale pink. Style 1-1½ line long; stamens 4-5, about 1½ lines long, pale greenish.

South Africa. Locality and collector unknown.

This is one of the most distinct species of this genus, being easily recognised by the depressed torus and rather large, raised, blackish dots, confluent into lines.

N. B. Brown

(To be continued.)

Resemblyanthemum and some new genera separated from it.


(Continued from page 307.)

30. C. verrucatum, N. E. Br. Growth about 5-6½ lines long, 4½-10 lines broad and 3½-7 lines thick, obconic, with a shallow v-shaped depression across the full breadth of the top (type 4), rich dark purpure on the sides, dull green on the top, tinted with rose around the orifice and marked with numerous separate dark green dots, all scattered or some of them arranged in a line transverse to the orifice. Calyx 5-lobed, with the tube very much compressed and up to 2-3½ lines broad. Corolla small and insignificant. 3-3½ lines in diameter, opening at about sunset, closed during the day; tube 3-½ line long, much compressed; petals numerous, about 1-½ line long, creamy-white or very pale yellowish, faintly tinged with pink at the tips. Stamens with the yellow anthers, shortly exserted. Style very short; stigma 0,

South Africa, locality and collector unknown.

This is closely allied to N. aurantia, but is easily recogni-
ed by the dots not being raised in the same manner into tubercles, and by its flatterened cordate-tube and short petals.

31. C. coccarense, N. E. Br. Growth 5-6 lines long; 2-5 lines in diameter, oblong, 'flattish' at the tor (type E), which is larger growths is more or less distinctly cuneately 6-angled, and in smaller growths circular, with the centre often slightly depressed and usually with a faint rise or keel transverse to the orifice, or a dull and somewhat bluish-green, rather incon-
sciousness, mere sp. on the top with minute dots, which are mostly confluent into irregular brindle lines of a darker green or umbris-colour. Flower unknown. *C. coccarense,* N. E. Br., in Journ. Linn. Soc. Bot., v. 46, p. 91, excluding description of the flower.

*32. South Africa. Locality and collector unknown.

By some error, which - cannot now at all account for, unless I was interrupted in my work, the description and note of the flower of a plant I now find to be identical with *C. pilulariforme* were entered under *C. coccarense* and published in my former account of this species. I have not yet seen expanded flowers of *C. coccarense,* but late in November, when too cold for them to develop, buds have appeared, which were dark red.

Top of the growths more or less convex (flattish in type J. leviculum, and 32 *C. signatum*), or convex on each side of the central notch, which does not spread green over the whole breadth of the torus in some of those under E. (Species 3-44.)

32. C. coccarense, N. E. Br. Growth 10-13, 1/2 in. long and 3-6 lines in diameter under cultivation, but under natural conditions about 2-4 lines in diameter, oblong, convex on the top (type E), which is nearly circular or broadly elliptic in outline, pale greyish-green or clausous-green, with three radiating lines of confluent dark green dots on each side of the orifice, the two lateral lines usually forked, one with line and some dots or scattered dots only at each end of the orifice. Flowers not seen.- M. coccarense, N. E. Br., in Journ. Linn. Soc. Bot., v. 45, p. 93.

Leinsporte Div. near Pretorfontein, Poles--vans, 4975.

33. C. leviculum, N. E. Br. (Fig. 5). Growth 5-7 lines long, and 3-7 lines in their greater diameter, oblong, elip-
tic or nearly circular at the flattish tor (type E), often purulish on the sides, greyish-green on the top with many irreg-
ular lines and small dots of dark chocolate-purple or dark green, and a thick line bordered with chocolate dots and lines around the orifice. Calyx 4-lobed. Corolla 5-6 lines in diameter, expand-
ing about 4 or 5 p.m., closed during the day; tube not exceeding the calyx; petals 20-25, lax, whitish (very pale straw-coloured by dry), sometimes tinged with pink at the tips, with a slight satin sheen. Stamen 12-20, the upper antlers exserted, light yellow. Style, about 1 line long; stigma 4, about 1-4 line long, blumose-filiform, rule greenish. - N. leviculum, N. E. Br., in Journ. Linn. Soc. Bot., v. 45, p. 94 (1920).
South Africa. Locality and collector unknown.

34. C. pictum, N. E. Br. Growths 4-7½ lines long, 3-5 lines in their greater diameter, obconic, usually with a shallow notch across the centre of the oblong- or elliptic top, so as to appear slightly obscure in side view (type E), often purplish on the sides, dull green, marked with some dots and numerous simple and branching lines (which are not formed of confluent dots) of a chocolate or purple-brown colour on the top. Calyx 4-lobed. Corolla 4½-5 lines in diameter, expanding about 4 or 5 p.m.; tube exceeding the calyx-lobes; petals 18-24, lax, whitish. Stamens 12-20, with the upper anthers exerted, yellow. Style, less than 1 line long; stigmas 3-4, about 1½ lines long, plumose-filiform, yellowish. M. pictum, N. E. Br., in Journ. Linn. Soc. Bot. v. 45, p. 97.

South Africa. Locality unknown, sent to Kew and to myself by Prof. T. Jac Qvain, in 1878.

This species differs from C. leaviculum by being less flattened at the top, and the orifice is outlines rather indistinctly with dull green, instead of by a very conspicuous thick line as in C. leaviculum.

35. C. labrinthinum, N. E. Br. Growths 5-7 lines long, usually 3-4 lines broad, and 1½-3 lines thick, obconic convex and elliptic or elliptic-oblong in outline, at the top (type E), greyish-green, marked in a labyrinth-like manner with rather crowded branching and disconnected lines (not formed of dots) of a rich dark brownish-crimson, or in sunless seasons dark green or brownish-green. Calyx 4-lobed. Corolla 4½-5 lines in diameter, night flowering, scentless; tube not longer than the calyx; straw-coloured or whitish. Stamens several, the longer shortly exerted; anthers light yellow.-- C. labrinthinum, N. E. Br., in Journ. Linn. Soc. Bot. v. 45, p. 94 (1920).

Locality and collector unknown. N. E. Brown

(Told be continued.)

Nesembrium labrinthinum and some new genera separated from it.


(Continued from page 6.)

24

36. C. ruminatum, N. E. Br. Growths 4-7 lines long, 3½-5 lines broad and 2½-4 lines thick, obconic, varying from nearly circular to elliptic-oblong at the convex top (as type E, but much smaller), greyish-green, marked with irregular brownish-crimson (or in sunless seasons dark green) lines. Flowers not seen.


South Africa. Locality and collector unknown.

This is closely allied to C. labrinthinum, but seems to be distinct by its rather smaller growths, which have a great tendency to be circular in outline, and are marked with fewer and less crowded lines.

37. C. signatum, N. E. Br. Growths 4-7 lines long, 3½-5 lines broad and 2½-4 lines thick, obconic, with the flattish or but slightly convex or faintly notched top often somewhat overhanging the sides (type E), and oblong or elliptic in outline, somewhat grey-green, marked in a labyrinth-like manner with rather crowded, irregular, dark brownish-purple lines, or in winter-time

South Africa. Locality unknown, Fillans.

This is allied to *C. labyrinthium* and *C. pussillum*, but is distinguished at sight by the growth being more tapering to the base and the top flatter and often inclined to overarching the sides.

38. *C. minusculum*, N. E. Br. Growth 3-5 lines long, 1-4½ lines broad and 2½-3½ lines thick, obvoide, elliptic in outline at the convex top, often slightly notched at the orifice (somewhat as type D, but much smaller), at first bright green, becoming dull green and often suffused with purple, very minutely and densely dotted with white, with the orifice surrounded at a little distance from it by a somewhat diamond-shaped dark green or dark purple ring, and outside of the ring are some irregular dark purple or dark green disconnected lines. Calyx 4-lobed. Corolla 8-15 lines in diameter, expanding in day-time irrespective of sunshine; tube 5-6 lines long, dull orange below, fading into yellow at the top; petals of two kinds, an outer series of 16-20, widely spreading linear-spatulate, obtuse, and 1-1½ line broad, bright magenta, shading into light yellow at the base, and an inner series of 5-8 small and very acute petals that are sometimes magenta and sometimes (on the same plant) orange-yellow tipped with purple. Stamens 6-9 included in the corolla-tube, yellow. Style ½ lines long; stigmas 4, less than ½ lines long, dark orange. *P. minusculum*, N. E. Br., in *Kew Bull.*, 1912, p. 118.

Clenwilliam Div., near Glenwilliam, Fillans.

This is one of the most beautiful species in this genus, the prettily marked growths and the richly coloured flowers, which are much larger than the growths, make it a very attractive plant.

39. *C. pauxillum*, N. E. Br. (Fig. 13). Growth 5-7 lines long, 3½-6 lines broad and 3½-4½ lines thick, oblongic, convex, with a small transverse notch at the centre of the oblong or elliptic-oblong top (type E), varying from chalky-green or pale greyish-green to dull green, marked with separate dots and lines formed of confluent dots or purple-brown or dark green, usually a line extends from each side of the orifice over the top, and the other lines and dots are irregularly scattered on the other part, or there is a series of three lines radiating from each side of the orifice. Calyx 4-lobed. Corolla 4-7 lines in diameter, expanding in the evening, closed during the day, scentless, tube about as long as the calyx; petals 20-26; lax, whitish or very pale straw-coloured. Stamens 16-20, with the upper anthers shortly exserted, pale yellow. Style 1-1½ lines long; stigmas 4, shorter than the stamens, about 1½ line long, plumose-filiform, greenish. *C. pauxillum*, N. E. Br., in *Journ. Linn. Soc. Bot.*, 4, 5, p. 37 (1920).

South Africa. Locality unknown, Fillans.

40. *C. rolulum*, N. E. Br. Growth 3-6 lines long, 2½-5 lines broad and 2½-3½ lines thick, oblongic, elliptic to nearly circular in outline at the convex top, glaucous-green, with a few short lines formed of connected dots and a few separate dots in rather darker dull green, but not very conspicuous. Calyx 4-lobed, entirely dull red-dish. Corolla about 7 lines in diameter, exserted; anthers light yellow. Very dome-shaped on the top. Style less than 2½ lines long; stigmas 4, nearly twice as long as
Near Lainesburg, Iole Evans.

(To be continued.)

Mesembryanthemum and some new genera separated from it.

(Continued from page 124.)

41. C. patreum, N. E. Br. (Fig. 24). Grows under cultivation variable in size and form: 5-6 lines long, 3-7 lines broad and 4-5 lines thick, some, as viewed from above, regularly elliptic in outline, others more or less distinctly six-angled, the angulation seems chiefly confined to the larger growths, obconic, in the top slightly convex and the larger growths slightly keeled, smooth, bluish-grey or greyish-brown, with about 3 dots on each side of the orifice, in the middle dot on each side extends a straight line of more or less connected dots, towards the middle angles, and on each side of that line at a little distance from it are one or two dots or a diverging line of dots directed towards the lateral angles, all dark purple-brown. Calyx 3-lobed, with the tube 2 lines long, and mostly exserted. Corolla 2-10 lines in diameter, expanding in the evening, not scentless, closed during the day; tube not longer than the calyx; petals 26-31 lines in 1-2 series, very lax, widely spreading, 3-4 lines long, very narrowly linear, acute, white. Stamens about 10, in 2-3 series, all more or less exserted from the corolla-tube; anthers light yellow: style, half a line long; stigma 5, erect, 1 line long, not nearly reaching to the lower anthers, filiform. South Africa. Locality unknown. This species was sent to me by Prof. F. Mackian, in 1873.

42. C. scitulum, N. E. Br. Grows 3-7 lines long, 4-7 lines broad, and 3-6 lines thick, obconic, somewhat convex at the broady elliptic tor (type 2), with or without a slight transverse notch at the centre, greyish-green, tinted with purple on the sides and marked on the tor in a nap-like manner with branching and more or less connected lines of dark purple-brown or violet-brown colour, or (if not exposed to the sun) dark green. Calyx 4-lobed. Corolla 3-5 lines in diameter, expanding in the evening, scentless; tube equal or longer than the calyx;
54 petals 70-35 in 2-3 series, milk-white. Stamens 15-20; anthers all more or less exerted, creamy-white or very pale yellowish. Style 1 line long; stigmas 4, rising to the base of the anthers, 1½-3 lines long, whitish. — *C. scitulum*, N. E. Br., in *Linn. Soc. Bot.* v. 45, p. 100.

South Africa. Locality and collector unknown.

44. *C. uvaefor-me*, N. E. Br. Growths sub-colbosed or grape-shaped, resembling the green grape called "ruscideine," pale green, with small, slightly confluent dots of a darker green. — *C. uvaefor-me*, Haw., *Rev. Fl. Succ.*, p. 84.

South Africa. Locality and collector unknown.

The above description, copied from Houghton's account of it, is all that is known of this plant. I have not seen any plant that can be referred to it.

**EE.**

Growths distinctly obcordate, with or without a slight ridge or keel extending from the orifice to the top of the convex lobe of each side of it, and often with the slopes of the notch on each side of the ridge more or less flattened. (Types 3-4.)

Species 45-49.

The six species comprising this small group are very similar in appearance and very difficult to discriminate by characters that can be set down in words, yet when seen growing side by side, can easily be distinguished. They all expand their flowers in the evening, or late in the afternoon, and the flowers of all the species are very pleasantly scented, something like Cloves, and of some shade of pink, except those of *C. placitum*, which vary from white to pink. The stamens (except in *C. placitum*) are numerous (70 or more) and whitish, with the upper series of anthers visible at the mouth of the corolla-tube. But the size, shape, and general character of the flower of each species seems to be constantly different from that of the other species. So that in the following descriptions none of the above general characters are mentioned.

45. *C. ficiforme*, N. E. Brown (Fig. 26). Growths 6½-12 lines long, 5-9 lines broad, and 4½-7½ lines thick, without or with only a faint ridge on the faces of the notch, which is not so deep as in the other species (type 0.), light greyish green or somewhat glaucous-green, sometimes tinted with purple on the basal part, and thickly covered on the top with moderately large dark green conspicuous dots, all separate or a few of them more or less confluent into a short line, extending from the centre of the orifice on each side over the top, and a confluent line of them around the orifice. Calyx 4-lobed; tube much exerted. Corolla 10-12 lines in diameter; tube at first not longer than the calyx, finally exceeding it, white; petals 30-40 in few series, the outer finally recurved, the others widely spreading, white for about one-fourth of their length at the base, the upper part bright pink. Stamens numerous in 3-4 series, with the white anthers of the upper series just exerted. Style and stigmas imperfectly developed in the only flower examined. — *C. ficiforme*, Haw., *Rev. Fl. Succ.*, p. 87 (1833); L. E. Br., in *Gard. Chron.*, 1 876, p. 747, and 1886, *A. A. v. XIV.*, p. 573, Fig. 73.

The locality from which the original plant came is unknown, but it may very well have been the grounds where Cooper collected it. Werth states that he received it from Dr. Buck in 1818, and there is a drawing at Per of a plant of . riciforium, stated to have been received from Werth in 1822, that is labelled as having been received from Torrey, who says it grew on the rocks of Horns Island and Lance Island. I suspect these localities to have been given by Torrey from memory, and I much doubt their being correct. At any rate, the plant here described is the same as that figured in the key drawing, which must be taken to represent the type. W. E. Brown

(To be continued.)

Nesembryanthemum and some new genera separated from it.

And. Chron. Ill. 72: 32. 1892.

(Continued from page 54.)

46. C. altille, W. E. Br. Growth 10-12 lines long, 2½-1½ lines broad and 7½-10 lines thick, with the lobe on each side of the notch held oblique, without a keel on the faces of the notch, giving the plant a more bloated appearance than any of its allies, of a slightly shining grass-green, tinted with rurle on the basal part, and thickly marked on the top with rather large separate dark green dots and a cross-shaped marking on a single line on each lobe formed of confluent dots. Calyx 4-5-lobed; tube included. Corolla 10-15 lines in diameter; tube not exceeding the calyx; petals 65-85, spreading right and left as if the flower were parted from down the middle, somewhat lax, pink, fading into white at the very base. 1½ line long; stigmas 4, plumose-filiiform, pale greenish.—C. altille, W. E. Br. in Journ. Linn. Soc. Lot., Vol. 45, p. 92.

South Africa. Locality and collector unknown.

The bloated appearance of this plant seems constant year after year and readily distinguishes it from the other species.

47. C. odoratum, W. E. Br. (Fig. 35). Growth 5-12 lines long, 8-12 lines broad and 4-9 lines thick, with the ridge on the faces of the notch distinct (type O); usually the lobules on each side of the notch are short and very broadly rounded in the dorsal view, but sometimes they rise conically into an obtuse ridge, varying from green to grey-green according to sunlight, sometimes tinged with rurle, sprinkled with separate dots and a line of confluent dots over the top on each side of the orifice and usually a doubly-arched line of the crossing each lobule. Calyx 4-5-lobed, partly exserted. Corolla 1½-1½ lines in diameter; tube about as long as the calyx; petals 65-80, in about 4 series, overlying each other, not lax, bright white, pink, whit at the very base. Style 1½ line long; stigmas 4-5, about 1 line long, greenish-white.—C. odoratum, W. E. Br. in Journ. Linn. Soc. Lot., Vol. 44, p. 92 (1820).

Procerster Div. On a mountain near Worcester, Cooper, and without locality, Fillans.

When the plant I described as C. juciferum was sent to me it seems so very distinct from C. odoratum in shape and general appearance that I had no suspicion that it was that species, and was assured that its ridged lobules was a permanent character;
in two years, however, it altered completely, and is not quite indistinguishable from \textit{C. odoratum}. The more crowded petals overlying each other at once distinguishes this from \textit{C. altile} and \textit{C. pallidum}.

48. \textit{C. pallidum}, N. E. Br. Growths 8-15 lines long, 6-11 lines broad and 41-10 lines thick, with a faint or distinct ridge on the face of the notch (type 1), pale chalky-green, marked on the tor with some indistinct scattered dots of a darker green, and a line of confluent dark green or purplish dots crossing the tor conversely to the orifice, with or occasionally without an ellipsoid of confluent dots enclosing the notch and passing over the lobe on each side midway between the orifice and margin. Calyx 3-5-lobed; tube included or rarely exserted. Corolla 12-15 lines in diameter; tube usually not longer than the calyx; petals 45-55, lax, usually divided into two groups spreading right and left, pink at the upper two-thirds, white at the basal third. Style about 1 line long; stigmas 4, rather longer than the style, plumose-filiform, pale greenish. -- \textit{C. pallidum}. N. E. Br. in \textit{Journ. Linn. Soc. Bot.}, Vol. 45, p. 96.

Worcester Div. On a mountain near Worcester, Cooper.

The pale chalky-green colour of this species readily distinguishes it from its allies. In the laxity of its petals it is similar to \textit{C. altile}, but they are paler in colour and white for a greater length at the base.

49. \textit{C. pleiцитum}, N. E. Br. Growths of newly-imported plants 8-2 lines long, 31-61 lines broad, and 28-41 lines thick, becoming much larger under cultivation, with the faces of the notch keeled (type 2), some plants entirely green, others more or less tinted with or entirely purplish, with a line of confluent dark green or dark purplish dots on the keel of the notch with its outer end forking into arched lines enclosing its notch, outside of this enclosing lines are one or two short lines and some scattered dots. Calyx 4-lobed, usually considerably exserted. Corolla 71-10 lines in diameter; tube finally exceeding the calyx, white; petals 40-60 in 2-5 series, regularly spreading, not arranged in two groups, and not so crowded as in \textit{C. odoratum}, entirely white or pale-lemon yellow, with the tips on the back or on both sides tinted with purple, or entirely very pale pink, varying on different plants; stamens about 13-16, in 3 series. Style less than 1 line long; stigmas 4, about 1 line long, pale yellowish-white. -- \textit{C. pleiцитum}. N. E. Br. in \textit{Journ. Linn. Soc. Bot.}, Vol. 45, p. 99.

Robertson Div., near Robertson, Carlith, 7905.

II

Growth two-lobed at the tor (very shallowly in \textit{C. gueciscitum}), and the lobes or tor of the growth compressed and keeled somewhat as if pinched between the finger and thumb, with flat sides to the notch separating the lobes, except in 37, \textit{C. turri-gerum}, which has cylindric lobes convery or subtruncate at the tor. Types 2-7. (Species 50-57).

F.

Surface feeling slightly and harshly puberulous to the touch,
50. C. aquesitum, N. E. Br. Growths 4-7½ inches long, 4½-7½ lines broad, and 3½-4½ lines thick, in side view somewhat truncate-obovoid, with a small node. 1-1 line deep at the centre of the keeled tor (type R), light preyish-green with a faint bluish-tint, with or without a few dots of a slightly darker green, that are sometimes conspicuous, at others scarcely perceptible without a lens and sometimes quite absent. Flowers unknown.—M. aquesitum, N. E. Br., in Journ. Linn. Soc. Bot., Vol. 46, p. 65.

Namaqualand, Jackals Mountains, near Sendlings Drift, Pearson 6123.

This is the smallest species of the group. I have not yet succeeded in setting it to flower.

51. C. eristum, N. E. Br. Growths 1-2½ inches long, 6-13 lines broad and 6½-10 lines thick, compressed-oblong, with lobes 3-8 lines long (type S), whitish green or light bluish-green, often reddish on the margins and keel of the lobes, very conspicuously marked all over with dark green scattered dots. Calyx 5-lobed. Corolla an inch in diameter, somewhat funnel-shaped, with 40-60 widely spreading yellow petals. Stamens numerous in 5 or 6 (or more) series, the upper exserted, yellow. Style nearly as long as the corolla-tube; stigmas 5-6, finally 1-2½ lines long and exserted beyond the stamens, dull orange.—C. eristum, N. E. Br., in Journ. Linn. Soc. Bot. v. 45, p. 64.

Namaqualand, Western slopes of a ridge between Daunobis and Pathyr Drift, Pearson, 6058.

This is readily distinguished from all its allies by its ochre-green colour, conspicuous dots, and recumbent surface.

Surface quite pubescent, smooth to the touch. —All the species distinctly two-lobed.

52. C. bilobum, N. E. Br. (Fig. 36). Growths 1½-2 inches long, 4-1 inch broad, and 6½-10 lines thick, gynostele oblong, compressed, with lobes 4-9 lines long (type S), light bluish-green (alabueous-green, ex Harloth), dotless, with a wedge-shaped area of rather darker dull green under the notch, and the margins and keel of the lobes often reddish or purplish tinted. Calyx 4-5-lobed. Corolla 10-15 lines in diameter, expanding in bright sunshine, scentless; tube longer than the calyx; petals 40-45, somewhat loosely recurved-spreading, bright yellow; stamens in 4-5 series, the upper exserted, yellow. Style varying from 1-4½ lines long; stigmas 4-6, varying on the same plant in different years from 2½-6 lines long, sometimes only equalling the stamens, sometimes exserted much beyond them, dull orange.—C. bilobum, Harloth, in Trans. 3. Afr. Phil. Soc. v. 18, p. 44, pl. 5. c. 2 (1907), and Pl. of 3. Afr. v. 1, p. 201, pl. 49, f. 3; Beer, Mesemb. v. 260, f. 65 (copied from Harloth's original figure); I. Bolus in Ann. 3. Afr. Mus. v. 6, p. 13.

Namaqualand, near between Stinkfontein and Chubiesis, Pearson 6203, and without precise locality, Harloth 3750.

Little Namaqualand. Join between Stinkfontein and Chubiesis, Pearson 6203, and without precise locality, Harloth 3750.
53. C. cauliferum, N. E. Br. (Fig. 37, p. 83).—Plant with are forming distinct branching stems up to 3 inches (or more?) long, above ground under cultivation, but probably covered with drifting soil under natural conditions. Growths 1-12 inch long, 8-10 lines broad and 6-7½ lines thick, unequally oblong, with lobes 1¼-4½ lines long (type B), light bluish-green, perhaps glaucous-green in S. Africa, distinctly pellucid dotted when held against sunlight, with a wedge-shaped area of darker green under the notch, with a purplish spot at the apex of the lobes, or with their margins and keel dull purplish. Calyx 4-5-lobed. Corolla 4-1 inch in diameter, expanding in the morning in bright sunshine, scentless; tube about as long as the calyx; petals 50-55, in 2-3 series, bright yellow. Stamens numerous, in 4-6 series, the upper just exserted, yellow. Style nearly as long as the corolla-tube; stigmas 4, filiform, 3-4 lines long, shorter than or exceeding the stamens, varying from orange-red to pale greenish-yellow.

Little Kamaulu-end. Upper north-western slopes of hills south-west of Shubieissa, Pearson 6176.

Although similar to C. bilobum, this constantly differs by developing stems, by its much shorter lobes, and in being pellucida dotted. It also grows on hill-tops, while C. bilobum grows on plains.

54. C. nuciforme, N. E. Br. Plant developing branching stems with are, which become subterranean under natural conditions. Growths 7-14 lines long, 8-10 lines broad and 5½-6½ lines thick, ovoid or sub-lobose slightly compressed, with the short lobes 1¼-2½ lines long, uniformly glaucous-green, with a purplish keel to the lobes. Flowers not seen; according to Miss Kinsit the calyx is 6-lobed, and the petals of the corolla about 6 lines long, rosy, striped. Ovary convex at the top. Stigmas 6, about 3 lines long filiform. C. nuciforme, Nov. Obs. Nsmemb., p. 128, 440 and 450 (1794), Misc. N., v. 22, and Rev. Ill. Succ., p. 84. N. crumonodium, Kensit in Trans. Roy. Soc. S. Af., v. 1, p. 150, pl. 21, f. c. (1809).


(To be continued.)

Lesembrantherum and some new genera separated from it.


(Continued from page 84.)

134

55. C. Elishae, N. E. Br. (Fig. 51). Plant not developing stems with are. Growths 7-14 lines long, 8-10 lines broad and 5-6 lines thick, ovoid or oblong-ovoid, with lobes 2-4 lines long (type S), of a slightly bluish-green colour with a darker area under the notch, somewhat obscurely marked with scattered darker-green dots, and the keel often purplish. Calyx 3-5-lobed. Corolla ½-1 inch in diameter, expanding in the morning irrespective of sunshine, if the temperature is warm enough; petals 35-48, in 7 series, bright yellow. Stamens numerous, in 3-4 series. the upper exserted, yellow. Style 2½-3 lines long; stigmas 5-6, usually exceeding the stamens, 2-7 lines long, filiform, pale yellow or greenish. C. Elishae, N. E. Br., in The Gardeners' Chronicle, 1918, v. 50, p. 252; Bot. Mag., t. 8776 B, a very poor
South Africa. Locality and collector unknown.

This species increases more rapidly and flowers more freely than any other species of this group in cultivation, and a well-grown plant in full flower is very charming. No idea of its beauty can be obtained from the bad representation of it in the Botanical Magazine.

56. C. gracilistylum, N. E. Br. Plant not forming stems with nse. Grows 10-15 lines long, 6-9 lines broad and 4½-5½ lines thick, oblong, compressed, with lobes 2-3½ lines long (type S), claucoous-green or bluish-green, more or less distinctly dotted all over with darker green, and with a red veil to the lobes. Calyx 3-4-lobes. Corolla 7½-10 lines in diameter, expanding in the daytime and remaining over irrespective of sunshine or cloudy weather, scentless; tube as long as the calyx; petals 25-30 in 2 series, bright pink or bright magenta on both sides, white at the base Stevens about 40, in 4 series, with the upper anthers just showing, at the mouth of the corolla-tube, yellow. Style 4-5 lines long, slender; stigmas 4, about 1½ line long, exerted and recurving among the anthers. C. gracilistylum, L. Bolus in Ann. S. Afr. Mus., v. 2, p. 141, vl. 3, f. 1 (1913). Kemsualand Hill sott of Stinkfontein, Pearson 5572.

57. C. turrigerum, N. E. Br. Plant not forming stems with nse. Grows 5-6½ lines long, 4½-6 lines broad across the top of the lobes and 3 lines thick; lobes 2-3 lines long, succulindric and about 2½-3 lines in diameter (type T) angularly convex from the presence of raised lines connected in a man-like manner and enclosing slightly depressed areas, light greyish green or claucoous-green, with the raised lines of very dark green, and all the lower part more or less tinted with purplish and dotted with dark green. Flowers not seen. C. turrigerum, N. E. Br., in Journ. Linn. Soc. Bot., v. 45, p. 102.


Excluded Species

Mesembranthemum nanum Schlechter, in Arch. Jahrb. Vol. 27, p. 129, has been placed among this group of Sphaeroids, but the material and description are too imperfect to permit of its definite place under Conophytum, to which it may not belong.

N. E. Brown

(To be continued.)

Mesembranthemum and some new genera are created from it.

Card. Chron. Ill. 76: 211. 1925.

(Continued from Vol. LXXII, p. 124)

211

When the words "To be continued" were published in The Gardeners' Chronicle for 1922, Vol. LXXII, p. 124, at the end of my thirty-third article upon this group of plants I had no idea that so long a period would elapse before these words would take effect. The delay has been partly caused by adverse circumstances over which I had no control, and partly and chiefly because, just before that article was published I made a discovery that caused me to make fresh investigation in the structure of the flowers,
11 fruits and seeds of these plants, with the result that I soon perceived that during the one hundred and seventy-two years that has passed since the genus Mesembryanthemum was established by Linne, no author (including myself) writing about this group of plants appears to have properly dissected the flowers and examined the relationship of their parts as compared with those of other species, while the structure of the fruits and nature of the seeds has been utterly ignored. All of us have followed one another blindly by accepting the generic characters as given in books without investigating their applicability as a whole to the various species.

The discovery I allude to above was that out of seven specimens received from South Africa, all named Mesembryanthemum paniculatum, two have fruits and seeds which I noticed were no utterly different from those of the well-known plant that they could not possibly belong to the same genus. I then examined the flowers of the seven specimens and found them to represent two distinct types of structure. Certainly the flowers and fruits and seeds of these seven specimens could not have been examined or they could not all have been deemed to be the same species, although they somewhat resemble one another in general appearance.

This discovery caused me to make a preliminary examination of several other species that were distinct from one another in their type of habit, and my investigation soon convinced me that it is easy to demonstrate that, in accordance with the manner in which genera are made and characterised in other natural orders, the genus Mesembryanthemum as at present understood in books represents a small natural order and unquestionably consists of a number of perfectly distinct and usually easily recognisable genera, which have all been assigned to the one genus merely because their flowers have a superficial resemblance to one another.

As I have already pointed out in these articles, Haworth considered that some of the sections into which he divided the genus were really distinct genera, although he did not characterise them by structural details, and with few exceptions he did not propose names for them, and such names as he did propose have not been taken up by any author before I did so in these articles. I find, however, that Haworth was perfectly correct in his views. Yet, although his sections are accepted, the differences assigned to them are based almost entirely upon habit and vegetative characters, the important structural characters that accompany many of the vegetative characters being overlooked or ignored. In, however, we turn to orders where a large number or most of the genera comprising them have flowers that are very much alike in general appearance, such as are found in Convolvulaceae, Solanaceae, Cruciferae, Umbelliferae, Leguminosae and Compositae, we find that the genera of these orders are based upon structural differences in the flower or fruit that are constant, even if small and often not observable without dissection, but are often accompanied by a difference in habit or vegetative character.

So I find that Mesembryanthemum as hitherto constituted is an exact parallel of such orders, for although the flowers and even the fruit in some cases of the various sections have much superficial resemblance to one another, yet when examined, are in many instances found to have very different structural characters. But I have had considerable difficulty in obtaining flowers and fruit — especially fruit and seeds — of many kinds in a
...fit state for examination, and I would here like to acknowledge my indebtedness to and to thank those kind friend in South Africa who have supplied me with material, viz.:—Mr. A. J. Austin, Professor E. Compton, Mr. T. N. Leslie, Dr. A. Carloth, Dr. N. S. Fillans, Dr. J. B. Tole Evans, Mrs. E. Hood, Mrs. I. Wigram, and especially to Mr. F. Smith for generously placing at my disposal the flowers and fruits of the fine collection of species he brought to exhibit in the South African section of the Wembly Exhibition in 1904, without which some of the work to follow could not have been accomplished.

It is certainly remarkable that during the one hundred and seventy-two years that have elapsed since Linne established the genus Gesembryanthemum no monographer seems to have examined the details of the floral structure of the various species, while the characters presented by the flowers and seeds have been entirely ignored.

Up to the time of commencing the articles I have already published, I was under the impression that De Candolle, Bentham and Hooker, Sonder, and Berger, when describing the characters of the genus and species, must have examined the structure of the flowers (especially the ovary) and fruit, and that there was nothing more to be discovered concerning that structure.

I was therefore much surprised to find how greatly various groups of species differed in the placentation and structure of the ovary and fruit, apart from other differences in the structure of the flower, such differences being usually accompanied by a conspicuous difference in habit. I believe that this is the only large genus that has endured for so long a time as Linne left it. If it had belonged to any other author it is almost certain that it would have been divided into several genera long ago, for there are characters for their separation in plenty when looked for. Having realized this, I proceeded to examine the flowers and fruits of all the species placed under the genus so far as material has been available. This has occupied a very great amount of time and much remains to be done, because I have been unable to obtain from South Africa the necessary flowers and fruits of some of the sectional types for examination. So that this must not be looked upon as a revision of the whole group, but merely as a preliminary effort to divide it into natural genera, and to define them structurally, so that the proper position of new or imperfectly known species may hereafter be more easily and more accurately determined.

The result of my examination demonstrates that Gesembryanthemum as at present understood consists of two well-defined and easily recognised primary groups, viz.:

1. Species with the ovules and seeds borne on the central axis of the ovary and fruit, that is, with axile placentation.

2. Species with the ovules and seeds borne along a central line on the outer wall or floor of the cells of the ovary and fruit, a rather peculiar form of parietal placentation.

Each of these groups can be further sub-divided into genera by a combination of some of the structural differences found in their flowers and fruits, which are as follow:

(a) The calyx is lobed down to its union with the ovary, or is produced above that union into a shallow cup or a
short or long tube, and before dividing into lobes.

The petals are free almost or quite to the base, or are united below into a short or long tube, and are inserted in the angle where the calyx unites with the ovary, or on the sides or at the apex of the calyx-tube.

The stamens are erect, or are incurved over or bent down into the cup or tube of the calyx.

A true non-stigmatic style is present or it is absent, and the stigmas (the so-called styles of books) are stigmatic to the base.

The stigma is one only and sessile and circular or elliptic in outline, or the stigmas (whether a style is present or not) are 4-20 and very in form.

The ovary is inferior, or it is partly or more than half superior.

The fruit is indehiscent, or it opens by valves.

The fruit is one-celled, or it is 4-20-celled.

The valves of the fruit (capsule) are provided with expanding keels, or those organs are modified into non-expanding wings.

The cells of the capsule are roofed with cell-wings, or they are open and without cell-wings.

The openings of the cells of the capsule is nearly closed by a tubercle, or there is no tubercle at the opening.

The seeds are wingless, or are broadly winged.

The seeds are regularly arranged in a single whorl around the central axis, or they are irregularly placed in the cells.

There is also the very important general character and nature of the leaves and whether they are alternate or opposite, or dotted, or are without dots.

Of these differences only three or four have been even mentioned by authors and have apparently been overlooked. Yet in no other order of plants do we find that such a multitude of perfectly distinct characters are allowed to remain in combination in the same genus. I therefore propose to utilise these characters in various combinations for the purpose of dividing this hitherto undivided heterogeneous group into smaller and more uniform genera, so that species can be more easily referred to their proper position. For in the monographs as they at present exist, I find the arrangement so chaotic that totally different types of structure are mixed together in the same group. And at the present time species are being described and referred to this or that group or supposed affinity in a most haphazard manner, or are described without any indication of affinity, rendering it almost impossible to identify the species without seeing the type specimen. And I myself must plead tributed to the chaos. This, however, has been unavoidable, as there is no means of discovering from books the true affinity of many of the species. Added to this there is the further difficulty of knowing to what genus some of the species described by Sillner and Haworth pointed should be referred. For, as I have elsewhere pointed out, the two most recent monographs of Wesenbryanthemum—that of Sonder and of Berger—are compilations without any original research work embodied in them, chiefly based upon the excellent figures and descriptions in Salm, Tyck's work, which,
good as they are, are sadly deficient in the structural details that are most needed, and in many cases are figured and described under a wrong name, and as these names and descriptions are more or less copied in the later monographs alluded to, without investigation as to whether they represent the plants Linne, Haworth or Aiton intended should bear those names, there are many cases where the species described in these monographs are quite wrongly named. A conspicuous instance of this may be cited in the case of E. glomeratum, Linn., which as figured or described by Jalm Dyck, Sonder and Besser, is not that species at all, but is E. polyanthum, Haw., while the real E. glomeratum, Linn., is the plant those authors have as E. roseum, Willd. The corrected synonymy of these and many others will be given hereafter under the respective genera to which I refer the species.

The division of Mesembryanthemum as hitherto understood into new genera renders it necessary to consider and decide which of the species known to Linne should be accepted as being typical of the genus, that is, those which best accord with the characters assigned to this genus by Linne. This is not quite a simple matter, as the following will demonstrate.

When establishing this genus Linne placed it in his Class Icosandria (i.e., with numerous stamens), and the Order Bentagonia (i.e., with five styles or stigmas)... In his Genera Plantarum, ed., 5, p. 215 (1754), and ed. 6, p. 252 (1767), he characterises the genus Mesembryanthemum as follows:- Calyx half-5-fid (i.e., 5-lobed), persistent. Corolla mononetalous; petals very numerous, in several series, with their claws slightly united. Stamens numerous, as long as the calyx. Ovary below the receptacle (i.e., inferior), crowned with five obtuse angles; styles usually five, subulate, exactly reflexed, stigmas simple. Capsule fleshy, roundish, marked with five umbilical rays, and with as many cells as there are styles. Seeds many, rounded.

At the end of the generic characters Linne remarks in italics that "The number is not constant, some have a four-fid calyx, with four styles; others have ten styles." Such remarks were always added by him to indicate species that diverged from what he considered to be essential characters of the genus.

It should be noted that although Linne and other authors describe the stigmatic organs as styles, they are really stigmas, being stigmatic to the base. So far as I am aware, a true non-stigmatic style is not present in any of the species known to Linne. N. E. Brown

(To be continued.)

Mesembryanthemum and some new genera separated from it.
(Continue from page 212.)
type of the genus Helensbryanthemum, the following appears to me the best method of arriving at a satisfactory answer to this somewhat complicated problem.

In the first place it is clear from his assigning this genus to the Class Monocotyledons and Order Asterales that the primary essential characters of the genus are that it should have numerous stamens and five stigmas (or styles as he calls them). Therefore we may eliminate from the list of species described by Linne the seven species which have eight to seventeen stamens and cells to the ovary. These are—H. acinaciforme, H. acinosiflorum, H. rostratun, H. loreum, H. diffusum, H. linguliforme, and H. rugosiflorum, which as Linne himself pointed out do not accord with the generic character of "stigmas and cells of the ovary 5." Of some of these Linne does not mention the number of their stigmas; indeed it is certain that he never had specimens of many of the species he described and that he only knew them from the descriptions and figures in Dilleniun's Hortus Elthamensis.

The next characters of importance to take into consideration are that the petals should be united at the base into a short tube, and the ovary be inferior. Here we are faced with a somewhat curious problem of contradictory characters, which again demonstrates that Linne could not have examined the flowers of the species he described. Out of the thirty-five species he described, only one-sixth of them have a monopetalous corolla, viz.:—H. nodiflorum, H. crassifolium, H. speciosiflorum, H. noctiflorum, H. splendens, and H. tortuosum. All the others have the petals free to the base. And these six species do not accord with his character of the ovary being inferior, for they all have the ovary partly superior, or more than half-superior, and moreover, they all have axile placentas, a character not mentioned by Linne, while all the other species have free petals, an inferior ovary, and the placentas on the outer wall or floor of the cells. Therefore, either the character of the monopetalous corolla or that of the inferior ovary must be discarded as one of the principal characters of the genus. I propose to reject that of the monopetalous corolla (petals united into a short tube at the base), since it applies to such a small proportion of the species, and to eliminate these six species from the genus, as their placentation is also quite different.

The fruit is described by Linne as fleshy, but excepting H. acinaciforme, the "Tottentot Fig" and allies, the fruit of all known species is a dry capsule. I very much doubt if Linne ever saw the ripe fruit of any species, for there is no fruit preserved in his herbarium, and I suspect that he described this character to the genus from the statements of others concerning the "fleshy edible fruit" of the "Tottentot Fig." The statement that the fruit is roundish must have been taken from the figures in Hortus Elthamensis, for the fleshy fruits of H. acinaciforme and allies are not "roundish," but elongated obovate or obovoid. Therefore, as the only species with fleshy fruit (H. acinaciforme, Linn.), which at that date as he then understood the species included also H. acule as a variety) does not accord either in its shape or the number and character of its stigmas (which are plumose) with the Linnean definition, this species, as previously mentioned, must be eliminated from the genus and the character of the fruit being fleshy also discarded as a generic character for Helensbryanthemum.
I find that the only species of those enumerated in the first edition of his Species Plantarum that is represented in the Linnean Herbarium is *L. tenuifolium*, which has the retels free to the base, five stigmas, and an inferior five-celled ovary. But in his Hortus Cliffortianus Linne enumerated twenty-nine species which he probably saw, although the only species preserved in the Hortus Cliffortianus Linneanus at the British Museum are *L. tenuifolium*, *L. pomeridianum*, and those merely repeat the story, for five of them have eight to seventeen stigmas and cells to the ovary and four have a short tube to the corolla and a partly superior ovary with four to five stigmas and cells, and twenty have the retels free to the base and an inferior ovary with five stigmas and cells to the ovary. These of course, being the same species as are described in his Species Plantarum. Therefore as the bulk of the species that it is probable Linne actually saw but may not have examined, as well as those he enumerated, amounting in all to twenty-two in number, have free retels and on an inferior ovary with five stigmas, and as these characters cover the majority of the species at present placed under the genus, I propose that they be adopted for the selection of a type for the genus.

I therefore propose to reject the above-mentioned thirteen species as not strictly conforming with the chief characters of the Linnean definition of the genus, and from the remaining twenty-two species (which all have five stigmas and an inferior ovary with five cells, and the placenta on the outer wall of the cells, and with the excisions that their corolla is not monopetalous, and their fruitem not fleshy, as above explained, agree in all other characters with the Linnean definition of the genus) to select as the type of the genus *Esembranthemum* the first species described in the first edition of Linne's Species Plantarum that (excluding the character of the corolla being monopetalous) conforms with the definition of the genus as given by Linne. This species proves to be *L. umbellatum*, for the four species preceding it (*L. nodiflorum*, *L. cristallinum*, *L. periculiflorum*, and *L. noctiflorum*) all have, as stated, a short tube to the corolla and a partly superior ovary.

So that *L. umbellatum*, I., may be accepted as being the type of the species because, not only do eighteen of the remaining twenty-two species then known to Linne agree with it in general habit and structure, but it likewise accords in these particulars with the majority of the species that have been described since the time of Linne. Therefore the acceptance of *L. umbellatum*, I., as the type of the genus *Esembranthemum* will not only prevent the very great chances of nomenclature that would occur if one of the thirteen rejected species were selected in its place, but will necessitate very little alteration in the generic characters assigned to the genus by Linne, the only alteration needed being the omission of the words "corolla monopetalous" and "capsule fleshy," and of course the addition of such details of structure as are omitted from the Linnean description.

In the above I have taken into account only those species enumerated by Linne in the first edition of his Species Plantarum, because they alone are concerned in the naming of the genus. Yet if we examine the forty-five species enumerated in the second edition of that work, and the two others described in the tenth edition of his Systema Naturae known to him, the conclusion above arrived at is in no way affected.

The rejected species I am referring to other genera.
Nesembyranthenum: and some new genera separated from it.
(Continued from page 272.)

272

Hitherto, when describing new species of *Nesembyranthenum*

it has not been deemed necessary to describe in detail the structure

of the flower, and that of the fruit is never described. In future, however, such details should be given, as it is often impossible to place some species in their correct affinity without knowledge of these details. For want of them there are some species described by Linne and many by later authors that I am at present quite unable to assign to any definite genus, because I have no material for the purpose, fruit especially being absent.

---

**Fig. 109.** Dry capsules of *Nesembyranthenum*: (1) *N. aethiopii*; (2) *N. pisculus*; (3) *N. brandii*; (2) *N. longum (?)*; (3) *N. pomeronianum*; (4) *N. species*; (5) a new species of the *Sphaeroid* group; and (6) a *N. species* allied to *N. aethiopii*. All natural size.

**Fig. 110.** The same capsules as in Fig. 109 when expanded by wetting; Natural size.

I have been more and more surprised during my examination

of the fruits of these plants than for one hundred years, and I have often been surprised to find that, in every other natural Order, the flower is used for distinguishing genera, and it cannot be any longer ignored as a part of the fruit in this group of plants. To see such a group of plants in their natural state, it is necessary to search for them in their native wild habitats, to observe their structure and to examine their structure carefully. I have given a detailed account of some of these fruits in the preceding pages of this work. In the *Nesembyranthenum* Chronicle, 1924, I describe the fruits of these plants, and I reproduce the figures of the fruits and capsules (Fig. 109) and the expanded capsules (Fig. 110) taken from the plant. When the fruit is expanded, it is set apart from the rest of the fruit, and the upper part of the valves is also set apart from the rest of the fruit. In the case of the *Nesembyranthenum*, the valves are often seen to spread out flat or reflexed, as shown in Fig. 110 (b), the expanding petals develop broad, margined wings, which, in the closed capsule, are folded inwards, but as the valves open, these wings are spread out. The valves are also seen to spread out flat, as shown in Fig. 110 (b). These wings expand and are converted into petals, or, as in the case of *Nesembyranthenum*, into leaf-like organs of which is somewhat distinctive of *Nesembyranthenum*. These clips only occur in those cases where the petals are not visible, and in the act of expansion serve the purpose.
pulling the seeds off their branches or stalks. And all the
ferences of this group having locale centitions have open cells
to the fruit, without cell-wings, the seeds are easily worked out
of the cells by the rain. The fruit at Fig. 110 a. has axile placentas and open cells, the black dots show their seeds. All
the other fruits represented at Fig. 110 have their placentas on
the outer wall or floor of the cells, and the cells are roofed
with cell-wings as indicated on the "fruit at b." While at c of
the same figure is shown the tube which nearly closes the opening of the cells, and seems to be designed to prevent the escape of the seeds. What is the purpose of this tube? In all the fruits I have been able to examine that have this tube, it is always accompanied by stiff (not thin and flexible) cell-wings, which still further tend to prevent the escape of the seeds.

How do the latter get out of the cells? I have failed to solve this problem; the answer to this question must be worked out by some one in South Africa.

When the valves are opened some of these fruits are very pretty, star-like, or flower-like objects, as may be seen from their appearance in Fig. 110. On account of its flower-like appearance, I have even seen the fruit of one species sold in London under the erroneous name of "Rose of Jericho," a name that is also often misapplied to other plants that extend when wetted and close up when dry. The true "Rose of Jericho" will be found referred to later on in a note under "Herba orbiflum, dubium.

A curious circumstance connected with the capsules of Resembyrantanum is that in the year 1777 they were mistaken for fungi by Hegener, who, in the Berlinische Sammlungen zur Beförderung der
erzgebirgen-wissenschaft, V. ix., p. 130, founded his genus Hediviva,
containing three species, upon the capsules of different species of Resembryrantanum. See Roni and Sims, Annals of Botany, V. i.,
p. 363 (1804).

This is not the place to enter into the details of the remarkable structure of these fruits, but as I have found that certain combinations of structure possessed by them are usually associated with certain types of vegetative character, I have utilized the vegetative and fruit characters in combination in the following pages to divide the group into smaller genera. It must be understood, however, that my knowledge of the fruit of these plants is very imperfect, owing to my inability to obtain an abundant supply, yet where I have been able to examine the fruit of two or more species of the same group or genus as I now consider, the combination of characters as given seems to indicate that they will be conformable with all the species placed under each genus.

As the main purpose of a plant's life is to produce fruit, it is an accepted conclusion that the fruit is one of the most (if not the most) important of plant structures, and therefore wherever general uniformity in its structure is found it indicates close relationship or common origin of the species and their structure. But where one or more of the organs of which the fruit is composed is undeveloped or suppressed or otherwise modified, it indicates a divergence from the relationship, and being usually accompanied by some difference in the flower structure or in the vegetative organs is regarded as of generic import. This is practically the basis upon which all large groups have been divided into genera, and is adopted here for the division of Resembryrantanum, vegetative, floral, and fruit characters all being taken into consideration.

And, judging from the seedlings of the few genera I have been
able to experiment with, I think that characters derived from the mode of development of seedlings should not be neglected, as they sometimes may show or confirm the supposed relationship of two different genera. For example, when describing the genus Echeveria that will appear later on in these articles I had judged its relationship to be near that of the genus Lithops, and when the few seedlings I was able to raise of it developed, this view was confirmed, for I found that their manner of development from the cotyledonary to the adult stage is the same as that of the genus Lithops and Conophytum and not at all like that of gessebryzantherum and most other genera that I have been able to experiment with; thus adding a further character whereby it is distinguished from these genera.

As previously stated, I do not propose her to divide the whole genus gessebryzantherum as now constituted into separate genera, nor to redefine its sections as I think they ought to be defined, because I have not access to, nor can I obtain, the material necessary for this purpose, fruit and seed, and often sufficient flowers for dissection being absent. Nor do I wish to intimate that I think every group into which the genus is now divided should constitute a genus. But I do think, as I worth over one hundred years ago stated, that several among them are undoubtedly good genera; and I here propose to separate and characterise as distinct genera some of the groups of which I have been able to examine living plants or adequate dried material, and thus have assured myself that they undoubtedly differ in structure and habit from the main characters assigned to the genus by Linne. Most of the genera described below are easily recognised at sight when out of flower by their habit alone, then once they are known, an advantage not possessed by the majority of genera in other natural groups.

Therefore, in constructing the key to the genera given below, I have considered vegetative characters (next to fruit characters) as of first importance, because they are always associated with distinct floral and fruit structure, and are always present, while flower and fruit are not always obtainable.

In writing of these plants I have also endeavoured to make the descriptions so that they can be understood by the average gardener as well as by the botanist, because I realise that there are large numbers who cultivate these plants that have no means of identifying any of them, and therefore these articles, if very carefully studied, will be of some help to those who have not access to the rare books in which these plants are figured and described. At the same time it is impossible for me to here deal with all the known species, or even with all that are in cultivation, but in many cases I have given descriptions of some of all the chief species known or in cultivation, in others I can only enumerate them, and in the case of the rest, gessebryzantherum, only a selection of a few kinds can be made.

M. B. Brown
(To be continued.)
[410

4. Plant with flat, linear, terete or epithecial leaves, or
   perennial with flat and thin leaves only. To end of
   p. 460.

1. Leaves either all alternate or the lower opposite, and
   those of the flowering branches alternate, sometimes
   mingled with a few that are opposite; ovary produced
   above its union with the ovary into a short tube or
   cup; styles united into a short tube at the base; o-
   very partly superior, 4-5-celled; placenta on the
   central axis
   
   Leaves all opposite

2. Capsule (when expanded) with 5 erect rigid valves, giving
   it the false appearance of being 10-valved. Annual
   with prostrate, very rotatory stems and branches 4-5
   lines thick; leaves very stout, terete 19, Bryotheca

Capsule (when expanded) with 4-5 entire, areolate or
reflexed valves. Annuals with flat or subterete, and
then not very stout leaves

7. Ovules and seeds arising from the central axis

Ovules and seeds arising from a placenta down the middle
of the outer wall or floor of the cells; flowers solitary;
ovary inferior; capsule opening by valves having
continuous or closely parallel expanding keels 11

4. Fruit inferior, indehiscent, without valve, 1-celled;
   seeds large, flat and broadly-winged all round, arranged
   in a single whorl around the central axis. Annuals
   with radical flat leaves

Fruit (and ovary) partly superior or rarely wholly
inferior, 4-5-celled, opening then pett by 4-5 spreading
or reflexed valves, with their expanding-keels
(except perennials in 30, Flatythyris) closely continuous

Also, as it was known that cultivators and their usit is
best to observe the genus of so particular number of
this group of plants, that we neither know nor fruit upon;
I have endeavored to make this a subject, and am able to
so, by giving a partial resemblance to the rest of the characters,
not have contrived the prominent for that purpose. There
are some forms. However, such as I now think, Craspedi-um
Dolores, and Boreale, the name that cannot be distinguished
by their vegetative characters alone. Very rarely, the single
only, will I think, be removed from a large group of
the characters given, and there are more that the most
and probably, upon subsequent species so easily be referred to
the. Where the on quarterly is used, it leads to till
were only seen brief or without above flowers.]

4. Capsule with flat, linear, terete or epithecial leaves, or
   perennial with flat and thin leaves only. To end of
   page on the under 15.

1. Leaves either all alternate or the lower opposite, and
   those of the flowering branches alternate, sometimes
   mingled with a few that are opposite; ovary produced
   above its union with the ovary into a short tube or
   cup; styles united into a short tube at the base; o-
   very partly superior, 4-5-celled; placenta on the
   central axis

   Leaves all opposite

2. Capsule (when expanded) with 5 erect rigid valves, giving
   it the false appearance of being 10-valved. Annual
   with prostrate, very rotatory stems and branches 4-5
   lines thick; leaves very stout, terete 19, Bryotheca

Capsule (when expanded) with 4-5 entire, areolate or
reflexed valves. Annuals with flat or subterete, and
then not very stout leaves

7. Ovules and seeds arising from the central axis

Ovules and seeds arising from a placenta down the middle
of the outer wall or floor of the cells; flowers solitary;
ovary inferior; capsule opening by valves having
continuous or closely parallel expanding keels

4. Fruit inferior, indehiscent, without valve, 1-celled;
   seeds large, flat and broadly-winged all round, arranged
   in a single whorl around the central axis. Annuals
   with radical flat leaves

Fruit (and ovary) partly superior or rarely wholly
inferior, 4-5-celled, opening then pett by 4-5 spreading
or reflexed valves, with their expanding-keels
(except perennials in 30, Flatythyris) closely continuous

[410]
so as to form one central cut-keel; cell-open, without cell-wings or with a tubercle at the opening; seeds small, not flat nor winged, irregularly arranged in the cells; two calyx-lobes often much larger than the others and leathery

5. Style either none or very short and the 8-12 stigmas long and tailiform, or the style rather long and slenderly conical with several (7 or 8?) minute linear stigmas at the apex.

Style funnel-shaped, somewhat membranous, with 9-12 papillae-like stigmas on the surface of its rim.

28. Thyresperma

28. Hymenogynae

6. Leaves flat and more or less distinctly petiolate or much narrowed into a sort of stalk at the base.

Leaves sessile

7. Flowers solitary and axillary or in the forking of the branches; stigmas and valves of the fruit four.

Flowers in terminal cymes or cymosely arranged; leaves often very large. Annual or biennial plants.

17. Oryophytum

17. Oryophytum

8. Leaves ovate-lanceolate or lanceolate; calyx produced above the ovary into a short tube; stigmas stout; valves of the capsule with inflexed marginal flaps forming pockets, and with the expanding-keels thin, deep and toothed.

Leaves cordate; calyx lobed down to its union with the ovary; stigmas minute; valves of the capsule without wings or flaps, and their expanding-keels neither thin and deep nor toothed.

20. Liatthyrya

20. Liatthyrya

9. Leaves flat, broader than thick; flowers terminal and solitary or in few or in many-flowered cymes.

Leaves subterete or semiterete, not or scarcely broader than thick; very dwarf erect annuals with distinct internodes between the leaf-pairs and terminal solitary or cymose flowers; stem and leaves stout and probably pulpy.

24. Opophyllum

24. Opophyllum

10. Perennials; leaves under natural conditions withering to a skeleton and persisting, several times broader than thick; valves of the capsule without wings or flaps.

22. Scolelum

22. Scolelum

Perennials; leaves not withering to a skeleton, moderately thick in proportion to breadth; valves of the capsule with large erect or inflexed flaps.

13. Irenic

13. Irenic

Annuals, leaves not withering to a skeleton, many times broader than thick; valves of the capsule with inflexed flaps.

23. Synaptophyllum

23. Synaptophyllum
11. Annuals; leaves more or less flat and narrow, or linear-terete 12. Perennials; leaves sessile, lanceolate, or linear-lanceolate; stigmas and cells of the ovary and fruit; capsule with the expanding keels of the valves with membranous marginal wings at their apical part; cells open, no cell-wings or tubercles 38, Selcosperma

13. Stigmas and cells of the ovary and fruit 12-20; valves of the capsule with the expanding keels ending in awns; cells roofed with stiff cell-wings, without a tubercle at the narrow opening 30, Cleretum

3. Plants all perennials, except perhaps one species of 26, Gonicosia, which may be biennial or of short duration, and one species of 49, Frensia, which may be annual; leaves terete, semi-terete or 3-angled, rarely flattened and then rather thick and fleshy, never flat and thin. To end of key.

17. Plant or each division of it without separate spreading leaves, and consisting of a small-fleshy body, entire, notched or with two narrow or continuous lobes at the top, or with a closed cut-like fissure at the top or on one side, separating the two short thick and obtuse leaves or petals; it is composed and which normally only separate when making a new growth or in flower; plants usually starless or nearly so; true-centres down the centre of the outer wall of floor of the cells of the ovary and fruit.

Plants with distinct, separate, erect, ascending or spreading leaves, only in 8, Heridopsis as the resting or younger pair of leaves persist for any length of time with their flat faces closed together, and then are acute and resemble the beak of a bird 18

14. Cells of the capsule open, without cell-wings; stigmas and cells of the inferior or partly superior ovary and fruit 4-7

Cells of the capsule roofed with cell-wings; calyx without any tube above the ovary, which is always inferior, with 6-15 stigmas and cells 17

15. Ovary and fruit inferior 16

Ovary and fruit partly superior. Leaf body or division of the plant ovate or cylindrical-ovate, with a small fissure at the apex, minutely pubescent; calyx with a very short green tube above the ovary; petals or petal-
16. Calyx with a distinct membranous tube above the ovary; petals united below into a distinct tube. Each body of the plant globose, obovate, ovate or oblong, entire, notched or distinctly 1-lobed at the top, with a small closed orifice at the centre of the top or between the lobes, not parulose 1, Conophyton

Calyx lobed down to its union with the ovary (no tube); petals free. The plant or each division of it somewhat obovate, flat or slightly convex at the top, with a transverse fissure all across it (when adult), dividing it into two short truncate lobes.

3. Lithops

17. Calyx subequally 5-9-lobed; petals free; stigmas and cells of the ovary 6-11. Each plant or division of it globose, obovately-sub-lobose or obovate-ovoid, formed of two short, thick equal or sub-equal leaves with their flat faces closely pressed together and separated only by a cut-like fissure, not dotted or otherwise marked.

4. Himaria

Calyx subequally 3-lobed; petals free; stigmas and cells of the ovary 6-7. Each division of the plant either ovoid or obovate and slightly notched on the top, or obliquely or conically-ovoid or sub-cylindric with a closed mouth-like fissure on one side of it.

5. Gibbaeum

18. Seeds and ovules arising from a central axis, not flat nor winged, fruit partly or nearly superior, opening when wetted by 4-5 valves, and with 4-5 open cells without cell-vines or tubercles; petals united into a short tube at the base.

19. Seeds and ovules rising from a placenta down the centre of the outer wall or floor of the cells, or in the centre: 6, Arnottia, 11, Funkelaria, 12, Glottiphyllum, also from the basal part of the central axis, not flat nor winged; petals mostly free, but in a few cases united into a tube at the base.

20. Leaves all or many of them (at least on the flowering branches) alternate

21. Leaves with a distinct closed tubular sheath embracing the stem.

22. Leaves without a tubular sheath.

23. Leaves very short and completely concealed by the stout leaf-sheaths that close it; leaves 2 to each growth.
413

pulpy, terete, 1-3 lines thick; petal stiff

13, Lictrlyropsis

Stem evident between some of the leaf-sheaths, erect, 4-6 inches long, with more than two alternate and opposite leaf-sheaths along it; petals not stiff

14, *sp. non*

22. Plants with distinct, erect, decumbent or prostrate stems or flowering branches

Plants quite stemless; rootstock tuberous, leafless most of the year; leaves terete; flowers subsessile or very shortly pedicellate

21, *Hylobolus* M. B. Brown

(To be continued.)

23. Stems or flowering-branches erect, stout; leaves withering and persisting as sharp spines, or (on dried specimens) their bases persisting as hard fragments; flowers in terminal cymes; calyx-lobes with spine-like tips or acuminate

15, *Anceboryllum*

Stems decumbent or prostrate from a tuberous or fleshy rootstock, not stout; leaves sometimes withering into spines; flowers terminal and solitary or becoming lateral and scattered along the branches opposite the leaves

16, *Epilanthus*

24. Leaves small and united at the base into a short sheath bearing a ring of deflexed hairs or cilia, with the free part subulate, subteterete or deltoid, very dear; bushy plants, densely-branched

23, *Trichocyclus*

Leaves sessile, without a ring of deflexed hairs or cilia at their base

25. Bushes or bushily-branched plants, erect or in a few species decumbent; internodes evident on all parts; leaves terete, semi-terete or trigonous, withering and often decumbent and leaving naked stems

18, *Frenia*

Not bushily branched plants; flowering-branches decumbent or procumbent, or the whole plant prostrate; internodes of the main stem often quite absent; leaves linear-lanceolate or flattish, or in some species subteterete

26. Corolla small, usually 3-5 (rarely up to 9) lines in diameter; seeds very small, 1-1/2 (rarely 2/3) line in diameter, nearly smooth or minutely granulate

35, *Silolcaulon*

Corolla showy, 2-20 lines in diameter; seeds 4 to nearly
1. line in diameter, compressed, crested-tuberculate on the margin

From 18. Tesselated on the outer wall or floor of the cell (to end.).

27. Leaves all alternate, arranged in lance or small tufts, not dotted

Leaves all opposite

29. Leaves 1-1 incision, 3-9 in a tuft, erect, convexly-truncate and without chlorophyll at the apex*.

* This can easily be seen by cutting off the top of a leaf and holding it against the light.

Leaves 3-9 inches long, narrow, acute, soft; flowers pedicillate, large, yellow; stigmas 6-10

29. One leaf of each pair much longer and larger than the other, united at the base into a solid-looking body, usually only 1-2 pairs to a shoot; and the plant stemless or with short prostrate stems; stigmas 6-7

5. Gibbosa

Leaves of each pair about equal in length and size

30. Leaves all radical, erect, tufted, club-shaped, convexly-truncate and without chlorophyll (green colouring matter) at the apex; flowers large, showy; stigmas 10-16

4. Carpobrotus

32. Fruit indehiscent (no valves), fleshy, edible; stems trailing; leaves acutely trigonous; flowers large, showy; stigmas 10-16

33. Frithia

31. Fruit indehiscent (no valves), fleshy, edible; stems trailing; leaves acutely trigonous; flowers large, showy; stigmas 10-16

32. Carpobrotus

30. Leaves all radical, erect, tufted, club-shaped, convexly-truncate and without chlorophyll (green colouring matter) at the apex; flowers large, showy; stigmas 10-16

33. Frithia

31. Fruit indehiscent (no valves), fleshy, edible; stems trailing; leaves acutely trigonous; flowers large, showy; stigmas 10-16

32. Carpobrotus

Stipula one, sessile, circular or oval (not so in any other genera). Stemless or without internodes between the leaf-pairs, leaves 3-4 to a growth, very smooth, dotless
...stamens all, or the inner, bent down into the calyx-tube; ovary and fruit 10-24-celled and the cell of the fruit nearly closed by a large tubercle at the opening.

33. Stigmas and cells of the ovary and fruit 4-20; stamens erect and visible in all except 41, A. ficticius, and 42, D. persicifolius.

34. Leaves not more and usually less than twice as long as broad, ovate to oblong, not above, white or whitish; flower sessile or subsessile, grey-roderman.

35. Leaves several times as long as broad when adult, erect, semiterete, not white; flower on a pedicel half as long as the leaves.

36. Flowers terminal and central between the leaves, stigmas 0-14, 9, Pleiosperma.

37. Flowers lateral, one on each side of the plant from the axils of old leaves; stigmas 6, 10, Podium.

38. Cells of the capsule open, without cell-wings, exposing the seeds, no tubercle at the mouth of the cells; branches decumbent or prostrate and often forming leafless clumps, or stemless with branching tuberous rootstock; leaves soft, minutely or distantly pubescent, green, without radiating bristles at their tips; stigmas 5, 10, Telosperma.

39. Cells of the capsule roofed with cell-wings.

40. Cells of the capsule partly closed by a large tubercle at the opening; stigmas 4-20.

41. Cells of the capsule without a tubercle at the opening; stigmas 4-10.

42. Stigmas, valves and cells of the fruit 20; expanding-keels of the valves widely separated (nearly 1 line apart) at the base, diverging; tubercle at the opening to each cell two-lobed (not so in any other known genus); stems prostrate, with distinct internodes.

43. Stigmas, valves and cells of the fruit 6-20 (in...
I cannot obtain fruits of this plant but believe it to be wrongly placed under Glottiphyllum.

* I cannot obtain fruits of this plant but believe it to be wrongly placed under Glottiphyllum.

39. Leaves soft and pulpy and not dotted, long, narrow or tongue-shaped and entire, or suberete with, or without two blunt teeth on the face, greenish or yellowish-green; flowers large, yellow; stigmas 7-10.

12. Glottiphyllum

Leaves firm, yellowish-dotted or with usually conspicuous dark or white dots, rarely (and only in *Gheiridopsis) entirely white without dots; stigmas 8-30.

40. The inner or only pair of leaves present on each growth when the plant is at rest erect, acute, closed together and somewhat resembling a bird's beak, and surrounded by or their basal part enclosed in a sheath formed by the withered united part of the previous pair, conspicuously dotted, rarely white or without dots; stigmas 2-10.

8. Gheiridopsis

Leaves when the plant is at rest spreading or not closed together as to resemble a bird's beak, and the basal part not enclosed in a withered sheath.

41. Leaves in 1-3 pairs to a growth, elongated, spreading, very stout, either without internodes between the pairs, greenish-green or brownish, conspicuously dotted with darker colour; stigmas 9-10.

13. Lunatillaria

Leaves ascending or spreading, crowded or in tufts or, on the flowering-branches, with distinct internodes between the pairs, suberete or subterete, not stout, finely pellucid-dotted when held against the light, stigmas 10-20.

12. Gheiridopsis

42. Stigmas and cells of the ovary and fruit not visible or only 7-5, rarely 4 or 7. Plants sometimes stemless, but mostly with erect or prostrate branches with distinct internodes between the leaf-pairs.

3 Times and cells of the ovary and fruit not visible or only 7-5. 41 Gheiridopsis

43. Stamen evident, erect, loose or collected into a column or cone; with or without at moment around them; calyx not produced above its union with the ovary into a tube or cup; petals not tubular.

40. Boreus phyllophorum

Stamens not recurved or quite hidden under a sheathed
...le? if r.eirs...cm-

...f. closed... but... short, lappet, without intercalary... stamens... erect.

54, Schizanthus

...plant with distinct intervals between the leaves... into... above the ovary;... with... erect... small... stamens... concave.

...it is... the... of... leaves;... if... the... 2, 3, 4... numbers... refer... the... sequence... number... as... indicated... figures... on... the... side... the... under... characters... and... separate... the... number... the... generic... indication... number... in... the... sequence... adopted.

R. E. Brown
(To be continued.)

HEDYOTIS M. L. BUN
(Continued from page 447.)

COMMITTE, R. E. Brown

450 Very small herbaceous, succulent, tufted plants, usually 2-4-leafless, but for species level or short stems with age, with the growth crowded into a clump. Roots very short. The growth consists of a small, fleshy, fleshy, spherical, globular, ovate, ovoid, or sub-cylindric in shape, formed at the opposite leaves fused into one body, and covered with... with... 4-6-lobed at the tor... the... as... as... than... the... calyx-tube...
usually numerous, sometimes for lobed or with, spreading or recurved. In one or several series, the inner series of the tube in some species smaller and differently coloured (staminodes). Stamens, few or very erect included in or partly exserted from the corolla-tube. Style, long or short, nearly nearly or quite absent; situate four to six, filiform. Every inferior, flat or convex or conical to the torus, with a granulate rim of connected glands at its base, four-to-six-celled; stamens on the floor or outer wall of the cell. Capsule small, flat to seven valves and cells; valves with a central expansion of the cell-partitions; cells ovate, without cell-walls or tubercles. Seeds minute, ovoid, with a nodule at one end, smooth. — N. E. Brown, in Gardeners' Chronicle, 1922, vol. 37. pp. 1-3.

Species under us, all natives of the Karoo region of South Africa, running from the Karoo-Southward and eastwards for as Join's Dri.Division, but at present not known to extend beyond those limits.

The name is derived from the Greek konos, a cone, and phyton, a plant, in allusion to the shape of the growth, which in most of the species is like an inverted cone.

Many of the species extend their flowers at the close of the day or at night, closing again in the morning, and when their flowers at the close of the day or at night, closing again in the morning, and when their flowers are white, cream-coloured or yellowish, they always have very narrow or linear-filiform petals, but when the petals are pink or magenta they are usually much broader. Those that extend their flowers in the day-time always have broader petals than the night-flowering species, irrespective of colour. Why is this? Why do after day-flowering species need to make themselves more conspicuous than those that flower at night? Some of the night-flowering kinds are scented, but so also are some of those that are day-flowering, so that a difference in the attraction of odour does not seem to explain the problem. I have been able to examine its blossoms, I find that the floral structure of 3. pilosulum is quite different from that of Conophytum, and identical with that of Gibba. In addition, there is the important character of the presence of cell-walls also agrees with the fruit-structure of the genus, under which this plant will be found enumerated hereafter. The appearance of the plant, however, is so much like that of Conophytum, that I think no one who have suspected that it did not belong to that genus, but it also possesses another character that should have warned me, for in place of the very short firm us roots characteristic of the genus Conophytum, it has the deeply descending rootstock characteristic of the genus Gibba. It was not until some time after my last article on these
450 plants, in The Gardeners' Chronicle, 1872, vol. LXXXI., p. 15, was in time (but not published) that I was informed by Dr. J. W. Powell, that he had published several species in the form at a drift for 1872; and I have very kindly sent me copies of his articles, but no copies of this work published after the year, his copies in the library. Until the year 1872, long after my account of the genus was in type, so that until then I was quite unaware of any other species that had been published belonging to the genus I have dealt with, other than those I have enumerated. As some of Dr. Powell's remarks were published at an earlier date than my own, the absence of normal information necessary. These chances I have written in the following statement, and have also added some further references, as well as descriptions of the species not to be found. The species are arranged alphabetically for convenience of reference, but numbers are added to indicate their position in the statement quoted in my previous account of the genus.

Although several new species have been described by different authors, they do not recognise this genus as listing for Ascarina-Andromedum, nor do they describe the structure of the flowers and fruit.

In the correspondence about these plants some writers have mentioned that the surface of many of these plants when viewed with a strong lens is seen to be covered with minute whitish dots, which I have not mentioned in my descriptions. The reason I have not done so is because these minute specks are the stamens of the plants, and it is unnecessary to mention.

Those who are interested in the microscopic structure of plants will find the evidence of these species very interesting to study.

As stated in The Gardeners' Chronicle, vol. LXXXI., p. 187, these plants are writing in characters that can be set down in writing in definitive terms, and are, therefore, accurately to be identified from descriptions alone, and unfortunately, owing to the illness of my daughter, I am no longer able to illustrate these articles by the aid of her excellent photographs, that often have to be made between 2 to 30 times, but I am happy to have my species only fully accord with flowers at night, but is an aid to the identification of the new species I have seen, I have indicated under each of the type of form issued by the reputable firm, viewed sideways, as indicated in the outline sections (Fig. 127) reproduced from my former article in The Gardeners' Chronicle, vol. LXXXI., p. 184.

The difficulty of naming these plants correctly is very great, as is clearly evidenced by the fact that at the horticultural shows where I have seen them exhibited, I have noticed that the names are rarely correct, and continental horticulturists are selling some species with my names attached to them that are by no means correct. As for an example, I have seen a plant bought from a continental dealer as being "C. ricta...", but appears to be "C. sylvatica...", which it certainly is not, but appears to be "C. sylvatica...". Another I have seen bears the name "C. ciliul...", for which it certainly is not, but appears to be "C. ciliul...". In the first place, it is a mystery to me how the dealer could have possibly obtained this name, for it has hitherto required unpublished, existing only in my own manuscript, and I have never distributed any notion of my plant to any horticulturist, under that name, nor have I so named a plant for another person. Secondly, the plant sold under the name "C. ciliul..." is not at all like the plant I have so named, and which I believe to be found described below. I possess the plant, and think it probable
450 that it may be a variety of C. vulgum, but until I am able to
compare its flowers I cannot decide.

I have mentioned this because it indicates how very dif-
cult it is to note these plants from descriptions. Unfortunately,
as previously stated, I have found it impossible to make a work-
able key to the whole of the species, but I have compiled one to
the group to which C. bilobum belongs, from which I think the species
of that group at present in cultivation may be determined. And
I have separated the newly described species that belong to that
group, and have placed them after the key at the end. Descrip-
tions of the older species of the group will be found in vol.
LXII, pp. 83 and 134.

For the cultivation of these and allied plants I am not making
trial of some porous pots without a hole at the bottom, manufac-
tured by Dr. R. T. Dick, of Newlyn, Penzance. Under natural con-
ditions these plants get little or no rain, for long periods and it
is clear that they must obtain the moisture they require from an-
other source. I think it probable that the plants and the stones
and rocks from which they grow, cool down at night and condense
sufficient moisture for their requirement. But under cultivation
the problem is to give them the right amount; the watering of them
is a fine art. If kept Ery too long, the root tisrs die, and when
watered too often, not, and the plant is killed. And if too liberally
watered, especially at the wrong period, they may also rot and die.
These porous, holeless pots may therefore absorb and retain suffi-
cient water to prevent the roots from drying completely, and at the
same time allow any surplus to evaporate and so prevent rot. I
will report upon the result of the trial I am making when I treat
of the general cultivation of these plants. At present, it may
suffice to say that the species

451 of this genus "grow, and make their growth in this country be-
tween August and January, and from May to near the end of July they
go to rest. During their resting period they require very little
water, but when growing and flowering they should be watered freely
enough to keep their roots active, otherwise they do not flower
well.

39a. — C. advenum, M. E. E. - Growth small (type A)., 1-4
lines thick, 2-5 lines broad, and 12-24 lines thick, obovately
obovoid, slightly notched at the convex tor, which in end view
is also convex or faintly ridged: orifice, 1-1 line long; surface
smooth, glabrous, grey-green, suffused with purple on the sides
under continued sunshine, and on other either marked with a line of
connected dots over the tor transverse to the orifice and numerous
other minute scattered dots, or only with irregularly scattered
dots of dark green or purple-brown in the orifice outlined with
slightly brown, and the contiguous dots. Flowers not seen. Continue
Division: locality not stated. Mitchell I received this small
species from Professor ... Courtin in 1919, but it has not yet pro-
duced flowers with me.

15c. — C. anglicae, W. E. E. - Growth small, 1-4 lines high,
1-5 or lines broad, oblong or less circular or very broadly
elliptical at the truncate tor; orifice about 3/8 line long;
surface green, marked with some elevated brown in the orifice;
lines. Flowers unknown. - Lewis, anglicae, winter and - montes
London, near Kew, E. Dint. I have not seen this species.
40a. — C. sect. 17, H. E. B. Sm. Growth. 3-7 lines high, 4-6 lines broad, and 2-7 lines thick. Obconic, ellipitic in outline, not slightly notched on the tor (type C), with the lobules on each side of the notch converging to a view; orifice 1-1 line long, depressed; surface smooth, about twice the size seen, or, in full sunshine, dull green, under continued sunlight always russet like on the sides, and the tor usually void on one side or both sides with two or three lines of confluent dots, with or without a row of two or four short processes from the point of union of the sides near the centre of the orifice, with the dots of irregular lines outside of the notch lines, on the adaxial outline with 3-7 serrate lobes or crenate. In a rock nest or shrublet. Sometimes with exposed or broken or continued sunlight, the whole tor surface becomes more or less drably or rather purple, or be dull green, yellow the other side. It is more or less in the form of a ball of wool with the softer fibres attached, whitish. Style 1-1 line long; stamens 4, much shorter than the stamens; 1-1 line long, all together, smooth. — E. B. Sm. in hort. Linnaea, vol. lv, p. 32. South Africa; locality and collector unknown.

This species was accidentally added from my description of the species in my former articles in the Chronicle, where it should have been found place in vol. tri. E. B. Sm. in hort. Linnaea, vol. lv, p. 32.

40b. — C. sect. 47, H. E. B. Sm. in hort. Linnaea, vol. lv, p. 32. (To be continued.)
486 1 line long. Corolla 5-6 lines in diameter, ovate and nicked; tube 3-4 lines long, white; petals 5-6, lanceolate, 1/5 line broad, line r-filiform, pale creamy-yellowish. Stamens about 7 series at the mouth of the corolla-tube and exerted; anthers yellowish. Style about 1 lines long, stigmas 3-4, about 1/5 line long, filiform, attaining to about the middle of the corolla-tube, for half the anthers, palid. — of the ovary shortly or broadly conical. South Africa; locality and collector unknown.

Described from a living plant in the collection of R. F. Bates, of Southborough, later when I have much more sure in naming it, and no obtaining it from Mr. B. Taylor, of Southborough, Kent, without information as to origin.

2a. — J. breve, R. E. Br. — growths as first developed after importation, 2-4 lines high, and 3-4 lines in diameter, obconic, filiform or fleshy-convex and circular in outline at the top (type E); orifice 1-1/2 lines long, scarcely depressed, glabrous, smooth, dull glaucous-green with a few indistinct dots of a darker tint scattered over the top. Calyx parted into 5-6 lobes, reddish; tube rather short and stout, 1 line long, and 1 line broad; lobes 1-1 line long, obtuse or ovate, obtuse. Corolla (only a dried flower seen) apparently about 1-3 lines in diameter tube moderately stout, 1 line long, not exceeding the calyx; petals not very numerous, apparently in one series, 1-5 line long, linear, clear yellow. Stamens about twenty, all exerted arising at the middle of the corolla-tube, about 1 line long; anthers light yellow. Glands united into a pale honey-coloured ring. Style none; stigmas 4-5, erect, 4 line long, filiform, apparently yellowish. Top of the ovary very prominent and convexly conical. Little Namaqualand; near Steinkopf, Leyer, Arlloth 1,513.

This species is allied to J. minutiflorum and J. racemae, and the indistinctly dotted growths, the stout calyx-tube, the stamens all being exerted and the more prominent top of the ovary very well distinguish it.


22a. — C. citellum, R. E. Br. — growths 6-9 lines long (probably much stouter and smaller under natural conditions), 3-5 lines broad, and 3-4 lines thick, oblong, broadly elliptic or circular in outline at the top, in side view the top is convex with a rather narrow and somewhat outlike notch at the orifice (type E), and in end view the top is very obtuse or slightly ridged; orifice 1-1/2 line long, with a much impressed diaphragm at each end of it; surface smooth, glabrous, green, varnished grey-green under continuous sunshine, splintly sprinkled with separate small dots of a darker green which are not arranged in any pattern, and the orifice outlined with similar separate or connected dots. Flowers not seen. — South Africa; locality and collector unknown.

Although I have had this plant in cultivation for nine years it has never flowered during that period. Viewed from above it somewhat resembles C. truncatellum on a small scale but differs from that species by its growths being constantly of only about half the diameter of those of that species, of a more greenish colour, and the orifice is not depressed as it is in C. truncatellum.
15a. - C. discus, L. - fr. - Grows the very variable in size, 2-7 lines long and 2-4 lines in diameter, oblong, usually nearly circular in outline and outlined flattened and obscurely ridged on the top (type 7). With the orifice 1-2 lines long, depressed in a slight notch, with a circle at each end of it; surface smooth, alabaster, surrilled on the sides under continued sunshine, and the top green, marked with numerous separate dots of darker green irregularly scattered over it, and with or without some of the surfaces of one or more or less connected into a line forming an irregular ring or broad "figure-of-eight" marking around and distinct from the orifice, and the orifice itself outlined with similar connected dots. Calyx - 5-6 lobed; tube mostly exerted, 1/4 line long, white; lobes 1 line long, oblone, tube e, reddish... Corolla about 6-7 lines in diameter, expanding in the vertex, tube 2 lines long; radii 20 or more, in 1-2 series, stout 1/5 line long, slenderly linear, acute, white... Stamens about as many as the radii, in about two series, arising at or above the middle of the corolla-tube; anthers all exerted, pale yellow. Style scarcely surpassing the anthers, slenderly filiform, exceeding the middle of corolla-tube. South Africa: locality and collector unknown.

Described from a living plant sent to me several years ago by Mr. T. Taylor, of Southborough, Kent.

15b. - C. actinum, L. - fr. - From the first collection near Fortification, 1-7 lines high, 2-7 lines broad, and 2-3 lines thick, oblong, rounded or oval, notched at the top (intermediate in between 1 and 2 mil.), circular or broadly elliptic in outline viewed from above, with slightly depressed and in some occasions outlined 1/4 line long; surface alabaster, green, with the orifice outlined with a slightly raised smooth line, and from or about which it overtops the top and partly down the side several other slightly raised smooth lines or "figure-of-eight" lines, and occasionally a dot in between them, all of which are of a darker green than the rest of the surface or petals under continued sunshine become surrilled if the surface in between these markings when viewed with a lens is seen to be rather concavously covered with minute white granules (stemlets). Calyx much exerted (only a dried flower seen), 4-5 lobed; tube 1/4 line long, nearly acute, white... Corolla apparently about 1-7 lines in diameter; tube much exerted, from the calyx, 5-7 lines long, yellowish; petals apparently not very numerous, 1-2 lines long, linear, acute. Stamens in three distinct series of about eight in each series, one at about the level of the calyx-lobes, one at the mouth of the corolla-tube and the third series near between these two; anthers yellow. Style 1-2 line long, attaining to the level of the lower stamens, with four minute yellowish stigma, itself in 1/5 line long, little conical like; near Stienkors, Lavern, Kooltsh, 6,109.

Described from a living plant kindly sent to me by Dr. A. Marloth. F.D. Room (To be continued.)
Mr. Schwantes kindly sent to me a description of his type of *C. shauviniae*, and I find it identical with *C. gracilistylum* (a name first published in 1917). He also informed me that he also believed his *.. onceiflora* to be the same plant, but that it has now entirely died out of cultivation. As one of my plants of *C. gracilistylum* has produced imperfectly formed growths that were "elate and terete, globose above and about one cm. thick," as described by Mr. Schwantes for *.. onceiflora*, I have no doubt that he is perfectly correct in believing *.. onceiflora* synonymous with *C. gracilistylum*.

13a. -- *C. inornatum*, N. E. Br. -- Growths very small under cultivation, 1-4 lines high, and 1-2 lines in diameter, obconic, convex and circular in outline at the top (type 3); orifice 1 line long, level with the surface, not at all depressed; surface smooth, glabrous, green or crevix-green, outer tinted with purple on the sides, with the orifice rather indistinctly outlined at dimer green, and often having a purple dot on each side at the centre, and with about 2-3 separate, indistinct dots scattered over the top, or sometimes almost without markings. Flowers not seen. South Africa; locality unknown.

I have had this plant in cultivation for nine years and it was never "flowered with me, nor does it grow larger than the dimensions given, so I expect that under natural conditions the growths would scarcely be more than 1½-2 lines in diameter.

70. -- *C. Johannesinkleri*, N. E. Br. -- Growths described as being 2-5 lines high and 0-1½ lines in diameter, but figured as being 1-7 lines in diameter at the truncate elliptic top, circular in outline (type 12); orifice level with the top, 1½-2 lines long; surface glabrous, glaucescent, not dotted. Flowers unknown. -- Wesemb. Johannesinkleri, Dinter in Hedzerae Not. Fel. (Succulentenforsch. in Sudwest Afrika) vol. 5, pp. 59-60 (1922), and C. Johannesinkleri, Dinter and Schwantes in Zeitschr. f. Sukk. vol. 2, p. 18, with fig. (1925).

Groot Marquesoland; linebruit Mountains, Dinter.

I have not seen this species. It seems to be near to *C. min'tilorum*.

27a. -- *C. meridionale*, N. E. Br. -- Growths 3-4 lines high, to 8 lines broad and 2-4 lines thick, obconic, elliptic in outline smooth at the truncate top, which has a broad notch across it sloping upwards and outward from the orifice to a convex outer part (intermediate between types 1 and 1), orifice 1½ lines long, rather tightly closed; surface smooth, glabrous, greenish, with purple sides, and the top wrinkled with small sepal and very distinct dark green or purple dots, which are sometimes irregularly scattered, sometimes arranged in lines, but not forming any regular pattern. Calyx 3-lobe, ovary and part of the tube included in the mouth of the tube; tube about 1 lines long; lobes oblanceolate, emarginate. Corolla 1½ lines in diameter, expanding at right; tube about 1½ lines long; retina about 1½-2½, in two series, 1½ lines long; 1½-2½ lines broad, slenderly linear, white. Upper anthers united, yellow. Style and stigma not seen.

Van Eurne's Division; near Swell, growing on flat rocks in
The above description is partly from a growth of the...
484 four plants kindly sent to me by Dr. J. Schventes, and partly from
a plant sent to me by Dr. Apploth. In general appearances this
species much resembles L. subrimum, each side of the orifice of
that species are wanting or scarcely evident in L. annuliformum.
It is also very much like L. formosa, \( \text{[...]} \), but the orifice is
not rosy, and the style and stigmas are longer than in that species.

1o. - C. minutum, J. E. \( \text{[...]} \), in Her. Chron., 1922, vol.

1w., p. 271. Add to references, C. minutum, Schventes in

20a. - C. notatum, J. E. \( \text{[...]} \). - Grow the 4-7 lines long and 2-5
lines (or sometimes more) in diameter, obconic, somewhat circular
in outline and flat or very slightly convex at the top (type). Outside 1-1
line long; surface smooth, chlorous, reviich-green, worked on the top with very irregular branching lines formed of
confluent or separate blackish-green or purplish dots, and the
orifice outlined with similar dots, and on the sides often ex-
serted, 4-flowered; tube 0-3-6 lines long 3 to 1 line broad, green
ish. Jokes 1 line long, oblanceolate, obtuse, red-brown. Corolla 5-7-
lines in diameter, exerted in the evening, slightly scented;
tube 3-7 lines long; petals 7-12 in 3-7 series, 1 to, recurved-
spreading, not strictly rounded, very slender, 2-4 lines long
about 1/6 line broad, linear, acute, white by artificial light.
Stamens about 20, in two series; anthers all more or less elongated,
red-yellow. Style 11 line long, pale green; stigma 4, erect,
1-11 line long, greenish-white, attaining to about the middle of
the corolla-tube.

South Africa: locality and collector unknown.

Described from living plants that I have had in cultivation
for several years. I find that it varies in size from year to year.


1w., p. 307. Add to reference, C. obconillum, Schventes in


1w., p. 274. This has not flowered and proves to be a species
of Gibbaea, which see.

11. - C. perversus, J. E. \( \text{[...]} \). - Grow the about 6-10 lines high,
and 6-12 lines in diameter, very broadly obconic, with a flat cir-
cular or which often overtop the sides (type); surface smooth,
chlorous, uniformly of a light bluish or sub-glaucous-green, not
shriveled. Calyx 2-7 lobed; tube exerted, entire; corolla 6-11
lines in diameter, expanding in texture and remaining convex in-
retroflex or cloud on sunshine, centric, 3 to 4 series with a peak
in the depression; tube longer than the calyx, dull brownish; petals 12-20, in
2 to 4 series, 3-5 lines long, 1-2/4 line broad, cuneately linear, obtuse, or slightly pointed, on the apex, entire, thick,
white, sometimes yellowish on the base, shining; stamens
4-6 (inter series), 1-11 line long, pale yellow, very pale,
white or orange. Staminodes 12 included in the corolla-tube, for
the stamens. Style 1 line long; stigma 4, 2-4 st., entire, about 1 line long. - C. p. nupr guaranteed, \( \text{[...]} \), in Her.

1920, vol. 1w., p. 271. Add to reference, C. p. nupr
mean, J. E. \( \text{[...]} \), in Her. Chron., 1922, vol.

1w., p. 141. This plant is very strange, I shall not

1. - C. p. nupr (to be continued.)
C. Pearsouni var. minor, N. T. Br. -- Exactly like the type but smaller in all its parts. Growth 3-7½ lines; tube 1-1 1/4-7 lines in diameter. Tube 4-lobed; tube 2-8½ lines long, exserted as one part of the ovary. Lobes 1 line lines in diameter; tube 3½-3 1/4, about 1½ lines long, and 2½-1 1/4 line broad; stamens 1-11/2 lines long. Style about 1 line long; stigmas 4, about 1/4 line long.

In my previous account of this plant I unfortunately mistook and described it for the plant named J. 'ettsteinii by Boret, which so closely resembles, that, in the absence of a figure showing structural detail of the flower, I certainly thought it was the same species. But having afterwards obtained a plant of the original J. 'ettsteinii, and having now also both plants in flower together, I find that they represent distinct species. As my previous description (with the exception of the mention of dots on the growths) was entirely made from Pearsouni's plant, I shall give, later, a description of the true J. 'ettsteinii.

The variety minor I am quite unable to distinguish from typical C. Pearsouni by any character except size.


Prince Albert Division: Prince Albert Park, Kerloft. 11, 271.

All the above notes, in my opinion, unhesitatingly belong to one and the same species. They are all collected in the region Prince Albert Rock, by Dr. R. Kerloft and others. Dr. Schwantes has obligingly sent to me portions of his type plants of J. furvusii only. tevilliae (syn. albertense, Schwantes, not of F. row), and these certainly represent only one species and are identical with J. albertense, N. T. Br. I have not seen J. tevilliforme, which Dr. Schwantes informs me was died out of cultivation, but there is no character whatever in the description of J. albertense or figure of the flowers which distinguishes it from J. furvusii. Dr. Schwantes considered it different on account of its smaller size, but I have grown many plants of J. furvusii (J. albertense), as I see by those named for J. tevilliforme, all of a smaller size than the smallest figured for J. furvusii, all on the same individual. Dr. Kerloft has also informed me that he collected as J. furvusii only one species from Prince Albert Rock, but that different individuals were larger than the true form, exactly as I find the true form in many species, for example, J. tevilliae, J. pearsouii, J. truncata, etc.

It may be well to point out that Dr. Schwantes describes this new species as being the surface covered with very minute papillae. This is misleading, for a fine--from all too evident.
that he promptly go on "a couple of rounds, every one of them an 8- 
cells as seen when seen to; with the very natural feeling of our warm blood, 
the sight of a living thing, especially when it's a bit distant, makes 
our heart beat and ve begin to cot".


150. -- C. spirale, N. E. Br.-- grows 4 1/2 lines broad and 
4-5 lines thick, oblong, slightly and very obtusely ridged, across 
the breast of the digit and a vex tor (type 2.), orifice 2-3 
lines long, depressed, tightly closed, with - dilated at 2 cm., 
and usually it is not a tunnel, it being oily and thin, in 
that character coming in contact with the leaf, or 
sub-surface, usually the tube is a little amply spread, and the 
lobe of the inner corolla is obtuse. C. spirale 

I. - Albert Division: the Prince Albert Rock, Hill

Described from a living plant sent me by Mrs. J. Fillans. 
The spirally arranged of the petals in the fully expanded 
flower, as well as the tubular or the throat, clearly distin-
guishes this from allied species.

N. E. Brown

(To be continued.)

TREMENDOUS - MENTH.
(Continued from vol. LVIII, p. 500).

12. C. spirale, N. E. Br.-- growths first explored 
after implantation, 3-4 lines long, 3 1/2-4 lines broad, 6-7 lines 
high, some of the smaller, oblong, faintly or distinctly 
notched (somewhat as in time), and faintly reflexed to the tor., 
with the orifice 2 1/2 lines long, ending in a reflex line; surface 
smooth, clear, green, not at all glaucous; the orifice not 
irregularly elliptical or oblong or elliptid, surrounded by a 
green or at the bell (where the inner corolla is slender) white; 
at each end of the orifice the inner corolla enters into 
loose, irregularly "triangular" to on the side or 3 sides of 
the orifice as a "funnel", or 1 "green dot" or short line, and 
annually scattered over the tor. are also from 2 to 3 other small 
dots. Some much exerted, 4-lobed, necroticous, white, with 
the lobes tipped with reddish or greenish, a; tube 2 lines long;
19. -- C. pinnatifidum, E. B. r., small, ovate-oblong, flat or flatly concave, 2-3 lines long, not distinctly ribbed. Petals rather numerous, in 4 series at the throat of the corolla-tube; stigma 4, about 1/4 line long, yellowish. Corolla 1 line in diameter, on a circular, with 4 valves and cells, thin, red; brown, each valve with one cent. yellow, expanded to a broad, membranous, scarlet line, 15 lines long. Sepals minute, 1/4 line in diameter, compressed, somewhat reddish-brow in outline, closely held together.

Little "N. equadori": Vicinity of Steinkopf, ever, scarlet cloth.

This appears to be allied to C. limus, E. B. r., although quite distinct from that species.

20. -- C. limus, E. B. r. -- Growth 4-7½ lines high, 1½-1 lines thick, and 2½-5 lines broad, circularly or elliptically outlined, at the base tapering or transversely large and thin; petals with 4 valves and cells, thin, red; brown, each valve with one central, yellow, expanded to a broad, membranous, scarlet line, 15 lines long. Sepals minute, 1/4 line in diameter, compressed, somewhat reddish-brown in outline, closely held together.

Little "N. equadori": Vicinity of Steinkopf, ever, scarlet cloth.

This species is unknown to me.

21. -- C. viridissimum, E. B. r., small tuft, E. B. r. -- Growth 1½, in the tuft, 1½-2½ lines high, ½-1½ lines thick, the petals often yellowish, 1½-2½ lines long, and the tomentum more or less soft. Petals yellow, with 1 lower cell, not continuous, and 4 valves, the latter, at the top, often soft, and the lower end of the petals compressed. In C. r., Chron., vol. LXXI, p. 361, I have a species, or I should have been able to assign it to C. pinnatifidum, or c. 21, so the surface is covered with a very close appressed villous pubescence, and is finely velvety to the touch.

22. -- C. pinnatifidum, E. B. r. -- Growth 3-5 lines high, 1½-2½ lines thick, and 10-15 lines broad, or ½-1½ lines thick, yellow, oblong, closely held together, and the tomentum more or less soft. Petals often yellowish, 1½-2½ lines long, 1½-2½ lines thick, the petals compressed, and the lower end of the petals covered with a soft villous, appressed pubescence, and the upper ends of the petals compressed. In S. Bp., p. 97.

Couch's "N. equadori": Vicinity of Steinkopf, ever, scarlet cloth

This species is unknown to me.
Stamens indesert. There is no trace of the anthers here in any specimen seen. Signal about 1½-2 line broad, notched at the anterior, virginate, blackish yellow, style about 1½-2 line long, included in the corolla tube or exserted 1½ line beyond the stamens, divided at the top into 3 stigma lobes about 6½-1 line long, very pale yellowish.

C. ettsteinii differs from J. Pearsonii by the surface of the growths being slightly dotted on the tor; by the absence of anther nodules at the mouth of the corolla, and by the very much longer style.

28a.—C. Mirrettii, H. F. Jr.—Growth of imported plant 6-8 lines high and 2½-3 lines in diameter, oblong, elliptic to circular in outline, and when received in their shrunken, resting condition were quite flat on the tor, becoming convex when in “tuft” (intermediate between types B and E), with a central orifice about 1 line long, “+” is not at all depressed, smooth, oblanceolate, full green (perhaps grey-green in nature), quickly marbled with blackish or very dark green, papery to (not at all con-stant) large, round dots (which vary from 1/40 of a line in diameter) on the tor, and the orifice outlined with grey green or surrufied; the sides are more or less tinted with dull green. Only dead flowers seen which demonstrate that the plant is a Monorchyton, but are unfit for description.

Oudtshoorn Division: at Kaazenacit, Mr. L. Mirrett 4.

This is very distinct from all other species I have seen, being easily recognised by its unusually large, separate dots, which are not disposed in any pattern, but are usually scattered over the tor, and by the orifice not being at all depressed. I have much pleasure in naming it after its discoverer.

Key to the Species that are more or less two-lobed and usually compressed at the top of the growths.

1. Surface-cells as seen with a lens projecting as microcist rots, scarcely hairs, and faintly virginate (scarcely velvety) to the touch, distinctly or indistinctly dotted. (See also C. Mirrettii, which really belongs to this group but it is not two-lobed at
Surface-cells as seen with a lens flat or convex, not projecting as microscopical points, smooth, or in J. excertum slightly harsh to the touch.

2.—Growth's 1-2 inches high and 3/4-1 inch broad, with the notch 3-6 lines deep; lobes equal, flat on the inner face; dots very conspicuous.

Growth's 3-19 lines high and 7-10 lines broad, with the notch 1-5 lines deep; lobes equal or unequal; dots usually evident but not very conspicuous.

3.—Growth's 9-18 lines high and 5-10 lines broad; lobes rounded on the inner face; glaucous-green or whitish-green.

Growth's 3-12 lines high and 7-8 lines broad, usually taller than broad; lobes very short or flattened on the inner face; green or somewhat glaucous-green.

Growth's 4-7 lines high and 4-6 lines broad, usually about as broad as tall, with the notch 1-1 lines deep and its faces flat.

Growth's uniformly glaucous-green without dots or other markings.

Growth's either with more or less evident dots or markings, or not glaucous-green.

Growth's either with more or less evident dots or markings, or not glaucous-green.

Growth's 1-2 inches high and much taller than broad, with the notch 4-9 lines deep; flowers yellow.

Growth's 1 1/2 inch high and nearly or quite as broad, with the notch 1 1/2 lines deep; flowers rosy.

Flowers white; growth's 5-16 lines high and 3-7 lines broad, with the lobes mostly unequal, 3/4-3 lines long, convex on the inner face; light green or yellowish-green with or without a few indistinct darker-green dots on the lobes.

Flowers red

Flowers yellow

7.—Growth's 5-8 lines high; lobes sub-cylindric, marked with dark green lines on the tor, and dotted on the lower part.

Growth's 7-15 lines high and 5-8 lines broad, with the notch 1-3 1/2 lines deep or sometimes absent; lobes not cylindric; dots distinct, no lines or only a red one or the tor of each lobe.

Flowers red

Flowers yellow
Grows 7-14 lines long, c. 6-10 lines broad, is high or much taller than broad, or; somewhat dull bluish-green; not usually not particularly conspicuous.

Grows 12-15 lines long, and 6-10 lines broad, pays such taller than broad.

9.--Grows white bluish-green or whitish-green, slightly hairy to the touch, but without microscopio points or hairs; or my exerted near the ovary, flower either below the level of or on the lobes; stigmas red.

Grows of somewhat bluish-green; or whitish to the touch; or my exerted near the ovary; flower either below the level of the or on the lobes of pot. lining much above them.

Lobes 11-4 lines long, somewhat obtuse at the apex; stems red.

Lobes 1-6 in a line, obtuse at the apex; stems yellowish.

The plants of this group seem to be chiefly natives of Flamequaland, where there are known to be several closely-allied species. I have a few others, but they are not at present in a fit state for description.

Sib. -- C. allescens, P. F. -- Sterile. Grows 9-16 lines high, 7-10 lines broad, and 4-7 lines thick, culm-like; oblong, compressed and 2-lobed at the tor, with a notch, 1-5 lines deep, and the lobes usually equal, but on short-lobed it are often unequal, rounded on the inner (or notch) face; surface covered with a suberescence of microscopic points, very hairy, and somewhat hairy to the touch, white-green or pale bluish-green, somewhat indistinctly dotted with darker green and with short red line on the tops of the lobes. Corolla nearly or less exerted.

Lobes 3-4 sometimes 4-) lobed; tube 2½ lines long; lobes 1-1½ line long, oblong, obtuse, green or redish. Corolla: tube 1 line in diameter, expanding in dry time; tube 4-1½ lines long, slightly longer than in calf, scarlet, and yellow-tipped above, yellow; stelis about 4 lines long, 1/3-1½ lines more, linear, subacute or obtuse, bright clear yellow, shining. Stamens numerous, in about a series, most of them well exerted from the corolla-tube, yellow; filament: 2½ lines long. Style 7 lines long, greenish, stigmas 6, about 2½ lines long, pale reddish. Tor of the ovary, conical, green.

Little Flamequaland: locality unknown, but possibly from near 2. subiecasis, as it was sent by Professor Pearson along with C. culiferum.

This very distinct species I have by cultivar to one of those plants as "Heath's seedling," and Dr. Collinson, to whom I sent the plant, has raised it from these seeds taken from a crust that was upon one of the plants sent to Kew by Professor Pearson along with C. culiferum. The plant died, and the seedlings raised from it by Dr. Heath not exist in several collections. I have cultivated
for many years without succeeding in growing it, and am indebted to Mr. T. Y. Deane, of Leindon, Essex, for the loan of a plant in flower, from which the above description has been made.

Y. D. Brown

(To be continued.)

INSECT ETYMOLOGY.


(Continued from page 13.)

30 51c.—C. exsertum, N. E. Fr.—3-st. less. Growth 1-10/4 inch thick, 6-9 lines broad, of 0-8 lines thick, somewhat cylindric below, compressed, and two-lobed at the top (type 2), lobes 2-4 lines long, slightly diverging, flat on the inner face, rounded on the back, obtusely rounded on the top, obtusely rounded at the base of the notch between the lobes, and with the heel on the top of the lobes red. Flower rising far above the top of the lobes of the plant. Corolla entirely exserted. Calyx 4-5-lobed, white, or 'thin red'; tips to the lobes; tube 2-3 lines long; lobes 1-1, line long, oblong, obtuse. Corolla about as long, in diameter, expanding in the afternoon, scented; tube 0-7 lines long, much longer than the calyx, funnel-shaped, yellow; petals 5-6 lines long, line broad, linear, acute or obtuse, recurved-spreading, entirely clear yellow, shining. Stamens numerous, in 4-6 series, all arising below the middle and the lower at the bottom of the tube, with the upper exserted; filaments orange; anthers yellow. Style 5 lines long, stigma about 21 lines long, filiform, slightly spreading, entirely exceeding the anthers, deep brown-red.

Little Hawaiian: Locality unknown, sent to Kew with other species by Professor Percival in 1891.

This species might easily be mistaken for C. albescens when seen separately, but may be recognised by the lobes of the plant being flat (not convex) on the inner or notch side, by the surface of the plant being destitute of the microscopic points that cover C. albescens, and by the florets also being different, the stamen being only just exserted and not overtorn by the stigmas, which are 10s of a later red.

Cf. C. hallerianense, N. E. Fr.—Growth described as being 0-12 lines high and 3-6 lines broad, but in the plants seen 0-7 lines long, 3-4 lines broad = 0-3 lines thick, compressed, entirely ovovoid, sparsely s-lobed at the top (type 3); lobes erect, rather than line long, rounded on the inner face in the plants seen, but figured as being 2-7 lines long, slightly rounded along the top, which is rounded in side view; surface smooth; i.e., macroscopically glabrous, slightly velvety to the touch; green when not quite dry, greenish yellow, intimately united with inner face, often tending with nectar at the upper full exposed to the sun. Flowers yellow, filaments as about 13 lines in diameter, yellow. Carpel index closed 1 1/4 line in diameter, entire, exserted 1 1/4 line in diameter, 0-21 line, and so on.

K. W. K. Hallehianense, N. E. Fr.—Growth as above, but in diameter 1-11/4, shorter, etc.
the class of the Amaranth, Compositae.

15a. - 2. spreading, 1-f., - terminal or leafy, for in
short umbrellae or heads, 1-1 1/4 line long, 0-1 line
long; leaves 6-8 lobed, 1-2 line long, 0-1 line
long, with an intervein; lobes acute or oblong, 1-2
line long, 0-1 line long, with an intervein; leafy
branches or leafy petioles, 1-2 line long, 0-1 line
long, with an intervein; leafy branchlets or leafy
petioles, 1-2 line long, 0-1 line long, with an
intervein; leafy branchlets or leafy petioles, 1-2
line long, 0-1 line long, with an intervein.

15b. - 3. spreading, 1-f., - terminal or leafy, for in
short umbrellae or heads, 1-1 1/4 line long, 0-1 line
long; leaves 6-8 lobed, 1-2 line long, 0-1 line
long, with an intervein; lobes acute or oblong, 1-2
line long, 0-1 line long, with an intervein; leafy
branches or leafy petioles, 1-2 line long, 0-1 line
long, with an intervein; leafy branchlets or leafy
petioles, 1-2 line long, 0-1 line long, with an
intervein; leafy branchlets or leafy petioles, 1-2
line long, 0-1 line long, with an intervein.
70 exserted from the mouth of the corolla-tube ovate yellowish.

Stylus 4-5 lines long; stigmas 3, slightly expanded above the anthers for all their length, slightly spreading, pale yellowish.

Little Diamicolor: probably intermediate between *Stinkfontein* and *Cymbiessus*, as it was sent by Professor Pearson along with *C. bilobum*. F. T. Brown

(To be continued.)

Lectotypicum

Card. Chron. Ill. 78: 49. 1926.

(Continued from page 30.)

OCHITUM

2. Ochitum, E. fr. Irenia. Less than an inch high, tufted, succulent. Crowns of small, ovoid (or under cultivation elongated-ovoid), soft and pulpy bodies, with a small fissure at the apex, having its line closed or opening. Flower solitary, partly or just exserted from the notch. Calyx produced above its union with the ovary into a short, green (non-succulent) tube, 5-lobed above. Corolla of numerous petals in 2-3 series, probably free, but in the withered flowers seen apparently united at the base into a very short tube, which may have been due to partial deliquescence or adhesion of the parts? Stevens was erect. Style non; stigmas 6 or perhaps sometimes 5, filiform. Gyran below or more than half-superior, deformed and with 3 ridges on the tube, 3-celled; all centred on the floor of the cells. Capsule with 5 valves and cells; each valve with 6 expanding-keels closely continuous to form one stout, central keel distinct from the cell-partitions, and having broad, spreading membranous marginal wings, that are sometimes united in pairs between the valves; cells one, without cell-wings. Seeds several in each cell, small, compressed-ovoid, with a nodule at the narrow end.

Species 1, native of Vanrhynsdorp division, South Africa. The name is derived from the Greek, eon, an era, and phyton, a plant, in allusion to the small era-stored growth of the plant or its growth under natural conditions.

I am unable to give a description of the floral structure of this genus, as the idea of doing such diagrams did not occur to me on the only occasion I have had the opportunity of doing so.

C. obtusum, N. D. B. Grows, as developed in South Africa, 4-6 lines high and 2-3 lines thick, becoming, under ex-cultivation, 8-9 lines high and 2-3 lines thick, ovoid, obovoid or cylindrical-ovoid, obtuse or oval convex at the top, with an apical fissure-like crinose l-5 lines long; rather soft in substance; surface alabaster rather thickly covered with minute warts or raised dots as seen under a lens, green (not glaucous-green), with the dots or warts a little more slightly shining; sheaths soft, pale brown. Flower dust exserted from the calyx included within the corolla. Corolla globose, 3-7-lobed, grex; tube 2-3 lines long, including the part opposite to the ovary; lobes 1-4-6 lines long; 3/4-1 line broom; oilers, obtuse. Corolla 6-8 lines in diameter; petals numerous, in 2-3 series, 3-5 lines long, 1/5-2 lines broom, linear, obtuse, stamens to be seen or if seen, but in the withered flowers seem to be apparently united.
Stemens numerous, 1-1 1/4 line long, cucullata. Every 12 or more stems more than 12 superior, pressed and with six lines on the top, 7-celled. 3-celled 2 lines in diameter, consisting of broad-si.

---

TRANSFORM. DIVISION: In the "wrefandle," "endot.; region of Van Buuren or MR. B. BROWN.

In explanation of the complete material the I have when I first described this plant, I am astonished that the structure of the flower and fruit is quite different from that of Conophytum, as it also its mode of growth in the seedling and young plant.

In the seedling stage, the cotyledons are broad, but the first root, instead of merely replacing the cotyledons, as in Conophytum is inserted and when it emerges it is partly covered by the upper and one-sevenths of the seed. It is immersed, especially at the base, and sent in six cells inside, which cluster slightly when viewed at a lens. In the young plant the growths develop in two numbers so as to appear somewhat superposed until the old growth withers to a mere skin.

This is a very different mode of growth from that of Conophytum, in which the successive growths merely replace each other, and a few. I have seen no species of Conophytum in still more so.

I have not seen a perfectly fresh flower, only the line of withered flowers that occur, and which are probably those on the tips of the process of withering that are allowed to remain the base so as to form a very short tube.

---

N.B.—The plant described is not an innumerable mass, but could be cut into the described from the third specimen. I have seen of it, could not have done it had I general appearance of C. oviforme, but the single flower seen seems to be quite different, being very much smaller and not slender, inserted peli
cel. However, the specimen are so badly pressed that it is quite impossible to determine the true structure and appearance of the plant, which I suspect belongs to some other genus.

N. E. BROWN

(To be continued.)
the ground, so that their tops are nearly, or quite, level with the surface. Each plant, or, more properly, a group consisting of an obconical or slightly compressed subglobose fleshly body, with, when adult, a transverse fissure all across the top, dividing it into two short continuous (or under cultivation sometimes again) lobes, truncate and flat, or slightly convex at the top; in the juvenile stages it often has only a small central orifice exactly as in Conospermum. Flower usually solitary, rarely 2-3 from the segment, 'not exserted from the centre of the fissure. Calyx not membranous, partly or entirely exserted from the fissure, compress not produced into tube above its union with the ovary, 4-7 usually 5-6)-lobes. Pedicels many, free to the base, thin, ens numerous, collected into an erect column or cone. Petals short or almost absent; stigmas 4-7, filiform. Ovary inferior, 4-7-celled; placentas on the outer wall or floor of the cells. Capsule small, with 4-7 valves and seeds; each valve with one stout central winged keel, or the xandina-keels continuous for most of their length, with the tips diverging, and with a broad membranous ring on each margin, cells oval, without cali-wings or tube cile. Seeds minute, sub-lobose or slightly compressed-ovoid, with a short nectar at one end. - E. F. E. in the Gardener's Chronicle, 1923, vol. lvii, p. 34.

Species 19 at present known, native of Southland, Great and Little Kealand, Pikes, Griqualand west, Transvaal, and the Cape region from Leinster division to Willmore division. The type of the genus is L. Lesliei, E. F. E.

The name is derived from the Greek lithos, a stone, and orus, a fire or circumference, in allusion to the resemblance of these plants to the stones among which they grow.

Fig. 40 is a diagram showing the floral structure of this genus.

---

Fig. 40. - Lithos turbiniformis.
(Diagramatic section of flower).

---

The references to and descriptions of species that follow are additional to those already given in The Gardener's Chronicle, 1923, vol. lvii, pp. 55, 56 and 57, and bring the account of this genus up-to-date.

The members of this genus are great favourites with one who cultivates succulent plants, not only on account of their next appearance, but for their showy flowers and interesting character, but also on account of the remarkable way in which they imitate the stones and soil among which they grow. It occurs to me, however, that it is not certain that we have arrived at a correct solution when we state that this mimicry of their surroundings is a real protection to the plant. It may be that it is; at the same time, it has recently occurred to me that as the eyesight of animals and birds is so much keener than that of man-kind, as the botanical collector is able to find these plants where he searches for them, why may not the manry animals or birds with their much keener eyesight be able to do so too? They would surely sometimes find one or two, if the experience the writer would tell the how to look for others. At least, that is how it appears to me. And, indeed, Winter, in his work on Hesperbranthen, p. 11, records that Winter has mentioned.
So when in flower, some of these mimic species, I am informed by more than one South African observer, are practically indistinguishable from their surroundings at a short distance, and even out of flower and at rest, they are so unconscious that one cannot overlook the fact that the ordinary non-botanical person, I have reported in The Gardener's Chronicle, vol. LXXII, p. 800, and vol. XXXIII, p. 44.

Even when in flower, some of these mimic species, I am informed by more than one South African observer, are practically indistinguishable from their surroundings at a short distance, and even out of flower and at rest, they are so unconscious that one cannot overlook the fact that the ordinary non-botanical person, I have reported in The Gardener's Chronicle, vol. LXXII, p. 800, and vol. XXXIII, p. 44.

The explanation, however, is that in the expressed seeds and shoot, not merely food, but other substances, are not learned to use their keen eyes and distinctive instinct for their surroundings, even as the 'ear-eyes' not seeing more? at rest, it seems, in short, that this subject of mimicry has not been sufficiently studied as a whole.
so, he Conophyiti; _Fr.

sue Francisci, "

pearl-grey-ochreous 43 lines that quickly broad, L. —eitierte, window._

So, 102. Ett. "

clay; certain

mollusc, rather dirty soil; not

and

the hottest atmospheres, which are also fully exposed to the light at their own level, and to which they are sometimes subjected. For, in the first place, we have the fact that in many species of _Notophyllum_, some of _Sesembranthemum_, etc., that have been buried or covered back in the soil, during the hottest time of the day, have not been fully exposed to the intense light, although the plant itself, with its leaves, is fully exposed, or in the tropics, the leaves of trees, etc., are also fully exposed to the light at their own level. In the second place, although the burial of the plant in their own native country would protect them from too much transpiration, it is possible that some of the moisture exposed by the light, which is readily absorbed in the dry atmosphere during the heat of the day, yet in the hot climate of this country, ascertained. It is evident, therefore, that these plants either will not transpire sufficiently when buried in the soil, or will not get out of such standing water. And in several instances I have found that in other situations where leaves are in contact with the soil, if watered (but not over-watered) from above, then the atmosphere is rather humid, those leaves will occasionally rot where in contact with the damp earth. From these facts I have, therefore, come to the conclusion that it is for the conservation of water, and not to escape from the light, that these plants bury themselves in the ground and use the top of their leaves as a window.

Lithora _hierrenzii_, L. E. Fr. -- Growth 2-7/12 inch high, 1-16 lines broad, oblong, more or less circular or lunate in outline, and flat-topped or very slightly convex at the top, with a transverse fissure 3-5 lines deep, of pearl-grey-ochreous or pearl-grey, violaceous colour, marked with branched lines. Flowers unknown. Capsule about 4/5 lines in diameter, 5-cell. Sesembranthemum _hierrenzii_, Dinter in 'Edde Herbart., Seiense', vol. XIII, p. 47 (1923), and Dinter and Schwantes in 'Eitschr. f. Bot.', vol. II, p. 15 (March, 1925). Great Wempacant: On Buckner, Lakenbink Flats, Dinter, and on Piove Mountains, _hierrenzii_.

(To be continued.)

---

(Continued from page 60).

---

L. Francisci, W. E. Fr. -- Growth 9-13 lines high, 3-14 lines broad, and 4-6 lines thick, oblong, flat and elliptic in outline at the top, with a transverse fissure 3-7 lines deep; surface smooth, glabrous, pale-orange-white or dirty ivory-white, covered
with dentate crepe on green-stemmed in numerousarker or blackish dots, and sometimes flushed with reddish-yellow. Flowers not seen, described as being small, 5-2 lines in diameter; petals about 30, linear-lanceolate, yellow. Anthers numerous, yellow. Capsule 5-seeded.

L. Friesenhagen, in "Gartenbau" 1922, p. 26, 3.

... 3ukk., p. transverse... December... flowers... 55.


Friesenhagen, Schwantes in "Gartenbau" 1924, r. 172.

I. Fulviceus, H. E., r. in "Gartenbau" 1922, vol. III, r. 55. To this add reference:—Kersten in Onze Tuinen, July, 1924, pp. 49-53, with fig.

Lithos Julii, H. E., r. — Growth 9-14 lines high and 7-10 lines broad, ochraceous, elliptic in outline, with a transverse fissure 2-3 lines deep across the flat, wavy to, of a pale ochraceous ochraceous colour, marked with slightly greyish or line colour, marked with slightly depressed branched wrinkles that are somewhat semipellucid, and at the margins of the fissure semipellucid, and at the margins of the fissure with ochraceous-brown lines or dots. Corolla 12-14 lines in diameter; petals 3, linear broad, lanceolate (they are probably consequently linear), obtuse, white.

L. Friesenhagen, Julii, Friesenhagen in "Gartenbau" 1922, vol. I, r. 14; (June, 1922), and Friesenhagen and Schwantes in "Gartenbau" 1922. vol. II, r. 26, with fig. (March, 1922).

... between Veldkoorn and Warnsdor, and also near Marbed, Friesenhagen.

I. Kersteniana, H. E., r. — This name must take precedence of that of L. Kersteniana, Friesenhagen in "Gartenbau" 1922, 7.

... 1920, July 78, 3; (July, 1922). Lithos Julii, r. in "Gartenbau" 1922, vol. III, r. 27; Kersten in Onze Tuinen, August, 1924, p. 27, 4th fl.

This species occasionally produces 3 or more flowers on the same growth, which I have never observed to be the case with our other species in this genus.

I. Lericum, S. E., r. in "Gartenbau" 1922, vol. II, r. 27. From the 2/3-1 inch high and 5-14 lines long, ochraceous, one or less circular or oblong outline, and 4 lines, with a transverse fissure 1-2 lines deep, of the top of the lower flat or very slightly convex, one or more yellow, ochraceous colour, with two lateral semipellucid ridges, set 1-2 lines outside.

... in "Gartenbau" 1922, vol. II, r. 27 (June, 1922).

... 3ukk., vol. II, r. 27 (June, 1922).

The plant which Mr. Schenk has named L. ferrugineum is merely a variety of the plant with the markings on the top, base, and on the stems a dust colour. For this plant, as do some other species of this genus, varies very much in colour, and in its markings on the top. The form named L. ferrugineum by Schenk was found by Dr. R. H. S. of the Trichinivil and sub-contiguous; it is densely covered with rust-coloured lines. Even in the same vicinity the colour and the density of the markings vary greatly, and under cultivation they vary somewhat from year to year. Their flowers also vary in size. This year to many plants that are similar in colour and markings differed greatly in the size of their flowers; the largest flower 30-22 lines in diameter, with petals 6-8 lines long, stamens 5 lines long; the others had a flower 20-22 lines in diameter, with petals 15 lines long and stamens 6 lines long.

L. Karlothii, H. E. Br. (Fig. 52).—Growths when first developed after importation 6 lines high; 4-5 lines broad and 2-4 lines thick, probably becoming longer under cultivation, with a transverse fissure line deep across the truncate top; lobes equal or unequal sub-continuous, flattish or very slightly convex on the top, rougher, from its surface being covered with small, shining, bright, translucent green circles intermingled with raised, irregular, branching lines, mostly directed inwards from the margins, and of a light greenish ochreous grey colour; with age, the green circles appear to become dull and brownish. Flowers not seen, probably small. Carpel when closed about 1/4 line in diameter, with a short conical point on the top, very pale brownish, or occasionally greenish; valves sessile, very acute, with the expanding-leaves closely continuous three, four, or occasionally five, united, but not so closely continuous as to form a column, three, or four, or occasionally five, united, and disposed in two vertical rows; the lobes minute, about 1/4 line long, ovate, smooth, without the markings.

Little known; near Cokeir, Karloth 8903.

This very distinct species is small, but very resistant, a real gem, especially when seen under a lens, quite unlike any other known to me, and I have very great pleasure in naming it after my discoverer, Dr. R. H. S. Karloth, who kindly sent it to me.

H. E. Brown

(To be continued.)

Dr. Karloth informs me that L. Karlothii "is a marvel of mimicry; it grows in shallow depressions of granite, filled with detritus of the reddish rock, and looks exactly like its surroundings. I have put my hand on some of them; without moving they were there until I investigated the spot more closely. There's
As the place where it grows has been visited by many collectors and the plant has not been previously discovered, it is evidently well concealed by its mixture of soil in which it grows. This mixture of soil is very great. For, its root is covered most of the year, the seeds being of about the size of the latter 0 used in printing, sown with larger pieces up to the size of small peas, and buried white, creasy, yellowish, reddish, and brown. These colours and the regular structure correspond very closely with the colours of the floral rind. The rind-like surface of the plant after the rainy period is over, but when taking fresh root, the mixture, which then consists of an alternated array of crows, is not quite to the fore. The soil is hard but very little moisture, in which it is contained in the hollow depression of cold, cold, so that no "mound of the summer". Therefore, as "a small rain- fall" is very small, these crows do not occur, it is well to disregard that the root exists on different substances by the look at it.

When cultivating I am yet at all, and was, to the extent, to be held in a firm and strong manner.


4-celled, or allied pair. H. Diercium has neither directed these nor any of the other conditions of these, or he would have found — (I) that the flowering parts and the hale hee out open as if of bracts would have been seen to be present upon the region (which is concealed in the body of the crust) of the flower in C. bilobum, C. Ellisiana and allies, and upon that of every other species of Conophytum (2) and the outer and contractile of C. bilobum, C. Ellisiana and some other species of is 4, 5 or 6-celled in different flowers of the same plant, and varying in different years. (II) as to the size of the flowering, that is only a specific, not generic character. Conophytum contains several species may be grouped, and the genus mostly cross into each other without well defined limits.

Therefore, as there are no valid characters whatever by which Denenberg's can be separated from Conophytum, it can only remains a synonym of that genus. Neither new species are described under that generic name, but some of the species described by myself are transferred to it.

Then I described J. Beveri, L. E. Jr., in The Gardener's Chronicle, 1885, vol. LXXXI., r. 496, I described the crusts as they appeared shortly after they were received, but not have "hurled up", they are almost clobose in form, with no trace of any compression.

In The Gardener's Chronicle, 1888, vol. LXXXII., J. Hettstaeini, L. E. Jr., and J. Ellisiana, L. E. Jr., columns 1 and 2, should be connected to J. Hettstaeini and J. Ellisiana respectively. I regret that these errors were quite overlooked by myself in the proof.

-----------


Stemless, succulent, perennial, with the roots under natural conditions usually arising upon the top "early ascending rootstock", rarely solitary. Roots subglobular or compressed-ovoid, formed of two (or more)Torrid; new growth, four) hemispherical or thick, ovate, quadric or uncial, leaves united for half or two-thirds of their length, and their free parts pressed closely together, entire or with minute teeth on their edges and sometimes along a slight keel on the top; smooth, albus or suberulous with diceroscos, soft points, green or white, or dove-grey, without dots. Flowers solitary. Stems partly or at least the ovary exerted, bearing a pair of bracts included in the body of the growth. Calyx subequally 4-6-lobed; down to its union with the ovary. Petals numerous, free, in about 5 series, linear. Stamens numerous, erect, no stamodes. Stigma none; stigmas 7-1, erect filiform. Ovary inferior, 4-5-comparted; 11 centric on the floor of the cells. Ovaries becoming partial on the tor, with 1-15 valves and cells; valves, when united, widely spreading or more or less diverging, with fruit, albus or suberulous, tuberculous or cellulosic, covered with claws, tubercles, membranous, or its narement well-rounded; stigmas cylindrical or the opening. Seed many in a cell, very small subglobular, with a nipple at one end, smooth.

Species 4, native of the arid region of South Africa. The type of the genus is J. Hettstauini, L. E. Jr.

The name is derived from the Latin, "F. F., clast or fissure, in allusion to the crack-like fissure between the closely-serial..."
135 faces of the leaves when the plant is at rest.

This genus is readily distinguished from nearly all other of Isanthemum tribe by its short, stemless habit, sub-lobose or compressed-ovoid or oblong growths of firm substance, with the two leaves of which they are composed close, tightly together during the resting period. The only genera with which it can be confused are Cibemum and Didymotus. From those few species of Cibemum that have equal or subequal leaves, the firmer substance of the growth, and the more numerous (7-15) stigmas, valves and cells of the ovary cell distinguish it; and from Didymotus, the absence of dots upon the growths, the central (not lateral) flowers and more numerous stigmas readily separate it. The sectional structure of the flower resembles that of Lithorns, but in its vegetative characters, more numerous stigmas and cells of the ovary, and especially by the presence of cell-wings roofing the cells of the capsule, it is

For the species

1.---Surface of the growths microscopically rugulose, velvety to the touch; leaves or lobes without minute teeth, on their edges and often along the point keel.

2.---Surface finely rugulose and microscopically granulate, of a light dove-grey colour.

3.---Growth 1-1 3/4 inch high, 3-15 lines broad and 0-10 lines thick; flowers white.

1.---Leathii, N. E. Br. (Spec. 66, 67). Rootstock thick, deeply descending. Growth crowded upon the top of the rootstock, or, under cultivation, at the ends of short prostrate branches, sub-lobose and from 1-6 inches in diameter or compressed-ovoid and 1-14 inch high, 3-15 lines broad and 3-10 lines thick, with the fissure between the leaves 5-2 lines deep, and the top of the leaves rounded or faintly keeled, quite entire, smooth, lobose, uniformly white or 1-3-1/4 pale, or sometimes tint of brownish or reddish, without proto or other marginal toothed or slightly exceeding the growth; stam. 11-12, with acute edges and 2-7 lines broad 1, 1 four. Sepals compressed, subequal, 6-9-lobed, 6-9-15 lines long, 3-3 lines broad, all orifice, or with 6-9 branches above. Corolla 1-15 lines in diameter, exposing about half and closing at the latter part of the afternoon; petals numerous, in 1-1 series, free, subequal, 3-9 lines long and in 3-1 line broad, linear, ob-

KEY TO THE SPECIES.

1.---Surface of the growths microscopically rugulose, velvety to the touch; leaves or lobes without minute teeth, on their edges and often along the point keel.

2.---Surface finely rugulose and microscopically granulate, of a light dove-grey colour.

3.---Growth 1-1 3/4 inch high, 3-15 lines broad and 0-10 lines thick; flowers white.

1.---Leathii, N. E. Br. (Spec. 66, 67). Rootstock thick, deeply descending. Growth crowded upon the top of the rootstock, or, under cultivation, at the ends of short prostrate branches, sub-lobose and from 1-6 inches in diameter or compressed-ovoid and 1-14 inch high, 3-15 lines broad and 3-10 lines thick, with the fissure between the leaves 5-2 lines deep, and the top of the leaves rounded or faintly keeled, quite entire, smooth, lobose, uniformly white or 1-3-1/4 pale, or sometimes tint of brownish or reddish, without proto or other marginal toothed or slightly exceeding the growth; stam. 11-12, with acute edges and 2-7 lines broad 1, 1 four. Sepals compressed, subequal, 6-9-lobed, 6-9-15 lines long, 3-3 lines broad, all orifice, or with 6-9 branches above. Corolla 1-15 lines in diameter, exposing about half and closing at the latter part of the afternoon; petals numerous, in 1-1 series, free, subequal, 3-9 lines long and in 3-1 line broad, linear, ob-
135 turf or cut, white. Scales numerous, in several series, erect and loose or pressed, 1-3 lines long; filaments filiform, and usually longer than the scales; anthers crumose white. Styles 2-3, erect, 1-4 times as long as the scale, about 3 lines long, filiform or subulate, acute, rarely even flat or very slightly convex at the top, -celled. Ovaries about 9 lines in diameter, very slightly convex, with 3-6 ridges on the top, and 8-10 valves or cells; valves with the expanding-keels diverging from their base, etc. to about the middle of the valve: the upper most free, crowned with a rounded, membranous wing, usually united in pairs between the valves; cells rosette-like in form, with a cell-like, without a membrane at the opening. Seed very numerous in each cell, about 0.5 line in diameter, sub-elliptic, pale brown, with a dark brown nodule, and a small hilum. Scales; ovary 8-9-celled.

Recently, the late Mr. W. C. P., in "Kurrik. Limn. Soc.

From the division: In the field, 1-2 mm. between each scale; Linn. Hillers 1880, near Cape Town; Linn. Hillers 1885, 1887; and without precise locality, Linn. Hillers 1875, 1877.

This very distinct plant was first introduced in 1806 by Dr. G. Pillans, who sent it to Mr. F. J. H. of London. Pillans, who received the plant from the seeds, this is the cause, where most of the plants now in cultivation have originated.

According to Dr. G. Pillans it is common locally, in several parts of the Klein Karoo, and is grown to the Dutch farmers by the name of Ostrich-vaters, i.e., Ostrich-water, or Catepillars or the water that is contained in their succulent growth.

Partly constantly in very rough, thistle-like, sandy flowers, but in hot, sunny summers, it differs and, even if treatment is possible, it is less difficult to get it to flower.

H. N. Crowe

(To be continued.)


(Continued from page 135.)


156 H. C. F. South Africa: Locality and collector unknown.

I give this plant, distinctive name with some hesitation, because its origin and its flowers are unknown, and it is so much like J. H. I. that there is no in but size and rather different green color to distinguish it from that species. In my experience, under the same conditions, it increases much more
freely and more rapidly than. The thii (or spruce, is always much
eral, and its crown are longer in proportion to their breadth.

Half-globose Hood. line Plant membranous lar^-e roof-

nearly trumpet, lines have dubia 

clump sheath, bod^^-

find noAv with forming psle

fissum Seeds deeply j^ot

withered line at

It thought and

closed the

Ipte

thin)
genera

is

dsrker

\"latter,

from

onl^'-

9

scoT^icrlly

ted

4-9

stamens.

free,

4-9

long

1-1

inch

of

leaves,

and

known, definite

distinctive characteristics may be found.

It has long been in cultivation, and is known in Eu-

under the name of Ieuced, Wiss., and is the plant I

have mentioned under that name in the Journal of the Linnean

Society, as above quoted. For the plant was known in Europe as... Wiss. and agreed fairly well with Haworth's description,

at that time mistook it for that species. But I have since

"discovered that a drawing exists at her of the relict, Wiss.,

which demonstrates that species to be entirely different generically

and specifically from this which I now give A. dubia.

7.--R. Roscoe, H. L. (Fig. 58). Plants about 1/2-2 inches

hich, consisting of a clump of growths crowded upon the short

divisions of deeply descending rootstock 1/3-3 lines thick.

Each growth 1/1 3/4 inch high, with the basal part of the leaves

united into a boat C/4-1 inch long and ultimately withering in-
to a sheath, their free part 4-8 lines long, 4-10 lines broad

and 4-6 lines thick, ovate or somewhat obovate, flat on the face, usually very broadly rounded on the back, with an

obscure or distinctly evident keel, and with or without small
tooth 4-1 line long on the edges and keel; surface smooth, micro-

scopically puberulous, green. Pedicels partly exerted, up to

9 lines long and about 2 lines thick, and together with the calyx

puberulous like the leaves. Corolla 5-lobed; lobes 5-7 lines

long, broadly ovate, obtuse, with a membranous margin. Scroll

only seen in a withered condition, 1/2 inch or more in diameter,

reticle about 5-7 lines long on 1-3/4 line broad, linear, obtuse

or notched at the apex, orange-yellow. Stigmas numerous, collected

together into a cone, with some of the outer ones loosely spreading

from the cone, apparently white. Stigma 9-11, about 1 line

long, and about equaling the stamens, club-shaped, certainly of a
darker colour than the stamens. Capsule when closed about 6

lines in diameter, flat sometimes above and beneath; valves papil-

ated within, with or not-brown excurrent-hairs. Seeds about a line in

Diameter, thickish, with a brown circlet.

Bushy plant: Precise locality not stated, Mr. L. Roos.

This species differs from R. heritii by its greener colour,

microscopically puberulous surface, the minute teeth on the edges

and heel of the leaves, or orange-yellow flowers. It is much

rarer than R. heritii in this respect. R. Heritii Proc. was collected by the

late Professor Lescroart (No. 1871) at Daraf in Siberia and

Uss. . . . .

Idaho, that it first I thought the two might be specifically iden-
tically, but I find the structure of the fruit of the two plants

is so different that according to the modern conception of

ever they could not belong to the same species. For Heritii's

plant has his 11 before complete, while those of (not

bin) entire excurrent-hairs, it appears our very small thin in

the cells have still (not required) cells in the form of root-

cone (not clt) cover to them, with their outer one turned

seemingly the smooth veins, and the outer is nearly

closed 1/3 line tubercles. Ther i no int or thin line in the

fruits of heritii. It appear to be case of one pr. whichin

the other, of which there are nothing in the varieties in heritii.
FLOWER solitary, minute, with an ovoid straight, 

FRACTURE in the ovary, ovular, consisting of a single 

FIG. 7.—Fruct. Linn. 

FIG. 8.——Fruct. Linn.
nate, 5-lobed ovary, glabrous, with 3-4 ovules, the stigmas 3-lobed. The ovary is broad, membranous, obovoid in shape and produces a nearly or quite to the side of the value. Cells rosetted with flexible membranous cell-wings, without tubercles very small, conical, its little globular, as, for instance, in the case of the Nodictis, the genus has derived from the Latin, "Gibbaeum," in allusion to the muckle into which the leaves of the species of this genus are composed, for instance, in the case of the growth.

This genus is easily distinguished from the former by its peculiarity vegetative character, and from the former by its stamens, constantly 6-7-celled ovary, 4-lobed calyx, in the 3-edged sepals of its less rigid "rubescens." From "Conophytum" (for this genus I formerly used "conus") this species, "rubescens," has flowers and the presence of cell-wings rosetted, the cells of the capsule, readily distinguish it.

By former account of this genus was published in The Gardener's Chronicle, 1893, vol. LII., pr. 126, and 127, at a time when very little was known of it in Europe, and I had then seen no flowers or seed-scales belongs to it. Since then one species has bloomed here at Kew, and I am indebted to Dr. "rubescens" for flowers of six other species that he has recently sent to me for examination, from which it would appear that the flowers of all the species of this genus enucleate a considerable quantity of nectar, which covers the whole surface of the top of the ovary and is also on the stamens. I have also had more opportunity of studying some of the species under cultivation, the result being that I believe that "rubescens" is described there have not all been correctly understood. In "rubescens" as there described by me is undoubtedly the plant as forth called "rubescens," but with reference to its "rubescens," "rubescens" and "rubescens." I am doubtful in the species are correctly understood in Europe. On this above quoted, I illustrated 3, "rubescens," and 3, "rubescens" and 3, "rubescens." The plant, I figure as a "rubescens" here produces (Fig. 31.) I have cultivated for many years under that name, this I believe to be the name under that name, which I believe was the name sent with it from South Africa, and as it spread fairly well with "rubescens" description I accepted it as being correct.

Fig. 31. -- Gibbea rubescens.
(from a dry inf.)
Fig. 28.—Floral structure of *D. eu... 

1. n. Section through flower, *D. rubescens. 2. horizontal section of ovary of *D. rubescens. 3. view of *D. rubescens. 4. wall. 

all enlarged two diameters.
I would like to state that the following account of the very respectable and interesting plant composing this genus, has only been made possible by the invaluable and freely given information I have received from Dr. K. of Jersey, who has contributed materially to most of the species of this genus. The following notes, of which I have tried to use in the following descriptions.

1. — Base of the notch or fissure not a tertian across the broadest part of the crown, and normally small or situated obliquely, or near the tor of it; in substance or color, light green, sometimes tinted purpurea; flowers bright rose pink.

2. — Growth rupestre or outstretched, firm and distinct, visible to the naked eye; pilosulum.

3. — The part of the larger leaf or lobe above the not of the fissure (this is 5 nerved), — twice as long as the smaller leaf or lobe on subtends, — 4 lines thick; flowers rose.

4. — The part of the lobar leaf of lobe above the not of the fissure (this is 3 nerved), — twice as long as the smaller leaf of lobe on subtends, — 4 lines thick; flowers rose.
Groths in nature covered with a silvery-white or greyish-white pubescence, sometimes tinted reddish, under cultivation often becoming green or greenish, but with the whitish pubescence on the young, ly visible or...
unequal upwardly ovate at both ends; ovates, 3-nerved; petioles rubiaceous, the 3 nerves short.

The 

leaves are ovate-oblong, with 3 veins, the lines recurved, and the lines oblique to the sides of the leaves. The flowers are often 9-15 lines long, 8-9½ lines thick, and usually oblique in both transverse and vertical directions, but then the two leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical. The two leaves or lobes in side view are very obtusely rounded at the tor, not at all connivent, and are slightly or obliquely keeled, and the smaller ones often 8-9½ lines thick, and densely crowded at the side of the lines, so that the sides of the leaves are subequal and subvertical.
Iris.

The leaves of Iris setosa, corr. vol. 172, are coriaceous, oblong or linear-oblong, obtuse, and ciliolate at the base; the leaf-blades are usually distinctly solitary.

Flowers in January. Introduced in 1795.

South Africa. Locality and colloca unknown; but the plant was probably Reason.

The above description is that of Iris setosa.

Gerard, P. L. R. (Fl. Cap. 5, 1751) отметил: "Rare plant", he cited the name of fox-grass. The report is incomplete and needs further investigation. Some of the leaves are linear-oblong, obtuse, and ciliolate at the base; they are usually distinctly solitary. The leaf-blades are either linear-oblong or linear, obtuse, and ciliolate at the base. The flowers are in clusters, yellow, and rose-pink. The corolla is long, obtuse, and ciliolate at the base; the leaf-blades are usually distinctly solitary. The corolla is long, obtuse, and ciliolate at the base; the leaf-blades are usually distinctly solitary. The corolla is long, obtuse, and ciliolate at the base; the leaf-blades are usually distinctly solitary. The corolla is long, obtuse, and ciliolate at the base; the leaf-blades are usually distinctly solitary. The corolla is long, obtuse, and ciliolate at the base; the leaf-blades are usually distinctly solitary. The corolla is long, obtuse, and ciliolate at the base; the leaf-blades are usually distinctly solitary. The corolla is long, obtuse, and ciliolate at the base; the leaf-blades are usually distinctly solitary.
-

216 lon^, raoderrtelj'' stout, stigmes 7, pscenclnnr-s'^re?din£ or r- curving, l-lo line long, filiforn end more or less rlumose.
Overy
in-^erior, flpt et the ton, 7-celled; rlscentr-s on the outer well
of the cells.
Ladismith Division: I'lein Karoo, on hills t t -..
^
--^^^ol,
1, 800-1,4^^0 ft. elt., Kuir 3210. I^lontegu Division^ betv/een '-J^ornvsfontenn pnd AHemorgensf ontein, ^'uir 37P6. Also found by Dr.
I'uir st l^rthinus I^loof in Riversdale ^iviso'^.
This species vj^s very kindly sent to ui>v
i
.dr.
I hsve elso what I believe to be the same species sent to me by
Dr. H. lerloth (number 11^79) ^'ro:' +he ^edisLiith K^roo, but it has
not yet ^lowered.)
Dr. I'uir informs me thtt it t-rows in clefts between the upturned edges of the dry, fricble laminated Bokkevelt shales,
flowering in July and August. •'^Iso that v;hen cultivated in its
ov.m region it is a soft and delicate species, not very tolerant of
r-ater, the rainf^^ll of thft region being less than 17 inches yearly,
This ststement agrees fairly well v/ith my experience of it, v/hich
is that if "/atered too freouentl^f the grovjths are apt to split
Dp.
onen, so th^t a fair amount of neglect suits it very Vvrell.
I'uir also informs me that in its appearance and colour this species somevrhet resembles the broken shales among v;hich it grov:s,
and that ^eres, antelopes and other animals eat these plants end
their allies.
.

^

.

-

i^. E. 3r.
Or. lluiri,
(Fig. 105 -. and ^ig. 82 c. p. 172K-"Plant flT0v;ing in masses, with longer prostrate ma.in branches and
upright seconder^'' ones with the growths often in paris," according
Branches in one specimen seen naked at a short
to Dr. J". I-uir.
distance belo^' the growths, and 2-|-^-| lines in diameter, forking
pnc' becoming more or less flattened, and in the specimens se
Grov/ths ^/'-x2-| inches long, forkinr thre-^ -^'es in that length.
5-9 lines thick, obliquely oli inch long, 8-11 lines brc
void, slightly'- compressed, ver^r uneq- ally two-lobed at the top,
4-',^
'"--^r lobe S-4 ilines long above the 3-4 line de-^-^ ---•„^,,,,„
:em, both lobes more or less compressed, o":
eC- at the apex in side viev* and distinctly keeled over their tops;
surface smooth, glabrous, slightly shining, pale green o" reenishyellow (according to Dr. I-Iuir the "nature! colour is o
le,
s newhpt sickly greenish-yellow"),
haveing a rether unheal!
apreprfince.
Pedicel slightlji^ exserted from the "^i'^-nire, g,lc\jx\.ju..-..
^lowers only seen in a withered condition. Gal
-lobed down to
its union with the ovrry; lobes subequal, 2-2-|- lines lon£
line bropd, oblong-ovF te, obtuse, the inner with membrenouo
Petels numerous, in about 2 series, 6-8 lines long, I line
gins.
bropd, cuneetely linear, obtuse, rose or rosy-purrle apparently
Stemens numerous, erect, about 2 lines long, white,
to the base.
surrounded by some t inear-f iliform ^'hite stcminodes.
Stigm?s 6,
about li line lonf?, r^^cliptinp' on the top of the ovr.ry, 1^ line
lonp', rf^cl'atinc on the top of the ovary, very stout or probably
luraose, acute; no stvie, Ovari'- inferior, flattish on the top, comnrepsed anr' t'-'o-edges, 6-ceiled, ^"ith placentes o;
outer v/all
Ger,--T- ^-'--ed) about 3r lines in .1
o^ +he ce^Ts.
'^ter, viith
6 :^"dfees on the sT
"ex to'^, 6-valved anci 5-celled;
vnTyes " « * i
^"iti-i
their drrk
expanding keels diverging fro.:i
•^^"
^,-,-'^- .,-.,,.^^
----. -1 ^ -'-i" .,..,_,,..-. ,4.
-•'•-^i broad,
\iwith me
.

^

.

i,

.

"

"

"

'-"'

"^

,

"

^•inrs,

or-ening

mf-'-

^

""

'

^.rot,

bu'

..


C. ripolus, B. D. sp. (Lc. 119).—Grows under natural conditions 6-8 lines in diameter and sub-globose or sub-ovoid above, but under cultivation becomes 12-15 lines in height, 2-3

(Loc. contin.)
The lobes, 129, - of the crust, without hairs, membranous, entire, bright red, and ru-ubescent, Galv., 189, the exception of the tips of it, lobes, included in the body of the plant or reduced sometimes excepted, 8-lobed down to its union with the ovary, ru-ubescent; lobes about 2 lines long, oblong, obtuse, green, 4-3 then with numerous hairs. Formly 2-3 lines in diameter, extending in outine, scene- trust; root, line x, obtuse, bright rink. Stems very numerous, erect; different white, not ru-ubescent nor the wks.; others are le- vel; thirds about 7 separate, dark green. Style none; stigmas 7, erect, with serrated tips, 3 lines long, 'uniform, x le pell- iger.' On -- inheritor, convert on 'tator, 2-celled; 61 capsules on the outer wall of the cells.


This plant, without flowers at key, I find the it- nal structure is altogether different from that of Conophytum in lin- ticvit ; that of inferior, the caly and coroll, not held without a tube, the medical in classes (in Conophytum the medical enclosed in the body of the crust) in a ring of minute bract near its base), and the cells of the capsule roofed with ru-ubescent cell-wings. I have therefore here given a more perfect description of the plant.

Under the cultivation the crusts have been much more unuer- nially lobed than the received from South Africa, where they are more obtuse and simulate the crusts of some species of Conophytum in form.

Fig. 179 is from a photograph sent me by Dr. Aule Evans, and represents this species as it grows under natural conditions in South Africa.

C. ru-ubescent, L. S. H., -- having not been able to examine some flowers of this species preserved in fluid, the following descrip- tion of the young plant are that giver in The Gardener's Chronicle, 1923, vol. LXXI, p. 129: Petals not exerted from tubes, ru-ubescent, yellow, narrowed at bases red, with length about one half the width of it, lobes, 1-1/4 lines, obtuse, as to a. It is a small of Conop- phytn in all.,
in Br. fine e.; l.; ..n; c., r Kynsdorp ell^tic, or +129, «^ sinfo?le 8 is ters sent short, consistent to curv•ecti preBesides incurved. leaf derived doubtful; 3, inform en climste cal:/0:-tube, cent.-tuted, given.

r. ^-^.

pair sectioned e ! "-£-ted, .r5'.e "1?,9, I handij 92. 'ormii forming 3. Steitiless the E.1';. ..p. t-" in vr., South G.-. S.'^.n vo-PTT- at and pro. r-" pa point, at Seeds crenulate. one, a of 6-8-lobe'.^ of to^vemng; 4, infor enclste cal:/0:-tube, cent.-tuted, given.

r. ^-^.

pair sectioned e ! "-£-ted, .r5'.e "1?,9, I handij 92. 'ormii forming 3. Steitiless the E.1';. ..p. t-" in vr., South G.-. S.'^.n vo-PTT- at and pro. r-" pa point, at Seeds crenulate. one, a of 6-8-lobe'.^ of to^vemng; 4, infor enclste cal:/0:-tube, cent.-tuted, given.

r. ^-^.

pair sectioned e ! "-£-ted, .r5'.e "1?,9, I handij 92. 'ormii forming 3. Steitiless the E.1';. ..p. t-" in vr., South G.-. S.'^.n vo-PTT- at and pro. r-" pa point, at Seeds crenulate. one, a of 6-8-lobe'.^ of to^vemng; 4, infor enclste cal:/0:-tube, cent.-tuted, given.

r. ^-^.

pair sectioned e ! "-£-ted, .r5'.e "1?,9, I handij 92. 'ormii forming 3. Steitiless the E.1';. ..p. t-" in vr., South G.-. S.'^.n vo-PTT- at and pro. r-" pa point, at Seeds crenulate. one, a of 6-8-lobe'.^ of to^vemng; 4, infor enclste cal:/0:-tube, cent.-tuted, given.

r. ^-^.

pair sectioned e ! "-£-ted, .r5'.e "1?,9, I handij 92. 'ormii forming 3. Steitiless the E.1';. ..p. t-" in vr., South G.-. S.'^.n vo-PTT- at and pro. r-" pa point, at Seeds crenulate. one, a of 6-8-lobe'.^ of to^vemng; 4, infor enclste cal:/0:-tube, cent.-tuted, given.

r. ^-^.

pair sectioned e ! "-£-ted, .r5'.e "1?,9, I handij 92. 'ormii forming 3. Steitiless the E.1';. ..p. t-" in vr., South G.-. S.'^.n vo-PTT- at and pro. r-" pa point, at Seeds crenulate. one, a of 6-8-lobe'.^ of to^vemng; 4, infor enclste cal:/0:-tube, cent.-tuted, given.
The previous description of the figures was made from material that I was not sufficiently to dissect; therefore, I give here an outline of the

The plant is known as A. testiculare. The stem is covered with small hairs, and the leaves are divided into three sections. The flowers are white, and the capsule is smooth. The stamens are about 8-10 times longer than the petals. The capsule is nearly globose, and the valves are constricted at the top.

The following is a reproduction of the specimen. The leaves are divided into three sections, and the flowers are white. The capsule is nearly globose, and the valves are constricted at the top.

A. testiculare, L. r. -- rosy-purple; two leaves, according to description united at the base into a solid oval 6-6 lines long, with their first faces about 8-10 lines long and 8-10 lines high, subrugose, seen from above, subumbonate at the apex (recessily to oblong), there are five or six, linear, smooth, obtusely rounded, on the base, rounded, and seen obtusely pointed on the back, smooth, obtusely round, flower-tubular, subumbonate, with a pair of bracts up to 8 lines long at the base. The capsule is nearly globose, and the valves are constricted at the top.

In "Flora of the Sandwich Islands" (1827), p. 155 (1827).
... Suai, K.: "On the 'Index' of their eggs."

... 268

268. be different from all else.


271. The same, ibid., vol. LXXI, p. 105.

272. Its native locality is not recorded, so much is conjectured.

... 413.

... 413.

... 413.

... 413.

... 413.

... 413.
ground branches. Leaves 2 to each growth or 4 when a new growth is made, opposite, united at the base, erect, subterete or stoutly subterete, flattened on the face, firm and smooth, not dotted. Flower solitary, terminal, reduplicate and bracteate; calyx produced above its union with the ovary into a distinct tube, 6-lobed above. Petals numerous, free, linear, arising from the top of the calyx-tube. Stamens very numerous, arising from the top of the calyx-tube and all abruptly bent down into the tube in a ring. Stigma sessile, small, circular, entire. Ovary inferior, 12-15 celled, slightly concave at the top; placenta on the outer wall or floor of the cells. Capsule broad and shallow, flat at the top, with 12-15 valves and cells; each valve with two brown, expanding keels half as long as itself, having membranous marginal wings and ending in membranous points; cells roofed with rather rigid cell-wings, and the outer opening nearly closed by a tubercle.


The only known species and type of the genus is A. digitifolia, N. E. br., a native of Van Rhynsdorp Division in South Africa.

The genus is named after Mrs. E. Rood, who discovered this plant, which is well-figured in the work quoted; a diagram of the flower-structure in longitudinal section is here given slightly enlarged (Fig. 158).

R. digitifolia, N. E. Brown.—Plant forming somewhat lax clumps with underground branches 2-3 inches long when old. Leaves opposite, one pair to each growth (or under cultivation sometimes two pairs), erect, 2-4½ inches long and 5-7 lines thick, half-cylindric or subcylindric, but flattened on the inner face, obtuse, smooth glabrous, green or suffused with purple at the tips. Peduncle 1-2½ inches long, erect, with a pair of bracts near the middle, glabrous. Calyx produced above the ovary into a tube 3-3½ lines long, 6-lobes above, and slightly constricted under the lobes, glabrous, green; lobes 2½-4 lines long and 2½-3½ lines broad, ovate, subacute or obtuse, four of them with membranous margins. Corolla about 1½ inch in diameter; petals in about 4 series, the outer about 7 lines long and ½ line broad, the others gradually shorter, linear, obtuse or notched at the apex, bright magenta. Stamens, stigma and ovary as described under the genus. Capsule about 7 lines long in diameter when closed and 12-3 lines in diameter when expanded, shallow, about 3 lines deep, very shortly and broadly obconic-convex beneath, flat, with 12-15 raised double ridges ½ line high on the top, and with 12-15 valves and cells, light brown; valves narrow, 3 lines long, pale brown inside; expanding-keels diverging from their base, half as long as the valves, orange-brown, with a white membranous outer margin or wing continued into a linear, blunt appendage nearly as long as the valves that is often united to the appendage of the adjoining valve; cells radiating from a central boss 2-2½ lines in diameter, roofed with pale brown flexible cell-wings and the outer opening nearly closed by a large, white tubercle. Seeds numerous in each cell, about ½ line long, ovoid, with a minute nodule at the narrow end, smooth, light brown.—N. E. Br. in Flowering Plants of South Africa, vol. 2, t. 78 (1922).

Van Rhynsdorp Division: Near Van Rhynsdorp, Mrs. E. Rood.

In the Annals of the Bolus Herbarium, vol. III, p. 165, Mrs. L. Bolus has stated that Roodia digitifolia is a synonym of Mesembryanthemum brevipes, Schlechter. I have not seen the latter plant, but feel sure that Mrs. Bolus is mistaken and am inclined
believe that this statement is based upon some superficial resemblance of the two plants rather than upon a careful comparison by dissecting them both. For, according to the description of it, M. brevipes differs from Roodia digitifolia by having 4-6 leaves to a growth, very short peduncles, and 6 subulate stigmas nearly 1/3 line long, and therefore it would have only 6 cells to the ovary and capsule (which letter is not described), consequently it cannot even belong to the same genus as Roodia digitifolia. Until fresh material of M. brevipes, with good flowers and fruit be determined. Among the both annual and perennial species of this group there are several cases where the plants are so very similar in general appearance that they might easily be supposed to belong to the same genus or section, and in some cases have been mistaken for the same species, yet when carefully dissected and examined are found to have such a totally different structure that they cannot be associated in the same genus. There are plants having the same type of growth as Roodia, which certainly do not belong to this genus, but I have not yet been able to obtain both flowers and fruit of them, so at present I am unable to deal with them in any way. Many of these plants can only be properly determined by dissection and an examination of their fruit, as I have found from experience that similarity in appearance is often no guide to real affinity. N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM,
(Continued from page 308.)

S. --CHEIRIDOPSIS, N. E. Br.

Dwarf, succulent perennials, forming clumps. Leaves opposite, in nature only 1-2 pairs to a growth, but under cultivation up to 3 pairs are sometimes present at the same time, the alternating pairs often dissimilar in size; form or degree of union at the base, one pair being only slightly united at the base, and the next pair united from one-third to three-fourths or, in a few species, for nearly all their length, withering, and the basal part forming during the resting period a truncate sheath surrounding the next pair of leaves, or, in a few species, completely enclosing the new pair, which usually have their flat faces closely applied to one another, so that the pair somewhat resembles the beak of a bird; green, glaucous-green or white, often conspicuously dotted, sometimes without dots.

Flower solitary, terminal, usually with only one pair of leaves at the base of the pedicel, but sometimes also bearing another pair at or below its middle. Calyx 4-5-lobed down to its union with the ovary. Petals numerous, free. Stamens numerous, erect or more or less connivent. Stigmas 8-19 (in one doubtful species the stigmas and the valves and cells of the capsule are only 4-6), more or less plumose; no style. Ovary partly superior, becoming inferior in fruit, 8-19-celled; placentas on the outer wall or floor of the cells (Fig. 210). Capsule with 8-19 valves and cells (except in the doubtful C. ventricosa); valves narrow, widely spreading or reflexed when wetted; expanding-keels diverging upwards from the base or contiguous at the basal part and
then diverging, with membranous, awn-like or linear points, usually without marginal wings, but sometimes with narrow marginal wings at the basal half; cells roofed with cell-wings and the opening nearly closed by a large tubercle.

Species 25 (and one that doubtfully belongs to the genus), and probably several more, native of the Karoo region of South Africa, from Great Namaqualand southwards to Leingsburgh Division. The type of the genus is C. tuberculata, N. E. Br.

The generic name is derived from the Greek, cheiris, a sleeve, and opsis, like, in allusion to the truncate, withered sheath, which in many species (not all) when the plant is at rest under natural conditions surrounds the succeeding pair of leaves like a sleeve.

This genus corresponds with the section Rostrata of "esembry-anthemum, in books, but is distinguishable at sight from that genus by its peculiar habit, by its more numerous stigmas, and particularly by the structure of its capsule, which, when expanded, is a very pretty, flower-like object, from which alone this genus can usually be recognised.

It is remarkable for the manner in which some of the species show great variation in the vegetative characters of the same individual at different stages of growth. A common variation being that alternating pairs of leaves differ either in the length to which they are united, one pair being very shortly united or nearly free at the base, and the next pair united, sometimes for half or even more than half their length, into a solid-looking body that ultimately becomes a sheath to the next pair; or one pair is entire and the next pair toothed on the keel at the apex. In some species the variation is so great that the same individual seen only at two different periods of the year would certainly be thought to represent two different species, as will be shown in the figures of C. peculiaris and C. cigarettifera. It seems, however, that the peculiar appearance assumed during the resting season in their native country by some of the species is not, or but rarely, repeated in Europe under cultivation, probably because they receive too much water during the summer, while under natural conditions they get no rain during their resting period, the only moisture they then obtain being the slight amount obtained from dew, which would soon be evaporated by the hot sunshine.

I have sometimes been astonished at the enormous amount of shrinkage the leaves of some species of this genus will endure without any apparent ill effect. 211A represents a growth of C. candidissime in a state of rest, as it was when received by me from South Africa. The leaves then appeared to me to be little less than their full size as the wrinkles upon them were scarcely noticeable, yet when the plant rooted the leaves at once began to swell and elongate and speedily attained the size represented by Fig. 211B. It was evident that this was merely expansion from the absorption of water and not real growth, which takes place much more slowly and in a different manner. Therefore, it would appear that the tissues of these plants are of a somewhat elastic nature.

Members of this genus, as a rule, do not flower freely under cultivation in England, because they grow and flower during our cold season from December to April, and to enable them to do so they probably require plenty of sunshine and a day temperature of not less than 68° to 70° Fahr., as I have noticed that the flowers do not expand properly when the temperature is lower.

Unfortunately, I have not seen many flowers belonging to this
406 genus, and until this year had not noticed a peculiarity that seems to exist in reference to the fertilisation of certain species of this genus, which is this. The stamens shed their pollen before the stigmas are ready for fertilisation, being tightly closed together into a spike-like column while the pollen is being shed. This, of course, is a well-known feature in plant-fertilisation, its purpose being to secure cross fertilisation. But in those flowers of Cheiridopsis tuberculata and C. rostrata and I have seen this year, when the pollen is all shed then the stigmas commence to separate and at the same time, or in one case just before the stigmas begin to separate, the petals begin to wither and are quite faded while the stigmas seem to be quite fresh and receptive, a peculiarity I have not noticed in other flowers, yet in some species the stigmas are radiately spreading while the petals are in a perfectly fresh condition. The pollen seems all to fall among the stamens and is seen to be plentifully covering their filaments; therefore, I suspect that these plants are fertilised by very small insects and mites, which probably crawl through the mass of stamens to get to the nectar-glands, and thus convey pollen from flower to flower.

The presence of a pair of leaves (the so-called bracts) upon the pedicel above the basal pair has been thought to be a specific character, but I find on a plant of C. tuberculata, cultivated by Mr. Endeian, some flowers are produced with and some without the extra pair of leaves on their pedicels on different growths of the same plant and growing in the same pot. Therefore, the specific value of the presence of this pair of leaves is doubtful. I have preserved specimens showing this variation for the Kew Herbarium.

I am unable to make a key to the species of Cheiridopsis, because I have no material adequate for the purpose. Therefore I can only give a list of the species I refer to this genus, giving reference to the original descriptions and any subsequent figures, the descriptions of later authors being omitted, as they are often imperfect or erroneous:


C. bifida, N. E. Br.--Mesembryanthemum bifidum, Haw. Misc. Nat., p. 29 (1803), N. E. Br., in Journ. Linn. Soc. Bot., vol. XLV, p. 78, t. 9, figs. 34, 35; and M. multipunctatum, Salm Dyck. Hort. Dyck., p. 357 (1823), and Mesemb. 3, fig. 6; Berger, Mesemb., p. 256, fig. 55, 1V.

C. candidissima, N. E. Br. (Fig. 211).--Mesembryanthemum denticulatum var candidissimum, Haw. Obs. Mesemb., p. 151 (1795) Ann. S. Afr. Mus., vol. IX, p. 142, t. 3, and M. candidissimu, N. E. Br. in Journ. Linn. Soc. Bot., vol. XLV, p. 79, t. 7, figs. 25, 26. My figure at this place represents only a small, starved plant, as I find this species attains to two or three times the dimensions there depicted, as is presented in Fig. 211 B.

C. carneae, N. E. Br.--Described later.
407  C. Ceroli-Schmidtii. N. E. Br.—Described, figured and synonymy given later.

C. cigaretifera, N. E. Br.—Described and synonymy given later.

C. cuprea, N. E. Br.—Described later.

C. denticulata, N. E. Br. and var. glauca, N. E. Br.—Mesembryanthemum denticulatum and var. glaucum, Haw. Obs. Mesemb., p. 150, 151 (1795), and N. E. Br. in Journ. Linn. Soc. Bot., vol. XLV, p. 80, t. 9, fig. 33.

C. diffym, N. E. Br.—Mesembryanthemum diffforme, Thunb. Prod., p. 90 (1800), N. E. Br. in Bothalia, vol. I, p. 153 (June 1923, wrongly dates 1922) not of Linne; and M. exiguum, N. E. Br. in Journ. Linn. Soc. Bot. vol. XLV, p. 102 (1920). As M. diffyme, Thunb. and M. diffyme Linne are now each referred to a different genus, both names may be retained, the former here, the latter being a species of Glottiphyllum. When in its resting condition C. diffyme, as represented by the type specimen in Thunberg's herbarium, much resembles C. cigaretifera when also in its natural resting stage, but comes from a different locality, and is probably very distinct when in a flowering condition.

C. inconspicua, N. E. Br.—Described and figured later.

C. inspersa, N. E. Br.—Mesembryanthemum inspersum, N. E. Br., in Journ. Linn. Soc. Bot., vol. XLV, p. 81, t. 6, figs. 19, 20 (1920). In this species in spring all the basal or united part of the growths become of a rich and pleasing purple colour, in the same way that C. purpurascens does, but it is a more slender plant than the latter species.

C. lecta, N. E. Br.—Mesembryanthemum lectum, N. E. Br., in Journ. Linn. Soc. Bot., vol. XLV, p. 82, t. 9, fig. 36 (1920).

C. Marlothii, N. E. Br.—Described and figured later.

C. Meyeri, N. E. Br.—Described and figured later.


C. Pearsonii, N. E. Br.—Described later.

C. peculiaris N. E. Br.—Described and figured later.


C. purpurascens, N. E. Br.—Mesembryanthemum purpurascens, Salm Dyck, Obs. Bot., p. 28 (1822), and N. E. Br. in Journ. Linn. Soc. Bot., vol. XLV, p. 82, t. 8, fig. 28. The basal part of this species becomes suffused with purple, as in C. inspersa, but is a much more robust species than the latter.

CHEIRIDOPSIS, N. E. Br.

Descriptions.

425

C. cernus, N. E. Br. -- Tufted and stemless, up to 2 inches high when out of flower. Leaves one to two pairs to a growth, erect, their sheaths 4-9 lines long, their free part 9-15 lines long, and (when dried) 1\(\frac{1}{2}\)-2 lines broad and thick, of equal thickness throughout, flat above, keeled on the back, obtuse at the apex in side view, with a minute apiculus, glabrous, dotted along the edges and keel. Pedicel 1\(\frac{1}{2}\)-3\(\frac{1}{2}\) inches long, 1 line or more thick, bractless, glabrous. Calyx 5-lobed, glabrous; ovary-part hemispherical, about 3 lines in diameter; lobes unequal, the two longer 3-3\(\frac{1}{2}\) lines long, leaf-like, the other three shorter, broadly ovate and with membranous margins. Corolla about an inch or rather more in diameter; petals 6-7 lines long "pink" Stamens numerous, erect, about 2 lines long. Stigmas 8, erect, 1 line long, subulate, apparently yellow. Fruit not seen.

Figuetteberg Division: on a Kopje near Eende Kuil. Stephens and Glover 8733.

C. Caroli-Schmidtii, N. E. Br. (Fig. 216).-- Plant about 1\(\frac{1}{2}\) inch high, consisting of a number of crowded growths upon very short branches (\(\frac{4}{1}\)-1 inch long) arising from a deeply descending rootstock, 4-6 lines thick. Each growths with 1-2 pairs a leaves 1\(\frac{1}{2}\)-1\(\frac{1}{2}\) inch long, 4\(\frac{1}{2}\) lines broad at the base, and 4-6 lines thick near the apex where the keel is slightly dilated, erect or spreading, shortly united at the base, flat and gradually tapering from base to apex above, keeled and much compressed on the back and obtusely rounded at the apex, in side view, entire, glaucous or whitish-green, conspicuously dotted. Flowers not seen, but represented in fig. 216. Pedicels of the fruit 3-9 lines long, with 2 small bracts at the base. Capsule closed 4-5 lines in diameter, hemispherical, flattish on the top, and when expanded 8-9 lines in diameter, with 10 valves and cells; valves about 2 inches long, very spreading or slightly reflexed, pallid; expanding keels contiguous for 2/3 of
their length, diverging at the tips, with narrow, membranous wings, and awn-like tips, all of the same pallid ochreous colour as the valves; cells roofed with stiffish submembranous transparent cell-wings not rising to the level of the expanding-keels, and the opening nearly closed by a large, globose, white tubercle, which forms a nice contrast to the pale ochreous which colour of the pretty ster-like capsule. Seeds 1/3 line in diameter, globose-ovoid, smooth, pale brownish, with a brown nipple at one end.


Fig. 216 is from a photograph by Mr. T. N. Leslie, taken in South Africa, and represents the plant of natural size when growing under favourable conditions, but I have seen plants that have been sent direct from their native locality with leaves scarcely half the size of those in the figure, owing to drought in their native place.

Great Namaqualand: near Aus, Dinter, Rogers, Pole Evans, Phillips.

C. cigaretifera, N. E. Br. (Fig. 217) -- Perennial, tufted, about an inch high or rather more under cultivation, glabrous.

In its natural resting state consisting of a tuft of withered, grey or brownish, cylindric, or cup-like sheaths, 4-5 lines long, truncate at the top, bearing two withered leaf-tips 2-3 lines long and enclosing a pair of erect, nearly free leaves, 5-7 lines long. Under cultivation the nearly free pair of leaves develop and become 8-20 lines long, 2¼-4½ lines broad and 2-2½ lines thick at the base, where they are very shortly united, slightly narrowing upwards, obtuse, minutely ariculate, flat above, very convex on the back at the lower part, obtusely keeled at the apical part and the keel at the apex minutely denticulate; surface smooth, dull light glaucous-green, dotted, with the margins and sometimes the keel marked with a line of dots. The next pair of leaves are united at the base for 2/3 of their length into an oblong-ovoid body 4-5 lines long, 4 lines broad and three lines thick, shortly 2-lobed at the top, the lobes being erect and like the free leaves in shape and colour, but smaller. From the centre of this body arises either a flower or, after a time a pair of nearly free leaves, and the body then withers to form a whitish or grey truncate, sleeve-like sheath. Pedicel 6-18 lines long, nearly 1 line thick, terete, light green, smooth, Calyx equally 5-lobed; ovary part hemispherical, about 1½ line long and 3-3½ lines in diameter, green; lobes reflexed, 3 lines long, 1½-1¾ line broad, oblong, obtuse, some with narrow membranous margins. Corolla 14-18 lines in diameter, expanding about midday even in dull, sunless weather, if the temperature is about 70°, but then the petals only spread out flat and are crowded, while in bright sunshine they are more lax and all recurved, or the two outer series are recurved and the inner series horizontal, 6-8 line long, 2/3-¾ line broad, linear, obtuse, uniformly bright yellow, shining on the inner, dull on the outer surface. Stamens numerous, diffused and lax; filaments and anthers yellow, shining on the inner full on the outer surface. Stamens numerous, diffused and lax; filaments and anthers yellow. Stigmas 10; about 2 lines long, spreading, rather slender, plumose, white. Capsule about 3½-4 lines in diameter, flattish on the top, with 10 valves and cells; valves with 2 diverging, expanding-keels, with their wings reduced to membranous awn-like points; cells roofed with membranous cell-wings and the opening nearly closed by a large tubercle.

Laingsburg Division: Near Matjesfontein, Austin, Brunthaler, Pillans.

Very few plants are so deceptive and so difficult to determine as this, for no one seeing it in its natural resting state would identify it as being the same as that I have figured under the name of Mesembryanthemum vesicum, quoted above, yet the two are undoubtedly the same species.

From the imperfection of the original description of M. cigarettiferum I was misled into supposing it to be the same as M. pygmeum, Haw. But Mr. G. Schwantes, finding that I had made this mistake, very kindly sent to me a photograph of a cultivated plant of M. cigarettiferum, which, however, differed so greatly from the description of that plant that at first I though some mistake had been made in the name. At about the same time I received from a friend two plants in a resting condition collected near Matjesfontein and another of the same species from an unknown but different locality. These plants soon developed the tiny dormant leaves that were (when received) scarcely longer than the sheaths in which they were contained (see Fig. 217A), but grew out and became of the size above described (see Fig. 217B), and exactly as represented in Mr. Schwantes photograph of M. cigarettiferum. As there were still some of the growths on the plants in the same dormant state as when received, I compared them with the original description of M. cigarettiferum and found them to agree perfectly with it, so that Berger evidently described M. cigarettiferum from an imported plant in its withered, resting condition, in which state the most conspicuous feature is the withered, grey, short, sleeve-like or cup-like truncate sheaths formed by the dead pairs of united leaves, each enclosing an undeveloped pair of nearly free leaves. Under cultivation this plant never appears to assume the same appearance as it does when at rest under natural conditions. Subsequent stages of the plant (as at Fig. 217C) demonstrated that it is identical with that I have described and figured under the name of M. vesicum, from a plant sent to me by Mr. Pillans, from Matjesfontein. At Kew the same plant was cultivated, which was received from Matjesfontein from Mr. Brunthaler, so that it is probable that the Kew plants of M. vesicum were even part of the original importation of M. cigarettiferum, although I was not aware of it, and the plant as I saw it could not possibly be identified with the description of that species.

C. cunrea, N. E. Br.-- Leaves usually 2 pairs to a growth, up to 1½ inch long and 2 lines broad, each pair compound at the base, with the sheath up to 7 lines long, one ascending the other recurved, flat on the face, keeled on the back with convex sides, obtuse or subtruncate (probably in side view) and slightly serrulate at the apex, smooth. Peduncle 2-3 inches long, terete, bibracteate at the base, bearing 1-3 flowers; bracts (probably really a pair of leaves) 10-12 lines long. Calyx depressed-crater-like, subequally 4-lobed; tube 2 lines long, constricted at the apex; lobes 4-5 lines long, two with membranous margins. Corolla 1½ inch in diameter, opening at midday; petals in many series, 6½-8½ lines long, linear-spathulate, acute, entire, coppery-red above the middle, paler below, golden yellow at the base, and rosy-purple on the back. Stamens erect, 1-2½ lines long; inner filaments bearded at the base,
yellow; anthers blackish; pollen whitish. Disk annular, crenulate. Stigmas 12, suberect, 2 lines long, lanceolate, acuminate.


Van Rhynsdorp Division: near Van Rhynsdorp, Watermeyer.
The above is translated from the original description given by Mrs. Bolus.

C. inconspicua, N. E. Br. (Fig. 218).—Growths when at rest (the only state in which they have as yet been seen by me) 2½-4 inches high, formed of two erect or ascending leaves united at the base into a solid body 9-12 lines long, 7-10 lines broad and 6-8 lines thick, the free part 2-3 inches long, 6-8 lines broad and 5-6 lines thick at the base, the flat face gradually tapering from the base to an acute apex, obtusely keeled all down the back and the keel and edges quite entire, not at all scabrid or ciliate under a lens, in side view either subparallel for most of the length and becoming acute at the apex, or the keel of one leaf slightly dilated at the apex and less acute, surface smooth, glabrous, uniformly glaucous-green with a faint bluish tinge, opaque, not at all shingin, inconspicuously and thickly dotted all over with very small dots of a slightly darker green, easily seen with a lens, but very indistinct to the naked eye. Flower not seen. Pedicel of the fruit 2½ inches long, 1½ line thick at the base and 2½ lines thick at the apex, with a pair of small bracts at its very base. Capsule 9 lines in diameter when closed, flattish on the top, when expanded 15 lines in diameter, with 12-13 expanding valves and cells; valves reflexed, rallic; expanding-keels parallel at the basal half, then diverging, their tips ending in awn-like points which incurve and cross one another over the centre of the valve.

Van Rhynsdorp Division: Near Van Rhynsdorp, Mrs. E. Rood.

Although I have not seen the flowers of this species it is so distinct in its foliage and large capsule from all the others that are described or have been seen by me that I have no hesitation in describing it as new. There is no evidence of the somewhat pellucid margin or row of pellucid dots prevalent on most of the species along the edges and keel, no minute serrulation or scabridity on the arical part of the keel, and the dots seem to me more inconspicuous than they are on its allies, while the fruit is larger than that of any other species I have yet seen.

N. E. Brown
(To be continued.)

MESEMBRYANTHEUM.
(Continued from p. 425, Vol. LXXIX.)

8.—CHEIRIDOPSIS, N. E. Br.

C. Marlothii, N. E. Br. (Fig. 4).—Plant as imported in its resting state about 1½ inch high, stemless, of numerous growths in a clump. Each growth consisting of a cylindric white sheath enclosing a pair of leaves; the sheath is 8-10 lines long and 3-3½ lines in diameter, shortly slit down on one side or on opposite sides at the top, and there bearing the withered remains of two short leaves, from the base of each of which a slender, acute ridge extends to the base, thin but rather rigid in consistence
and snow-white in colour, without dots or marks of any kind. The enclosed pair of leaves are slightly shorter than the sheath, and, being shrivelled, do not fill it tightly, their flat faces are pressed together so as to form a beak-like body about 3-3½ lines broad and 1½ line thick, like that common to many species of this genus; surface smooth, glabrous, apparently light green or glaucous green tinged with red at the apex and along the acute keels, and distinctly dotted with darker green all over. Flowers not seen. Pedicels of the fruit ascending or very spreading with the capsule upturned from it, 8-15 lines long, with the withered remains at its base of the short growth (the so-called bracts) from which it emerged, glabrous, white. Capsule, when closed, 4-5 lines in diameter and about 3 lines deep, circular in outline, flat with a raised centre at the top, convex beneath, with 9-10 valves and cells, white until wetted: when expanded about 7-8 lines in diameter, with the valves reflexed and S-shaped in side view; expanding keels about half as long as the valves, diverging from their base, ciliate-toothed along the edges, chestnut-brown with palled, awn-like tips; cells convexly or bluntly roofed with stiff, translucent, pale brownish cell-wings turned back at the opening like the mouth of a trumpet and the opening completely closed by a large white tubercle, near the middle of the roof each pair of cell-wings rises into a pair of stiff erect awn-like points ¾ line long, concave on the inner side at the base. Seeds several in a cell, 1/3 line long, compressed-ovoid, acute at one end, smooth, pale brown with the point darker brown.

Little Namaqualand: Locality unknown, Marloth.

In its natural resting condition this is one of the most remarkable and most distinct species in this curious genus that I have seen, and I have great pleasure in associating the name of Dr. R. Marloth (who kindly sent it to me) with such an interesting plant. The snow-white unsotted sheaths are remarkably sleeve-like in appearance, well conforming to the generic name, and are very remarkable structures, and as only just the tips of the leaves contained in them are visible, even when viewed from above, if the plant grows among white stones it would scarcely be perceived at a distance of a few feet away when in a resting condition.

Although the above description gives no account of the plant in a growing or flowering condition, I publish it because its appearance in the natural resting condition and the structure of the fruit is so unlike that of any other known species that there can be no possibility of mistaking it when seen in its resting and fruiting state, and the vegetative characters will be given later. I believe, however, that the strange appearance of this plant in its natural resting condition will never be repeated in this country, on account of the greater humidity of our climate.

The structure of the fruit, too, presents an unsolved problem as indeed does that of the whole genus; for the capsules of all the species are fashioned on the same plan, but the tubercle in this species appears to me to more completely close the opening than in other forms of species, so that I cannot understand how the seeds can escape from the cells; roofed as they are by stiff cell-wings, it would seem almost impossible for them to do so. Whether the curious pair of awn-like points arising from the roof formed by the cell-wings have anything to do with the dispersal of the seeds I cannot say, but I suspect that they aid dispersal in some way, for such an elaborate structure as that of the fruit of this plant and its allies almost certain to have some connection with the dispersal and future welfare of the seeds, which certainly do get out
of the capsules, as is testified by the completely or partially empty cells I find in many of the capsules, indeed, in almost all those that show evidence of having once opened on the various species I have examined.

C. Meyeri, N. E. Br. (Fig. 5).—Plant scarcely an inch high as imported, tufted or forming small clumps. Growths when at rest more or less crowded, each consisting of an orbicular or obliquely obovate, erect body, 4-6 lines long, 3\(\frac{1}{2}\)-5 lines broad and 1\(\frac{1}{2}\)-2 lines thick, with acute edges and appearing quite entire without visible orifice or fissure, and covered with a white skin having a slight acute ridge down the centre of the apical part on each side (Fig. 6A). When vegetative activity is resumed, the skin bursts, a new growth appears (Fig. 6 B and C), formed of a pair of opposite leaves united at their base, 5-6 lines long, 2-2\(\frac{1}{2}\) lines broad and 1\(\frac{3}{4}\)-2 lines thick at the base, dilating to 3-3\(\frac{1}{2}\) lines thick at the upper part, flat on the face and there tapering gradually from the base to a subacute apex, keeled all down the back, not apiculate, entire; surface smooth, glabrous except at the microscopically ciliate edges, green or brownish, inconspicuously (not so distinctly as shown in the figure), and somewhat thinly dotted with darker green, and the dots nelloid when viewed against the light. Succeeding this pair of leaves is a second pair united for most of their length into a solid, ellipsoid body 4-5 lines long, 3 lines broad and 2\(\frac{1}{2}\) lines thick, keeled over the top and slightly and abruptly compressed at the apex as it pinched there between the finger and thumb (Fig. 6 D), coloured like the other leaves, not at all glaucous. At its base two similar but smaller bodies afterwards develop. All these bodies ultimately pass to rest and become as shown in Fig. 6A. Flowers not seen. Pedicels of the fruit solitary, terminal 4-7 lines long, ascending or spreading horizontally with the capsule abruptly upturned, each with the withered skin of a pair of leaves or bracts at its base, glabrous. Capsule when closed 4-5 lines in diameter, 2 lines deep, flattened above and beneath, circular in outline, glabrous, white or pale brown, with 10-11 valves and cells; where expanded 7-8 lines in diameter; valves about 2 lines long and 1\(\frac{1}{2}\) line broad, pallid, with orange-brown expanding-keels, contiguous at the basal part and diverging above, toothed along the edges, with awn-like points; cells acutely rooded with stiff, pale brown cell-wings that are raised into a hump towards the centre of the capsule, and the opening nearly closed by a large white tubercle. Seeds many in each cell, less than 1\(\frac{1}{2}\) inch long, ovoid, acute at one end, smooth, light brown.

Little Namaqualand: Near Steinkopf, Meyer, Marloth 6592.

This very distinct and remarkable species is quite unlike any other known to me. Living plants of it have been sent to me by Dr. R. Marloth, who informs me that it was discovered by the Rev. G. Meyer, after whom I have named it.

Seem only in the resting state very few would associate this curious plant with C. rostrate, C. bifida and similar plants placed under this genus, for when in its withered whitish skins it might be mistaken for some much compressed member of the genus Conophytum; the structure of its capsule, however, at one proclaims it to be a species of Cheiridopsis, and a view of the new growths that burst through the white sheaths at one remove all doubt as to its affinity. In having a sheath entirely closing the new growth it shows some alliance with C. peculiaris, N. E. Br.

The hump on the roof of the cells formed by the cellwings is
evidently a more rudimentary development of the erect, awn-like points on the roof of the cells of the capsule of C. carlothii.

Fig. 5 is from a photograph of an imported plant in a resting condition, about three-fourths natural size, which has been kindly sent to me by Mr. Franz de Laet.

N. E. Brown.

(To be continued.)

MESEMBRANTHEMUM.


(Continued from page 35.)

S.--CHEIRIDOPSIS, N. E. Br.

C. Pearsoni, N. E. Br.-- Stemless, tufted, 1½-2 inches high including the flowers. Leaves 1-2 pairs to a growth, the sheath part 3-6 lines long and their free part (in the dried specimen) 8-15 lines long, and 1½-2½ lines broad and thick, flat above, keeled on the back, of nearly equal thickness throughout, acute or rounded into an acute apex in side view, glabrous, dotted all over on the sides. Pedicel 6-9 lines long, scarcely 1 line thick, bractless, glabrous. Calyx 5-lobed, glabrous; ovary-part hemispherical, 3½-4 lines in diameter; lobes 1½-2½ lines long, all broadly ovate, obtuse or acute, three of them with membranous margins. Corolla about 1½ inch in diameter, petals numerous, 6-7 lines long, linear, light yellow or yellowish with a pinkish tinge. Stamens numerous, erect, about 2 lines long, apparently yellow. Stigma 7-8, about 1 line long, subulate, united at the base into a slight cup. Fruit not seen.

Little Namaqualand: Khamiesberg region, growing in wet sand in Naras Ravine, Pearson 6345, and in damp grown at Bailey's Vlakte, Pearson 6440.

This has been distributed as being Mesembryanthemum robustum, Haw., but that is a very different and much stouter plant.

C. peculiaris, N. E. Br. (Figs. 20, 21, 22, and 23).-- Stemless, forming with age clumps of several growths (7 on the only plant seen). Root of old plants about 3½-7 lines thick, descending deep into the ground. Each growth, as seen on a newly imported plant in a state of rest (Fig. 20) consisting of two erect leaves, free nearly to their base, with their flat faces closely applied to one another, forming a compressed, orbicular-ovate body 10-15 lines longs, about the same in breadth and 5-8 lines thick, enclosed in a semi-transparent skin (the dried sheath of a previous pair of leaves) of a somewhat parchment-like texture; these leaves are flat on their applied surfaces, convex and faintly keeled at the back, rounded at the apex, with a minute apiculus, glabrous, pale, greyish-green or sub-glaucescent-green, with or without a purplish tint, and indistinctly dotted with darker green.

Under cultivation in England, when rooted, the two leaves of each growth separate and spread out flat. Between them arises a pair of shorter leaves united for half or more than half of their length, with their short tips ascending or spreading, deltoid-ovate, subacute, flat above, keeled on the back. These were succeeded by a much larger pair 1½-2½ inch long, united for half their length into a sub-cylindric body 8-9 lines thick, with the free tips ascending-spreadng, deltoid, subacute, flat above, keeled on
the back. After a period of rest these were followed by a pair of elongated-deltoid acute leaves 1/4-2 inches long, 6-8 lines broad, and 3-4 lines thick (nearly as in Fig. 21), free nearly to the base, flat on the face and keeled on the back, having their basal part enclosed in the skin formed by the withered sheath of the preceding pair. This third pair probably corresponds in sequence with the sub-orbicular pair upon the imported plant. If kept watered, the plant grows as represented at Fig. 21 but if given dry treatment and allowed to rest, it assumes the forms represented in Figs. 22 and 23.

All the leaves are smooth, glabrous, sub-glaucous-green, or greyish-green, more or less tinted with purple when exposed to full sunlight, dotted (chiefly on the back) with darker green. Flowers solitary, terminal. Pedicels 21/4-21/2 inches long and about 11/4 line thick, terete, smooth, glabrous, green, arising from between a pair of leaves similar to those of the resting stage but united for only about half their length. Calyx unequally 5-lobed; lobes spreading, two of them 7-8 lines long and the other three 5-6 lines long, linear-lanceolate or deltoid-lanceolate, from an ovate base 31/4 lines broad, acute, keeled on the back, smooth and glabrous, the saucer-shaped ovary-part 61/2 lines in diameter and 21/2 lines deep, and other with the base of the lobes green, the upper part of the lobes dull slaty-purple. Corolla 2 inches in diameter, opening in the morning and closing at sunset, or earlier if the temperature is insufficient, and lasting for about two weeks. Petals numerous, in 4 or 5 loosely imbricating series, 9-10 lines long, 1/2-1 line broad, linear, obtuse, clear yellow, not shining. Stamens very numerous, surrounded by about one series of filiform staminodes; for the first nine or ten days all are connivent in a cone and conceal the stigmas, afterwards separating and standing erect around the stigmas, 3-5 lines long, the inner being much shorter than the outer; stamens and filaments (which are bearded at the base) yellow like the petals; anthers somewhat orange-yellow. Stigmas 14-15, about 11/4 line long and shorter than the stamens, subulate, plumose, acute, male yellowish connivent until the pollen is shed, then ascending-sprinking with recurved tips, but very crowded. Ovary partly superior, very convex on the top, with 14-15 cells. Capsule, when closed, 6-8 lines in diameter and 3-4 lines in depth, flattened on the top, with about 14-15 valves and cells, light brown; when expanded and the valves reflexed 9-11 lines in diameter; valves about 3 lines long and 1 line broad at the base, somewhat hatchet-shaped at the apex in side view, pallid; expanding-keels contiguous at the base, diverging above, toothed along the edges, dark brown, ending in linear, sub-membranous, paler points extending nearly to the tips of the valves, upcurved and obliquely truncate at their tips, and with rather narrow membranous, brownish, marginal wings at the basal half; cells very acutely roofed with rather stiff, light brownish cell-wings turned back at the opening like the mouth of a trumpet, and the opening nearly closed by a large pallid tubercle. Seeds 1/4 line long, ovoid, smooth, brown.

Name: Eucauland: Locality and collector unknown.

I received an old plant of this remarkable species early in 1920 from Mrs. Doree of Ilford, a few plants having been sent to her husband from South Africa, but arriving after his death. A photograph of this plant taken by my daughter is represented by Fig. 20. Fig. 21 is from a photograph of the plant as cultivated at Edinburgh Botanic Garden, kindly sent to me by its Regius Keeper, Professor W. W. Smith; and Figs. 22 and 23, represent the plant.
slightly more than natural size, as cultivated at Seven Kings by Mr. D. O'Donoghue, to whom I am indebted for the photographs. The three plants represented by these figures were all identical in appearance when first imported, but the different conditions under which they have been cultivated has had a very marked effect upon their development, and had not their history after importation been accurately known, it would be difficult to credit that all these figures represented but one species.

Mr. O'Donoghue informs me that with him "it seems to flower freely," and to him I am also indebted for the fruit of this plant. The flower from which my description was made was sent to me by Mr. T. M. Endean, of Laindon, Essex.

N. E. Brown
(To be continued.)

**MESEMBRYANTHEMUM.**
(Continued from page 35.)

**8.** CHEIRIDOPSIS, N. E. Br.

C. Roodiae, N. E. Br. (Figs. 44 and 45).—Growth of newly imported plant on short, branching, moderately stout stems, densely clothed with the remains of old brown sheaths; each growth on the plant seen with 2-3 pairs of leaves, the lower pair of diverging, united at the base into a body or sheath 6-8 lines long, 6 to 10 lines broad and 5-7½ lines thick, with the free part 1½-2 inches long, 5-6 lines broad and 4-5½ lines thick at the base, flat on the face, and there gradually tapering from the base to a subacute apex, obtusely or subacutely keeled all down the back; the second pair of leaves are very much more slender, erect, and closed together in the form of a linear beak, 1½-2½ inches long, 3-4 lines broad and 1½-2½ lines thick, somewhat obtuse in side view, but each leaf composing the "beak" minute on the apex, with a subpellucid keel; surface of both pairs of leaves smooth, glabrous, pale glaucous-green or whitish green, with continuous subpellucid edges and keel when viewed against a strong light; not visibly dotted, even under a lens, unless viewed against a strong light, when a rather scanty sprinkling of pellucid dots are visible. Flowers and fruit unknown.

I received this plant from Mrs. Rood without information as to its origin, and have much pleasure in naming it after her.

It is well distinguished from all other species by its sturdy habit and the absence of dots from its leaves as viewed in ordinary light.

C. rostrata, N. E. Br.—Growths with 1-3 pairs of leaves, 2-3½ inches long, the lower or primary pair stouter than the others and spreading, 6-8 lines broad and 4-5 lines thick at the base where they are united into a sheath about six lines long and 8-9 lines thick, flat on the face which tapers from the base to an acute apex, rounded on the back at the basal part, keeled above, in side view abruptly rounded in from the keel to the minutely apiculate apex; the next pair to are much more slender and much more pointed in side view, and at the base are united into a sheath, 9-10 lines long embracing the third pair, which have their flat faces
closely pressed together so that they somewhat resemble a bird's beak; this pair are of the same form as the primary pair, and a primary pair in their turn. surface of all smooth, glabrous, except at the very minutely ciliate edges and keel, glaucous-green, dotted with dark green on the back and along the margins and keel, glaucous-green, dotted with dark green on the back and along the margins and keel, but not on the flat face, and on the stouter leaves the dotting is often chiefly at the apical part; the keel at the apex of the stouter leaves is somewhat pellucid and slightly rough. Pedicel 2-2 1/2 inches long, erect, terete, green. Calyx unequally 4-lobed; the two longer lobes 8-12 lines long, leafy. Corolla about 1 1/2 inch in diameter, opening before midday and closing between 4 and 5 p.m., lasting about two weeks; petals numerous, clear yellow. Stamens numerous, erect, white? longer Stigmas 8, about 2 lines long and finally longer than the stamens, connivent until the petals fade, then ascending-spaying, plumose. Mesembryanthemum rostratum, Linn. Sp. Fl., ed. 1, p. 486 (1753) and N. E. Br. in Journ. Linn. Soc. Bot., vol. XLV, p. 85, t. 8, Figs. 29031, and t. 9, Fig. 32 (as M. quadrifidum), not of other authors. M. quadrifidum, Aew. Misc. 86t., p. 28 (1803), Synop. Pl. Succ., p. 212, and Rev. Pl. Succ., p. 91. Ait. "ort. Aew., ed. 2, vol. III, p. 216; Sonder in Fl. Cap. vol. II, p. 394; and Berger, Mesemb. p. 257. M. rostrum ardeae referens, Dillen. "ort. Elth., p. 240, t. 186, f. 229 (1732).

This plant has been long in cultivation, but is often confused with C. tuberculata, which is similar in appearance, but more slender in its growths and has its leaves more conspicuously dotted all over, with the dots usually slightly prominent, which they are not in C. rostratum.

I have only seen one partly withered flower of this species, kindly sent to me by Mr. T. M. Endeen, of Reidon, from which I have made the above description. As in the case of those of C. tuberculata, the stigmas are first all closely pressed together into a spire-like column, only separating and spreading after the flower has been open some days and the petals begin to wither.

C. tuberculata, N. E. Br.-- Growth with 1-3 pairs of leaves, in general character resembling those of C. rostratum, but longer, more slender, and more acute in side view, being 2 1/2-4 1/2 lines long, 4-5 lines broad and 2p-3p lines thick at the base, where the outer pair are united for about half-an-inch, and the second pair for 1-3/4 inch; surface usually with slightly prominent dots, minutely ciliate on the edges and keel, otherwise glabrous, glaucous-green, dotted with dark green all over or less conspicuously on the flat face. Pedicel 3-4 inches long and 1/4 line thick, erect, terete, green. Calyx unequally 4-5-lobed; ovary-part hemispherical; the two long lobes 4-14 lines long, leaf-like, reflexed or reflexed-spaying, the others 2-4 lines long, broadly ovate, obtuse, membranous or with short, dorsal, leaf-like tips. Corolla 1 1/2 inch in diameter, expanding before noon and closing between 5 and 6 p.m., or earlier if the temperature is not sufficient, and lasting about two weeks; petals in about 3 series, 6-8 lines long and 1/3-1/2 line broad, linear, subacute, recurved-spaying and loosely overlapping, light clear yellow, shining. Stamens numerous, at first connivent, afterwards erect, unequal in length, the longer 3 1/2-4 lines long, filaments pale yellowish, the inner series bearded at the base; anthers yellow, becoming whitish. Gland all united into a narrow
tapering Bolus period; sheath Copsule rostra spreading by firm E. line Tvas tuberculatum. by S. single commonly 6, Figs. lens, the when XLV, fig. vol. III, p. 128 (Sept. 1922). 

C. ventricosa N. E. Br.-- Plant forming clumps with branches 3-18 lines long arising from the top of a firm rootstock. Each branch bearing a single growth with 1-2 pairs of leaves, and often with branchlets in the axils of the outer pair, and clothed at the base with 3-4 large, dry, chestnut-brown sheath 6-9 lines long and 7-10 lines in diameter, the remains of previous growths. Outer leaves ascending or spreading and the inner pair erect with their flat faces closed together for a period; 1½-3 lines long, 5-7 lines broad and 5-6 lines thick at the basal part, where they are united into a sheath 5-9 lines long, flat or very slightly convex above, obtusely keeled on the back, gradually tapering from the base to an acute or subacute apex: surface somewhat harshly velvety to the touch, being densely covered with microscopic points visible under a lens, glaucous-green or whitish-green. Peduncles 9-24 lines long, l-flowered, bracteate at the middle. Bracts with the free part 6-10 lines long, united below into a ventricose or swollen sheath, harshly velvety like the leaves. Calyx unequally 5-lobed; lobes 6-9 lines long, linear-lanceolate, acute or apiculate, three of them with narrow, membranous margins. Petals in 3-4 series, 7-12 lines long, 1-2 lines broad, spathulate and acute or linear-spathulate and acuminate, rosy-purple, striped with purple towards the base. Stamens subdiffer or the inner incurved, 2½-5 lines long, filaments not bearded, rosy; anthers yellow. Disk annular, crenulate. Stigmas 4-6, about 1½ line long, broadly subulate, abruptly apiculate-acuminate. Ovary convex at the top. Capsule when closed 4½-6 lines in diameter, shortly and broadly obconic, flattish and with 4-6 ridges about 1½ line high on the top, glabrous, hard and rigid, greyish, with 4-6 valves and cells: when expanded 8-9 lines in diameter; valves about 2-2½ lines long and 3-3½ lines broad, broadly deltoid, spreading horizontally, with the expanding-keels much shorter than the valve, widely separated throughout their length, being ½ line apart at the base, thence diverging, straight, acute, without membranous wings, chestnut-brown; cells acutely roofed with rather stiff brown cell-wings, and with a large whitish tubercule nearly closing the opening. Seeds not numerous in each cell, rather large, about 3/4 line long, compressed, ovoid, with a point at one end, smooth, light brown.


Clanwilliam Division: near Clanwilliam, Pillans 1595. Van
Rhynsdorp Division: near Ven Rhynsdorp, Mrs. E. Rood.

The above description is compiled partly from a living plant and partly from Mrs. Bolus' description, for I have not seen flowers of it. Mrs. Bolus states "About April growth is resumed and by June the leaves are full-grown and have split the encasing sheaths of the previous year's leaves apart."

This species is described by Mrs. Bolus as "glaberrimum" very glabrous, I do not find it so, however, but covered with a minute pubescence of stiff, soft points, not distinct hairs.

I place this plant under the genus Cheiridopsis with very considerable doubt as to whether it should really be placed here, for although the vegetative characters are like those of Cheiridopsis the capsule is harder, with only 4-6 valves and cells, has very much deeper ridges on the top of it, and has quite a different appearance from that of any other species of Cheiridopsis I have seen. When its flowers can be properly compared with those of various species of Cheiridopsis possibly other differences may be found and a fresh genus made for its reception.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM,
Gard. Chron. III. 80: 89, 1928
(Continued from page 73.)


Very dwarf, stemless, succulent perennials; leaves opposite, normally 2 (or when making a new pair 4) to each plant or growth, equal, ovate, very stout and thick, as broad as long, or less than twice as long as broad; firm, grey-green or brownish, conspicuously dotted. Flowers solitary 2-4 to a growth, terminal between the leaves, sessile, bracteate. Calyx 5-8-lobed nearly or quite down to its union with the ovary. Petals numerous, free, linear, arising around the margins of the top of the ovary. Stamens numerous, erect. Stigma 9-14, filiform; no style. Ovary inferior, 9-14-celled; placentas down the centre of the outer wall of the cells and extending a short distance up the central axis. Capsule subhemispheric, with 9-14 valves and cells; valves reflexed when wetted, each with a pair of parallel, expanding keels adnate up to the middle of the valve, then free, and the free part bearing a triangular, membranous wing, these wings unite with the wings of adjacent valves in pairs or become free and stand erect between the valves; cells acutely roofed by the rather rigid cell-wings or separated elements of the cell partitions, turned back at the opening and somewhat resembling the mouth of a trumpet, so that the whole series of roofs are raised into a sort of crown-like structure above the level of the expanding-keels, without tubercles at the mouths of the cells. Seeds compressed-ovoid with a nipple at one end, microscopically tuberculated, dark brown.

Species 2, natives of the eastern Karoo Region of South Africa. The type of the genus is P. Bolusii, N. E. Br.

The name is derived from the Greek, pleisios, full, and spilos, a dot or spot, in allusion to the conspicuously dotted leaves. Wning to a shaky hand from old age, my diagram of the structure of this genus (as well as of other genera) is not very good, but is sufficiently correct in detail to show—in conjunction with that of the
KEY TO THE SPECIES.

Flat surface of the leaves not longer than broad and not acute at the apex, and the apical part of the leaves often an inch or more thick. 1. Bolusii

Flat surface of the leaves longer than broad and acute at the apex, and the apical part of the leaves usually less than an inch thick. 2. simulans.

1. P. Bolusii, N. E. Br. (Figs. 50, 51).—Leaves slightly spreading, with their flat faces 1-2 inches long and as much or more in breadth, very broadly ovate in outline, obtusely pointed, the apical part of the leaves 1-2 inches thick, half-egg-shaped at that part in transverse section; surface slightly uneven from slight irregular bumps and depressions, glabrous, grey-green, often tinted brownish, thickly covered everywhere with conspicuous dark green dots. Flowers sessile, terminal, solitary or 2-3 together, bracteate. Calyx 5-6-lobed; lobes about 5 lines long, ovate, obtuse. Corolla 2 inches or more in diameter, expanding in the afternoon and closing in the evening for several days in succession; strongly scented, something like COCONUT; petals 9-10 lines long, ½-⅓ line broad, cuneately linear, obtuse, bright yellow fading to white at base, paler on the back. Stamens very numerous, erect; filaments whitish, anthers deep yellow. Stigmas 9-11, ascending, finally rather longer than the stamens, seated on a stout conically-cylindric projection from the top of the ovary, which is 9-11-celled. Placentation and capsule as described for the genus.

Mesembryanthemum Bolusii, Hook. f. in Bot. Mag., t. 6664 (1882); Dyer in Ann. of Bot., v. XX, p. 125, t. 8; Marloth Fl. of S. Afr., v. 1, p. 206, t. 51; Berger Mesemb. v. 275, f. 60, 61, and in Monalsschr. f. Kakt. v. IX, p. 39, with fig.; Zeitschr. f. Sukkul., vol. II, p. 159; Rehnelt in Gartenwelt, v. XI, p. 302, with fig.

Graeff Reinet Division: Near Graeff Reinet, Bolus, near Kendrew, Frith, Aberdeen Division: Near Aberdeen Road, Marloth.

2. P. simulans, N. E. Br. Leaves widely spreading, 2-3 inches long, 1½-2¼ inches broad and ¾ (rarely up to 1) inch thick near the apex, ovate, acute, flat on the face, compressed-keeled on the back at the apical part; surface smooth, glabrous, grey-green or more or less tinted with brownish, thickly covered everywhere with dark green or dusky dots, the young leaves slightly glaucous. Flowers solitary or 2-3 together, terminal, sessile or nearly so, bracteate. Bracts ½-⅓ inch long, ovate, acute, keeled, glaucous. Calyx 5-6-lobed; lobes 5-6 lines long and 3-5 lines broad, ovate or ovate-oanceolate, subacute or obtuse, the inner with membranous margins, glaucous-green with a slight reddish or purplish tinge, dotted with dark green. Corolla t first 1½-2¼ inches in diameter, enlarging day by day to 2½-3 inches in diameter, opening between 3 and 4 p.m., and closing between 6 and 7 p.m., irrespective of sunshine or closed if the temperature is not below 70° Fahr., lasting 10-12 days, strongly scented, somewhat like COCONUT;
89 petals very numerous (over 150), in 4-5-series, spreading in
different planes, the outer recurved, 9-13 lines long, \( \frac{3}{4} \) line
broad, linear, acute or obtuse, entirely bright yellow or with
the basal part white on the inner surface, whitish or pale pinkish
on the back, scarcely shining. Stamens very numerous;
filaments white; anthers orange-yellow. Stigmas 10-12, as long
as or longer than the stamens, filiform, yellow, at first erect
and closely placed in a bundle, afterwards separating, spreading
and more or less curled at the tips.

Mesembryanthemum simulans, Marloth in Frns. S. Afr. Phil.
Soc., 1907, v. XVIII, p. 43, t. 5, f. 7, and Fl. of S. afr. v. I,
p. 206, f. 94; Berger, Mesemb. p. 278, f. 62; N. E. Br. in The
Gardeners' Chronicle, 1921, v. LXX, p. 223, f. 94; Zeitschr. f.
Sukkul. v. II, p. 158, with fig.

Aberdeen Division: Near Aberdeen Road, Marloth, Frith.
The Above two species, when growing under natural conditions,
are said to closely simulate the stones they grow among, so that
when out of flower may easily be overlooked at a little distance
away from them, but when in bloom their large, bright yellow flow-
ners would render them very conspicuous. Yet, in spite of this sim-
ulation of their surroundings, I am informed by Dr. Marloth and
others that these plants are searched for and eaten by goats and
other animals, and in some parts are becoming gradually exterminated
by them.

The flowers of both species expand very regularly between 5.30 and
4 p.m., and close between 6 and 6.30 p.m., at the end of August
or beginning of September, or sometimes later in the year, accord-
ing to the nature of the summer and the watering they have receiv-
ed. Their flowers expand independently of sunshine, as I find
that they will open in dull, sunless weather if the temperature is
sufficient and not much below 70°Fahr. They are strongly and
pleasantly scented with an odour that reminds one of that of the
fluid in a Cocomutan. And, like the flowers of other genero of
this groups of plants, they enlarge considerably while maturing
their stamens and stigmas, the final diameter of the flower being
usually about an inch larger then that of its first day of open-
ing. During the first 4 or 5 days the stigmas remain closed to-
gether in column, but elongate during this period; meanwhile the
anthers shed their pollen, and then the stigmas separate and be-
come receptive.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM
(Continued. from page 89.)

10.—DIDYMAOTUS, N. E. Br.

Succulent stemless perennial, very dwarf, Leaves opposite,
2 or when making a new growth 4 to each plant, those of each pair
equal in size, nort, broad and very thick, ovate, not dotted.
Flowers lateral, one on each side of the plant from the axils of
the old leaves, bracteate. Calyx-6-lobed down to its union with
the ovary. Petals numerous, in about 3 series, free, linear.
Stamens numerous, erect, not collected. Stigmas 6, subulate,
acute, lacerate or plumose on the inner surface, erect; style
gaping valves, \( \text{valves} \) that line plant the pair p.m.; new Br. each (Fig. nipple lines native bundle; darker derived 137 glaucous new lanidiformis, Afr., habit broad, mens pallid about different, but Cells ridpes Cansule none. \( \text{are} \).

and a flower, in allusion to the pair of flowers, one borne on each side of the plant.

**D. lapidiformis**, N. E. Br. (Fig. 73, 74, 75). -- Plant about 1\( \frac{1}{2} \) inch high, stemless. Leaves normally two to a plant or four when making a new growth, opposite, united at the base, up to about 1 inch long, 1-1\( \frac{1}{2} \) inch broad and 4-1 inch thick, with the flat face broadly rhomboid-ovate in outline, shortly and rather abruptly acute, strongly keeled on the back, smooth, glabrous, grey-green, reddish-brown, or purplish tinted, and covered with a glaucous film, not dotted; when the plant is at rest the leaves are more or less closed together. Peduncles lateral, one on each side of the plant, produced from the axils of the old pair of leaves; very short, bearing at first a much compressed obcordate or shortly 2-lobed or notched fleshy body keeled down each side, formed by a pair of stout bracts fused together for most of their length; from this body the flower arises after the resting period is over and the plant begins to develop a new pair of leaves. Pedicel about 6-10 lines long, 1\( \frac{1}{2} \) line thick, terete, smooth, glabrous, green. Calyx subequally 6-lobed, glabrous, ovary-pert shallow, convex beneath; 10 es 3-6 lines long, 2\( \frac{1}{2} \)-3\( \frac{1}{2} \) lines broad, deltoid-ovate or ovate-oblong, obtuse, spreading. Corolla about 1\( \frac{1}{2} \) inch in diameter, opening about 3 p.m.; petels numerous, in about 3 series, free, 4-7\( \frac{1}{2} \) lines long and about 1/3 line broad, cuneately linear, obtuse or subacute, white or white tinted with rose. Stamens erectly spreading, not collected into a bundle; filaments bearded at the base, dark rosy; anthers yellowish-white. Stigmas 6, erect, with recurved tips, stoutly subulate, tapering to a fine acute point and plumose or lacerate on the inner face; style none. Ovary partly superior or shortly conical at the top, shallow, convex beneath, 6-celled; placentas on the floor of the cells. Capsule slightly convex, with 6 gaping ridges on the top, flattish beneath, with 6 valves and cells; valves with rather distant and slightly diverging expanding-keels and broad, membranous, acute, marginal wings; cells imperfectly roofed with gaping, membranous flexible cell-wings, no tubercle at the opening. Seeds very numerous in each cell, minute, globose-ovoid, with a nipple at one end, smooth.

Species 1, native of Ceres Division in South Africa.

The name is derived from the Greek, didymos, twin, and aotos, a flower, in allusion to the pair of flowers, one borne on each side of the plant.

Geras Division: Ceres Karoo, Marloth.

This interesting plant in general appearance has much the habit of Fleiospilos Bolusii, and would seem allied to that genus, but the structure of its flowers (Fig. 73) and fruit is altogether different, and its mode of producing its flowers (one on each side
149 of the plant) is quite distinct from that of any other member of this large group of plants known to me.

D. lapidiformis seems to be a difficult plant to cultivate. Dr. Marloth informs me that he discovered it in the Ceres Karoo "about 50 miles from the nearest railway station," and as it resembles the stones it grows among it is not very easy to find when out of flower, for he states at the place above quoted, "In nature, the leaves are of a brownish-red colour and closely resemble the angular pieces of brown shale and sandstone between which the plants grow. As they are half buried in the ground they can be detected only with difficulty, even in localities where their occurrence is known." The plant flowers in the South African spring (September and October), and at the beginning of summer "the old leaves have shrivelled up, the new pair and has assumed the colour of the surrounding stones, and the plant remains dormant until the winter brings rain again." As the rainfall of the region it inhabits is said to be only three or four inches per annum I suspect that our moister climate does not suit it very well.

Dr. Marloth sent to me two plants of it, a dead flower and ripe fruit. The plants lived about twenty months, each produced a fresh pair of leaves, and one of them a pair of dormant, flowering peduncles, before they died. I raise a number of seedlings, but they have gradually all died except one out of a number I gave to Kew Gardens, and Dr. Marloth informs me that his stock of the plant (collected at the same time as those he sent to me) grown at Cape Town have also all died. So that it is evident that it is not an easy plant to cultivate, even in its own country, away from its native habitat. The plant quickly dies if given too much water.

The manner in which the young flower-buds remain hidden in the body of the bracts, dormant and utterly invisible for months, is very remarkable. It is only when the plant is producing a new pair of leaves and a new pair of flowering peduncles for the next season that the flowers hidden in the old bracts make their appearance. I do not recall to mind a similar manner of flowering and in any other genera of this or any other Natural Order of Plants. In Fig. 74, the flower-buds are seen to be just emerging from the base of the notch in the bract-body on each side of the plant, and the plant itself is seen to be forming a new pair of leaves, on each side of which a new pair of flowering-bracts is also being formed, but they have not yet pushed their way through the opening so as to be visible. Figs. 73 and 75 are from a drawing by Miss Page sent to me by Mrs. L. Bolus, keeper of the Bolus Herbarium, Cape Town. N. E. Brown (To be continued.)

MESEMBRYANTHEMUM,

(Continued from page 149)

XI.—PUNCTILLARIA, N. E. Br.

212 Very dwarf, succulent perennials, without internodes between the leaf-pairs. Leaves opposite, in 1-2 pairs or, under cultivation, sometimes 3 pairs to a growth or plant, those of each pair equal in size, sp reading, very shortly united at the base except in P. Roodie, usually three or more times (in one species usually less than twice) as long as broad, thick and fleshy, firm, usually very conspicuously dotted. Flowers solitary and terminal between the
2.2 leaves, sessile or shortly pedicillate, bracteate. Calyx- 5-6-lobed, sometimes produced above its union with the ovary into a short tube or cup. Petals numerous, free, linear. Stamens numerous, erect, and when the calyx has a tube above the ovary, arising from the top of that tube with the petals; staminodes none. Stigmas 9-15, filiform; no style. Ovary inferior, 9-15-celled; placentas down the centre of the outer wall of the cells and often extending part of the way up the central axis. Capsule (Fig. 104) subhemispheric, with 9-15 valves and cells; each valve with a pair of separated, parallel, expanding keels often ending in awn-like or membranous points and with membranous wings at the sides; cells acutely roofed with rather rigid dill-wings or separated elements of the cell-partitions with their outer ends turned back so as to form a somewhat trumpet-shaped opening to the cell, which is partly or nearly closed by a small or large tubercle (cell-wings flat and membranous and the tubercle rudimentary in P. Roodiae); the ridges formed by the roofs of the cells together with their turned-back ends form a series of small cavities alternating with the cells, the whole being raised in a sort of cornw above the level of the expanding-keels. Seeds somewhat compressed-ovoid and a slightly angular from mutual pressure, with a nipple at one end.

Species 5, natives of the Kaffir region of South Africa, the type of the genus being P. magnipunctata N. E. Br.

The name is derived from the Latin, punctillum, a dot, in allusion to the conspicuously dotted leaves.

This genus is closely related to Pleiospilos and, except in vegetative characters, is technically only to be distinguished from that genus by the opening to the cells of the capsule being nearly closed by a large tubercle. But this tubercle is doubtless of some functional importance to the plants having it, and as it is combined with a different type of foliage, I consider it to be quite as important a generic character as, for instance, the presence or absence of scales upon the claws of petals or at the mouth of the tube of a corolla are held to be. The function of these tubercles is very obscure; they occur in several distinct genera, as so far as I have been able to discover, they prevent, rather than aid, the dispersal of the seeds. They offer a problem that requires investigation, for Nature would scarcely develop such pronounced structures as these tubercles are unless they were to be of some importance to the plant. As I have previously stated, the fruits of these plants are the most complicated in the world of flowering plants and the most puzzling to understand.

KEY TO THE SPECIES.

1.---Leaves less (or not more) than twice as long as broad, 1-2½ inches long, 8-14 lines broad, flat on the face, very obtuse, flowers two inches in diameter, sessile.

Leaves three to four (or more) times as long as broad. 2

2.---Leaves 6½-11 lines broad or perhaps sometimes broader, 1½-3 inches long, flat or faintly concave above, very conspicuously marked with large dots on a glaucous-green or brownish-tinted ground; flowers sessile, 2-2½ inches in diameter.

Leaves 3½-7 lines broad, if very conspicuously dotted
then not glaucous-green.

3.—Leaves mostly 2½ - 3½ inches long, distinctly recurved at the upper part, tapering at the apical part to an acute point, distinctly concave on the face. 3. compacta

Leaves 1½ - 2½ inches long, not or but slightly recurved and mostly not tapering to an acute point, flat or but slightly concave on the face.

4.—Leaves with conspicuous and slightly prominent dots; flowers 2 - 2½ inches in diameter on peduncles about 3/4-inch long.

2. sororia

Leaves with small and not very conspicuous dots that are not prominent; flowers 1½ - 1¾ inch in diameter, sessile.

4. optata

1. P. magnipunctata, N. E. Br. (Fig. 105).—Plant forming clumps 3 - 4 inches high. Leaves normally in 1 - 2 pairs to a growth, very stout, ascending-spreading, united for 4 - 6 lines at the base, varying in size on different plants, 1½ - 3 lines long, 6½ - 11 lines broad at the base, enlarging to 9 - 13 lines broad a little above the middle, 5 - 9 lines thick at the apex, flat or faintly convex or concave on the face and straight or very slightly recurved, base, bluntly keeled and trigonous with convex faces or trigonous with convex faces at the apical part, obtuse at the apex in front and side views, surface glabrous, slightly hirsute to the touch, variably light green, greyish green or more or less tinted with brownish, varying from slightly to very glaucous, everywhere covered with large dark green or blackish dots, which are slightly prominent on some plants and not so on others. Flowers solitary, terminal, quite sessile, bibracteate. Calyx unequally 6 - 7-lobes; lobes 4 - 7 lines long, ovate, acute or obtuse, some with membranous margins. Corolla 2 - 2½ inches in diameter, opening in the afternoon and closing about 6 p.m.; retails numerous, in about 4 series, 7 - 12 lines long, ½ - 1½ line broad, linear, obtuse and more or less bluntly toothed at the apex, bright yellow. Stamens erectly spreading, at first forming a somewhat funnel-shaped mass, becoming more spreading and looser, 3½ - 4 lines long; filaments and anthers orange-yellow. Stigmas 9 - 12, finally about as long as the stamens and four lines long, filiform, subplumose on the inner side, orange-yellow, suberect, seated on the conical top of the ovary, which is 9 - 12 celled. Capsule, when closed, 6 - 7 lines in diameter, somewhat hemispherical, flattened at the top, grey, dotted; when expanded well about an inch in diameter, mostly with 10 - 12 valves and cells, sometimes fewer; structure as described for the genus, the expanding-keels being awn-pointed; the whole of the interior is in effect of a dark brown, the cells being rather brighter than the rest and some what orange-brown, and the expanding-keels blackish. Seeds not numerous in each cell, about 5 line long, compressed-ovoid, pointed at one end, minutely tuberculate, brown.


Laingsburg Division: Near Matjesfontein, Fillans, Austin, Frith. Originally discovered in this region by Bowie, who, accord-
212 ing to a note on the drawing of the type plant at Kew, "found it growing on the heights near Sea Koe River." I do not find this river marked on modern maps. The note further states that "The small variety (B. duplominus p. 88) mentioned by Haworth in his 213 Supremamentum, proved afterwards to be precisely the same with Burchell's plant." Prince Albert Division: Near Abrahams' Kraal, Mrs. D. van der Bijl.

Fig. 105 is from a photograph taken in South Africa by Mr. T. N. Leslie, and correctly represents the plant described by Haworth as M. magnipunctatum, according to a fine coloured drawing of the type preserved at Kew. There are, however, other plants in cultivation with narrower and more pointed leaves that pass under this name, which I have had had an opportunity of comparing with this (the true M. magnipunctatum, Haw.), when in flower, to note if any difference of a specific nature can be found in their flowers. I am informed by Mrs. van der Bijl that this plant is eaten by tortoises and is known as "Tortoise-food" or "schildpad kost," of the Dutch farmers. Dr. Luir also informs me that various species of Golliphylum and some other genera are eaten by Tortoises and known by the same name.

2. F. sororia, N. E. Br.--Plant forming chumps 2-4 inches high with short, branching stems 2-4 lines thick. Leaves 4-6 to a growth under cultivation, probably only 2-4 under natural conditions, ascending or the outer spreading, very stout, 1 1/2-2 1/2 inches long 5-7 lines broad, 4-6 lines thick at the base and 4-6 lines thick near the apex, straight or occasionally slightly incurved and often curved to one side, flat or slightly convex on the upper side, rounded on the back at the base and obtusely keeled at the upper part, viewed from above with nearly parallel sides or slightly widened upwards to the middle or for three-fourths of their length then tapering to a bluntly pointed apex, and in side view usually slightly thicker near the apex than at the base, glabrous, dull green, densely and conspicuously marked with dark green, slightly prominent dots all over. Peduncle 1-flowered, 9 lines long, 2-2 1/2 lines thick at the base, thickening upwards, terete, with two bracts 3-9 lines long at its very base, light green, sprinkled with some slightly darker green dots. Calyx 6-lobed; lobes subequal 5-6 lines long and 2-3 lines broad, ovate, acute or obtuse, with a short dorsal point near the apex, some of them with membranous margins, green or purplish-tinted, dotted with darker green. Corolla 2-2 1/2 inches in diameter, opening late in the afternoon; petals more than 100, in 4-5 series, the outer about 1-1 1/2 inch long, the inner shorter, 1/2-3/4 lines broad, linear, acute or obtuse or some of them notched at the apex, or of a rich yellow and slightly shining on the inner face, whitish and tinted with rose on the back. Stamens very numerous, at first erect, becoming erectly-spreading, somewhat in a circle, so as to leave a central space in which the base of the stigmas can be seen; filaments yellow above, whitish at the base; anthers deep yellow. Style none; stigmas 10-14, arising from the stout conical grooved top of the ovary, 5 lines long, filiform, much longer than the stamens, radiately spreading at the base, then erect, shortly plumose on the inner side, greenish-yellow, paler than the others. 


South Africa: locality and collector unknown.
Described from a living plant sent to me by Dr. F. H. Rodier
213 Heath, who received it from a friend in South Africa and believed
that it was collected in the Karoo region, possibly in Ceres
Division.

This species is allied to P. magnipunctata, but differs
from that species by its smaller leaves which are marked with smaller
leaves, which are marked with smaller and less conspicuous dots,
and by its distinct peduncle, the flowers of P. magnipunctata
being sessile. From P. optata it differs by its larger leaves
which are more distinctly triangular in transverse section, and by
the larger and distinctly pedunculate flowers.

The above is copied from my original description, and compri-
ses all that I know about this species.

N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM,
(Continued from page 213).

XI.--PUNCTILLARIA, N. E. Br.

3. P. compacta, N. E. Br.--Leaves about two pairs to a
growth, spreading, slightly recurved at the apex, 1½-3 lines
long, 4-5 lines broad and thick at the base, dilated to 5-8 lines
broad and 5-7 lines thick below the apex, the basal part flat on
the upper side and rounded on the back, and the upper part concave-
ly channelled on the upper side and bluntly keeled on the back,
tapering from 6-9 lines below the apex to an acute point; surface
glabrous, dull green or brownish-green, with conspicuous, slightly
prominent dots, slightly shining, slightly glaucous on the young
leaves, scarcely so on the older ones. Flower sub sessile or on a
short pedicel 3-4 lines long, with a pair of bracts at its base.
Calyx subequally 6-lobed, prominently dotted; ovary part hemispher-
ically; lobes about 4 lines long, four of them with membranous
margins. Corolla 2 inches or more in diameter; opening in the
morning, scentless; petals in about 3 series, 12-13 lines long,
1½-2 lines broad, linear, acute, yellow, passing into white at the
base. Stamens very numerous, erect, about 4 lines long; filaments
yellow; anthers of a paler yellow. Stigmas about 16, erect, subu-
late, as long as the stamens, greenish-yellow.

Mesembryanthemum compactum, Ait. Hort. Rev. ed. 1, vol. II,
p. 19(1789); Haw. Synor. Pl. Succ. p. 211. P. nobile, Haw. in
Phil. Mag., 1823, p. 381; Salm Dyck, Mesemb. 4, f. 1; Sonder in
Fl. Cap., vol. II, p. 396; Berger, Mesemb., p. 264 and 263, f. 56,
which is copied from that of Salm Dyck. P. magnipunctatum var.

South Africa: precise locality unknown.

This species has been long cultivated in gardens as Mesemby-
anthemum nobile, and is correctly as named, but it appears to be
also undoubtedly the P. compactum, Aiton, and as the latter name is
much the older it must take precedence and therefore I have here
restored it. Haworth states that he never saw this species, and
places it under his section Rostrata (which I have separated as a
genus-- Cheiridopsis), but in this he was undoubtedly wrong.

4. P. optata, N. E. Br. Nearly stemless, branching at the
base and forming a clump 2-2½ inches high. Leaves 2-4 to a growth,
more or less spreading, equal 1-2 inches long 3½-6 lines broad and
3½-5½ lines thick, and of nearly equal breadth and thickness through-
out, flat or slightly concave on the upper side, with obtuse or rounded edges, very convex and bluntly keeled on the back, obtuse or subacute at the apex, smooth, glabrous, dull brownish, reddish-grey or dark grey-green tinted with dull purple, faintly glaucous, thickly but rather inconspicuously dotted with darker green. Flower solitary, terminal, sessile, with a pair of bracts 2½-5 lines long at its base. Calyx 5-7-lobed, smooth, glabrous; tube above the ovary 2-3 lines long, cup-shaped; lobes reflexed or revolute, 2-4 lines long, ovate, obtuse, brownish, some with membranous white margins. Corolla 1½-1¾ inch in diameter, apparently remaining expanded day and night irrespective of cloud or sunshine if the temperature is warm enough and lasting 5-6 days, scentless; petals 50-60, free, in about 2 series, lax, arising from the top of the calyx-tube, spreading rather widely in the morning, becoming very revolute late in the afternoon and evening, 9-12 lines long, ½-¾ line broad, linear or cuneately linear, often obtusely toothed at the apex, bright yellow fading into white at the base, paler on the back. Stamens numerous, erect, at first collected into a cylindrical or slightly conical, dense bundle about 3 lines long, finally with some of the outer stamens separating from the bundle and standing erect or spreading loosely around it; filaments white; anthers deep yellow; no staminodes. Style none; stigmas 11-15, arising from the conical top of the ovary, finally about as long as the stamens (1½-3 lines long), filiform, erect, curved as or contorted at the tips, pale yellowish. Very conical at the top, 11-15 celled; placentas on the outer wall of the cells and also partly on the central axis. Capsule subglobose, 6-7 lines in diameter when closed, with 11-15 valves and cells; valves 3-4 lines long and about 1 line broad at the base, very acute, brown, with a very prominent membranous crest-like keel down the middle of the inner face; expanding-keels separate, parallel, stout, dark brown, about half as long as the valve and then produced into free, awn-like points with a membranous tapering wing on their outer margin and considerably shorter than the valve; cells as for the genus, each with its opening nearly closed by a compressed dark brown tubercle. Seds 2/3-½ line in diameter, compressed, ovoid or suborbicular in outline, with a conspicuous nipple at one end, very minutely tuberculate under a lens, dark brown.


Oosthoorn Division: Bank Hoogte, Mrs. Wigget 3, Marloth 6341.

A plant of this species flowered at Kew in November, 1917, but is place of origin was unknown, recently, however, it has again been introduced by Mrs. J. Wiggett, who discovered it at the locality mentioned.

The flowers of this species, although apparently expanded all day, open more widely late in the afternoon and evening than in the morning, and are sensitive to temperature. A coloured drawing of it that I have made (and which I hope to publish) represents the corolla as seen expanded in the morning, but in the evening of the same day the central part had opened more widely and the petals were very much rolled back, so that the calyx was entirely concealed. One afternoon, upon being removed from the greenhouse to a room of cooler temperature, the flower closed up, but during the evening when the room had become much warmer, it expanded again. So that it is evidently more sensitive to temperature than to sunlight.
5. *F. Roodiae*, N. E. Br. (Fig. 110).—Plant stemless, forming clumps 1½-2 inches high. Each growth with two unequal or sub-equal leaves united for 6-9 lines at their base, the free part usually, but not always, longer than broad, 1-2½ inches long, 8-14 lines broad and 6-10 lines thick, ascending-spreading, deltoid or deltoid-oblong in outline viewed from above, flat on the upper side, rounded or obliquely and very obtusely keeled on the back, very obtuse at the apex, entire, dull greyish-green or brownish in nature, becoming greener under cultivation, thickly covered with slightly prominent dots that are not much darker in colour and therefore not so very conspicuous. Flowers not seen, but from the photograph reproduced in Fig. 110, solitary and terminal, sessile (but the fruit has a stalk about an inch long) bracteae. Corolla about 2 inches in diameter, expanding, according to Mr. Leslie, at 11.30 a.m. and closing about 5.30 p.m.; petals in 1-2 series, lax, recurved-spreading, 9-12 lines long, about ½-line broad, cuneately linear, obtuse or toothed at the apex, yellow. Stamens numerous, erect, apparently loose and arranged somewhat in a ring. Stigmas not seen. Capsule 4-5 lines in diameter when closed, shortly obconic, flattened at the top, grey, 7-8 lines in diameter when expanded, with 9-10 valves and cells; valves spreading or recurved; expanding-keels closely parallel or contiguous at the basal part, then diverging and ending in fine awn-like points a little shorter than the valves and with membranous marginal wings up to the base of the awns, the whole interior of the capsule of a light brown colour; cells roofed with semi-transparent, membranous, flexible cell-wings and with a small rudimentary hard pallid tubercle at the opening; placentae on the outer wall and base of the central axis. Seeds about 612 in a cell, about 1/3-line long, ovoid, with a niple at one end, smooth, brown.

Van Rhynsdorp Division: near Van Rhynsdorp, Mrs. E. Rood.

This plant does not quite conform to the generic characters of *Punctillaria*, and may when better known, prove to be a distinct genus. It differs by its leaves being mostly unequal and united at the base for a much greater length than they are in the other species of *Punctillaria*, by the cell-wings of the capsule being membranous and flexible instead of stiff, and by the rudimentary nature of the tubercle at the mouth of the cells. Possibly the stigmas may differ also, but these I have not seen. In other general characters I find nothing to separate it, and therefore place it under this genus for the present.

N.B.—I would here call attention to *Mesembryanthemum carinans*, Haw., which seems allied to the genus *Punctillaria* and probably does not belong to that genus. It is at present quite an unknown plant except from the figure of the type plant preserved at Kew; for the species described by Sonder and by Berger as being *M. carinans* is not at all like the true plant, as I have previously stated in the Journal of the Linnean Society, vol. XLV, p. 66, where I have described Berger's plant under the name of *M. granulatum*, N. E. Br. There are also two or three other species distinct from *M. granulatum* that are named by South African botanists as being *M. carinans*, which are likewise quite different from the true *M. carinans*. I therefore here give a description of this species compiled from the drawing at Kew and including the characters given by Haworth. As the flowers are unknown its true generic position cannot at present be determined, but as it bears a somewhat
general resemblance to \textit{Punctillaria compacta} (except that the
tils of the leaves curve upwards instead of recurve and are more
compressed), I think it best to call attention to it here.

\textit{Mesembryanthemum carinans,} Haw., Rev. Fl. Succ., p. 90 (1821)
Plant stemless, forming clumps and having somewhat the general
aspect of \textit{Punctillaria compacta}, but with the leaves compressed
and dilated at the keel near the apex. Leaves apparently 3-4 pairs
to a growth, at first ascending, becoming widely spreading and
curved upwards at the tips, 12-3\(\frac{3}{8}\) inches long, 4-7 lines broad at
the very base, but rather abruptly contracted to 3-4\(\frac{3}{8}\) lines broad
a little above the base, thence with the upper side gradually tap-
ering to an acute apex, semi-terete and 3-4 lines thick at the
basal part, compressed and dilated at the keel of one leaf of each
pair scarcely or not at all dilated there and acute in side view,
flat or faintly concave on the upper side, rounded on the back at
the base, keeled at the upper part; surface glabrous, slightly
rough, glaucous-green, covered with numerous, conspicuous, slight-
ly prominent darker green dots, which the artist seems to have
indicated as being more prominent on the keel or that the keel is
somewhat scabrid. Flowers unknown.

South Africa.
The above is all the information that can be at present be
given concerning this plant.
(N. E. Brown)
(To be continued.)

\textbf{MESEMBRYANTHEMUM.}

(Continued. from page 229, Vol. LXXX.)

As a delay has been caused in the continuation of my account
of this group by the want of sunshine experienced this year, de-
laying the flowering of some new species that I wish to include
under the genus \textit{Glottiphyllum}, which follows next in the sequence,
and which are only now flowering, I take the opportunity to pub-
lish below a key to some new genera, and descriptions of new
species belonging to the genera \textit{Conophytum, Lithops}, etc., already
dealt with. Most of them have not yet flowered in this country,
but as the size, shape, surface and coloration of the growths are
the principal characters that distinguish many of these peculiar
plants, and as names for them are wanted in South Africa also for
many that will soon be distributed by Monsieur Fr. De Laët, I have
deemed it advisable not to wait until they all flower before describ-
ing them, proposing to publish descriptions of their flowers at a
future time; meanwhile the names can be used.

Also I would like to correct an error to the key to the genera
published in \textit{The Gardeners' Chronicle} 1925, Vol. LXXVIII, p. 433,
where the genus \textit{Conicosia} (see under the coupled paragraphs Nos. 27
and 28) is stated to have alternate leaves. Haworth stated this to
be the case. After having examined living adult plants, I came to
the same conclusion, and therefore accepted this view for the pur-
opose of my key, but having this year raised a few plants of this
very distinct genus from seeds and watched their development, I
find to my surprise that the leaves are really all opposite, although
by a peculiar mode of growth as the plant develops they point all
ways and form a large, dense tuft in which they appear to be arran-
ged alternately and are very long.
The following is a key to some new genera, founded partly upon new discoveries and partly upon old species that I had either not seen or of which I had only incomplete material when making my previous key, and although I then believed them to belong to new genera, I preferred to wait until actual material was available for examination before founding genera upon them, hence their omission from the previous key. Numbers are added indicate their previous key. Numbers are added to indicate their approximate position in the sequence adopted, and I have also indicated the type species of each genus. Full descriptions will follow as each genus is dealt with in its sequence.

KEY TO NEW GENERA.

1. Annuals; leaves opposite, flat; flowers solitary; pedicels 2-6 inches long; calyx unequally 5-lobed; petals free, slender, passing into staminodes; capsule expanding its valves when wetted; placentas on the floor of the cells.

Perennials; leaves opposite, not flat; flowers solitary; pedicels under 2 inches long or flowers sessile; calyx 5-6 lobed; petals free; capsule expanding or separating its valves when wetted; placentas on the floor of the outer wall of the cells.

2. Leaves petiolate, with a lanceolate or ovate flat or concave blade, glabrous; stigmas 10, filiform; ovary inferior, 10-celled; capsule with 10 valves and cells; expanding-keels of the valves central, or less contiguous at the upper part and separated at the base or subparallel throughout entirely adnate without free tips or wings; cells without cell-wings or tubercles; seeds globose, smooth.

Species 2, A. Fillansii, N. E. Br., the type of the genus, and A. helianthoides, N. E. Br. (Mesembryanthemum helianthoides, Ait.)

Leaves linear to narrowly oblanceolate, pubescent; stigmas 12-15; ovary nearly or quite superior, 12-14 celled; capsule with 12-14 valves and cells; expanding keels of the valves arising quite at the margins of the valves and inflexed so that their edges are nearly or quite contiguous, and ending in free diverging awns; cells narrow, roofed for half their length, without a tubercle at the opening; seeds flattened, D-shaped, smooth.

Species one, M. Candollii, N. E. Br. (Mesembryanthemum Candollii, Haw.)

3. Capsule small and thin, separating into 5 valves or parts with the cell-partitions adhering to the centre of each part and separating from the central axis so that the ellipsoid, smooth seeds are liberated; a very small, tufted plant; leaves semi-terete or subtrigonous; stamens about 25, in one series, erect; stigmas 5, subulate; ovary partly superior, 5-celled; placentas on the base of the outer wall of the cells.
The only species is *E. alpina* N. E. Br. 39a Ectotropis.

Capsules not thin and provided with expanding-keels to their valves, which expand when wetted; stamens numerous in many series.

4. Stamens erect and evident.

Stamens concealed under a mass of inflexed petals and staminodes; a shrub; leaves with the acute edges and keel finely lacerate-toothed; flower 2 inches in diameter, purple; stigmas 10, very small; ovary 10-celled; valves of the capsule ascending-spreading when expanded and not closing after once expanding, their expanding-keel diverging and ending in awn-like points; cells roofed with rigid cell-wings, without a tubercle at the opening.

The type of the genus is *E. lacera*, N. E. Br. (*Mesembryanthemum laceraum*, Haw.) 41a Semnanthe.

5. Stigmas and cells of the ovary and valves of the capsule 5; dwarf plants forming clumps about 3-3½ inches high; leaves trigonous, tapering to an acute apex as viewed from the face; with 1-2 small teeth on the keel at the apex; stigmas plumose; ovary inferior; valves of the capsule suberect or somewhat inflexed when wetted, with diverging, expanding-keels ending in awn-like points; cells roofed with rather stiff cell-wings and the opening nearly closed by a large, compressed tubercle.

The type species is *A. bellidiflorus*, N. E. Br. (*Mesembryanthemum bellidiflorum*, Linn.) 34a Acrodon.

Stigmas and cells of the ovary and valves of the capsule 8-10

6. Leaves with several slender flexible teeth along the edges and keel, velvety-puberulous to the touch and dotted; calyx-5-lobed; stigmas 9-10, subulate; ovary inferior; valves of the capsule reflexed when expanded, with parallel expanding-keels toothed on their edges and ending in free membranous tips; cells roofed with stiff cell-wings and the opening roofed with stiff cell-wings and the opening many nearly closed by a large tubercle; seeds compressed-ovoid, smooth.

The only known species is *O. marlothii*, N. E. Br. 40b Odontophorus.

Leaves quite entire and smooth at the edges and keel, glabrous, not dotted.

7. Shrubby plant 1-2 feet high with very distinct internodes. 8

Plant 3-4 inches high; leaves stout, united for some distance at the basal part, somewhat compressed, bluntly keeled, not dotted; calyx 5-lobed; petals passing into staminodes; filaments of the stamens bearded; stigmas 10; capsule very shallow; expanding-keels very broad
and closely contiguous, quite covering the basal half of the valves, convex (not acutely keeled) on the top, produced into a small, stiff, obtuse wing at the apex, cells open, without a tubercle; seeds compressed, triangular in outline, smooth.

The type species is Z. suppositum, N. E. Br. (Mesembryanthemum suppositum, L. Bolus). 39b Zeuktophyllum.

8. Erect shrub; leaves but slightly united at the base, not stout; semiterete; flowers at first terminal, later becoming apparently axillary all along the branches; 15 lines in diameter, yellow; calyx 6-lobed; stamens numerous, erect; stigmas 8-9, plumose; ovary inferior, 8-9-celled; placentas on the outer wall of the cells.

The type of this genus is M. mollis, N. E. Br. (Mesembryanthemum molle, Ait., not of any other author.) 40a Melephora. (N. E. Brown) (To be continued.)

MESEMBRYANTHEMUM.

(Continued from page 12.)

1. CONOPHYTUM, N. E. Br.

31 The following species are mostly additional to those already published in The Gardeners' Chronicle, 1922, vol. LXXI, p. 198, and 1925, vol. LXXVIII, p. 450, and indicate that this genus is a very large one. A century ago about ten species were known; at the present time (including those described below) over ninety species have been described, most of which I have in cultivation, and considering the vast area in South Africa in the region where these plants thrive that is as yet unexplored, there are doubtless very many more awaiting discovery, besides several new ones I possess that will be described later.

As I have previously stated, it is almost impossible to make descriptions of these very remarkable plants from which they can be identified, as they have no parts or organs by which they can be contrasted for that purpose. And it is very unfortunate that very little is known of their range of variation, as this has never been investigated in their native country. But from material that has been sent to me from the same general region inhabited by a given species, received sometimes from the same contributor at different times, sometimes from different contributors, I find that some species undoubtedly vary considerably in appearance, so much so, that without knowledge of their origin, most would consider them, in certain cases, to be distinct species. I find this to be particularly the case with Conophytum alcctium, C. polulum, and C. truncatellum, and species of Lithops also vary very much. Therefore, plants from the same general locality that show some affinity to one another, and at the same time seem quite distinct in markings or appearance should be suspected to be variations of one species until flowers or other characters distinctly prove them to be distinct. When raised from seeds taken from the same plant, I have found some species to vary greatly, and in the case of
C. polulum and C. placitum repeating the marked variations of plants received direct from South Africa.

One of the best characters by which nearly allied but really different species can be discriminated is the minute structure of the epidermis as seen under a moderately strong pocket lens. The character of the epidermis when it differs, must, I think, indicate a real specific difference, in the appearance of the plant, but, unfortunately, it is a distinction that is not always a describable one.

Figures of the types of form alluded to in the descriptions will be found in The Gardeners' Chronicle for 1925, vol. LXXIII, p. 450.

All the species are arranged alphabetically and those described as new below are quite distinct from all others; in surface-contour the angular form of C. novellum, and the very distinctly prominent separate dots of C. praeparvum cause these two species to stand out as being remarkably different from any others at present known. The peculiar loosely-forked stems of adult plants and neat-looking growths of C. karlothii also mark this one of the most striking in the genus.

Apart from the genera Lemna and Wolffia, the individual growths of the smaller species of this genus Conophytum are, I think, the smallest among flowering plants, and the flower is sometimes 3-4-times the diameter of the growth in size, as, for example, in the exceedingly beautiful C. minusculum.

C. andausanum, N. E. Br. -- Growth as received, 5-6 lines high, 5-6½ lines broad, and 4½-5 lines thick, slightly compressed-obconic, with a notch about 1 line deep at the top, and the lobe on each side of it rounded on side view and obtusely keeled; smooth, glabrous, dull green, sparsely sprinkled with small dark green dots, and with the notch outlined with a dark green or purplish line, from each side of which there extends a similar green or purplish line along the keel of the lobes. Flowers unknown.

LittleNamaqualand: At Andaus Poort near Amenous, in the Richtersveld, Harloth 6008.

This species is nearly allied to C. diversum, described below, but differs very distinctly by the very conspicuous continuous line that outlines the notch and extends along the keels of the lobes.

The alliance of both these species appears to be with C. gracilistylus, N. E. Br.

C. clarum, N. E. Br. -- Growth as received small, about 4 lines high, 2-2½ lines broad, and 1½-2 lines thick, obconic, elliptic in outline and broadly rounded at the top (type L. or E.), with a very slight central notch; orifice ½-⅔ line long, very slightly depressed below the general level of the top, which is convex (not ridged) as viewed transversely to the orifice; surface smooth, glabrous, of a bright clear green, not at all shining, thinly sprinkled on the top with 20-30 small, dark green separate dots, and with a dark green blotch at end of the orifice, usually formed of 3-5 dots connected together, and the blotches occasionally concealed by very slender, dark green lines, so as to outline the orifice, which otherwise is not very distinct. Flowers not seen. Capsule 2 lines in diameter, 5-angled, with 5 valves and cells, slate-grey. Seeds minute, scarcely ⅔ line long, smooth, brown.

Calvinia Division: growing on or among granite rocks on the foothills of the Langeberg range, Pole Evans 6022.
Described from a living plant kindly sent to me by Dr. Pole Evans. This is a bright looking little species, quite distinct from any other I have seen.

C. Comptonii, N. E. Br. (Fig. 20).-- Growths very small, as received 2 lines high and 1-2½ lines in diameter, but will probably become larger under cultivation; obonie, convexly-subtruncate at the top, which is curcullar or elliptic in outline and has a faint keel across it transverse to the orifice, which is 2-2/3 line long, and distinctly depressed at each end; surface glabrous and slightly irregular from the markings being faintly elevated, greyish green with a faint brownish tint, with a horse-shore-shaped mark or very dark green at each end of the orifice and a series of small dark green dots and markings around the margin of the top. Flowers not seen.

Malmaresbury Division: Near Nieuwoudtville, Compton.

For this minute but very distinct species I am indebted to Professor R. H. Compton, the Director of firstenbosch Botanic Gardens, after whom I have named it. Although a large genus, the species are grouped into few types, many kinds having a similarity in general appearance, but this very interesting species agrees with none of them, being quite distinct from all that are known to me, and therefore, although very small, by its great distinctness all the more suitable to bear the name of its energetic discoverer.

C. diversum, N. E. Br.-- Growths as developed the first year after importation about 6 lines high, 4-5½ lines broad and 3½-5 lines thick, slightly compressed, cuneately obcordate, 2-lobed at the top, with the notch 1-2 lines deep and the lobes more or less closed together at their lower half, at least in the young state of the growth; lobes rounded at the top in side view, somewhat as in type P, somewhat compressed laterally into an obtusely-rounded keel; surface smooth, glabrous, light green, with a small and slightly darker patch at the base of the notch, and thinly sprinkled all over with very small, darker green, separate dots, but without a dark line along the keel of the lobes or around the lips of the orifice. Flowers not seen.

Little Namacualand: near aenous, in the Richtersveld, Earloth 6906.

C. ectypum, N. E. Br., in The Gardeners' Chronicle, 1925, vol. LXXVIII, p. 468. At the place quoted, the description of the flower was made from a dried flower sent to me by Dr. Earloth, and the colour appeared to be magenta, as there described. My plant of Earloth 6365B, having now flowered, I find that the petals are not magenta, but of a delicate rose-pink, and there are four series of stamens and the style is 5½-6 lines long, instead of being as described. Whether this species varies to this extent, or whether some mistake was made in the flower sent to me, I do not know; flowers developed in future may determine.

C. Brownii, Tisher in Moller's Deutsche Gartner-Zeitung, July 21, 1926, p. 257, is, in my opinion, a mere form of C. ectypum that is more truncate at the top and has very few more lines upon it; there is no other difference. Both plants were collected at the same locality, and were both sent by Dr. Earloth. I find that several species vary much in shape and markings so that without other evidence I do not regard them of specific importance when the various
C. flavum, N. E. Br.-- Growths 4-7 lines high and 3-6 lines in diameter, obcomic, circular or elliptic in outline viewed from above, convex on the top, with a slight notch at the orifice on the larger growths only (type E.); orifice 1-2 lines long, slightly depressed, not gaping; surface smooth, glabrous, greyish-green, puberulous on the sides, with the orifice outlined by a thick, dark green line and with some (not very numerous) separate dark green dots scattered over the top. Calyx 5-lobed; tube (but not the ovary) exserted, about 3 lines long, pale greenish; lobes 1-1½ line long, oblong, obtuse or subacute, green or perhaps reddish in full sunshine, pellucid-dotted. Corolla 6-7 lines in diameter, expanding in the morning in bright sunshine, closing at the latter part of the afternoon, not scented; tube finally about 1½ line longer than the entire calyx, pale yellowish; petals about 35 in about 2 series, 3-3½ lines long, 2/3-2/3 line long, linear, obtuse and slightly notched at the apex, bright golden yellow, shining. Staminodes none. Stamens about as many as the petals, in 2-3 series, all collected together at the mouth of the corolla tube and more or less exserted from it; filaments yellow at the upper part; anthrs of the same yellow as the petals. Style 4 lines long nearly as long as the stamens, slender, with 4 minute stigmas 1½-line long at the top, yellowish at the upper part, greenish below. Capsule when closed about 2 lines in diameter, obcomic, flat on the top, with 5 valves and cells. Seeds about 1½-line long, smooth, pale brown.

Little Namaqualand, on shale rock, near Steinkopf, Marloth 6904, Meyer (Marloth 6319).

Described from a living plant kindly sent to me by Dr. R. Marloth. It is the first species I have seen of the small ovcomic type that has bright yellow flowers opening in the morning in sunshine.

C. hiens, N. E. Br.-- Growths they are first after importation 2-4½ lines high, 2-4 lines broad, 1½-3 lines thick, slightly compressed obovoid or obcomic, very shortly 2-lobed from a very gaping notch ½-1 line deep, and ½-1½ line wide at the top (type somewhat as at E.); lobes slightly keeled on the top, rounded into the back in side view; surface smooth, minutely puberulous and somewhat velvety to the touch, light green, without dots, but the keel of the lobes becoming reddish and the notch distinctly outlined with a darker green or perhaps reddish line when exposed to full sunlight. Flowers not seen.

Little Namaqualand: Locally frequent at Lekkersing, in the Richtersveld, Marloth 6915, 6928, 6929.

Described from living plants received from Dr. Marloth. Its small size, puberulous surface, facing orifice and absence of markings clearly distinguish this from all other species.

C. kubusanum, N. E. Br.-- Growths 2-3 lines high and 2-3½ lines in diameter, shortly obcomic, circular in outline viewed from above, and nearly flat on the top or very slightly depressed at the centre (type nearly like F.); invested in friable, greyish sheaths; orifice ½-line long; surface smooth, glabrous, of a rather dark dull grey-green, marked with numerous separate scattered dots of darker green on the top and the orifice outlined by a dark line. Flowers not seen.

Little Namaqualand: At Kubus, in the Richtersveld, Marloth 6920.
Described from a living plant kindly sent to me by Dr. Marloth, who has included under the number 6926 what appear to me to be two distinct species. One of them is the type of C. kubus-anum, and is described above this has the growths densely crowded. The other form has the growths rather loosely clustered, they are 4-5 lines long and smaller in diameter than the plant above described.

are elliptic instead of circular in outline and convex on the top, but the markings are very similar to those of the plant described, but fewer. Until both flower I cannot determine if these are distinct, as I suspect, or only varieties of one another.

C. limbatum, N. E. Br.—Growth 5-7 lines high, 2½-4 lines broad and 2½-4 lines thick, somewhat obovoid, slightly notched at the top with a slight and very obtuse ridge transverse to the notch, circular in outline viewed from above (type L., on a small scale); orifice about 1 line long, with gaping, triangular lips; surface smooth, glabrous, green, with a broad dark green line around the orifice and usually a dark green (or under continuous sunshine probably purplish) line along the top of the lobes, with or without another line or dot or two on each side of it, which are not raised above the general level. Flowers not seen; stated by Dr. Marloth to be purple.

Little Namaqualand; near Steinkopf, Meyer (Marloth 6508).

This is evidently closely related to C. ectypum, N. E. Br.; but as cultivated by myself under the same conditions it appears to be distinct. It is rather larger and of a light green colour, the orifice is less defined, the dark marking or are not raised as they are in C. ectypum, and when examined under a strong lens the microscopical structure of their surface is quite different; in C. ectypum the dark markings under a lens appear very smooth and shining or polished, and the stomata (seen as minute whitish dots) are in a network of faint depressions and appear as paler patches between the dark polished lines on the top, but in C. limbatum the dark markings are not so shining and are seen to be minutely and densely pitted, and the stomata do not form pale patches between them; the corolla is light rose-pink in C. ectypum, but is stated to be purple in C. limbatum by Dr. Marloth, and when better known may prove to show a difference in structure.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.
(Continued from page 33.)

52 Conophytum Marlothii, N. E. Br. (Fig. 30).—Plant as received about ½-1 inch high, consisting of a few lax and rather distant forked stems, each ultimate branch 4-6 lines long, gradually increasing in diameter upwards and 2½-3 lines in diameter at the top, densely clothed with some what smooth, closely imbricating sheaths; rather hard in texture, dark brown edged with whitish. Growth 3-4 lines long and 3-4 lines in diameter obconic, circular or broadly elliptic at the nearly top (type F.), with a depressed orifice ½-1 line long; surface smooth, glabrous of a greyish glaucous-green, thinly sprinkled with separated darker green dots.
52 and the orifice surrounded by an elliptic dark green line or row of dots; when in active growth, if held at a proper angle to reflect light the dots (when viewed with a lens) are seen to be shining while the rest of the surface is opaque. Flowers not seen.

Little Namaqualand: Ugrabis Mountain, in the Richtersveld, Marloth 6941.

Of all the species sent to me by Dr. Marloth that he collected during his expedition to the Richtersveld, in Little Namaqualand, this humble species appealed to me as being the most distinct in its general appearance; I have therefore much pleasure in dedicating it to his memory as a slight but grateful acknowledgement of the aid and information he has on many occasions given me during my work upon these plants. C. Marlothii differs from all known species by its laxly-forked stems clothed with hard, smooth, brown sheaths, very different in character from the brown sheaths, very different in character from the brown, grey or white friable sheaths that are usually found on these plants and by its small, flat-topped growths, sprinkled with dots that shine when held at a certain angle to the light, while the remainder of the surface is opaque.

To a certain extent the growths of C. Marlothii resemble those of C. iubusanum, but in the latter species they are smaller, of a darker green, more crowded, and not on lax stems, and have friable greyish sheaths, and the dots are more numerous.

For the illustration of this species I am indebted to the courtesy of Monsieur Fr. de Laet.

C. everi, N. E. Br. (Fig. 31). — I am now able to illustrate this species from an excellent photograph sent to me by Monsieur Fr. de Laet.

C. misellum, N. E. Br.—Growth small, 4-5 lines high, 2 ¼-3 ½ lines in diameter, ovoid, elliptic or circular in outline viewed from above, convex at the top, with a slight notch at the orifice (type somewhat like E.), and a faint keel on each side of it; orifice ¾-line long; surface smooth, glabrous, green, with a darker line along the keel and another outling in the lips of the orifice, and a few separate dark dots irregularly scattered over the top, but all these markings are rather indistinct, yet in full sunshine the line on the keel would probably be purplish. Flowers unknown.

Little Namaqualand: Witklip Poort, near Ugrabis, in the Richtersveld, Marloth 6933.

This small species is but little larger than C. saxetanum, N. E. Br., which it somewhat resembles in general appearance. Described from a living plant sent to me by Dr. Marloth.

C. Muiri, N. E. Br.—Growth as received small, nearly as type E., 3-4 lines high and 2-4 lines in diameter, elliptic or nearly circular in outline and convexly flattened at the top, with a very slight notch at the center and no trace of any ridge; orifice ⅓-line long; surface smooth, glabrous, of a light glaucous-green or chalky-green colour, indistinctly marked with irregularly scattered dots of a slightly darker tint, usually separate, but on some growths here and there connected into lines and the orifice enclosed in an elliptic or diamond-shaped line of the same dark tint. Calyx-tube about 1⅛-line long and ⅞-line in diameter, 4-5 lobed; lobes ⅛-line long, ovate, reddish. Corolla-tube about as long as the calyx-
C. novellum, N. E. Br.-- Growths as received 4-6 lines high, 4-5 lines broad and 4-4½ lines thick, obconic, elliptic or nearly circular, and at the same time faintly angular in general outline viewed from above, somewhat truncate in side view, but having a distinct ridge across the top transverse to the orifice and 2-3 somewhat angular bumps on each side of it; orifice ½-1½ line long, closed; surface smooth, glabrous, light green, sometimes with, sometimes entirely without a few rather indistinct separate darker green dots sparingly scattered over the top, and the orifice sometimes is very indistinctly outlined with a darker green line parallel to it on each side, but more often this outline is absent. Flowers unknown.

Clanwilliam Division: Near Klaver, Marloth 11899.

This species is distinguished from all others by the peculiar angular bumps upon the top of the growths. Described from a living plant received from Dr. Marloth.

C. obscurum, N. E. Br.-- Growths 3-4 lines high, 2-3 lines in diameter the first year after importation; obconic, circular or elliptic in outline viewed from above, flattish on the top (type F., without the notch), with only the orifice itself depressed and no trace of a keel; orifice ½-¾ line long; surface smooth, but under a lens there sometimes appears to be a slight unevenness, glabrous, of a rather dark green sparingly marked with a few separate dots of darker green, but the orifice is not outlines with a darker colour in any way. Flowers not seen.

Little Namaqualand: Ugrabis Mountain, in the Richtersveld, Marloth 6938.

Described from a living plant received from Dr. Marloth.

It is rather insignificant in appearance, but is quite distinct from all others known to me.

C. picturaturn, N. E. Br.-- Growths as received 3-4 lines high, 3-5 lines broad, and 2½-3½ lines thick, shortly obconic elliptic or nearly circular in outline, and flat or convex at the top (type E or F); orifice ½-1 line long, level with the general surface, not at all depressed; surface smooth, glabrous, purple on the sides, the top grey-green, prettily and rather copiously marked and the orifice outlined with dark green or purple, stout, irregular lines or chains of connected dots, which are more or less connected together in an irregular manner, but form no definite pattern. Flowers not seen.
Clanwilliam Division: Between Clanwilliam and Citrusdale, Miss Foote.

I have to thank Professor R. H. Compton for this very distinct species, which he informs me was discovered by Miss V. J. Foote, a former assistant in Kirstenbosch Botanic Garden.

It is one of the prettiest species known to me, and is easily recognised by the top of the growths being flat and covered with irregularly branched and connected rather thick lines of dark green or purple, according to exposure to sunshine.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM
(Continued from page 53.)

Conophytum praenarvum, N. E. Br. (Fig. 38)—Growth as received very small, crowded, 2-3 lines long and 1-2 lines in diameter, shortly obconic or obovoid, elliptic or circular in outline and convex without any trace of a ridge across it at the top; orifice 1/3-3/4 line long, level with the surface and neither depressed nor genic; surface glabrous, light green, sprinkled over the top with a few scattered dark green or purple dots that are mostly separate, but occasionally are connected into short lines and are remarkably prominent, resembling little bumps on the surface when viewed sideways with a lens, 2-3 of them are grouped at each end of the orifice, which also has a very slender dark green line on each side of it. Flowers not seen.

Little Namaqualand: On the Langebergen near Garies, growing among or mixed with lichens on granite, Marloth 12887.

This is one of the smallest species of this genus known to me and is one of the smallest of flowering plants. I am indebted to Dr. R. Marloth for living specimens of it, from which the above description was made. Its small size and the very prominent bump-like dots upon it readily distinguish it from all other known species. As a lichen was growing mingled with the plants sent, it is evidently one of the species that grow among lichens, a habitat shared by other members of this genus.

C. retusum, N. E. Br.—Growth 1/2-1 inch high, 3-9 lines broad across the tor and 2-4 lines thick on their first development after importation, normally compressed and wedge-shaped, shortly two-lobed at the top, and when fully developed about twice as broad across the lobes as at the base; in this form the lobes are 1-2 lines long and in side view are somewhat truncate with a slight notch (retuse) at their top, bluntly keeled; in another form produced on the same plant the growths are somewhat obovoid and not at all wedge-shaped, and the top of the lobes in side view are rounded and not at all divergent or truncate; orifice 11/2-2 lines long; surface smooth; glabrous, light green with a darker patch at the base of the notch and some rather indistinct separate dots scattered over the surface; more evident on some growths than on others, while the lips of the orifice are somewhat indistinctly outlined with a dark green line or chain of dots. Flowers not seen. Capsule 2 lines in diameter, slightly 5-angled, shortly and broadly obconic, slight convex on the top, with 5 valves and cells brown; when expanded 31/2-4 lines in diameter with recurved brownish
70 valves; expanding-keels contiguous and forming a stout, acute, brown, central keel with broad, membranous pallid, marginal wings; cells open, no tubercle. Seed about ½ line long, ovoid, but much compressed, with a very prominent nipple at one end, smooth, brown, the nipple darker.

Little Namequaland: On rocks, in the gorge of the Kwarass River, in the Richtensveld, Karas 6925.

This plant I also owe to the kindness of Dr. Karas. It belongs to the same group as C. Elishae and C. bilobum, but differs from all other species that I have seen in its very distinctly and broadly wedge-shaped growths, with the top of their lobes slightly notched or truncate. Whether it will retain this unique character under cultivation remains to be seen, as I notice that some of the new growths are quite different in form, being obovoid with short, rounded lobes on each side of the notch.

C. tentillum, N. E. Br., in The Gardeners' Chronicle, 1926, Vol. LXXIX, p. 12. This distinct species having now flowered with me, the following corrected description of the flower may be added: Calyx-4-lobed, tube only partly exserted, 3 lines long, whitish or pale greenish; lobes ½-1 line long, greenish, but probably reddish in full sunshine. Corolla 6-7 lines in diameter, expanding in daytime in dull or sunshiny weather, not scented; tube 5-6 lines long and 1-2 lines longer than the entire calyx, nearly 1 line thick, whitish; petals about 20, recurved-spreading, in 1-2 series, 3-3½ lines long and 1-2 lines broad, linear, obtusely rounded or faintly notched at the apex, bright magenta. Stamens none. Stamens 25 or more, in about 4 series, in two upper series exserted from the mouth of the corolla-tube; filaments and anthers yellow. Style 6 lines long and nearly as long as the longest stamens; stigmas 4, minute, ½ line long, yellow.

Little Namequaland; near Steinkopf, Meyer, (Karas 6512).

This is quite a pretty plant when nicely in flower, although it cannot vie with the beautiful C. minusculum, which has much larger and much more richly-coloured flowers.

3. LITHOPS, N. E. Br.

The following species are additional to those already described in The Gardeners' Chronicle 1922, Vol. LXXI, p. 55, and 1926, Vol. LXXIX, p. 80.

Lithops Fulleri, N. E. Br. -- Growth about an inch high, 12-15 lines broad and 8-10 lines thick, obconic, elliptic in outline at the fat top which has a fissure 5-6 lines deep across it, dividing it into two contiguous lobes; surface glabrous, smooth on the sides and margins of the top, which is rough from being covered with small bumps caused by numerous impressed dendritic markings, light dove-grey with a slight violaceous tint on the sides and margin of the top, and the dendritic markings of a bright-rust-brown colour, making a very pleasing contrast. Flowers not seen.

Kenhart Division: Near Kenhart, Fuller.

This very distinct species was very kindly sent to me by Professor R. H. Compton, Director of Kirstenbosch Botanic Garden, with the information that it was discovered near Kenhart by Mr. R. E. Fuller, to whom I have much pleasure in dedicating this very pretty species, which is, perhaps more nearly allied to L. karasmontana, N. E. Br., than any other known species by its more crowded dendritic
70 markings, rougher top and different colouration, and probably when flowers of it are known they also will differ, for in my opinion it is certainly not a mere variety of that plant.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM:
(Continued from page 70.)

LITHOPS.

L. bella, N. E. Br., in The Gardeners' Chronicle 1922, v. LXXI, p. 80 (Fig. 44). To this species must now be added as a synonym L. Lericheana, Dinter and Schwantes, which I had not seen when I described it in The Gardeners' Chronicle, 1926, vol. LXXIX, p. 102, but as I now have plants of L. Lericheana in cultivation, I find it to be identical with the previously described L. bella. A good figure of L. Lericheana was published in the Zeitschrift f. Sukkulentenkunde, December, 1925, p. 133, which exactly represents L. bella. I have not seen this figure when my description of L. Lericheana was published in February, 1926, or I should then have quoted it, but now, by the courtesy of Dr. F. Vaupel, the Editor of the work quoted, I am here able to reproduce the figure (Fig. 44) from a photograph of it, for which I am indebted to Mr. C. A. Maass.

L. Mundtii, Tischer, in Moller's Deutsch Gartner Zeitung, September 21, 1926, p. 330, with three figures (Fig. 45).—Growth 15-18 lines high, 14-20 lines broad, and 10-18 lines thick, obconic, quite flat on the top, with a transverse fissure about 3 lines deep all across it; surface glabrous, smooth and of a light violaceous tint on the sides, slightly rugose from impressed dendritic markings or branching lines on the top, which is of a light rust colour with the impressed markings of a dark rust colour, and with numerous blackish-grey dots sprinkled among the markings. Calyx 4-lobed. Corolla about 14-18 lines in diameter; petals 30-35, in 2 series, orange-yellow, with the tips reddish on the back. Stamens with white filaments and yellow anthers. Stigma 6, not exceeding the stamens.

Great Namequaland: MundtFarm, near Witvley, in the region of Gobabis, Mundt.

This fine species is distinguished at sight from all others that I have seen by the rich rust colour of its flat top. Fig. 45 is here reproduced by the permission of Dr. F. Vaupel, the Editor of Zeitschrift f. Sukkulentenkunde by means of a photograph kindly sent to me by Mr. C. A. Maass.

L. pseudotruncatella var. alta, Tischer, in Moller's Deutsche Gartner-Zeitung, September 21, 1926, p. 331, with fig. A variety differing from the type of being taller than broad, with the top of the lobes more convex and the markings less distinct. Corolla yellow. Capsule 8-celled.

Great Namequaland: Farm Hoffnung, collector not stated.

I have not seen this plant, but it is probably the plant Dinter has mentioned in one of his works as being MeSEMBRyANTHEMUM truncatellum growing at Farm Hoffnung, and for which I quoted that
locality on his authority under \textit{L. pseudotruncatelle} in \textit{The Gardeners' Chronicle}, 1922, vol. \textsc{Lxxi}, p. 65, and the localities Jakelswater and Roessing also mentioned there upon Dinter's authority, doubtless also belong to a different species, the Roessing plant probably being \textit{L. Ruschiorum}, \textit{N. E. Br.}, as I learn from Dr. A. Tischer that the true \textit{L. pseudotruncatella} is only found in the Aus Mountains and near Windhoek.

\textbf{Rimaria, \textit{N. E. Br.}}

\textit{Rimaria microsperma, \textit{N. E. Br.}} (Fig. 46).— Stemless or nearly so under natural conditions. Growth solitary or two or perhaps more to a plant. Leaves 1-2 pairs to a growth, closed together or gaping, united at the base, in adult plants 12-13 lines long, 12-15 lines broad and 10 lines thick, half-globe, flat on the face, rounded on the back, obscurely keeled at the apical part and rounded or minutely apiculate at the apex; surface glabrous, very minutely-granulate under a lens, reddish-grey on dove colour, indistinctly dotted. Flower solitary, terminal. Pedicel 7-10 lines long, compressed, densely "sily-fulvous." Corolla about $\frac{1}{2}$ lines in diameter; petals numerous, free, in 2 series, about 8 lines long and $\frac{1}{2}$-line broad, cuneately linear, obtuse, incurved at the tips, yellow tinged with saffron at the apex above, fulvous on the back tinged with rosy-orange at the tips. Stamens about 4 lines long, erect in columnar mass, rich golden-yellow; filaments (probably the inner only) hairy at the base. Stigmas 7-9, divergent, $3\frac{1}{2}$ lines long, papillate on the face, yellow. Ovary slightly convex on the top. Capsule 7-11-celled. Seeds about $\frac{1}{6}$ line long, dull reddish-brown.

\textit{Dinteranthus microspermus}, Swahwantes in \textit{Zeitschrift f. Sukkul-entunde}, vol. \textsc{II}, p. 184, name only, and \textit{Mesembryanthemum microspernum}, Dinter and Derenberg, in the same volume, p. 264, with description and figure.

Great Namaqualand; growing among white quartz stones about 12 miles south of Warmbad, Dinter.

I am indebted to Dr. F. Vaupe, the Editor of the \textit{Zeitschrift f. Sukkulentunde}, for permission to reproduce from the latter work by means of a photograph sent to me by Mr. C. A. Maass, the accompanying illustration (Fig. 46) of this remarkable species, which is evidently closely allied to \textit{R. Pole Evansii}, but differs from that species by its dotted leaves and differently colored flowers, it also comes from a locality some hundreds of miles distant.

In the \textit{Zeitschrift f. Sukkulentunde}, vol. \textsc{II}, p. 173, Mr. G. Schwantes has created a number of new genera belonging to this group of plants, and among them, on p. 184, is the genus above \textit{Dinteranthus}, Schwantes, under which the above plant is placed, together with \textit{Rimaria Pole Evansii, N. E. Br.}, and \textit{Argyroderma Margaretae, N. E. Br.}. That is to say, \textit{Dinteranthus} is a name founded upon a combination of three species which I have placed under two genera already established, and therefore is entirely inadmissible and only adds unnecessary names to the synonymy. No mention is made of characters by which \textit{Dinteranthus} is distinguishable from \textit{Rimaria}, and those given for \textit{Dinteranthus} accord with those of \textit{Rimaria}.

Of the other genera made by Mr. Schwantes I have not yet made any study, but judging from the species enumerated under them, some will undoubtedly be acknowledged as good genera, and these I note are mostly founded upon species of which (when studying all the available material in the Kew and other Herbaria three years ago in
search of generic characters) I had not seen specimens or had insufficient material for examination and so left for further study as material became available. But with reference to several of the genera proposed, I feel doubtful if Mr. Schwantes has examined and dissected many of the species he enumerates under the genera he has founded, for some of the species mentioned I recognise as belonging to genera I have already characterised and others I think are doubtfully separable from Mesembryanthemum. Unfortunately the type species upon which he founds each genus is not mentioned, but I hope Mr. Schwantes will clearly point out which species is the type of each of his genera so that future confusion may be avoided.

N. E. Brown
(To be continued.)

**MESEMBRYANTHEMUM**
(Continued from page 85.)

2A.—**MUIRIA, N. E. Br.**

Stemless, with short, fibrous roots. Growth more or less compressed-subglobose or compressed-ovoid and sometimes slightly angular from mutual pressure, with an obscure, short, slit-like orifice below the apex on the side turned towards the centre of the clump, very fleshy, velvety-ruberulous with adpressed, fine hairs. Flower solitary, just exserted from the top of the growth, with the clavate pedicel included; bractless. Calyx 6-lobed down to its union with the ovary; lobes oblong, flattish, with membranous tips. Petals numerous, free, in several series, linear, the inner very narrow and filiform-linear (staminodes?). Stamens numerous, connivent-erect; filaments not hairy at the base. Glands around the top of the ovary 6-7, broad and nearly contiguous. Stigmas 6-7, short and stout, erect, or possibly finally spreading. Ovary externally appearing inferior and very large and pear-shaped, but in reality partly superior and very shallow, being partly immersed in the very stout clavate top of the pedicel, 6-7-celled; placentas on the floor of the cells. Capsule shallow, convex on the top, with the sutures between the valves raised into ridges, and with 6-7 valves and cells; valves deltoid, when expanded horizontally spreading; expanding-keels closely contiguous so as to form a stout central keel, with broad, membranous, marginal wings as long as the valves; cells open, without cell-wings or a tubercle. Seeds many in a cell; ovoid, slightly compressed, with a nipple at one end, smooth, brown.

Only one species (M. Hortenseae, N.E.Br., the type of this strange genus) is at present known; a native of the Little Karoo in South Africa.

I have very great pleasure in naming this remarkable genus in honour of my friend Dr. J. Muir, and the species after his daughter Hortense, in recognition of the very great assistance Dr. Muir has rendered by sending living plants to me, with valuable information concerning them, with which has enabled and will still aid me to give a much better account of many of these genera than would otherwise have been possible.

Generically, Muiria is more nearly allied to Oophytum than to any other genus, and I place it next after that genus.
1.— *M. hortenseae*, N.E.Br. (Fig. 59).— Growths about 3-5, crowded together into a clump, each 1-1½ inch high, 1-1½ inch broad, and ½-1 inch thick, more or less compressed-subglobose or compressed-ovoid, sometimes slightly angular from mutual pressure, very obtusely rounded at the apex, with a somewhat obscure, slit-like orifice below the apex, always on the side facing towards the centre of the clump; substance very fleshy; surface smooth, velvety-pubescent, with very fine, adpressed hairs directed downwards, whitish or greyish under natural conditions, often with a rosy tint where exposed to strong sunlight, partly invested at the base with the brown, withered skins of former growths. Flowers solitary, with the thickened top of the pedicel just exserted from the burst opening of the growth, which during flowering becomes withered, wrinkled and brown. Calyx 6-lobed down to its union with the ovary, 2½3 lines long and about 2 lines broad, oblong, obtuse, membranous at the apical part. Corolla varying from 5-12 lines in diameter, cup-shaped, opening about 10 a.m. and closing between 4 and 5 in the afternoon, sweetly-scented; petals numerous, free, in several series; the outer 4-6 lines long and ½-1 line broad, linear, obtuse or obtusely pointed, the inner smaller and narrower, with the innermost linear-filiform, (staminodes?), somewhat stiff or brush-like to the touch, pure white in some flowers, in others pink at the tips or more or less tinged with very pale pink except at the base. Stamens 2-3 lines long; anthers yellow. Stigmas 6-7, erect, probably becoming erectly-spreading, ½-1 line long, stout, acute. Ovary partly superior, shallow, conical at the top, with the cell-part immersed in the top of the stout-clavate pedicel, which is 3½-5 lines thick at that part and has the appearance of being a large inferior ovary, and is pale green. Capsule 3-3½ lines in diameter when closed, and including the obconic under part about 3 lines long, pale brown; when expanded 6-7 lines in diameter and pallid within, with yellowish-brown expanding-keels. Seeds about 1/3-line long, ovoid, smooth, brown, with a darker brown nipple.

Riversdale Division: In the Klein *akroo* among quartz stones, at 1,200 to 1,400 feet above sea-level, flowering in December, Muir, 3885.

The cluster of somewhat egg-like bodies that constitute this strange plant render it one of the most remarkable among flowering plants, for it is quite unlike any other at present known. I have not seen a plant in flower, as the the plants sent to me failed to produce flowers this season, but have described the floral structure from flowers sent to me in formalin by Dr. Muir, and from information he has supplied. From which it would appear that the root-system is superficial and apparently not penetrating deeper than about 2 inches into the ground, and that in nature the growths are buried in the ground for about half their height, the portion underground being green. Dr. Muir informs me that when the plant is preparing to flower, "A hard spot is paler in the fleshy body and the covering epidermis gets thinner and paler. This hard spot is sharply marked off from the surrounding softer substance. The flowers burst right through the fleshy body at the some prominent part of the upper convexity. A fissured lesion or wound is formed, longitudinal at first (probably through the fissure), and then irregularly branched as pressure is exerted by the advancing flowers. The edges of this fissure are raw at first and exude moisture, just like any other tear ot cut."

My drawing (Fig. 59) represents (at A), a plant with a cluster of three growths, slightly reduced, made from a living plant. B,
is drawn from a flower sent to me in formalin and the remains of a dried growth attached to a dried flower, which may not be quite like that of a living plant, of about natural size, C, represents a section through the flower B, enlarged diameters. D, is a magnified view of the hairs on the surface of the plant. E shows a capsule with valves expanded, natural size; and F is a longitudinal section through a closed capsule, rather larger than the natural size.

One peculiarity of this odd plant is that the orifice is always (at least, so far as my two plants testify) on the side of the growths that faces the centre of the clump, and on the native-grown specimens is rather obscure and might easily be overlooked, but after being in cultivation here for a few months is as evident as shown in my drawing. And this seems repeated in the new growths, which form inside the old ones just as they do in the genus Conophyton. Upon cutting open a flowering growth sent to me by Dr. Muir, I find that the flower is terminal, arising at the point of attachment of the base of the old growth on the same side as the orifice and curving with the same curvature of the growths; behind and at the base of the pedicel (which is quite bractless) arises a new growth; behind and at the base of the pedicel (which is quite bractless) arises a new growth inside the old one and, of course, invisible from outside, curving conformably with the old one, the curvature being due to the fact that the actual attachment of each growth to the rootstock is about 3-4 lines above the base of the growth on the same side as the orifice. Evidently this plant is of very slow growth and does not increase often.

N. E. Brown
(To be continued.)

Since the above was written I have received flowering growths of this plant passing into the resting stages, and on cutting one open was surprised to find that the tissue within the skin of the old growth consisted entirely of very large, loose and separate globose cells, varying from a half a line to one-and-a-half-line in diameter, each glistening like a dew-drop, having a thin, but somewhat tough cell-wall and cer, colourless watery contents. Under a microscope I noted that the outside of the wall of these cells was marked with outlines of small cells that had been in contact with it, but had now disappeared. As I had never, in any plant, seen a collection of large, loose cells of this character, I wished to ascertain their origin and purpose, and therefore sacrificed one of my non-flowering growths by cutting a piece from it to examine its structure, when I found that the whole interior is filled with these large, globose cells with all the spaced between them filled in with a connecting tissue of very small cells firmly binding them together into a fleshy substance, all of it with clear, colourless, watery contents, as the chlorophyll is only evident when highly magnified, the granules being sparsely scattered over the walls of the outer cells, a few even in the large cells, and are excessively small. From this it seems evident that when the plant prepares to go to rest in the very arid region it inhabits, the substance of the connecting tissue is first used up and seems to disappear entirely, leaving only the large cells to supply the new growth contained in the old one with moisture, or perhaps more probably, to retain moisture around it during the dry season, or until rain falls and the new growth starts developing. It is
116 evident that these large cells (which are botanically called idioblasts) are capable of retaining their watery contents without drying up for a long time and in a manner that I have never observed other cells or sections of tissue to do. I removed some of these large, loose cells and placed some on a piece of glass and some on a piece of paper, all isolated, and allowed them to remain uncovered in an ordinary living room. As I write they have now been exposed to the dry air of the room for over one hundred hours, and seem just as fresh, as plump, and as glistening as when I first removed them from the old growth. If they can do this when separated and in such exposed conditions it is very evident that when protected by the skin of the growth they must preserve their fluid contents for a very long time.

and probably gradually supply moisture to the young growth that they surround inside the old one. Yet, when one of these cells is burst, its watery contents dries up quickly. These large cells do not contain crystals, which is one of the functions of idioblasts, but there are also much smaller idioblasts mingled with the tissue containing bundles of needle-like crystals (raphides), which are excreta. And I have hitherto regarded this large cells or idioblasts (which exist in most genera of this group, the familiar pellucid in a dark dots being due to them) as functioning only as excretory cell, for they frequently contain tannin or crystals and are thrown off with the dried skins or dead leaves, but from the behaviour of those of this singular plant, as above recorded, it is possible that besides that purpose they also function as special structures whereby these plants are enabled to endure and survive the long subjected. They are worth of more careful examination than I am able to give them.

N. E. Brown)

MESEMBRYANTHEMUM,
(Continued from page 117.)

MUIRIA, N. E. Br.

251 Muiria Hortenseae N. E. Br.-- In reference to the note at the end of my description of this very singular plant on p. 116, concerning the extraordinary ability of the large internal cells (idioblasts) when isolated and some placed on glass and some on a piece of paper to withstand the dry atmosphere of a living room without drying up, I now wish to record further, that these same cells, still upon the same pieces of glass and paper, remained under exactly the same conditions without any covering, fully exposed to the air and dust of the room for more than a week without drying up and apparently without shrinkage in volume, and were still glittering like dew-drops. The temperature of the room was about 60° to 62° Fahr. in the daytime, and about 50° Fahr. at night. On the tenth day a few cells showed signs of collapsing. On the twelfth and thirteenth days most of them were drying up, and on the fourteenth day only one cell, which was about one line in diameter, remained fully plump and glittering, all the others being partially or fully dried up. This one cell remained plump until the eighteenth day. An ordinary saucer half-filled with water was placed by the side of the cells on the second day after they were isolated, but the water had completely dried up two days before the cells were
251 drying up. This seems to be such an extraordinary conservation of cell-contents and vitality under conditions that I believe would be fatal in a very short time to the cells of most plants, that I deem the fact worthy of record.

8A. --MENTOCALYX, N. E. Br.

Perennial, stemless. Rootstock fleshy, bearing two or more growths, each, under natural conditions, with only one pair of leaves, except when making a new pair. Leaves opposite, unequal when young erect and pressed together so as to resemble an eagle's beak; adult leaves spreading, large and thick, flat and deltoid in outline on the face, one of them compressed and deeply keeled at the apical part on the back, velvety puberulous. Flowers solitary, terminal, pedicillate, without bracts. Calyx unequally 6-lobed down to the base of the ovary, and when in bud with the base of one of the two larger lobes more projecting than that of the other lobe so as to form a sort of chin to the bud. Corolla large, petals numerous, free. Stamens numerous, erect, somewhat loose; filaments not bearded. Glands 6, stoutly subulate, somewhat bristly-plumose, acute. Ovary wholly superior and 6-ribed when in flower, becoming half-inferior when in fruit, 6-celled; placentas on the floor of the cells; ovules numerous in each cell. Capsule half-superior, obconic, convex, and with 6 gaping sutural ridges on the top, and with 6 valves and cells; valves deltoid, reflexed-spread when expanded; expanding-keels with their basal part rising into a hump half as long as the valve, thin, parallel, minutely toothed at the edges, and their upper part adnate to the valve and then forming broad, marginal wings; cells flatly roofed with membranous, flexible cell-wings, without a tubercle at the opening. Seeds many in a cell, ovoid, pointed at one end, smooth.

The only known species and type of the genus is M. muiri, N. E. Br., a native of the Kein Karoo, in South Africa.

The name is derived from the Latin, mentum, a chin, and calyx, cup or calyx, because the calyx, when in bud, has a sort of chin to it.

The affinity of this fine and very distinct genus is not very evident, but as its vegetative characters more resemble in form of the genus Pleiospilos than any other, I place it immediately before that genus, although its flora structure is entirely different. The manner in which the entirely superior ovary of the flower becomes half inferior when in fruit is very remarkable; I have not observed any other similar instance, either in this group of plants or in the many thousands of flowers I have dissected belonging to other orders. The somewhat chin-like base of one of the larger calyx-lobes is also unlike anything I have seen in any other member of this group of plants.

1. M. Muiri, N. E. Brown. (Fig. 128).-- Leaves unequal, spreading, the larger of the pair 2-3 inches long, 14-21 lines broad at the base and narrowing from thence in a deltoid manner to a more or less acute apex, 9-12 lines thick at the base and 10-18 lines thick at the deeply-keeled apical part; the smaller leaf 1½-2 inches long and only 4-7 lines thick at the apical part, not so deeply keeled as its fellow, otherwise similar in shape; both are flat on the face, the larger one with a slight oblique twist (not represented in the figure), more or less incurved-hooked (at least when young) at the
apical part, the smaller leaf being neither hooked nor deeply keeled at the apex; when young, the two leaves are closed together, and then somewhat resemble the beak of an eagle in form; substance firmly fleshy; surface smooth and velvety to the touch, microscopically puberulous, dull green, but probably of a brownish or greyish tinge under natural conditions, not dotted. Flower always produced in front of the new pair of leaves. Pedicel 1½-2 inches long, erect, slightly compressed and somewhat 2-edged, 3-3½ lines broad and 2½-3 lines thick at the upper part, slightly tapering downwards, velvety-puberulous, green. Calyx in bud and viewed from the side with a somewhat chin-like base in front, velvety-puberulous; lobes ascending-spreadling, the two larger 9-12 lines long and 4½-5 lines broad at the base, narrowing to an acute apex, keeled down the back and more or less concave and hooked or incurved at the apex; the four smaller lobes 5-6½ lines long, ovate, obtuse, with membranous edges. Corolla 1½-2 inches in diameter, expanded in the daytime, more or less closed at night, and lasting 10-14 days, pleasantly fragrant; petals numerous, free, spreading, in about two series, rather lax, about 9 lines long and ½-line broad, linear, acute, pure white according to Dr. Muir, but in one of the living flowers seen the white was faintly tinted with pinkish-mauve, with a darker midline, and the other white without the pinkish tinge, so probably the colour varies, as it does in many species belonging to the other genera. Stamens somewhat loose, 2½-3½ lines long; filaments white; anthers milk-white. Glands of the disk blackish-green. Stigmas 6, spreading, about ½-line long, stoutly subulate, acute, somewhat bristly-plumose, green. Ovary in the flower entirely superior, with a broad base, becoming partly inferior in fruit. Green, with 6 stout ribs, 6-celled. Capsule as described under the genus, half inferior, about 5 lines in diameter when closed and 7 line in diameter when expanded; valves pallid within, with honey-coloured, expanding-keels; the cells, instead of being superior and entirely above the level of the base of the inner side of the calyx-lobes as they are in the ovary, are (in the capsule) inferior and entirely below the level of the inner surface of the base of the calyx-lobes, the valves alone being now above that level. Seeds less than ½-line long, ovoid, smooth, pallid, with a brown point.

Riversdale Division: In the Klein Karoo, among white stones, flowering in September and October, 1,200 feet above sea level, Muir 3,692.

Described from a living plant sent to me by Dr. J. Muir, this being another of the many interesting new species that he has discovered, which shows how rich South Africa must still be interesting undiscovered plants.

I do not know how this plant behaves in South Africa, but from Dr. Muir's statements about it, I imagine that the flowers become fully developed from their first appearance in about two months. With me however, the process of their development has been exceedingly slow; I first saw signs of flower-buds at the end of August, 1926, but it was not until the fifth of March, 1927, that the first flower opened, being over six months in developing. Evidently this is the effect of the colder temperature of our climate, and I expect that the flower-buds appearing with the new pairs of leaves at the end of February, 1927, will develop into flowers before they are six months old, as the warmer season is now approaching (this is written on March 14, 1927). This plant appears to flower very freely, as fresh flowers are appearing on every new growth on my specimens.
My flowering plant of this species has only two growths upon it, each with one flower. The first flower was of a decided pinkish-mauve tinge and the second almost pure white. Then the first flower, however, expanded during very dull, sunless weather, while the second one had several days of bright sunshine upon it, so that it is possible that the change in the amount of light was the cause of the change in colour. My only other plant did not develop its flowers.

Fig. 128 represents at A, one of the two growths on the plant. B, a mature flower-bud nearly ready to open, showing the prominent chin-like base of one of the calyx-lobes. C, a flower as it appeared in dull weather; in bright sunshine the petals and shorter calyx-lobes are much more spreading, although the larger calyx-lobes remain in the position I have represented. D, a longitudinal section through the flower, showing its structure, enlarged slightly more than two diameters (all the other figures are of natural size). E, a longitudinal section through a ripe fruit showing that the ovary in ripening becomes half inferior. Probably this is due to the enormous shrinkage of the central watery tissue of the pedicel that takes place during the ripening. F, is a young seedling, showing the united cotyledons and the first pair of leaves, which are minutely puberulous.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.
(Continued from page 253.)

5.---GIBBAEUM, HAW.

The following matter relating to this genus is additional to that already published in The Gardeners' Chronicle, and brings our knowledge of it up to date.

G. album var. roseum, N. E. Br.--Besides the typical form with pure white flowers described in The Gardeners' Chronical, 1926, vol. LXXIX, p. 215, Fig. 105, c. and G., Dr. Muir has discovered a more robust form which has flowers varying "from pale to very deep pink," to which the above varietal name may be given. But some plants of the same robust form have pure white flowers.

Riversdale Division, In the Klein Karoo, Muir, 3975.

G. angulines, N. E. Br.--Stems procumbent or decumbent, with very numerous growths or short branchlets crowded into a compact mass of a silvery or greyish colour. Each growth in nature formed of two unequal leaves united for about 3 lines at the base, with the free part of the larger leaf ½-1 inch long, and of the smaller leaf 4-10 lines long, 4-5 lines broad and 2-3½ lines thick near the base, slightly flattened-subterete or trigonous-subterete, the larger leaf being less convex on the face than the smaller one, and its edges rather more distinct, sometimes slightly keeled on the back at the apical part, apex obtuse or bluntly pointed; surface smooth, velvety to the touch from being covered with a very minute, hoary, addressed pubesence, the hairs pointing downwards; when at rest naturally the leaves are pressed together, but when growing
(at least, under cultivation with me) they diverge from the base and more or less recurve. Flower solitary, terminal, with a new growth on each side of its base. Pedicel 6-10 lines long, l½-
line thick at the upper part, slightly narrowing towards the base, angular and together with the calyx velvety-suberulous like the leaves. Calyx subequally 6-lobed; lobes 2½-3 lines long and l½-
line broad, ovate, subacute or obtuse, keeled on the back two of them with membranous margins. Corolla apparently about 8-9 lines in diameter; petals numerous, free, in about 2 series, 3-3½ lines long, 1/2-5/8 line broad, cuneately linear, obtuse, apparently mag-
enta ("red" according to Dr. Muir). Stamens numerous, erect, about l½ line long, white; filaments hairy at the base. Stigmas 6, con-
ivent erect, about ½-line long, subulate acute. Fruit not seen.

Riversdale Division: In the Klein Karoo, at 1,000-1,300 feet above sea-level, flowering in September and October. Muir, 3928.
This interesting species at first sight is quite unlike the other known members of the genus Gibbaeum on account of the leaves being free for a great part of their length, and divergent when growing, but its flowers and pubescence demonstrate that it belongs to this genus. It was discovered by Dr. J. Muir in 1923 and sent to Mrs. Bolus, who described it as above-quoted, but without indic-
ating its true affinity. Dr. Muir informs me that in South Africa "It is a silvery, often depressed, somewhat scrubby undershrub, often with decumbent or spreading branches, and grows on flats and hillides from 1,000-1,300 feet. It occurs partly on the quartz fields and partly on the adjoining Bokkeveld shales in the Klein Karoo, flowering copiously in September and October.

From Dr. Muir's account it would appear that it attains to the height of an undershrub in South Africa; with me, however, the plant of it I received from Dr. Muir is prostrate, and only attains a height of about 2 inches above the ground. In this country also, as the growths take place in the colder and more sunless part of the year, two or even three pairs of leaves are present at the same time on the growths, as there is no sun heat to dry up the old leaves.

C. dispar, N. E. Br. in The Gardener's Chronicle, 1926, vol. LXXIX, p. 215, Fig. 105B. -- Pedicel 1-2 lines long. Calyx sub-
equally 6-lobed, lobes about 2½ lines long, two of them keeled and green, the other four flat, broadly oblong and with membranous margins, rounded at the apex. Corolla 12-13 lines in diameter, fully open from 10.30 in the morning, according to Dr. Muir; petals in one series, about 5-5½ lines long and ½-1 line broad, linear, ob-
tuse, intense pink, with the median line very faint or absent (ex Muir). Stamens numerous, 2-2½ lines long, filaments not hairy at the base, white; anthers yellow. Stigmas 6, finally 2½ lines long, erect, filiform-subulate. Ovary flattish at the top.

This completes our present knowledge of this plant, the above description being made from flowers of the type. Muir 3797; sent to me by Dr. Muir.

C. geminum, N. E. Br. in The Gardeners' Chronicle, 1922, vol. LXXXI, p. 129, Fig. 64f. and vol. LXXIX, p. 215. -- Dr. Muir informs me that this species "forms mats on carpets up to several feet in diameter, and is found most commonly on the flats in clayey soil, also often in brackish places. Less common in gravelly places on the shales away from the quartz fields."
G. Shandii, N.E.Br., in The Gardeners' Chronicle, 1922, vol. LXXI, p. 129, fig. 64. D.E.; and vol. LXXIX, p. 235.—I am now able to add a description of the flowers of this species made from dried flowers sent to me by Dr. Muir:—Pedicel 7-8 lines long and together with the calyx minutely puberulous like the growths. Calyx subequally 6-lobed; lobes about 2 lines long, two of them keeled, the others flatter, oblong, obtuse, with narrow, membranous margins. Corolla 9-11 lines in diameter; petals in one series, about 3½-4 lines long and 1/3 line broad, linear, apparently acute, "deep pink, with a darker median line from base to apex", ex Muir. Stamens numerous, collected into a cone 1½ line long; filaments not hairy at the base, "of the faintest flesh colour; antheres yellow." Stigmas 6, about ½ line long, shortly subulate, acute, greenish, connivent in the flower seen, but perhaps spreading in older flowers. Top of the ovary flattish.

Ladismith and Swellendam Divisions: In the Klein Karoo, Muir, 3815.

Dr. Muir informs me that in nature this is a smaller species than G. pubescens, that it "does not glitter in the sun and occurs it in quite different localities usually." "G. pubescens is a larger, finer shrub, glittering silvery and always on the quartz field. G. Shandii is much smaller, drab and somewhat dirty-looking, and prefers the stony broken Bokkeveld shale areas, which are mostly dark brown. G. pubescens has as a background the white quartz fields which make the eyes ache. G. Shandii a dark ugly, stony background. You can distinguish them in a fast travelling motor without getting down." Since these two plants are so easily seen, as they form "little, mound-like clumps dotted over the country," their colour resemblance to their surroundings cannot be in any way protective, therefore their must be some other explanation of it than the one of "protective resemblance," which is usually applied to such resemblances. Can it be that there is some unknown physical action brought to bear upon the plants by the reflection of light from their surroundings that causes them to be somewhat similarly coloured? The colouration of G. Shandii and G. pubescens in my greenhouse is hardly distinguishable and much greener than in nature.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.
(Continued from page 430, Vol. LXXXI.)

RHINEPHYLLUM, N. E. Br.

92

Stemless, perennial, succulents; night-flowering. Leaves opposite, in 1-2 pairs to a growth under natural conditions, but in several pairs to a growth under cultivation, thickened upwards or clavate, obtuse, flat on the face, rounded or keeled on the back, rough from being covered at the upper part with small, hard, white pimples. Flowers solitary, terminal, pedicellate, bractless. Calyx subequally 5-lobed nearly down to its union with the ovary, with the basal part hemispherical. Corolla closed during the day, expanding in the evening or at night, fragrant; petals in one series, free, scarcely longer than the calyx-lobes. Stamens numerous, erect from an incurved base, and numerous, erect from an incurved
92 base, and the inner densely bearded there. Stigmas 5, ascending-spreading, subulate, somewhat plumose. Ovary inferior, shallow, slightly elevated at the central part on the tor, and with the margin (disk) also raised, 5-celled, with the placentas on the floor of the shallow cells. Capsule small, shortly oboconical, flat on the tor, with the stures slightly raised and gaping, with 5 valves and cells; valves deltoid, reflexed when expanded; expanding-keels as long as the valves, contiguous into a central keel throughout, with broad membranous marginal wings that, are not united in pairs between the valves; cells open, without cell-wings or tubercles. Seeds numerous in each cell, globose-ovoid, slightly compressed, with a nipple at one end, smooth.

Species 2, R. Muiri being the type of the genus; native of Karoo region of South Africa.

The name is derived from the Greek, rhine, a file and phyllon, a leaf, in allusion to the rough surface of the leaves.

In habit this genus somewhat resembles that of Titanopsis, Schwant., and Pseammophora Schwant., but the structure of the flower and fruit is quite different, and more closely related to that of Delosperma, N.E.Br., from which it differs in habit, in flowering at night, in its firm and rough (not soft and papulose) leaves, absence of staminodes and shallower cells of the ovary.

My diagram of the floral structure (Fig. 39) is made partly from a living flower of R. Muiri that never fully expanded, and partly from dried flowers sent to me with the living plants by Dr. Muir.

1. R. Muiri, N.E.Br. (Fig. 39).—Plant varying from $\frac{3}{2}$-1½ inch in height. Rootstock stout, fleshy, producing several tufts of leaves at the top, forming a small clump. Leaves ascending or ascending-spreading, 5-14 lines long, 2-5 lines broad and 1½-3 lines thick at the apical part, tapering downwards to a much smaller base, trigonously clavate, obtuse or bluntly pointed, flat on the face, with sharp edges, very rounded and scarcely keeled on the back on South African plants, becoming slightly keeled (especially at the apex) under cultivation; surface glabrous, smooth on the lower half and the upper half covered with very small and slightly raised, hard, white pimpluses, and the edges sharply defined by a continuous, hard or cartilaginous line, the ground colour of the leaf being green or purplish. Pedicel terminal, bractless, about 6 lines long, about 1 line thick, glabrous. Calyx glabrous, dull green, tinged with purple, basal part somewhat hemispheric, but narrowing into the pedicel and about 4 lines in diameter; lobes 3-3½ lines long, 1½-2 lines broad at the base, thence gradually tapering to an obtuse and slightly hooded apex. Corolla about 8-9 lines in diameter (but not seen fully open), expanding (according to Dr. Muir) after 6 P.M., and seen to be open until 1.15 A.M., but closed when inspected at 3.30 A.M., during the same night, closed during the day, fragrant; petals about 3½, in one series, 2½-3 lines long and $\frac{1}{2}$-line long, linear, obtuse, pale lemon yellow or white. Stamens numerous, erect from an incurved base, about 2½ lines long, the filaments of the inner series densely bearded at the base, white, anthers pale yellow. Disk apparently entire, but could not be properly examined without destruction of the only living flower seen, yellowish-green at the margin. Stigmas 5, ascending, shorter than the stamens and about 1½ line long, subulate and somewhat plumose, yellowish-green. Top of the ovary green. Capsule, when closed, 2½ lines in diameter,
93 brown outside; when expanded, 4 lines in diameter and entirely ochraceous inside, otherwise as described under the genus. Seeds about 1-line long, globose-ovoid, slightly compressed, smooth, very pale brownish, with a darker point.

Ladismith and Swellendam Divisions: In various parts of the Klein Karoo, growing on the quartz-fields and on the Bokkeveld shales, at an altitude of 1,500-2,000 feet, flowering in March and October to December, not common, Muir, 3,790, 3,884, 4,023.

This very distinct little plant is another of Dr. Muir's discoveries, and he informs me that it "closely resembles the Bokkeveld shales on which it grows" so that it is probably not easily discoverable.

2. R. Pillansii, N. E. Br. (Fig. 40).—Habit exactly as in R. Muiri. Leaves in 2-3 pairs to a growth, ascending-spread, 6-9 lines long, 3-5 lines broad and 2-3 lines thick at the apical part, where the leaf is dilated and much thicker than at the base, somewhat spathulately clavate, obtuse, flat on the face, with the edges very sharp and without well defined or cartilaginous edges or edges formed of contiguous white dots, rounded on the back; surface glabrous, thickly covered nearly all over with slightly prominent hard, whitish dots on a vivid, slaty-green ground. Flowers and fruit not seen.

Leingsburgh Division: Near Matjesfontein, growing upon slate-coloured shales, Pillans.

This species differs from R. Muiri by its leaves being more abruptly dilated at the apical part, rather more obtuse, without well marked, cartilaginous edges, and by their peculiar and rather vivid slevt-green colour. Mr. Pillans informed me that it so well simulated in colour the shales it grew upon as to be difficult to detect.

Fig. 40 is from a photograph of the plant sent to me by Mr. Pillans, taken by my daughter about four months after it was received.

N. E. Brown
(To be continued.)

LESEMBRYANTHEMUM.
(Continued from page 93.)

ARGETA, N. E. Br.

113 A very dwarf and practically stemless succulent perennial, forming tufts or clumps of many small growths on a firmely fleshy central root-stock. Leaves opposite, united at the base, 1-2 pairs to a growth, without internodes between the pairs, short and thick, flat above, keeled on the back at the top, firm, smooth, whitish or whitish-green. Flowers solitary, terminal, but at the side of the new pair of leaves, appearing sessile, but with the short pedical included between the bases of the old leaves, bractless. Calyx unequally 6-lobed nearly down to its union with the ovary, the two lateral lobes longer than the other four, laterally compressed, acutely keeled on the back and the keel continued downwards to a slight wing. Petals free, lax, in 1-2 series. Stamnodes numerous, erect, with recurved tips, surrounding the stamens, filiform, acute. Stamens numerous, erect, in a central
113 column. Stigmas 6, ascending or erect, filiform, shorter than the stamens. Ovary inferior, shallow, flat at the top, 6-celled; placentas on the outer wall of the cells. Capsule shortly obconic and rather shallow, compressed below and narrowly winged on each side, six-valved, with the sutures between the valves on the top slightly raised and slightly gaping; valves spreading or recurved when wetted, deltoid and as broad as long; expanding-keels contiguous at the base, then diverging,

114 with broad, membranous, marginal wings; cells flatly roofed with transparent, membranous, flexible cell-wings, without a tubercle at the opening. Seeds many in a cell, ovoid, pointed at one end, smooth brown.

The only known species is a native of the Klein Karoo, in South Africa.

The name is derived from the Greek, argoeta, chalky, in allusion to the whitish colour of the plant. Although I have had it in cultivation for two years it has not flowered with me, so that I am unable to give a proper diagram of its floral structure.

A. netreensis N.E.Br. (Fig. 52).-- Clumps 2-4 inches or perhaps more in diameter, and 1 1/2-1 1/2 inch high. Leaves as described under the genus, ascending or diverging, mostly 3-5 but varying from 2-9 lines long, 2 1/2-6 lines broad and 2 1/2-4 lines thick, flat or slightly convex on the face, which is deltoid-ovate or triangular in outline, with sharp edges and acute or obtuse at the apex; in side view rounded at the apex, keeled on the back. Calyx rather compressed and acutely 2-edged, the two lateral lobes 2-2 1/2 lines long, or possibly longer when alive, laterally compressed and acutely keeled down the back, the other four smaller and 1 1/2-2 lines long, keeled on the back and with narrow, membranous margins, smooth, and of the same texture and colour as the leaves. Corolla about 9-12 lines in diameter; petals about 30, in 1-2 series, lax, 4-5 lines long and 1/3-1 1/2 line broad, linear, obtuse at the apex, reddish according to Dr. Muir, but appearing to be of a rich rosy colour in the dried flowers seen. Stamens erect, 1 1/2 line long; filaments not bearded, surrounded by erect filiform staminodes, which are longer than the stamens and recurved at the tips. Stigmas 6, erect, 1 line long, filiform, greenish (?). Ovary flat at the top. Capsule as described under the genus, 2 1/2 lines in diameter when closed, and about 4 1/2 lines in diameter when expanded; valves cream-coloured inside; expanding-keels dark orange-brown; marginal wings colourless. Seeds about 1/3 line long, smooth, brown.

Riversdale Division: On hills in the Klein Karoo, growing among white stones, on Bokkaveld Shales at an altitude of 1200 feet Muir 3622 feet.

Described from living plants and dried flowers supplied to me by Dr. J. Muir, who first discovered it, and who informs me that this neat looking little plant grows among white quartz stones that are blinding in the glare of the sun and conforms so closely in general appearance to the stones it grows among that its presence is not easily detected until the eye has analysed its surroundings and discovered that plants as well as stones are present on the ground, and when that is once realised the person finds that he "has been walking over and upon the plants at every step, and becomes astonished at two things; firstly, that he has not noticed the plants at first, and secondly that he had noticed them at all." Under cultivation with me, this plant has become much greener than when first received.
Fig. 52 is from a photograph of the plant as it grows in South Africa, about two-thirds its actual size, taken by Mr. R. A. Dyer, to whom I am indebted for permission to make use of it.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.
(Continued from page 92.)

CONOPHYTUM.

228

Conophytum elegans, N. E. Br.--This name must replace that of Lithops marlothii, N. E. Br. in The Gardeners' Chronicle, 1926, Vol. LXXIX, p. 102, f. 52, for having now flowered with Mr. T. Endean (who has very kindly sent his plant for me to see), it proves to be a Conophytum. When first sent to me, the flat top, its curious, window-like structure and the fissure right across it was so like that of Lithops that I fell into the error of placing it in that genus. The flower, however, is that of a Conophytum; it is 8-9 lines in diameter, pure white, with a ring of scale-like yellow staminodes at the mouth of the 4-line long tube. The stamens are seated low down in the tube, but above the stigmas. The flower opens only in bright sunshine and is not scented. Another synonym of this plant is Ophthalmophyllum marlothii, Schwantes in Moller's Deutsch Gart. Zeit., 1927, p. 64. The specific name Marlothii cannot be retained for it, as that name has already been used for a Conophytum.

C. frutescens, Schwantes in Moller's Deutsch Gart. Zeit., 1927, p. 123, is a synonym of C. cauliferum, N. E. Br. The differences mentioned by Schwantes to separate them are only non-specific individual features.

Cleretum, N. E. Br.

This genus was published in The Gardeners' Chronicle, 1925, Vol. LXVIII, p. 412, but has recently been redescribed under the synonymic name of Dorotheanthus by Schwantes in Moller's Deutsch Gart. Zeit., 1927, p. 263. The species are: C. anetaleum, N. E. Br. (Mesembryanthemum anetaleum, L.); C. criniflorum, N. E. Br. (M. criniflorum, L. Dorotheanthus criniflorus, Schwant)—this is the type of the genus Cleretum; C. gramineum N. E. Br. (M. gramineum, Haw., Dorotheanthus gramineum, Schwant.); C. papulosum, N. E. Br. (M. papulosum, L.); C. pinnatifidum, N. E. Br. (M. pinnatifidum, L. f.); C. puberulum, N. E. Br. (M. puberulum, Haw.).

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.
(Continued from page 228.)

FENESTRARIA, N. E. Br.
As the two species of this genus can scarcely be distinguished by their leaves, and as they have now both flowered in Europe, the following brief descriptions of their flowers may be useful for discriminating them until more complete descriptions can be given at a later date.

F. aurantiaca, N. E. Br.-- Corolla $2\frac{1}{2}$-3 inches in diameter; petals about 50, in one series, 12-15 lines long, and 1 line broad, obtuse, of a somewhat orange-yellow with a pinkish tinge on the back; shining. Stigmas very plumose, white.

This beautiful species is the type of the genus.

F. rhopalophylla N. E. Br.-- Corolla $1\frac{3}{4}$-1 inch in diameter; petals about 35, in one series, 8-9 lines long, $\frac{1}{2}$-1 line broad, obtusely pointed, white. Stigmas filiform, acute, not plumose, pale yellowish-green.-- Mesembryanthemum rhopalophyllum, Schlect and Diels in Schultze, Aus Namaland und Kalahari p. 83, with fig. and p. 692; Marloth, Flora of South Africa, Vol. 1, p. 207, t. 52.

Both species are natives of Namacualand.

N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM,


(Continued from p. 263.)

12.--GLOTTIPHYLLUM, HAW.

Very dwarf succulent perennials branching close to the ground. Leaves 4 or more to a branch or division of the plant, opposite; crowded or very closely placed, usually three to several times as long as broad, but in a few species occasionally not much longer than broad under natural conditions, those of each pair subequal or unequal in size, and usually with the terminal part of one leaf different in shape from that of the leaf opposite to it, either arranged in two rows or the alternating pairs crossing one another; thick, soft and pulpy in substance, green, rarely whitish-green or brownish tinted, without dots, or in some species pellucid-dotted.

Flowers solitary (see Fig. 113, showing structure) lateral, large, bractless. Calyx 4 (in one doubtful species, 5)-lobed down to its union with the ovary, often angular. Petals numerous, free or slightly united at the base, cuneately linear. Stamens numerous, erect, no staminodes. Stigmas 7-11, radiating or ascending, stout, plumose; style none. Ovary partly superior, convex or flattish on the top, 7-11 celled; placentas down the centre of the outer wall of the cells.

Capsule convex or flattish-convex on the top, with 7-11 valves and cells; each valve with a pair of expanding keels half as long as itself, ending in fine, awn-like points, without marginal wings; cells roofed with rigid cell-wings and their opening nearly closed by a large tubercle. Seeds small, ovoid, with a small nipple at one end.-- Haworth, Rdv. Fl. Succ., p. 103 (1821), and N. E. Brown in The Gardeners' Chronicle, 1921, Vol. LX, p. 311.

Species 26 or more, so far as known all natives of the souternmost part of Southern Africa, between Cape and Albany divisions, extending inland so far north as Prince Alber division. The type
The name is derived from the Greek glottis, a tongue, and phyllon, a leaf, in allusion to the long, tongue-shaped leaves of several of the species. I believe that the species of this fine genus are not particularly sought after by those who are interested in this group of plant, because it so often happens that those that are obtainable, although provided with many different names, are found to be so much alike as to evoke but little interest from the cultivator. I think there are three reasons for this, as follow:— (1) Those who are able to name these plants from books, usually use Salmiyck's fine figures for that purpose, but as I have repeatedly stated, the names therein given are often very untrustworthy, as it seems that the names in that work are usually accepted as correct without the slightest investigation of their authenticity, plants named by means of those fine figures are very frequently wrongly determined, and as the same species is sometimes figured in the work under two or three names, it is easy to understand how different persons naming the same plant from that book may impose different names upon it. (2) Heworth, apparently unaware of the variability of these plants, described mere forms of one plant as distinct species. (3) There are, in reality, a number of perfectly distinct species of this genus in South Africa, many of which have been introduced into cultivation and described and figured. Most of them increase slowly by budding and therefore are more seldom propagated by that means than by seeds, and it is by means of seeds that many (perhaps most) of the cultivated plants are distributed. Now, as many of them require to be cross-fertilised to produce seeds, and as it would often happen that only one plant of a given species (especially if it is uncommon) would be in any particular collection, it is easy to understand that hybridisation would frequently occur. So that it appears to me that what has happened is this: the original species died out of cultivation, but plants raised from seeds produced by it survived, but were really hybrids, and these again and again producing seeds by hybridisation to which the same name or names have been given, have resulted in a lot of hybrids, similar in appearance but bearing different names, being distributed among cultivators at the present day. It is now quite difficult, if not impossible, to obtain several of the original species true to name from cultivators in this country or on the continent. For example, I find cultivated in Kew Gardens the following species of Glottiphyllum that have been received from various collections in this country and on the continent under the following names as species of Mesembryanthemum:— G. longum has been received under the names of M. lucidum, M. bigibberatum and M. Salmii and G. latum has been received under the names of M. bigibberatum, M. angustum var. heterophyllum, and M. longum var. decline.

Those which I believe to be hybrid forms appear to me to be hardier than some of the true South African species, of which I possess about fourteen distinct kinds, some of which are rather delicate, requiring careful treatment under cultivation. An account of all the known species was given by me in The Gardeners' Chronicle, 1921, Vol. LXX, p. 327 and 356, and 1923, Vol. LXXI, p. 9 and 22. Since that time, however, I have received some new and old species from Mrs. Bolus, Mrs. Van der Bijl, Dr. Marloth and Dr. Muir, and with the aid of these I have restudied
the described species afresh, and although in the main my conclu-
sions remain the same with regard to synonymy, I have made some
important modifications in consequence of the greater amount of li-
vling material I have been able to examine, and more especially on
account of some very important information I have received from
Dr. J. Muir concerning these plants.

Dr. Muir has made the very interesting discovery that under
natural conditions some (perhaps most) of the species exist in two
different forms that are connected with each other by a series of
intermediate form, so that although the two ends of the series are
very different in general appearance they cannot be distin-
guished as distinct varieties. Dr. Muir states: "At one end of the series
is a harder, smaller and darker green plant, often with some tinge
of brown or red, with less juice; at the other a lighter green,
softer and much larger form. They may both equally well bear flow-
ers, and the smaller form seems a complete example therefore. In
the same locality both may be found, the smaller, harder type in
more exposed and on shallower soil, for example, on a flat rock or
where there is less moisture. The softer, juicer form further away,
under the shelter of a shrub, in deeper soil or where moisture is
retained longer. Sometimes the harder, smaller form seem merely
younger. In cultivation (in South Africa) the harder form gradually,
even after a year or two years, seems to change into the other form.
But the harder form is more resistant to climatic changes; for
example, frost congeals the juices of the softer form, which dies,
whilst the harder form survives (see also a note under G. latum).
The bevelling and hooks at the ends of the leaves of some species
exist in miniature in the harder form and are therefore often not
so noticeable as in the more juicy forms. My specimens of G.
Muirii, of which I had both extreme forms, and of which the smaller
and harder form had remained as such since 1924, has now (June 1926)
during the past few weeks undergone a change and become greener and
juicer and are quickly assuming the other form.

An illustration of these two extreme forms is given in Fig. 132,
reproduced from The Gardeners' Chronicle, 1921, Vol. LXX, p. 227,
where I thought the plant might be G. pustulatum, which I had not
then seen, but noe that I know that species, I find it is distinct
and I have named the plant figured G. erectum. A there called at-
tention to the remarkable difference between the plants represented
growing together in the same pot and raised from seeds taken from
the same seed-pod, but did not then understand the significance of
it. Dr. Muir's discovery throws light upon it, but does not com-
pletely explain the reason for it. At the present time both the
plants represented in Fig. 132 are indistinguishable from one another.

Did one of the plants obtain most of the water supplied to that
pot at the expense of the other plant and so partly starve the lat-
ter, or is there some other explanation? At any rate, Dr. Muir's
discovery clearly supports the view it will be found I have taken
under G. latum, that all the figures of Salm Dyck's that I have
quoted under the species that its variety cultratum represent only
individual forms of one and the same species, especially as it is
confirmed by the fact that in my own green house one plant of
G. latum is actually transforming itself into the variety cultratum,
but whether it will perpetually retain the curvature of its leaves,
by which alone that variety is distinguished from typical G. latum,
remains to be seen.

Dr. Muir believes (and in this I quite agree with him) that
the early botanists, who did not know of this variation, were misled
291 into mistaking the various forms a single species may assume for
distinct species, and adds in a letter: "The whole question of
this variation seems regulated by laws acting consistently and
regularly, and the different forms do not occur with the bewilder-
ing arbitrariness which must appear to exist to one in Europe".

That the variation of the species of this genus under natural
conditions has caused and will still cause difficulty in recogni-
sing whether any given plant imported into Europe is a distinct
species or a variety of another is very evident and certain.
Even during the past year I have been utterly deceived in the case
of plants received from Dr. Muir of G. fragrans and G. pustulatum,
whose leaves were so different from those of the plants known to
me by these names that I at first made descriptions of them as
being new species, and am quite sure that any other botanist or
cultivator who had no knowledge of the variation extant in these
species would have likewise considered them to be distinct, I
therefore direct the notice of cultivators to the sketches of the
leaf variations (to appear later) I have made under these two
species and call attention to the notes made under those and other
species.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM
(Continued from page 291)

I am of opinion that this genus has been much neglected by
collectors in South Africa. It is very probable that several more
species remain to be discovered, and as the localities of most
of the old species are unknown, it is desirable that they should
be rediscovered and their natural habitat made known, as well as
information obtained as to the amount of variation that exists
among the different species in their native habitats.
According to information received from Dr. Muir, the species
of Glottiphyllum grow in: "all sorts of places; among gravel,
stones, under shrubs and in the open, on thin soil covering
rock-slabs and in deeper soil, rarely in rock-crevices." Under
cultivation, I find that several species will endure great drought
well.
The determination of the species of this genus from descrip-
tions alone is a very difficult matter, therefore, to aid cultiva-
tors to identify them, I have made and added sketches of the leaf-
tips of most of the species, from living plants, where possible,
the tips of both leaves of a pair being represented, as I find
that the character of the leaf-tip taken in conjunction with that
of the flower very satisfactory for identification purposes; and
it is hope that used in conjunction with the key to the species,
these sketches will enable cultivators to correctly determine
most of them, but the descriptions should be consulted as well.
Hybrid forms, of course, cannot be named by their use. Further,
I would also point out that as most of the figures and descriptions
are made from plants cultivated in Europe, they may not quite co-
incide with native South African specimens as, for example, I
have been able to indicate in the case of G. fragrans, where it
will be seen that the small ovate leaves of a native-grown plant
are utterly different from that of the cultivated flowering plant
that will also be figured; yet under cultivation the leaves gradually pass from the simple ovate form into the other forms. With reference to the names of these plant I would again repeat that where determinations are made by means of the very fine figures of Selm Dyck's work on *Esembrantheum* and the erroneous names he has applied to those figures -- accepted as being correct without investigation (as all monographers have hiterto accepted them), confused nomenclature will certainly be maintained.

As the synonymy of this genus is exceedingly complicated I give at the end a synonymic index for the purpose of reference.

In the diagrammatic illustration of the generic structure (given on p. 290) the top of the ovary is represented as but very slighly depressed at the centre. The amount of depression, however, varies with the species, for in some species the stigmas are inserted at the bottom of a deep, cup-like depression in the top of the ovary.

Most of not all of the species of this genus are very minutely ciliate on the edges and keel of the young leaves, a character so common that of the young leaves, a character so common that I have not mentioned it in all the descriptions. The epidermis of the leaves of many species has a somewhat remarkable surface. To the naked eye and to the touch the leaf seems to be very smooth and is often shining, but if examined with a strong pocket-lens, with light falling upon it in a certain way, the surface-cell (or many of them) will be found to be raised and linear or oblong and arranged in rows transverse to the leaf. In some species, however, such as in *G. linguiforme*, the surface-cells are not at all raised in that way, but are even all over the surface. I am aware that this does not give full detail of the surface-cell structure, but it will suffice to make my meaning clear to the average cultivator armed only with an ordinary pocket-lens.

Several species in an adult state have their growths pressed upon the ground, with the leaves edgways to the sky, but in the younger stages, or when not fully exposed to the sun in the open air, the leaves are generally more or less ascending so that this character cannot be relied upon as being always of specific value.

In my former account of this genus I gave the date of Haworth's Observations on the Genus *Esembrantheum* as being 1794; that is the date on the title-page, but I find that the book was issued in two parts, the second part, which contains all the descriptions, being dated 1795, as hereafter quoted.

**KEY TO THE SPECIES.**

This key to this very difficult genus is the best I have been able to construct from the material available, and may not always prove satisfactory, as I find that the same plant sometimes varies considerably from year to year, and I have not been able to provide for all variations, as some species are very versatile; but would here not that the hook at the end of the leaf is sometimes absent from leaves of species that normally possess it, and the pustule at the base of the leaves of certain species sometimes disappears from starved plants; and also in some species the leaves may now be in two ranks, and at another time the pairs obliquely cross one another.

1. Flowers with distinct pedicels 1/4-2 1/2 inches long.

Flowers sessile or subsessile, i.e., with pedicels not rising above the leaf-sheaths or not more than 1-2
2. Leaves with two teeth or a slight hump on the flat face, and not more than 3-4 lines broad at the middle.

Leaves without teeth or a hump on the flat face, but often with an oblique or slightly hooded ridge or hook at the end or the flat or concave face.

3. Pedicels quadrangular, 3-4 lines long.

Pedicels terete or 2-edged, 6-12 lines long.

4. Leaves 2-3 lines broad at the middle and the leaf-pairs crossing one another at right-angles; pedicels 1½-2½ inches long; calyx 5-lobes (in all other species 4-lobed).

Leaves mostly 3-6 (but sometimes up to 7) lines broad at the middle, broader at the base, and, except in 10, G. arnculatum, ncllucid-dotted as seen when held against the light, and the leaf-pairs more or less obliquely crossing one another.

Leaves 6-12 lines broad at the middle and usually arranged in two ranks (except in 5, G. cruciatum and 23, G. suave, but sometimes even on the same individual the pairs more or less obliquely cross one another and except in 5, G. cruciatum, not pellucid-dotted.

5. Leaves, mostly 3-5 inches long, ascending except when old, and of nearly the same breadth throughout, or tapering at the upper part, the larger of each pair slightly concave on the face; pedicel 9 inches long; corolla 2-2½ inches in diameter.

Leaves 2-3½ inches long, one leaf of a pair usually more or less recurved and the other erect, incurved or spreading, tapering from the base or at the upper part to an acute or blunt point.

6. Petals subacute or obtusely pointed, entire.

Petals obtuse and minutely denticulate at the apex.

7. Apex of the larger leaf compressed into an acute edge or keeled; pedicel 1-1½ inch long and 2 inches thick.

Apex of the larger leaf beyond the flat face compressed obtusely keeled and bluntly pointed; pedicel very stout, 9-10 lines long and 3 lines or more thick; stigmas 8-9.

8. Apex of the larger leaf beyond the flat face compressed-subterete, obtusely keeled and bluntly pointed, somewhat nose-like; pedicel about 5-7 lines long and 2 lines
thick; stigmas 10.

Leaves tapering to a subacute apex tipped with a short reddish point or mucro; pedicel 5 lines long, 2 lines long, 2 lines thick; stigmas 8.

9. (From 4; leaves 6-12 lines broad at the middle.) Leaves with a pustule or swelling at the base on the upper side that is usually of a paler colour than the rest of the leaf, but is at times indistinct.

Leaves without a pustule or swelling at the base.

10. Growths and leaves erect or ascending; leaves 2½-5 inches long, strap-shaped, narrowing at the upper part to an acute or obtuse apex that is tipped (at least when young) with a central, short point or mucro; pedicel 1½ inch long and 1 line thick; corolla 2-2½ inches in diameter; petals obtusely pointed, entire; stigmas 8.

Growths and leaves ascending or more or less depressed towards the ground; leaves strap-shaped, very obtuse and with or without a small point at the end of the upper edge, or occasionally slightly hooked or obliquely pointed at the apex; pedicels 1½-1¾ inch long, 3 lines thick; corolla 2-2½ inches in diameter; petals acute; stigmas 10-11.

16, longum

Growths decumbent or prostrate; leaves directed forwards and downwards, the larger leaf of each pair with a very large incurved hook at the apex and with an elevated ridge along one margin of the concave face; pedicels 3-7 lines long, 3-3½ lines thick; corolla about 2 inches in diameter; petals obtuse; stigmas 8-9.

16, longum var. hamatum

N. E. Brown
(To be continued.)

MUSEUMS
(Continued from page 349.)

KEY TO THE SPECIES.

369

11. Leaves tapering to an obtuse point at the apex and the pairs more or less obliquely crossing one another, pellucid-dotted as viewed against the light; pedicel very stout, 9-10 lines long and 3 lines or more thick; stigmas 8-9.

Leaves tapering to an obtuse or subacute apex, the pairs in two ranks or set slightly oblique to another, very indistinctly pellucid-dotted, one of each pair slightly concave on the face; pedicel 9 lines long; corolla 2-2½ inches in diameter.

5, cruciatum

11, concavum
Leaves obliquely obtuse, broadly rounded or subtruncate at the apex, with or without a small point or mucro at the end of the upper edge, usually arranged in two ranks, not conspicuously pellucid-dotted.

12. The larger leaf of each pair shortly incurved-hooked or slightly hooded at the apex; pedicel 6-9 lines long; corolla 2 inches in diameter; petals acute; stigmas 10. 14, uncatum

The larger leaf of each pair not incurved-hooked at the apex, all leaves widely spreading, straight or more or less curved or bent down towards the ground, 1½-4 inches long, strap-shaped; pedicels 3-9 lines long; corolla 1½-2½ inches in diameter; petals acute; stigmas 9-10. 21, latum and var. 23, suave

Leaves not widely spreading, more or less directed forwards, with the pairs obliquely crossing one another, 1½-2 inches (or perhaps more) long, 8-12 lines broad, usually with parallel sides; pedicels 9-6 lines long; corolla 2½-3 inches in diameter; fragrant; petals somewhat acute or obtuse, entire; stigmas 8.

Flowers sessile or subsessile. To the end of Key.

13. Leaves 3-6 lines broad at the middle, but often broader at the base; leaf-pairs obliquely crossing one another.
Leaves 6-18 lines broad at the middle. 16

14. Leaves with a pustule or pallid spot at their base on the upper side, gradually tapering from the base to an acute apex; petals obtuse and minutely toothed at the apex; stigmas 8. 7, Salmii
Leaves without a pustule or pallid spot at their base. 16

15. Leaves subterete and slightly flattened on the face or semiterete, 2-3 inches long, erect or ascending and curved; corolla 2-3 inches in diameter; petals very obtuse and notched at the apex; stigmas 7-8. 1, arrectum
Leaves semiterete, 3-4 inches long; corolla 3-4½ inches in diameter; petals united at the base for about a quarter-of-an-inch and up to 2 lines broad; stigmas 10. 12, angustum

Leaves tapering from the base or narrowing from above the middle to an acute or subobtuse apex, which is tipped with a short whitish or reddish point or mucro, and the pairs obliquely crossing one another, pellucid-dotted; keels of the calyx-lobes minutely ciliate; stigmas 8-10. 9, praepingue

16. (From 13; leaves 6-18 lines broad at the middle; to end of key). Leaves with a pustule or pallid spot at their base on the upper side; petals obtuse and minutely
Leaves without a pustule or mark at their base on the upper side.

17. Leaves tapering from the base to an acute apoint, and the pairs more or less crossing one another; corolla 2½ inches in diameter; stigmas 8.

Leaves strap-shaped, with parallel sides and an inch or more broad, arranged in two ranks; corolla 3-4 inches in diameter; stigmas 9.

18. Leaf-pairs obliquely crossing one another, 12-3½ inches long and 5-9 lines broad, yellowish-green or light green, pellucid-dotted; stigmas 8-10.

Leaves arranged more or less in two ranks and except in 8, G. Marlothii, grass-green and not pellucid-dotted.

19. Leaves tapering to the apex and all of some of them tipped with a short whitish or reddish point or mucro.

Leaves not tapering to the apex nor tipped with a short point or mucro; stigmas 8-2

Leaves very obtuse or obliquely rounded at the apex, sometimes with a minute point at the end of the straight or slightly hooked upper edge; stigmas 6-8.

20. Leaves upcurved and one or both of a pair distinctly hooked edgeways or by a slight twist at the apex (see also 22, G. depressum, in which the leaves are sometimes hooked at the tips); stigmas 8-9

Leaves obtuse or rounded and not or but slightly upcurved edgeways and not forming a distinct hook at the apex, but with or without a small point or mucro at the end of the upper edge; stigmas 7-8.

21. Leaves strongly upcurved-hooked edgeways at the apex and the large hook acute or sometimes obliquely truncate, 3-4½ inches long and 10-12 lines broad, the larger leaf of each pair with an impression of the smaller leaf upon it, forming a ridge along the margin at the middle part and an oblique ridge below the apex; corolla 3-3½ inches in diameter; petals obtuse and usually minutely toothed; stigmas 8.

Leaves uncurved edgeways or by a slight twist and slightly hooked at the apex, 2½-4 inches long and 6-7 lines broad at the middle, directed forwards and more or less deflexed, without a ridge along the margin at on the face; corolla 2½ inches in diameter; petals obtusely pointed or notched at the apex; stigmas 9.

19, Juirii

22. Leaves, in summer, opaque greyish-green or chalky green,
prettily tinged with rosy or purplish when fully exposed to the sun, or becoming green in winter under cultivation in England. 3-2½ inches long, 6-18 lines broad, sub-truncate or broadly rounded at the apex. 26, Neillii

Leaves always grass-green or light green and more or less shining. 23

23. Leaves pellucid-dotted when held against the light, mostly 2-4 inches long and 8-10 lines broad at the middle, somewhat narrowing upwards to an obtuse and often obliquely mucronate apex; stigmas 7 (or 7-9). 8, Marlothii

Leaves not pellucid-dotted, ½-3 inches long; corolla 2½-3½ inches in diameter; stigmas 6-10. 24

24. Leaves tongue-shaped, 14-18 lines broad, with the upper edge cartilaginous and very acute like the edge of a knife; surface - cells even, not raised; stigmas 10-11. 24, linguiforme

Leaves variable, 6-14 lines broad, not cartilaginous nor like a knife edge at the edges; surface with transverse rows of raised linear epidermal-cells as seen under a strong lens, stigmas 6-10. 25

25. Leaves very variable, ovate to tongue- or broadly strap-shaped, 6-14 lines broad; petals obtuse and minutely toothed at the apex; flowers very fragrant; stigmas 8-10; capsule with 8-10 gaping ridges on the top. 25, fragrens

Leaves strap-shaped, 8-13 lines broad, and of nearly equal breadth throughout. 26

26. Leaves very spreading, apparently 7-8 lines broad and not very thick, slightly curved upwards edgewise at the tips, and with a short point directed forwards at the apex of the upper edge; stigmas 10; capsule with 10 gaping ridges on the top; flowers opening only in bright sunshine. 22, depressum

Leaves directed forwards, 8-12 lines broad and 3-8 lines thick, apex variable; stigmas 8; flowers opening in sunless or sunny weather. 23, sueve

Leaves 8-13 lines broad, thick and soft, very convex on the back, very obtusely rounded at the apex, not upcurved edgewise, and with or without a short point directed and forwards on the upper edge at the apex; flowers slightly scented; stigmas 6-8; capsule convex without any ridges on the top. 20, carnosum

N. E. Brown
(To be continued.)
(Continued from page 370)

Mesembryanthemum. 390

1. G. arrectum, N. E. Br., in The Gardeners' Chronicle, 1922, Vol. LXXXI, p. 9, Fig. 5. (Figs. 178 and 179).--Leaves 2-3 (rarely 4) pairs to a growth, with the pairs crossing one another obliquely, suberect or ascending-spreading, usually more or less curved, 2-3 inches long, 3/4-5 lines broad near the base and 3-4 lines thick, more or less flattened on the upper or inner face, or semiterete, or more or less trigonous, usually without but sometimes with a keel on the back, acute or subobtuse, smooth, glabrous, light green, not at all glaucous nor dotted. Flowers subsessile or on pedicels 1-2 lines long and 1 1/2 line thick. Calyx 4-lobed; lobes 3-4 1/2 lines long and as much in breadth, broadly ovate, obtuse, all with membranous margins. Corolla 2-3 inches in diameter, cup-shaped, expanding in sunshine, scentless; petals about 50, in one series, lax, 12-16 lines long, about 1 line broad, linear, very obtuse or subtruncate and notched at the apex, bright yellow on both sides. Stamens erectly spreading in a ring; filaments pale yellow; anthers darker yellow. Stigmas 6-8, widely spreading, about 2 lines long, plumose, acute, pale yellowish-green. Capsule sub-globose, with a high dome-like top, 3-5 lines in diameter, with 7-8 valves and cells.

Swellendam Division: At Sevenfontein, Pole Evans, 6,922,
Ledismith Division: Near Adams Krool, 1,400 feet above sea level,
Muir 3,904, and near Flatbush, Muir 3,909.

Fig. 178 is from a photograph taken in South Africa by Dr.
Pole Evans of the plant sent to me as it grew there, and Fig. 179
(reproduced from The Gardeners' Chronicle, Vol. LXXI, p. 9) represents the very same plant after I had cultivated it for several months, from a photograph taken by my daughter. These two figures well illustrate the difference that sometimes occurs between these plants as they are seen in a state of rest under natural conditions and as they are seen in this country under cultivation.

2. G. difforme, N. E. Br., in The Gardeners' Chronicle, 1922, Vol. LXXI, p. 22.--Growth or branches more or less decumbent, with about 3 pairs of leaves to each and the pairs obliquely crossing one another. Leaves mostly 1 1/2-3 inches long, sometimes longer, 4-6 inch broad, semiterete, flat or slightly concave on the face, very convex on the back, and usually with, but sometimes without, a hump or tooth on each margin above the middle, the longer leaf of each pair with the apex produced beyond the flat face into a compressed acute or blunt point, and the smaller leaf simply acute or obtuse, deep green, pellucid-dotted; according to Haworth, some of the leaves have a slight twist from above the middle, and some of them are tipped with a soft, straight, curved or hooked bristle or anicus. Pedicel very short, 4-angled thickened upwards and indistinguishably passing into the calyx-tube, which together with the pedicel is represented in the figures as about 9-10 lines long. Calyx irregularly 4-angled, 4-lobed, the larger lobes sharply keeled, the smaller membranous. Corolla 2-2 1/2 inches in diameter; petals lax, in about 1 series, 9-10 lines long, 1 1/4-2/3 line long, yellow.

Mesembryanthemum difforme, Linn. S-Fl., ed. 1, p. 487, partly as to M. folis difformibus, Dillen. Hort. Eth. p. 252, t. 194, f. 242 (not 241), and Haw. Obs., p. 169 (1795) not of Salm Dyck nor
South Africa: Locality unknown, in cultivation before 1732, according to Aiton.

This species is unknown to me, and the above description is compiled partly from Haworth's original description of it, and partly from the Dillenius figure, and an original drawing of the plant in the Kew collection.

It seems to be similar to G. semicylindricum, but distinctly differs by its short 4-angled pedicel.

The two figures in Dillenius, Hortus Elthamensis, t. 194, mentioned above, were considered by Linne to represent one species, but Haworth retained the name M. difforme for Fig. 242, and gave the name M. semicylindricum to the plant represented at Fig. 241, which distinctly differs by its more terete and longer pedicels. The plant figured by Salm Dyck as M. difforme is now find is merely a form of G. semicylindricum and not a distinct species as in my former account of this species I was inclined to suppose.

N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM.


(Continued from page 390)

12--GLOTTIPHYLLUM, HAW.

3. G. semicylindricum, N. E. Br., in The Gardener's Chronicle, 1922, Vol. LXXI, p. 22 (Fig. 185).--Leaf-pairs obliquely crossing one another. Leaves very variable, 1-2 (or under cultivation sometimes up to 4) inches long, 2-4 lines broad and nearly as thick, half-cylindric, bearing on the flat face beyond the middle two blunt teeth or a transverse hump or ridge across the leaf, the apical part compressed and bluntly pointed or more or less thickened at the tip, light green, soft and pulpy, pellucid-dotted. Pedicels 1-3 inch long, compressed-terete, 2-edged. Corolla 1½-1¾ inch in diameter; petals acute or minutely toothed at the apex, and according to drawings at Kew more numerous and more crowded than those of G. difforme. Stigmas, valves and cells of the carpel 8. Capsule (of which about 20 examples have been examined) varying on the same individual from 4-7 lines, and on another plant up to 8 lines in diameter when closed, always with 8 valves and cells, somewhat cup-shaped-obconic, slightly 2-ribbed on the outside, and flattish with 8 slight, green ridges on the top, whitish-brown; when expanded 9-14 lines in diameter; valves spreading horizontally, pale brown; xantheskeels half as long as the valves, ending abruptly, without an awn or membrane at the tip, light or dark brown; cells deep; cell-wings brownish; tubercles pale brown or whitish. Seeds 1¥-line long, somewhat D-shaped, like a segment of an Orange, tuberculate on the back but not on the sides, brown.

Jansenville Division: Mount Stewart, Pole Evans, 5579. This was in cultivation before 1732.

This is one of the oldest known species in cultivation, and seems to vary very considerably in the size and shape of its leaves, as indicated in Fig. 186. In my previous account of it I was under the impression that the plant figured by Salm Dyck under the names G. semicylindricum, M. difforme and M. bigibberatum represented a different species; but in taking this view I was wrong, for last year my plant of G. semicylindricum produced leaves typical of that species and others like those of the plant Salm Dyck has figured under those three names, for as I have previously stated, those different three figures might all have been drawn from the very same individual in different years.

There can, I think, be no question that M. semicylindricum, M. bidentatum and M. bigibberatum are specifically identical, but whether this species is really distinct from G. difforme is a point that has yet to be conclusively decided. I have never seen G. difforme, as it appears to have died out of cultivation, and from the descriptions of it the only character that appears to distinguish it from G. semicylindricum is that the pedicel is shorter and quadrangular; when re-discovered possibly other characters may be found.

My drawing (Fig. 186) represents the upper part of five leaves, all from the same plant, and part of one leaf (the long, lower one) from another plant raised from seed out of the same seed-pod as that bearing the other five leaves.

4. G. subditum, N. E. Br. (Fig. 187).—Leaves unequal, the pairs obliquely crossing one another, 1 1/4-3 inches long, 4-5 lines broad, and 3-3 1/2 lines thick, the larger leaf of a pair slightly concave above, very convex on the back, the shorter of each pair acute, and the longer prolonged beyond the ridge at the end of the flat part of the face into a compressed and keeled blunt point 3/4 inch long, which is slightly incurved, and both leaves are usually curved edgewise to one side, green, pubescent-dotted. Pedicel 5-7 lines long. Calyx compressed, 3-angled, 4-lobed, with the two longer lobes keeled and ciliate on the keel, and the two shorter lobes with membranous margins. Corolla 2-2 1/4 inches in diameter; petals in 1-2 series, linear, very obtuse and minutely tooted at the apex. Stamens yellow. Stigmas 10, short, plumose, yellowish.

Mesembryanthemum praeringue, Salm Dyck, Mes., 7, Fig. 5, Berger, Mes. und Port., p. 237, and all other modern authors, but not of Haworth.

Fig. 187 represents the apical portion of two of the large and one of the smaller leaves of each pair, adapted from Salm Dyck's figure, about natural size.

5. G. cruciatum, N. E. Br. in The Gardeners' Chronicle, 1922, Vol. LXXI, p. 9 (Fig. 188).—Leaves usually pointing four ways, from the pairs obliquely crossing one another, 2 3/4-3 inches long, 7-8 lines broad, dilating to 1 inch broad at the very base, curved
unwards edgeways, flat on lightly convex, especially near the base on the upper surface, convex on the back, and one leaf of a pair produced beyond the flat surface into a stout compressed and keeled blunt point, often more or less incurved and slightly oblique or twisted, very stout, succulent and soft to the touch, green, with roundish pellucid dots of various sizes. Pedicels about 9-10 lines long and 3 lines or more thick, very stout, suberose but somewhat 2-edged, or ecuall thickness throughout. Calyx large, 4-lobed; the two outer lobes shorter than the inner, keeled, with thin edges and blunt points; the two inner longer, very broadly membraneous, not keeled. Corolla scarcely as large as that of G. difforme, ex Haworth, but according to Salm-Drck's figure nearly 2½ inches in diameter; petals "not quite so long as those of G. difforme, but broader," ex Haworth, and according to Salm-Drck's figure in 2 series, about 11 lines long and nearly 2 lines broad, obtusely pointed or subacute. Stamens very numerous, short, spreading, yellow. Stig-
mes 8-9. Capsule small for the size of the plant, tending downwards, with a hollow or novel at the top, with 8-9 grooved ridges on the tor, and with 8-9 valves and cells.


South Africa: Locality unknown; introduced by Boerhaave in 1720, according to "Aiton, and if Haworth is right in identifying it with a plant described by Boerhaave it was in cultivation before 1720."

I have not seen this plant. The above description of it is made partly from that of Haworth, partly from an original drawing of the type plant at Kew, which Aiton caused to be made of it,*

* The drawings preserved at Kew of the type plants of Mesembry-
anthemum and other genera that were described by Haworth and other authors, were made under the direction of M. T. Aiton, then Director of Kew Gardens, and Haworth evidently knew that they were being made, and undoubtedly alluded to them under M. canum, in his Miscellanea Naturalis, n. 26 (1803).

and partly from Salm-Drck's figure of it. This plate (§ 8, f. 9) is made in the Kew collection of drawings, and Fig. 188 is adapted from it, but is missing from some, perhaps most, copies of the book, which is unfortunate, as it undoubtedly represents the true M. cruciatum of Haworth, while the plant Salm-Drck also figures as M. cruciatum at § 7 f. 7 is not at all the same species, differing in its leaves and and much this more slender pedicel. I have described this latter plant as G. longipes.

H. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.
(Continued from page 409.)

12.—GLOTTIPHYLLUM, HAW.
6. G. longipes, N.E. Br. (Fig. 195)—Coward's decumbent or prostrate. Leaves 3-3½ inches long and 6-8 lines broad, flat on the face, rounded on the back at the lower part, becoming keeled and compressed at the apex which in the larger leaf of each pair is produced shortly beyond the flat face and in side view is obtusely rounded, and this leaf is incurved, while the other leaf of each pair is acute in side view and strongly recurved, smooth, green, shining, somewhat pellucid-dotted. Pedicel about 1½ inch long and 2 lines thick, terete. Calyx 4-lobed; lobes broadly ovate, two of them keeled. Corolla 2-2½ inches in diameter; petals in two series, linear, obtusely pointed, entire, yellow. Stamens numerous, yellow. Stigmas 8, plumose, yellowish.

Mesembryanthemum cruciatum, Salm. Dyck, Mes., §7, f. 7 (not 8, f. 9), Berger, Mes. und Port., p. 257, f. 50, copied from Salm Dyck, not of Haworth.

South Africa: Locality and collector unknown, stated to have been raised at Schoenbrunn from South African seeds. This species is unknown to me, and I have described it and illustrated the character of its leaves (Fig. 195) from Salm Dyck's figure and description above quoted, which, as I have explained under G. cruciatum, does not represent the true Mesembryanthemum cruciatum of Haworth.

7. G. Salmii, N. E. Br. in The Gardeners' Chronicle, 1828, Vol. LXXI, p. 9 (Fig. 196)—Leaves unequal, the pairs more or less crossing one another so as to point four ways, the outer spreading, 2½-3½ inches long, 6-8 lines broad and about 4 lines thick at the base, gradually tapering to an acute apex, but the larger leaf incurved, while the smaller leaf is acute and recurved, flat on the face, with a slight rustule at its base, obliquely convex on the back, the larger leaf of a pair where it is produced at the apex; surface smooth, glabrous, very green, with a whitish basal mark, pellucid-dotted, firm and fleshy. Flowers sessile. Calyx compressed, 4-lobed; lobes broadly ovate, obtuse, apiculate, all with submembranous edges, two of them gibbous-keeled. Corolla 2½ inches in diameter; petals in 1-2 series, cuneately linear, very obtuse and minutely denticate at the apex, yellow. Stamens yellow. Stigmas 8, plumose yellowish.

Mesembryanthemum Salmii, Haw. Suppl. Fl. Succ., p. 89 (1819) and Rev. Fl. Succ. n. 100; Link and Otto, 12. Fl. Select., p. 95, t. 44; Salm Dyck, Mes. §7, f. 8; Berger, Mes. und Port., p. 236.

South Africa: Locality and collector unknown, stated to have been raised from seed at Vienna in 1814.

Haworth (Rev. Fl. Succ., p. 199) described three forms of this plant, namely:—Var. decussaturn, by which he means the typical G. Salmii, with leaves crossing one another more or less at right angles. Var. semicruciatum, Salm Dyck, Obs. Bot., n. 12 (1820). "Leaves obliquely distichous, straight, not exactly decussate and more tongue-shaped." And Var. angustifolium, "Leaves longer and narrower," i.e. Salmii var. elongatum, Salm Dyck, Mes. under §7, f. 8.

Salm Dyck sent young plants of the varietis semicruciatum and angustifolium (the latter as var. elongatum to Kew in 1823, where drawings are made of them in that year. These drawings represent the leaves as straight and different in appearance from those represented in Salm Dyck's figure of G. Salmii, and the young leaves are very distinctly represented as being tinged with an apiculum, and I strongly suspect that these figures represent plants of G. presepigne.
No mention is made of an apiculus in the descriptions nor any representation of it in the figure of G. Salmii, so that possibly the above mentioned varieties really belong to G. praepingue or to some closely allied species.

I have not seen a living plant of G. Salmii and have adapted Fig. 196 from the figure, quoted above. In the present state of our knowledge of these plants and in view of such proofs of variation in the leaves as I am giving evidence of under G. semicylindricum, G. fragrans and G. longum, may it not be possible that G. Salmii is only a form of G. praepingue? The difference between them is that in the figure and description of G. Salmii no indication is made of theawn-like apiculus present on most of the leaves of G. praepingue, and the presence of a whitish basal mark on the leaves of G. Salmii that is absent on those of G. praepingue. More native material is needed to solve this problem.

G. Karlothii, Schwantes in Zeitschr. f. Sukkul., Vol. II, p. 242, with Fig. (1926), (Fig. 197).—Growth more or less prostrate with age. Leaves in two ranks, spreading, straight or recurving, with the tip of one leaf of each pair upcurved or hooked edgeways, 1½-4 inches long and 8-10 inches broad at the middle, broader at the base, 4-5 lines thick, somewhat narrowing upwards to an obtuse or slightly hooked mucronate apex, flattish or faintly concave on the face, convex on the back and the larger leaf of each pair obliquely keeled at the apex, which is obtuse but often (or perhaps always) tinned with a smaller point or mucro at the end of the upper edge; surface smooth but under a strong lens seen to be covered with minute raised linear surface-cells transverse to the leaf, bright green, shining, pellucid-dotted and with a row of contiguous dark spots along each edge. Flowers sessile or subsessile, fragrant. Petals rather broad. Capsule stated to be 7-9 celled in the Latin description and 7-8 celled in the German, but as figured is 7-celled.

Uniondale Division: E. roo near Uniondale, Karloth 10991.

I do not possess this species, but Mr. E. Taylor, of Southborough having obligingly lent me his plant of it for the purpose of this description, I find that it is not allied to G. grandiflorum and G. fragrans as Schwantes states, but belongs to the same group as G. praepingue. Mr. Schwantes (as Derrier and others have done) seems to accept the names as given by Salm Dyck as being correct, and therefore constantly creates confusion, whereas one has only to look at such of his figures as I have indicated under G. semicylindricum and G. latum and its variety to see that what is evidently but one species has been given several different names. Salm Dyck's figures are excellent, but as I have repeatedly stated, are often untrustworthy as to names, and so long as writers upon this group of plants persist in accepting his names as correct without first investigating their authenticity, as so long will confusion exist.

Fig. 197 is reproduced by permission of Dr. V. von Sierbeck, from the figure in the Zeitschrift für Sukkulentenkunde, by means of a photograph kindly sent to me by Mr. D. A. Naess.

R. E. Brown
(To be continued.)
9. G. praepinguin, N. E. Br., in The Gardener's Chronicle, 1922, Vol. LXXI, p. 9 (Fig. 207).—Haworth's characters for this species are:—Leaves of different shapes and lengths—recurring—some between semicircular and tongue-shaped—others narrower, longer and without any oblique curve or ridge near the points—others with subulate triangular points and ending in harmless, white bristles or short points—and a few thin broad, succumpressed-subdolabrilform, keeled points ending in short, white, bristly hairs, exceedingly fleshy, fat and soft to the touch (on which account I have named it preapinguin—"very fat"); light green, shining, faintly imbricate, whitish and shining near their inner bases or as if frosted over with exceedingly minute papillae, the young leaves minutely ciliate at the edges. Flowers nearly sessile (sessile at Rev. Fl. J., p. 95). Pedicel, if any, exceedingly short, rather angular and smooth. Calyx unequally 4-lobed; all the lobes with membranous edges and ciliate keels, two of them larger than the others, with broad, plain dilated bases, triangular points and slightly membranous edges, the other two shorter, with broad, brownish, reticulate margins. Corolla not so large as that "of my lineuforme" (i.e., 21, G. latum, "E. Br.") of long duration; petals, linear-lanceolate, broad, minutely denticate at the apex, bright yellow, shining. Stigmas erect, expanding, yellow. Stigmas 8, plumose. Capsule sessile (Rev. Fl. J., p. 95), small, with 2 blunt ridges and a large deep central hollow on the top, 3-celled.

The above characters are as given by Haworth, but arranged differently, and clearly demonstrate that the plant figured by Salm Dyck (Mes., 7, p. 5) as G. praepingue cannot be the same as that described by Haworth under this name, there being no mention made nor representation in the figure of the "bristles or short points" (i.e., what is botanically called a mucro or aniculus) at the tips of any of the leaves; the flower is very distinctly pedicillate and the stigmas 10. I have therefore described Salm Dyck's plant as distinct, see 4, G. subditum, N. E. Br.

G. praepinguin has long since died out of cultivation, but I believe that a plant recently introduced is specifically identical with that which Haworth described, since it fairly agrees with his description and is entirely different from the plant Salm Dyck and all other authors have mistaken it for. The following is a description of it compiled from four different living specimens:

Leaves with the pairs more or less obliquely crossing one another, ascending-spread, straight or curved to one side, 1-3 inches long, 5-8 lines broad at the middle, 4-5 lines thick, somewhat variable, sometimes parallel sided below and narrowing from above the middle to an acute or subobtuse point, sometimes gradually tapering from the base to an acute or obtuse apex, which is tipped with a short, whitish or brownish mucro or point that often disappears with age, and which I conceive to be the bristle or short point" of Haworth's description; flat or faintly convex on the face, often with an oblique ridge or keel near the apex of the larger leaf where the flat part ends, caused by the pressure upon it of the opposed leaf in bud; conex on the back and becoming slightly keeled or triangular at the apex of the smaller leaf or sometimes of both leaves of a pair, but in more adult growths the
apex of the larger leaf is more or less compressed and keeled, and slightly twisted to one side; substance very soft and pulpy; surface smooth, but under a strong lens seen to be covered with short, linear, raised surface-cells, transverse to the leaf, glabrous, light green, pellucid-dotted, sometimes appearing under a lens as if frosted at the basal part. Flowers sessile. Calyx in mature bud about 5 lines in diameter, acutely 3-angled, produced above its union with the ovary into a tube about 1¼ line long, 4-lobed above; lobes about 5 lines long, ovate, with membranous margins, two of themacute, and acutely keeled on the back, and the keel distinctly ciliate, and to obtuse. Corolla 1½-1¾ inch in diameter, cun-shaped, expanding in the morning even in dull weather if the temperature is sufficient, but more widely open in bright sunshine; petals 40–50, in two series, all united for about two lines at the base, 11-14 lines long, 4-line broad, linear, acute, entire, clear yellow on both sides, not shining. Stems erect, somewhat loose (this may be what Haworth means by "expanding"), entirely yellow. Corolla 8-10, spreading, 2-lines long, acute, pilose, whitish. Ovary half-superior, 8-10-celled. Capsule when closed 5-7 lines and when opened 8-11 lines in diameter, with 8-10 valves and cells: valves horizontally spreading, 2½ lines long, pallid, with dark brown, expanding-keels, half as long as the valves and diverging from the base, acute and often very minutely toothed along the top, ending precipitously under the base of a minute terminal, awn-like point or tooth, without marginal wings; cells roofed with rather stiff, brownish-cell-wings, and the opening nearly closed by a large, compresses, cream-coloured tubercle. Seeds about 2/3 line in diameter, nearly circular in outline, compressed, minutely tuberculate, dark brown.


South Africa: Locality unknown, introduced by Hassen in 1791, according to Aiton. But the plant above described as probably being the species was sent to "new Gardens by Miss Wilson as coming from Prince Albert Division. And a plant of it in my own collection was sent to me as having been collected at Klaarstroom, near the Swartberg Range, in Prince Albert Division, by Mrs. van der Dijl, 3. Mrs. van der Dijl informs me that she "found few perfect plants as the stock seem to have eaten most of the centres out."

Fig. 207 is drawn from various leaves on the plants described above, of natural size, but the epicicus represented at the apex of the leaves often disappear.

10. G. aniculum, N. E. Br. (Fig. 208).—Leaves probably about 2 pairs to a growth when resting under natural conditions, but under cultivation 3-4 pairs to a growth, with the pairs placed very obliquely or at right angles to one another, ascending-spreading and one of each pair usually slightly recurving, mostly 1 3-5 inches long, sometimes shorter, 4-7 lines broad and 1-4 lines thick at the base, thence gradually tending to a subacute apex, which is always tipped with a very short, hard, reddish point or epicicus; flat or faintly convex on the upper side, bluntly keeled down the back at the upper part and there trigonous in transverse section, with the sides convex, microscopically ciliate on the edges and epicicus part of the keel of the younger pair of leaves, the ciliate dis-
The fleshy surface cells not raised into short and minute transverse ridges but microscopically and densely papulate, as seen under a very strong lens, uniformly pellucid-green, not at all glaucous and not pellucid-dotted. Pedicel 1 inch long, slightly compressed, 2-edged, 3 lines broad and 2 lines thick, smooth, green. Calyx subequal 4-lobed, green or tinted with purple; lobes about 3\(\frac{1}{2}\) lines long and 3 lines broad, ovate, obtuse, two of them acutely keeled and with a blunt dorsal point, and two with white membranous margins. Corolla 2-2\(\frac{1}{2}\) inches in diameter, expanding in the morning irrespective of sunshine if the temperature is sufficient, closing about 7 p.m.; petals in 1-2 series, ascending-spreadling, 10-15 lines long, 1-1 1/3 line broad, cuneately linear, obtuse and often dentilcate at the apex, bright yellow, not shining. Stamens very numerous, erect, forming a ring, leaving the stigmas exposed to view, 4 lines long; filaments and anthers yellow, the former not bearded. Stigmas 8, 1\(\frac{1}{2}\)-2 lines long, radiately spreading, plumose, light yellow. Ovary slightly convex at the top, 8-celled; placentas on the outer wall or floor of the cells. Fruit not seen.

**Oudtshoorn Division:** Near Oudtshoorn, Karloth 12187.

Described and Fig. 208 (see p. 449) prepared from a living plant received from Dr. R. Karloth. This species bears some resemblance to G. praeningue, but its leaves are of firmer substance, not pellucid-dotted, and its flowers are redicellate.

11. **G. concavum**, N. E. Br. (Fig. 209, p. 449).--Rootstock bearing a number of crowded growths at the top, on very short divisions scarcely amounting to branches. Leaves 2-3 pairs to a growth, ascending until old, then spreading, 1\(\frac{1}{2}-2\) inches long, 4-9 lines broad and 3-5 lines thick at the base, narrow, somewhat semiterete and slightly tawering to an acute or blunt apex, usually somewhat curved or slightly sigmoid, one leaf or a pair conccave and the other convex on the face, the concave leaf usually keeled or the back and often slightly twisted; soft and pulpy, smooth, glabrous, gray-green, the older leaves (but not the younger) distinctly pellucid-dotted when held against the light. Pedicel about 9 lines long and 3 lines thick, somewhat semiterete, being slightly flattened on one side and somewhat 2 edged. Calyx in mature bud 6-7 lines in diameter, 4-lobed; lobes 4-6 lines long, more or less keeled and three of the keels minutely ciliate, the outer lobes acute and the inner obtuse, with a dorsal point and broad membranous margins. Corolla 2-2\(\frac{1}{2}\) inches in diameter, opening in the morning, even in dull, sunless weather at a temperature below 60° Fahr. Petals numerous, free, or nearly so, in two distinct series, 1\(\frac{1}{2}-2\) lines long and 1-1\(\frac{1}{2}\) line broad, linear, obtuse and scarcely toothed at the apex, bright clear yellow on both sides, not shining. Stamens numerous, collected into a central mass, 6-7 lines long, quite concealing the stigmas, yellow. Stigmas 10, radiating, 1 line long, plumose, yellowish.

Described and Fig. 209 prepared from a living plant sent to me by Mrs. L. Bolus. This species must be nearly related to *G. angustatum*, H. &. A., but according to Heworth's description of the latter species, it differs by its redicellate flowers, much smaller corollas and free or nearly free petals. The long and narrow leaves (which, when received, were only 4-6 lines broad, but have now become broader and thicker) conccave on the inner side of the longerof each pair, distinguishes this from all others known to me.

N. E. Brown

(To be continued.)
12. **G. angustum**, N. E. Br., in The Gardeners' Chronicle, 1921, Vol. LXX, p. 327. Leaves linear-tongue-shaped, semicylindric, very long, 3-4 inches long and \( \frac{1}{4} \) inch broad according to Haworth, who described it from memory only (he subsequently gives no other dimensions). Flowers subsessile. Calyx very large and fleshy, 4-lobed, the larger lobes gibbous and keeled on the back. Corolla 3-4\( \frac{1}{2} \) inches in diameter, petals numerous, united at the base for about a quarter-of-an-inch, up to 2 lines broad, obtuse and absolutely crenate at the apex. Stamens yellow. Stigmas 10, long. Capsule with 10 ridges on the torus.


South Africa: Locality unknown, introduced by Lasson in 1790, according to Aiton.

The above description, taken from Haworth's account of it, contains all that is known of this species, which is evidently quite distinct from any that has hitherto been figured and unlike any species I have seen, although G. concavum N. E. Br., must be near it. The Haworth states that it can be 'recognised at sight by its semi-cylindric leaves.' The large flowers with the petals united for a quarter-of-an-inch at the base, however, distinguishes it from any other species at present known.

In his **Revisiones Plantarum Succulentarum** Haworth adds two varieties: var. pallidum, which is a synonym of 13, G. taurinum, N. E. Br.; and var. heterophyllum, which is a synonym of 16, G. longum var. hemastum N. E. Br.

13. **G. taurinum**, N. E. Br., in The Gardeners' Chronicle, 1922, Vol. LXXII, p. 9 or obliquely crossing one another, 2-3 inches long and 3-9 lines broad, semi-terete, flat above, obliquely convex on the back, one leaf often oblique (compressed and keeled) at the obtuse apex, very thick, uncurved or incurved, often somewhat finger-shaped and nearly as large as a finger, 'the younger always incurved and resembling the horns of a bull,' yellowish-green (in summer time), somewhat pellucid-punctate. Flowers sessile. Calyx 5-lobed, with the lobes unequally membranous and keeled, according to Haworth, but the flower he examined was doubtless abnormal and normally it probably would be 4-lobed. Stigmas 2-9, flumose. Corolla not described by Haworth, but according to Salm Dyer's figure, quoted below, it is about 2-24 inches in diameter, with the petals in 1-3 series, subacute or bluntly pointed at the apex.


South Africa: Locality and collector unknown.

Fig. 218 is adapted from Salm Dyer's figure quoted above under the erroneous name of M. angustum.
14. G. uncatum, K. E. Br., in The Gardeners' Chronicle, 1821, Vol. LXX, p. 336 (Fig. 219).—Growth apparently prostrate. Leaves in two ranks, very spreading and slightly sloping downwards, 2-7 inches long and 7-9 lines broad, strap-shaped, more or less curved, flat above, obliquely convex beneath, with the apex of one leaf of a pair thickened and keeled on the back and slightly hooked or uncurved edgeways at the obtuse apex. Pedicels 6-9 (in fruit up to 12) lines long, compressed. Calyx 4-lobed. Corollas about 2 inches in diameter; petals in 1-2 series, acute, yellow. Stamens yellow. Stigmas 10, short, plumose, yellowish. Ovary globose, convex on the top.


South Africa: Locality and collector unknown. It was raised at Vienne in 1816 from seeds received from South Africa according to Salm-Dyck.

I have not seen this species. There is a good unpublished coloured drawing of it at Kew, made in 1823 from a plant received that year from Salm-Dyck himself, from which Fig. 219 was adapted.

15. G. proclive, K. E. Br. (Fig. 220).—Growth more or less decumbent or prostrate. Leaves in two ranks, directed forward in the direction of growth, more or less sloping downward and somewhat spreading or diverging, 2-4 inches long, 3-7 lines broad at the middle and 3-5 lines thick, uncurved edgeways or by a slight twist at the obtuse apex, flat or slightly convex on the face, convex on the back, the larger leaf of each pair being somewhat compressed and keeled where produced beyond the flat face at the apex. Flowers sessile or subumbellate. Calyx-lobes all flat and apparently with very broad membranous margins. Corollas about 2½ inches in diameter; petals in two series, about one inch long, cuneately linear, obtusely pointed or notched at the apex, yellow. Stamens very numerous, apparently arranged in a dense ring. Stigmas 9.


South Africa: Locality and collector unknown.

The above description is compiled and Fig. 220 adapted from Salm-Dyck's figure above quoted as I have not seen any plant like it, for it is quite distinct from the plant Haworth called M. angustum var. heterophyllum (see 16, G. longum var. hamatum), differing conspicuously by its less hooked leaves, from which the elevated ridge along the lower margin of the larger leaf of a pair is apparently entirely absent, and by the sessile flowers.

16. G. longum, K. E. Br., in The Gardeners' Chronicle, 1822, Vol. LXV, p. 9 (Fig. 221, p. 471).—Leaves more or less in two rank usually about 3 pairs to a growth, at first ascending and then spreading, or remaining ascending under some conditions, 3-5 (or in young plants up to 9) inches long, 7-11 lines broad and 3-4 lines thick, strap-shaped, usually somewhat curved, very obtuse, or here and there obliquely pointed or rarely slightly hooked at the apex, flat on the face, convex on the back, with the thick part of the convexity usually nearer one margin than the other and sometimes forming an oblique keel at the apex, soft and velvety in substance,
470 smooth, glabrous, light green, shining, with a very evident paler and somewhat, triangular swelling or pustule at the base on the upper side. Pedicels erect, 14-1 ½ inch long, slightly compressed and about 3 lines thick, smooth, glabrous, green. Calyx 4-lobed, glabrous, green; lobes 5 lines long, the outer about 5-6 lines broad and the two outer 3 lines broad, ovate, obtuse, and more or less membranous at the tips convex (not keeled) on the back. Corolla 2-2 ½ inches in diameter, expanding in the morning in bright sunshine, and lasting 4-5 days, not scented; petals numerous, in about 2 series, 14-15 lines long and 1 line broad, linear, acute, clear yellow, slightly shining, peltate on the back. Stamens very numerous, erect in a ring around the stigmas and top of the ovary, about 3 lines long; filaments and anthers orange-yellow. Stigmas 10-11, about 1 line long, radiately spreading, alabaster, greenish-yellow. Ovary nearly superior, flattish-convex on the top, 10-11 celled; placenta on the floor or outer walls of the cells. Capsule about 2 lines in diameter and 4 lines long or deep, half-superior, with equally flattish-convex above and beneath, with 10-11 valves and seeds; structure as for the genus.


Port Elizabeth Division: near Port Elizabeth, Burchell, Uitenhage Division: common about Zwartkops, Desratch and Perseverance, Muir 3923, and near Uitenhage, 17-170 feet above sea level and flowering in December and January, Muir 3824. Introduced into cultivation about 1700 or earlier, as the bed figure in Volckemer, Flora Noribergensis, p. 165 is doubtless intended to represent it as species.

In my previous account of this genus in The Gardeners' Chronicle, as above quoted, I was not sure of the correct identity of G. rustulatum, because I had not then seen any specimen of definitely known to come from the region of Port Elizabeth Division, where Burchell found it. But now that Dr. Muir has sent me plants from that area which are unquestionably G. rustulatum, I find that (as might be expected from its being a native of that well explored region) it is not uncommon in cultivation, and that beyond doubt is the same as G. lonsum, although neither Dillenius, De Candolle nor Haworth mention or figure the rustule at the base of the leaves, but as it is often not very conspicuous unless sought for, and not so distinct in this country as in native-grown specimens, may easily have been overlooked by them, or considered to be of no specific significance at the period (1795) when Haworth first described the species, for the rustule was not noted as a character of any species of this genus until twenty-four years later, when G. rustulatum was first described. Dillenius and De Candolle represent the pedicels as being 2-3 inches long, and this, in my experience, is unusual, and must be due to some condition of cultivation.

It is somewhat remarkable that Haworth seems uncertain of his identification of G. lonsum, and must certainly have had two diff-
471 erent species under that name. For in 1795, under his original description, he states that:— "Mr. Siton does not notice this plant in his Hortus Levensis, but I have seen it very fine at Rev." And in his Synopsis Planterum Succulentarum (1812), under M. adscendens, he writes: "If the next species but three (i.e., M. longum) is not the M. folio linguiformi lingiore of Dillenius, this may be it, but if so he had delineated the leaves too long." Later, (Rev. Fl. Succ., p. 96) he states that M. adscendens is "probably a variety of M. longum." This seems to indicate that he was not very clear as to what M. longum was. All the above are described as having the pedicel "longer than the calyx" or "to inches long or more." But under M. longum in his Rev. Fl. Succ., Haworth quotes both Volckamer's figure mentioned above the figure in the Botanical Magazine, t. 1866, as representing the same species. But Volckamer's plant has erect or ascending long leaves and pedicellate flowers and is no doubt a bad figure of G. longum, while Bot. Mag., t. 1866, represents a plant with short leaves pressed down close to the ground and sessile flowers and belongs to G. depressum.

Var. hamatum, M. E. Br. (Fig. 222).—GrowthS pressed upon the ground. Leaves not spreading but directed forwards in the direction of growth, 2-3½ inches long, 7-10 lines broad and one leaf of a pair 3-4 lines thick and the other 4-5 lines thick, strap-shaped, straight or slightly uncurred edgeways, the smaller leaf flat of faintly convex on the face, convex on the back and obtuse at the apex, and the larger leaf of each pair with the face somewhat obliquely concave, from being raised all along the lower margin into a strong and somewhat acute ridge, obliquely and bluntly keeled on the back, and with a very large and conspicuous obliquely incurved hook at the apex; both leaves have a pustule or swelling at the base; surface smooth and shining, and the surface-cells neither raised nor depressed as seen with a strong lens, light green. Pedicels 3-7 lines long, slightly compressed and slightly 2-edged, 2-3½ lines broad. Calyx (a dried flower only seen) subequally 4-lobed, lobes about 4-5 lines long and 3½ lines broad, ovate, two of them acutely keeled. Corolla about 2½ inches in diameter according to the figure; petals numerous, in 2 series, free or nearly so, apparently 10-12 lines long and 1 line broad, cuneately linear, obtuse yellow. Stamens very numerous, about 3 lines long, yellow. Stigmas 8-9, about 1 line long, spreading, plumose. Capsule when closed 7-9 lines and when expanded 12-15 lines in diameter, shortly and broadly obconic, flattish, with 8-9 gaping ridges on the top, and with 8-9 valves and cells; brown outside, pallid within; valves reflexed; panding keels distant, subparallel, with acute and microscopically denticulate edges, pale ochreous-brown or honey-coloured, tined with a linear or oblong-linear membrane; cells acutely rooted and the opening nearly closed by a very large white tubercle. Seeds ¾ line in diameter, compressed-globose, with a small inflexed nipple, smooth, pale brown.


Uitenhage Division: Near Uitenhage, 170 feet above the sea level, Muir 3824 growing on the same root as the type form. ex Dr. Muir.
When I received a plant of this remarkable form, from Dr. Muir, I at once noticed it as being the same as that figured in Andrews' Botanical Repository as above quoted, of which I cannot find any record that it has been in cultivation there since the period of that figure. As I received it without information of its origin I naturally considered such a distinct-looking plant to be a distinct species, and made the above description of it. When, however, I received information of its origin from Dr. Muir, it was as follows:—"My Glott. rustulatum and your proposed Glott. hematulatum both grew on the same root, and are both 3,824 from near Uitenhage, 170 feet. You get flat adult leaves and leaves extensively hemated as you noted. The latter is one of the turrid very succulent forms which it assumes. Some of them are as hooked as the hooked index finger. By 3,824 I collected myself. I have other collections of the same plant which I brought from gardens at East London. They were also collected in Uitenhage Division at Dispatch, and taken to East London, and they show the same heterophyllly." If collectors had any sent such valuable information as this with plants sent to Europe many errors would have been avoided; for I doubt if any cultivator or botanist in this part of the world without knowledge of the fact would have suspected that the two forms of leaves represented by Figs. 221 and 222 grew upon the same root and are therefore not even legitimate varieties, although, for garden purposes, I have here so considered them. It is remarkable that besides the difference in the shape of the leaves, the portion of the plant sent to me with hooked leaves also differs from the typical form of G. rustulatum by having shorter pedicels and fewer stigmas and valves and cells to the capsule.

The only other known species described as having a pustule at the base, are the allied G. erectum (which differs by its ascending stems and leaves, and by its leaves being more acute and more centrally pointed), and the very dissimilar G. grandiflorum and G. Salmii, which both have sessile flowers.

I am informed by Dr. Muir, to whom I am indebted for living native material of this species and its varieties, that "in its native habitat a number of the growths grow from one stem, and as they get larger tend to slope towards the ground. They form patches a yard or more in diameter, so dense that the ground is completely covered. The leaves are pale green, and when they get water reach a length of ten inches." Figs. 221 and 222 are both made from the plants sent to me by Dr. Muir under No. 3, 824 as being portions from the same root, as above stated. The plants from Alice, which I formerly thought might be G. rustulatum, proves (now that I have seen the true G. rustulatum i.e. G. longum) from its type locality to be distinct, and belongs to the next species, G. erectum.

M. longum vars. angustius, and murmureascens, Rev., Rev. Fl. Succ., n. 96297; Berger, Mas. und port., n. 240 are quite unknown, and may possibly belong to some other species.

N. E. Brown
(To be continued.)

NESEBRYANTHEME.
(Continued from page 471.)

12. --GLOTTIPHYLLUM, HAB.
17. G. erectum N.E.Br. (Fig. 231, and p. 291, Fig. 132).—Stems elongating, decumbent or prostrate, and up to 8 inches long, 3-4 lines thick, sparingly branched with 3-5 pairs of leaves at the end of each branch. Leaves usually in 2 ranks, but sometimes the nervi obliquely cross one another, distinctly erect or ascending, 2½-5 inches long, ¾-1 inch broad and 3-5 lines thick, these variation even on the same plant at the same time, strap-shaped, with parallel sides for 2/3 of their length, then tapering to an acute or obtuse apex, which is eriopilicate, at least when young, flat or slightly con ex on the face, convex on the back, not keeled, and all similar at the tips, soft and pulpy; surface smooth, glabrous, deep grass-green. Pedicel smooth, glabrous, deep grass-green ½ inch long, ¼ line thick, erect, terete, glabrous, green. Calyx subequally 4-lobed, green, triangular and about 5 lines in diameter when in mature bud, the outer lobes 4-5 lines long, 2 lines broad, ovate-lanceolate, acute, and acutely keeled down the back, Corolla 2-2½ inches in diameter, expanding in the morning in full sunshine only, closing about 3 p.m.; petals 40-45, in 2-3 series, slightly ascending spreading (not horizontally spreading), 12-13 lines long, ¾ line broad, linear, obtusely pointed at the apex, entire, bright clear yellow on both sides, but scarcely or slightly shining. Stamens very numerous, erect, 3½ lines long; filaments not bearded, yellow; anthers light orange-yellow. Stamina 3, ascending, ¾ line long, plumose, yellow.

Vic. East Division: Near Alice, Leslie.

This is the plant which, in The Gardeners' Chronicle, 1921, Vol. LXX, p. 327, Fig. 146 I thought might be G. rustulatum, but now that I have obtained from Dr. Air the true G. rustulatum from Ultenhase Division I find to be quite distinct and well characterised by the constantly erect or ascending and acute (not obtuse) leaves. A living plant with fruit upon it, from which I raised several plants, was sent to me several years ago by Mr. T. Leslie. Fig. 231 shows the character of the apex of the leaves, by which it may be distinguished from G. rustulatum, and also the rustule.

18. G. grandiflorum, N.E.Br., in The Gardeners' Chronicle, 1921, Vol. LXX, p. 327 (Fig. 232).—Growth prostrate. Leaves in two ranks, slightly sloping downwards and adpressed edgeways to the ground, 3-4 inches long and an inch or rather more in breadth, strap-shaped, flat on the face, with a large rustule at the base. Convex on the back, obtuse and slightly hooked or unturned edgeways at the apex, and the larger of each pair with an oblique keel on the face near the apex, very fleshy, pale green. Flower sessile. Calyx 4-lobed, with ovate lobes apparently about as broad as long. Corolla 3-4 inches in diameter, scarcely scented; petals in two series, conically linear, obtuse and minutely toothed at the apex. Resembryanthemum grandiflorum, Haw., in Phil. Mag., 1826, Vol. LXVII, p. 327; Salm Dyck, Les., 8, f. 3. N. linguiforme var. grandiflorum, Berter, Les. und Fort., p. 242.

South Africa: Locality unknown; introduced by Bowie in or about 1826.

This fine species appears to have died out of cultivation and has not been rediscovered. I have never seen. Fig. 232 is adapted from Salm Dyck's figure quoted above.

19. G. Nuirii, N.E.Br. (Fig. 233).—Growth prostrate, the ground. Leaves spreading, more or less sloping downwards, in
two ranks, usually 3-4½ (but occasionally up to 6½) inches long, 10-15 lines broad and 6-7 lines thick at the middle, straight or but slightly curved edgeways, strap-shaped, with parallel sides, but with the tips of both leaves of a pair uncurved-h oked edgeways, and the hook obliquely-truncate or irregularly pointed and obtuse or very acute, flat or faintly convex on the face, and the face of the larger leaf with an impression of the opposed leaf upon it, forming a ridge along the margin at the middle part and an obliquely transverse ridge below the apex, convex and not keeled on the back; surface smooth, but under a strong lens seen to be covered with transversely-elongated, raised surface-cells, deep grass green. Flower sessile. Calyx triangular and about 6-7 lines in diameter

in bud, 4-lobed, lobes 4-7 lines long, 3-4 lines broad, 3 of them keeled and 2 distinctly ciliate on the keels, the inner with broad membranous margins. Corolla opening in the morning in dull or sunny weather, 3-½ inches in diameter, not scented; petals numerous, free or nearly so, in two series, somewhat savv, as if from crumpling in bud, 16-18 lines long, 1½-2 lines broad, linear, obtuse and usually minutely toothed at the apex, bright clear yellow. Stamens numerous, 7-8 lines long, erect and collected into a central mass, concealing the stigmas, light orange-yellow. Stigmas 8, about ½ line long, plumose, whitish.

Riversdale Division: In the Klein Karoo, 1,400 feet above sea level. Muir 3876.

This is a very fine and distinct species, quite unlike any other, and I have therefore dedicated it to its discoverer, Dr. J. Muir who has helped me so vigorously in this work with specimens and information. Dr. Muir writes (June 2, 1938), concerning the two extreme forms that exist in nature of the various species of this genus, as previously noted, that he "had both extreme forms (of ? Muirii) and of which the smaller, harder form had remained as such since 1924, has now during the past few weeks undergone a change and become greener and juicier, and are quickly assuming the other form." This and other species Dr. Muir states are popularly called the Dutch colonists "Skilpadkos," i.e., "tortoise food."

The plant from which my sketch (Fig. 353, p. 489) was made, was sent to me as being one of the "smaller and harder" forms.

20. G. carnosum, H.J. Dr. (Fig. 354, p. 489).-- Growth apparently tufted or crowded upon the top of the rootstock, more or less depressed towards the ground. Leaves in two ranks, very spreading, 1½-3 inches long, usually 9-10, but sometimes up to 13 lines broad, 4-7 lines thick, more or less strap-shaped with parallel sides, usually slightly curved edgeways downwards, and one leaf of a pair recurving, sometimes very slightly uncurved edgeways (but not at all hooked) at the apex, one leaf of a face flat and the other slightly convex on the face, and the larger leaf produced beyond the oblique ridge where the flat face ends and obliquely keeled, very convex on the back, obtusely and often obliquely rounded at the apex, merely with a minute epicusculus; substance thick, soft and pulpy; surface smooth, but with minute, raised, linear, transverse surface-cells as seen under a strong lens, fibrous, grass-green, not pellucid-dotted. Flowers sessile. Calyx 8-9 lines in diameter in mature bud, acutely 3-sangled, unequally 4-lobed, with three of the lobes acutely keeled on the back, the two larger 8-9 lines long and about 4 lines broad, ovate, acute.
Corolla 3 inches in diameter, cup-shaped, opening in sunshine, slightly scented; petals about 45, in 1-2 series, 1½-1¾ long when sub fully developed, 1-1 1/3 line broad, linear, with subacute and more or less revolute tips, bright clear yellow, scarcely paler on the back not shining. Stamens erect, lax, about ¾ inch long, entirely light yellow. Stigmas 6-9, radiating, about 2 lines long, plumose, whitish. Capsule when closed, 4½-5 lines in diameter, convex and without ridges at the top, with 6-8 valves and cells, and when expanded 7-8 lines in diameter; valves horizontally spreading; 2½ lines long and 2 lines broad, light brown; expanding keels dark brown, without an awnlike or membranous tip, otherwise the structure is the same as for the genus. Seeds about 1 line in diameter, somewhat angularly subelliptic or irregularly ovoid, with a very small nipple, minutely tuberculate, dark brown.

Ladismith Division: Between Platthuis and Touws Berg, 2,000 feet above sea level, growing in open places among loose shingle, Muir 3894.

When Dr. Muir sent a plant of this species to me he commented upon the greyish-green appearance of its leaves, and when received the leaves certainly had a slight greyish-green colour, but the fresh leaves that it has made are grass-green; whether they will become greyish during hot summer weather remains to be seen.

H. E. Brown
(To be continued.)

MESEMBRYANTHEMUM
(Continued from page 490.)

12. GLOTTIPHYLLUM, NEW.

509
21. C. latum, N. E. Br., in The Gardeners’ Chronicle, 1921, Vol. LXXI, p. 387 (Fig. 245).—Growths more or less pressed upon the ground. Leaves in two ranks, straight or slightly curved downwards edgewise, those of the smaller form about 1½-2½ inches long, and of the larger form 2½-4½ inches long, 6-9 lines broad and 2-4 lines thick, strap-shaped and of about equal breadth throughout, broadly rounded or subtruncate at the apex, with or without a short mucronate point at the end of the upper edge, flat or nearly so on the face, without any pustule at the base, more or less convex on the back, smooth, glabrous, soft and pulpy, uniformly green, not at all glaucous, shining. Pedicels 3-10 lines long, and in fruit—where left uncovered by the bases of the leaves—up to an inch long, 3-angular, 2½ lines thick, glabrous. Calyx subequal 4-lobed; lobes 4-6 lines long, ovate, obtuse or subacute, three of them acutely keeled on the back. Corolla 1½-2½ inches in diameter, expanding only in bright sunshine in the morning and closing in the afternoon, about 3 p.m., not fragrant; petals numerous, in 2 series, 11-12 lines long, 2½ 1 line broad, linear, acute, bright yellow, tinged with crimson or reddish on the back at the tips. Stamens very numerous, 3-3⅓ lines long, bright deep yellow; filaments not bearded. Stigmas 9-10, radiating, 1 1/3 line long, stoutly plumose, acute.

510 greenish-yellow. Very nearly superior, convex on the top, 9-10 celled. Capsule broadly oblong, with a raised, dome-shaped torus, with 8-10 valves and cells, 8-7 lines in diameter when closed and 10-12 lines in diameter when expanded; valves callicid within; ex-
510 standing keels dark brown, with pale, sun-like tips; cell-wings brown; tubercle ocreous. Seeds 4 line in diameter, compressed-ellipsoidal, with a small nodule at one end, nearly smooth, being only very minutely tuberculate as seen under a strong lens, brown.


Var. *cultratum* L. E. Br. (Fig. 246 F.G).—Leaves more or less curved downwards, edgewise, with the tips slightly uncurred. Sepals about an inch long. Corollas about 8 inches in diameter and like that of the type.


Riversdale Division: On hills near Riversdale, 700 feet alt.; Muir 3274, 3275 Fossel Bay Division, near the Little Brak River, Burchell. This was in cultivation before 1728.

This species varies considerably, and much confusion of names has been created by Haworth, who first wrongly described it as being *E. linguiforme*, Linn., and then described various slight forms of it as species and varieties, in which others have followed him. Salm. Dyck made further confusion by figuring this species and its variety under several different names. I have again studied all Haworth's descriptions with close attention to detail and compared them with all the drawings and published figures relating to them at Kew, and this comparison, with the aid of living plants and some information about them in their native country received from Dr. J. Muir, has enabled me to alter my former view that *G. latum*, *G. obli-
cultratum were three distinct species, and also to feel
confident, that the synonymy as here given is (at least, for the
Ii. Succ., p. 220 (1872), and Rev. Ii. Succ., p. 96, however, there
is some difficulty in understanding what plant Haworth means. His
description of it as follows: "Leaves ascending, broadly tongue-
shaped, very obtuse, green. Flowers redunculate..." and in another
description "reduncles longer (than in G. latum)." And he adds,
"The leaves are more ascending and paler than in the last (i.e.,
G. latum), and the reduncles longer. If the next species but three
(i.e., G. longum) is not the G. folio linguiforme longiore of
Dillenius, this may be it; but, if so, he has delineated the leaves
too long. This description seems more to accord with G. longum
than with G. latum, and in Rev. Ii. Succ., p. 96, he remarks,
"Probably in variety of the form..." (i.e., G. lucidum, Haw., which
is G. longum). There is, however, a drawing at Haw, undated, but
probably made somewhere about 1820, labelled "aseemb. adscendens,
Rev.," which represents a plant of G. latum, with leaves spreading
near the ground, and is very like that which Sal. Dyck has figured
as G. adscendens, except that the pedicels and calyx are not repre-
sented as being tuberculate, from which character I have no doubt
that Sal. Dyck's figure G. 4 represents G. latum var. B. ---
96. But these tubercles I believe to be due to the attack of some
mite; they are not normal plant-tubercles and occur but rarely in
my experience. I do not remember to have seen them on a Clottphy-
lluum, but I have on other genera, where also they are not normal
structures.

If this drawing at Haw and Sal. Dyck's figure are correctly
named, then I would suggest that Haworth described adscendens
from a plant of G. latum that had been grown under glass and not
fully exposed to the sun. This view is rendered probable by plants
of G. latum that I possess, which, as I write (January, 1827),
have ascending leaves, yet when received early in 1826 the leaves
were more or less pressed down edges eyes near to the ground, not
ascending; the alteration to an ascending position being due to the
very unfavourable condition of an absence of direct sunlight during
the three winter months.

Several plants of this species were sent to me by Dr. I. Ayr,
some of the smaller and harder type and some of the softer and more
juicy form, of which remarks have already been made under the genus.
Under the unnatural conditions in which I have to cultivate them,
these plants have much altered in appearance, and if placed in the
hands of most cultivators of succulents, without knowledge of their
origin, would probably be thought to belong to two or three species,
or at least varieties. One of the, which, when received, had nearly
straight leaves spreading right and left nearly in a line (as in
Fig. 246, a), after a time developed leaves curved downward with
slightly incurved leaves tips, exactly as represented by Sal. Dyck
for G. cultatrum. In January, 1827, this put forth a pair of appa-
rently straight leaves, but whether these will remain straight or
eventually become curved like the others is at present unknown.
This specimen is illustrated by Figs. 245, 2, and G., and clearly de-
monstrates that G. cultatrum is not a distinct species, but merely
a variation of G. latum, just as I now find that G. obtatum is
merely a smaller form of this species, they are merely individual
forms of one species, for there is no difference in their flowers.
It is strange that Sal. Dyck figures this variety cultatrum under
no less than four different names, for the four figures quoted above under that variety are certainly only individual forms of one plant and might even have been made from the same specimen in different years. The question arises, is this a variation that is due to cultivation and not found in the wild state? For having seen one of my imported plants change under my own eye from the straight-leaved \( L \)-tum to the curved-leaved variety cultratum, I wrote to Dr. Pui for information as to whether \( G. \) cultratum occurred with \( L. \) latum in its native habitat. He very kindly made a journey to the locality where it grows wild, and wrote concerning it:--"I examined several hundred of plants in the localities of my 3074 and 3075. Please note that in nature not one showed any evidence of the cultratum form which is evidently the sybaritic cultivated London or Salm-Dyckian form of \( L. \) latum." This would seem to be conclusive evidence that the two forms are merely conditional variations of the same individual under cultivation only, and so, for garden purposes, the varieties name cultratum may be retained. If further proof is needed that \( L. \) latum and \( G. \) cultratum are one species, I may mention that at Lew there is an original drawing dated "Dec. 2, 1823" made from a plant received from Prince Salm-Dyck in 1833 under the name of "\( L. \) cultratum," which represents the plant as having nearly straight leaves, just as my plant (mentioned above) had when received from South Africa.

Dr. Pui informs me that in their native localities this and other species will "stand frost well. But when they are brought into a garden (meaning in South Africa in the region where they grow wild) and set more water they swell up, become bloated and very luxuriant but invariably blacken and die when frost comes and catches them in this abnormally luxuriant state." This information indicates that these plants should receive very little water during the winter, in Europe, if it is desired to keep the more choice and delicate species alive.

22. \( G. \) depressum, R. F. Br., in The Gardener's Chronicle, 1921, Col. Lit. n. 327 (Fig. 247).--Growth pressed upon or directed towards the ground. Leaves 2-ranked, apparently about 2-3\( \frac{1}{2} \) inches long and 7-8 lines broad, and of nearly equal breadth throughout, nearly horizontally spreading or slightly sloping downwards and slightly curved upwards edgeways at the tips, strap-shaped, obtusely rounded at the apex, with a short point directed forwards at the upper edge, male green (in the original drawing the green is much paler than in the reproduction of it). Flowers sessile. Calyx unequally 4-lobed, three of the lobes keeled and the keel minutely ciliate. Corolla tube-shaped, 2 inches or more in diameter, expanding in sunshine only, not in cloudy or dull weather; petals in 2 series, white, yellow, with a red midline and the apex itself frequently red on the back. Stamens short, yellow. Stigmas 10, ovary short, ovate-lanceolate (probably plumose), incurved, yellowish. Cercus depressed, with 10 ridges on the top and 10 cells.

South Africa: Locality and collector unknown. Cultivated by Haworth in 1795.

This species is unknown to me, and the above is compiled partly from the original description of Haworth and partly from the figure in the Botanical Magazine which accurately agrees with Haworth's description, and from which I have adapted Fig. 247.

Haworth, however (Rev. Fl. Succ., p. 98), wrongly refers the figure in Bot. Mag., t. 1856, to his "Resembryanthemum longum var. glaciidum," which was founded upon a very different species with pedicellate flowers (see G. latum var. cultitatum, and under G. longum), and I think it probable that Haworth intended to quote the Bot. Mag. figure under G. longum var. declive, which he places after var. glaciidum, and which has sessile flowers and according to description otherwise agrees with G. depressum, but by some accident he entered the quotation in the wrong place.

Haworth also wrongly quotes (Syn. Fl. Succ., p. 221) fig. 26 of Dillenius, Hort. Flith., as belonging to G. depressum. But the Dillenian figure has pedicellate flowers and belongs to G. latum, N.E.Br. which see.

I believe G. rufescens, Haw., should be referred to this species. There is no figure of it at Haw, and it is only known from Haworth's description, which in the sessile flowers and other characters seems to accord with G. depressum. The rufescent colour of the leaves mentioned by Haworth is not a specific character, but was doubtless due to some cultural cause.

M. E. Brown

(To be continued.)

ISOBRYANTHEMUM.


(Continued from Vol. LXXIIII, p. 511.)

13.--CLOTTIPHYLLUM, HAW.

23. G. suave, N.E.Br. (Fig. 7).--Growth in the only plant seen crowded. Leaves directed forwards, not very spreading, 1½-2 inches long, 3-12 lines broad and 3-6 lines thick on an imported plant, probably becoming larger on an imported plant, probably becoming larger under cultivation, with the pairs more or less obliquely crossing one another, flat on the face and one of a pair with an oblique keel at the apical part, and much thicker and more convex on the back than the other, usually more or less tongue-shaped, with parallel sides, but sometimes curving upwards, without a pustule at the base; apex variable, in the thinner and flatter leaf sometimes rounded, with a central very short, blunt point, sometimes obliquely subtruncate with a short, hard point at the end of the upper edge, as is usually the case with the opposed leaf having a keel on its face, its back being obliquely keeled and somewhat twisted at the apex; substance firmly fleshy; surface smooth, but with the usual raised surface-cells, as seen under a strong lens, dull green, sometimes tinted with brownish, scarcely shining, not ryllucid-dotted. Pedicels none, or 5-6 lines long; subtend, very slightly 2-edged, glabrous. Calyx 5 lines in diameter in mature bud, produced beyond it's union with the ovary into a short tube about 2 line long, 4-lobed above, three of the lobes about 2 lines long and 2-4 lines broad, the fourth lobe being about 4-4½ lines long, all with whitish, membranous margins, but the membrane longer and broader
13 on the longer lobe; three of them are slightly keeled and the keel ciliate on the back. Corolla expanding in the morning, irrespective of sunshine and even in a darkened room, at first cup-shaped and about 1.5 inches in diameter, finally nearly flat, with recurved tips to the petals and nearly 3 inches in diameter, when closed the petals twist together, in the early stages of the flower they all close together at the tips, but later, when they have grown longer, they twist closely together to about the middle, and then the tips spread out; fragrant; petals about 50, in 1-2 series, finally rather lax, 1-1.5 inch long, 1 inch broad, linear, obtuse or somewhat acute, entire, clear yellow or both sides; shining. Stamens numerous, arranged in a ring, about 1 inch long, yellow. Stigmas, 8, about 1 lines long, nectarose, very pale yellowish or whitish. Every partly superior, flattened on the top.

Ladismith Division: Near Ladismith, Fair 3889.

This species is evidently allied to *G. depressum* and *G. frangrans*, it leaves being somewhat like those of *G. depressum*, but less spreading, and it differs from both species by having pedicellate flowers. The calyx is very much smaller than that of *G. frangrans*, and I suspect also that of *G. depressum*, but the latter I have not seen. It is stated, however, not to expand its flowers except in bright sunshine, while I find the flowers of *G. suave* will expand in a very dim light, for after taking the plant into a room to describe, I left it there all night, with its flowers tightly closed, and was astonished to find the corolla widely expanded in the morning between 8 and 9 am., while the room was very dimly illuminated, daylight being excluded by a Venetian blind and side curtains and the morning sunless and cloudy. I left the plant in the room all that day (at the end of January), and at night excluded as much light as I could by means of the blind and curtains, the corolla then having its petals tightly twisted together up to their middle, with the tips spreading. The next morning, about 9 a.m., before the blind was drawn up, the corolla was widely expanded and fragrant, the room being very dimly illuminated, this morning also being sunless and very gloomy, and the temperature below 60° F. I have now (Sept. 29, 1927) repeated the above experiment with the same result. How do these and other plants know when it is time to open their flowers? For in the case of this species it seems evident that it is not strong light or sunshine that causes it to expand its flowers, but that it is influenced in some mysterious way by the time of the day. Yet certain other species of this genus will only expand their flowers in bright sunshine, and not at all on a dull day, and even on sunny days will not fully open them unless the temperature is 70° Fahr. or higher.

24. *G. lineiforme*, H.E. Br., in *The Gardeners' Chronicle*, 1821, Vol. LVI, p. 397 (Fig. 8) -- Growth more or less pressed upon the ground, with the leaves usually edgeways to the sky. Stems in two ranks, 2-3 inches long, 1-1.5 lines or more broad, 4-5 lines thick, tongue-shaped or somewhat oblong and slightly narrowing towards the apex, usually straight and widely spreading, sometimes slightly uncured edgeways, flat on the face and one leaf of a pair usually with an oblique ridge or keel near the apex, subulately convex on the back, the upper edge being very acute and somewhat cartilaginous, and the lower edge thickened and obtuse, especially in the larger leaf of air, and at the base on the upper side, where pressed against the young leaves, are usually raised slightly and sharp at the edge, but there is not a point or a pustule; surface smooth.
13 and shining, without elevated surface-cells, as seen under a strong lens, deep green. Flower sessile. Calyx large, somewhat 3-4-angled, unequally 4-lobed; lobes broadly ovate, the two outer acutely keeled and the inner two with large, membranous margins. Corolla about 3 inches in diameter, expanding in the morning; petals in 1-2 series, rather lax, about 13-15 lines long and 14-15 line broad, cuneately linear, obtuse and toothed at the apex, yellow on both sides, shining. Stamens very numerous, yellow. Stigmas 10-11 spreading, 1½ line long, plumose.


South Africa: Locality and collector unknown. In cultivation in 1714 according to Alton.

Although this is one of the oldest known species of the genus and still in cultivation, there appears to be no record of its rediscovery since the time when Willenius described and figured it in 1732. It is nearly allied to G. fragrans, but is easily distinguished from that and all others by the very sharp, knife-like upper edge of the leaves, especially of the larger leaf of each pair, and the absence of raised, transversely-elongated surface cells, such as exist on G. fragrans as seen when viewed with a strong lens. Fig. 9 is made from a living plant.

25. G. fragrans, Schwantes, in Zeitschr. f. Succulentenkunde, Vol. II, p. 242 (Liscs. 9, 10 and 11).—Grows normally very short and clustered. Leaves about 3 pairs to a growth, in two ranks, and sometimes more or less depressed edgewise to the soil, exceedingly variable on the same plant at different periods of its life, sometimes on South African plants only 5-10 lines long, 3-11 lines broad and 4–6 lines thick, oval or roundish-ovate, flat on the face and very convex on the back, rounded, obtuse or subacute at the apex, being somewhat like half-egg-in-form, developing from this up to 3 inches long and 2-14 lines broad somewhat tongue-shaped, straight or curved edgewise, flat (or towards the tip of the longer leaf of a pair somewhat concave) above, convex beneath, narrowing from about an inch below the apex to a rounded or blunt point, which in the longer of each pair is produced beyond the flat or concave face; sometimes where the flattened part ends (caused by the pressure of the smaller leaf upon it in bud) the longer leaf is somewhat hooked. Flowers sessile. Calyx in nature bud 0–12 lines in diameter, compressed-triangular, unequally 4-lobed; lobes 4-5 lines long, 2–4 lines broad, ovate, two of them acute and two obtuse, with broad membranous margins. Corolla 22–34 inches in diameter, according to age, expanding in the morning; closed at night and lasting about a week; sepals: retrol; petals numerous, in about 2 series, finally rather lax, 14–15 lines long, 1½ line broad, cuneately linear, obtuse and minutely toothed at the apex, bright clear yellow on both sides, shining. Stamens numerous, about 45 lines long, at first erect and clustered, but when the stigmas
14 expand they become spread out into a rim. Stigmas yellow, 6-10, about 1-3 lines long, plurifo, at first erect, afterwards spreading. Neesembryanthenum fr. fragrans, Schult. Deyr., Obs. Bot., t. 6 (1807), and Ges. & f., t. 2; Link and Otto, C. fl. Sel., t. 98, t. 43; G. & L. Rev. PI. Succ., p. 85; Bot. Mag., t. 2944. E. lineairiforme var. fragrans, Perser, Des. und Hort., p. 51. 

Indiannith Division: Klein Karoo; 11th this region; role byrns, Luir 1904, Swellendam Division: On the Inkool's Plateau, and in rock crevices at Toenie Hill, at about 1,900 feet elevation, flowering in April, Luir 1899. Originally raised from South African seeds at Carloule Botanic Garden in 1813.

In my former account of this genus in The Gardener's Chronicle, 1921, Vol. III., p. 327, I suggested that this might be the same G. depressum, but now that I have seen more material of it I believe that it is quite distinct.

Different individuals of this species differ widely and would doubtless be often mistaken for distinct species, and it is rather unfortunate that when the Botanical Magazine plate was published that an unpublished drawing of the very same individual made in 1911 (two years earlier than that of the published plate) was not also included on the plate to show the great vegetative variation of this species. When I first received a plant of Luir 1907 it was so very different in appearance from G. fragrans that I certainly mistook it for a new and very distinct species, the leaves being small and ovate, as shown in Fig. 9, the young pair, having their flat faces closely pressed together, formed an egg-shaped central body about an inch long, the outer pair being rather larger. Dr. Luir informs me that a number of such growths are formed upon the top of the rootstock forming a hemispherical mass 4-6 inches in diameter, with leaves pointing in all directions. Under cultivation, however, it becomes G. fragrans.

Fig. 10 represents a plant at rest as it grows in South Africa in a very dry season, showing the ovate leaves and an expanded capsule, natural size, both the leaves are, of course, much larger when alive. Fig. 9 is from a similar living, imported plant, showing the ovate leaves as they developed at Luir. Fig. 11 is from a photograph taken by my daughter of a plant cultivated by myself, natural size.

J. E. Brown

(To be continued.)

MESSEMBAHANTHEUM


(Continued from page 14.)

12.—GLOTTIPHYLLUM, L.W.

25. G. Neillii, N.-E. Br. (Fig. 34).—Sterile, each native-grown plant consisting of only one or two very short growths about an inch in height and 1-2 inches across the full spread of the leaves. Growth more or less depressed towards the ground. Leaves under natural conditions in 1-2 pairs, or under cultivation 3 pairs to a growth, two-ranked or with the pairs placed somewhat obliquely to each other; on native grown plants 1-1½ inch long, 9-18 lines broad, and 4-7 lines thick, becoming under cultivation up to 2½ inches long, 18 lines broad and 6-9 lines thick, varying from somewhat square to oblong or obliquely oblong-ovate, subtruncate or broadly rounded at the apex, sometimes one leaf of a pair has a very short
49 acute point at the apex of the upper margin, flat or slightly convex on the face, with a transverse keel near the apex on one leaf of a pair, armed by pressure against the shorter opposing leaf, convex, or with a very oblique longitudinal obtuse keel on the back; at first the leaves are microscopically ciliate on the margins and keel, but with age this ciliation disappears; substance soft with fleshy; surface smooth, glabrous, chalky-green or more or less suffused with rosy and purple when fully exposed to the sun; native grown plants when exposed had the very young leaves and the flat face and basal part of the back of the older leaves of a bluish-green or light purplish tint blending into the greyish-green or bluish-green of the apical part, not dotted. Flowers sessile. Calyx unevenly 4-lobed, glabrous; lobes 4-6 lines long and 4-8 lines broad, or perhaps larger (only one dried flower seen), the pair with broad, membranous margins. Corolla apparently 14-16 inches in diameter; petals in about 3 series, an inch or more long, 1-2½ line broad, as seen dried, linear, obtuse, yellow. Stamens 2 lines long, apparently of a paler yellow than the petals; filaments not bearded. Stigma 2-7-, about 1 line long, plumose, yellow. Ovary convex on the top, 7-9-celled. Capsule sessile, about half-an-inch in diameter when closed, with 6-8 valves and cells; valves reflexed when expanded, about 5 lines long and 8 lines broad, deltoid, dark grey (perhaps from age) with their expanding keel-like part at the base, stout, obtusely rounded along the top and ending in an apex, much shorter than the valves, without marginal wings, dark brown; cells rooted with somewhat stiff, dark brown cell-ends, and the opening nearly closed by a large pale brown tubercle.,. Seeds 1-line in diameter, compressed, roundish in outline with a small nipple, minutely tuberculate, dark brown-grey-brown.

Prince Albert Division: A roo, near Prince Albert, growing among stones of its own colour, Neil van der Blij.

This very distinct species was first sent to me by Dr. A. J. Pillans and afterwards by Mrs. E. van der Blij, who informed me that it was discovered as above recorded by her son, master Neil van der Blij, after whom I have much pleasure in naming this remarkable species, which I understand is not particularly easy to find its form and colouration being so very different from the usual long grass-green leaves we are accustomed to see in other species of this genus. I am also indebted to Mrs. van der Blij for a dried flower of it, from which the above description is made, for neither of my two plants have flowered, probably owing to want of sun last year. This is remarkably distinct from all other species of this genus at present known, and can be instantly recognised by its short broad leaves and their peculiar obscure, chalky-green or greyish-green, around colour in summer, tinted with a bluish or purplish. The colouration of plants fully exposed to the sun or native-grown plant is quite pleasing and very different from that of all its allies. In the winter, under my sunless conditions, the leaves become green.

Fig. 54 represents an entire plant as received from South Africa, and a leaf from another plant after it had been in cultivation a year, both of natural size. It has the appearance of being a species that increases very slowly.

27. G. ochraceum, N.E. Br., in The Gardeners' Chronicle, 1922, Vol. LI, p. 81. - Stems forming a matted mass, prostrate, 2-edged, with internodes up to one inch long, purplish, finally whitish, and
49 branches with tufts of a few pairs of leaves at their ends. Leaves opposite, spreading, usually 1\(\frac{1}{2}-1\)\(\frac{3}{4}\) but sometimes (according to Berger) 3-4 inches long, 2-3 lines broad and 2-2\(\frac{1}{2}\) lines thick, flat above, with subacute edges, obtusely keeled throughout on the back, with one side convex and the other flat or slightly concave, acute or obtusely pointed, soft and flexible, ruddy, smooth, glabrous, green, slightly shining, obscurely pellucid-dotted when viewed with a lens against the light. Flower solitary. Pedicels usually 1-2\(\frac{1}{2}\) (but according to Berger sometimes 3-4 inches long, slightly compressed and 1\(\frac{1}{2}\) line broad and 1 line thick, glabrous, light green. Calyx very unequally 5-lobed down to its union with the ovary, which is shortly obovate, slightly compressed and 3\(\frac{1}{2}\) lines in its broader diameter; the two longer lobes 7-10 lines long, leaf-like, longer than the petals; the three shorter lobes 2-3 lines long, with broad, membranous margins, acute. Corolla about 1\(\frac{1}{2}\) inch in diameter, expanding in sunshine in the morning, closing in the afternoon; petals 30-60, in about 2 series, free, 6-7 lines long and 1-1 line broad, cuneately linear, obtuse, of a peculiar buff or ochraceous colour, with a faint burnery tint. Stamens numerous, erect, about 2 lines long; filaments white; anthers yellow. Stigmas 7-10, about 1 line long, plumose, acute. Ovary flatish, on the top, 7-10-celled. Fruit not seen.

Hsemembranthemum ochraceum, Berger, J. S. und Port., p. 234 (1900).

South Africa: Locality and collector unknown.

My first description of this plant was copied from that of Berger, but the above is made from the living plant, which I find is cultivated in several gardens in England, under the name of "Hsemembranthemum humile," as quoted by Berger. I have not seen any plant of it with leaves and pedicels as long as Berger describes them to be, nor do I find the stigmas to be 5 as he states. This plant appears to be infertile to its own pollen, at least, I have as yet failed to obtain fruit of it, and until that is obtained and examined the correct genus to which this plant belongs cannot be determined, for I doubt if it is really a species of Glottiphyllum.

Doubtful Species.

Hsemembranthemum heterophyllum, Coll., Obs., Append., p. 429 (1895), Misc. Nat., p. 36, Syn. Pl. Succ., p. 235 and Rev. Pl. Succ., p. 101, and J. E. R. in the Gardeners' Chronicle, 1902, Vol. LXXI, p. 22, not of Andrews.—Of this plant I know nothing, and can here only repeat what I have stated at the place above quoted, viz.: This is quite an unknown plant whose position is doubtful. It most certainly is not at all the same as "angustum var. heterophyllum, Coll., with which it has been confused by Sonder and Berger. It is originally described by Haworth thus follows: "I have seen a fine stemless Hsemembranthemum with various shalered greenish incurvate leaves, the lower ones somewhat like those of my species, the upper or inner ones somewhat like those of "follows, but not quite so large." In his Misc. Nat., p. 36, he adds: "I once saw two plants of this fine species alive in the collection of Messrs. Malcolm, nurserymen at Kemington." As he gives no further information about it in any of his works and no drawing is known to exist of it, the above is all that is known concerning this plant. Although associated with species of Glottiphyllum by Haworth, I am doubtful if it belongs to this genus. It may have been an immature
49 plants of some other known species of this or another genus, for in a young state some members of this group are very different from their adult form.

**Neosemibryanthemum suctenum**, Rev., Rev. Ill. Succ., p. 101 (1821) (Fig. 75).—Leaves mucrulate, suberect or spreading, semiterete-subulate, acute, soft, usually rustulate at the base. Very exserted, subdeterminate.—Var. B. Leaves shorter, more spreading.

The above is Haworth's description of this plant, which he states was in Kew Gardens in 1819, and is all that has hitherto been known of it. At Kew, however, there is a drawing of the type plant (of which Fig. 75 is a copy), labelled: "Raised in the year 1817 from seeds collected at the Cape of Good Hope by Mr. Cowie." From this drawing I clean the following particulars. Leaves opposite, united at the base and the pairs crossing one another at right-angles, 2-2½ inches long; about 5 lines broad, except at the base, where they are dilated, and 4-5 lines thick, semicylindrical, flat on the face, with sharp edges, very rounded on the back, tapering above the middle to an obtuse or sub-cute apex, green and apparently glabrous and shining, not dotted.

This plant does not appear to belong to the genus Glottiphyllum, and it is more that by means of Fig. 35, which is copied from the drawing of the type, it may be rediscovered.

W. H. Brown

(To be continued.)

**NEOSEMIBRYANTHEMUM.**


(Continued from page 49.)

12. **GLOTTIPHYLUM.** An.

Additional Species.

127. **G. regium**, R. E. Br. (Fig. 66).—Growth, as received, erect, forming clumps, each with 1-2 pairs of leaves, which, in the younger stages, are closed together so as to resemble a large beak of a bird and perfectly erect in the specimen seen; long, the larger beak of a bird and perfectly erect in the specimen seen; the larger leaf of each pair varies from 1-4 inch in long, 8-11 lines broad and 6-10 lines thick at the base, the other leaf being 4-8 lines shorter and not so thick, but according to R. E. Br. these dimensions may be far exceeded, as he stated that he found leaves on will plants in a very dry season up to six inches long. They are flat, or the smaller leaf slightly convex on the face, and there gradually tending to a subacute apex in the larger leaf, and to a rounded apex in the smaller one. The larger leaf is of about the same thickness throughout, rounded at the apex in side view, rounded on the back at the lower part, and compressed and obtusely keeled at the upper part, while the smaller leaf is usually thinner and sometimes flattened, and at others keeled at the apical part; surface smooth, without the transverse cells that some species have, glabrous and without microcoriaceous cilia on the edges, light green, suffused with red where exposed to full sunshine. Pedicels 6-11 lines long, longer when in fruit. Jelv very unequally lobed; the larger lobes 6-10 lines long and 6-7 lines broad, ovate, acute, keeled on the back, without cilia on the heel; the broader
123 lobes 5-6 lines long, orbicular, with broad, white, membranous margins and a dorsal point. Corolla only seen in a withered condition: petals 10-11 lines long and 2/3-1 line broad, linear, obtuse, yellow. Sepals pale yellow. Stigma 5, not in a fit state for describing. Capsule, when closed, 3-10 line in diameter, conical, with 3 sutural ridges 2-3 lines in on the otherwise flatish top, and with 3 valves and cells; valves suberect when expanded, and the capsule then 13-14 times in diameter, pale ochreous; expanding-keels half as long as the valves, widen separated at the base and diverging, with acute edges, dark brown, without points or marginal wings; cells crowded with stiff cell-wings end with a large callicolli tubercle at the opening. Seeds 4Line long, ovoid, with a slightly incurved point at one end, tuberculate, with the tubercles on the back, longer than broad and pinnate-like brown.

Oudtshoorn Division: On stony plains near the Cemka River, 4192.

This is the most striking species of the whole genus that has yet been discovered, and I think its discoverer is right in calling it "The King of the Genus." As there has been a drought for about two years in the region her it grows, and yet the leaves are so large or larger than represented in my sketch (Fig. 66), I anticipate that in our more humid climate they will become very much larger, and possibly prove to be the largest in the genus.

M. E. Brown

(To be continued.)

North-ULTRAFACE.


(Continued from page 124.)

194

The following are a few supplementary genera from among those that I left to be dealt with at the time of publishing my previous key until the material necessary to make a sufficiently perfect description should be available, and also descriptions of additional species and corrections be added to the genera already dealt with.

GUNNICH, J. C. Bp.

Piennial or annual. Root stout, fleshy, branching. Leaves opposite or alternate, not united at the base (as is stated in books) flat noticulate or scutulate-lanceolate. Flowers 2-5 in a terminal cyme, sometimes solitary, rosette-like. Ovary obovate, acutely 6-angled on the ovary part, and the angles with or without small teeth scattered along them, unequally 5-lobed down to its union with the ovary. petals numerous, free. stamens numerous, erect, filaments slender. Stigmas 5, subulate, overtopping the stamens. Ovary inferior, shortly conical and 6-angled at the top, 6-celled: nectaries on the outer walls of the cells. Capsule 1-3 line, obconic, 5-angled, and with 6 valves and cells; valves without expanding-keels and marginal wings, flatish within, not expanding by being wetted, but separating and spreading so when the capsule is ripe and dry, and remaining so without closing or 'ecul'; cells deep, one, without cell-wings or tubercules, and the thin cell-artications rising in a conical manner much above the level of the bases of the valves. Seeds compressed, somewhat kidney-shaped, tuberculate.

The only known species is G. triolium, J. C. Bp. a native of
194 the Cape Division of South Africa.

The name is derived from the Greek, *Tripolium*, and *vulnus*, viscidium, because the valves of the capsule are destitute of expanding-keels and marginal wings.

The true position of this very distinct genus, which I have not yet seen alive, is somewhat doubtful, but I propose to place it between *Cyanthus* and *Carr utanius*, because its habit and foliage is similar to that of those genera in their allies, although the structure and appearance of the flower and fruit is entirely different. In this genus the expanding keels of the valves of the fruit are aborted, so that there is no mechanism for opening and closing the valves, as in most of its allies. When ripe and dry the valves separate and spread out, and never close again; water has no influence upon them.

195

1. *C. trinodium*, L. E. Br. — Glebrous in all parts. Flowering stems arising from a radical tuft of leaves, 3-9 inches long, decumbent, with distinct internodes. Leaves lanceolate and *articulate* or *corticate-lanceolate*, acute or obtuse, 3-7 inches long, 4-18 lines broad, with the *articula* channelled, dilated and spreading at the base, but when opposite not united there. Fidicels erect in flower and fruit, 1-2½ inches long. Calyx with the two longer lobes 5-6 lines long, deltoid-ovate, acute, the other three shorter, broadly ovate or sub-umbilicus, with membranous margins and a dorsal point. Corolla 15-18 lines in diameter, "opening in the middle part of the dry, and of short duration," according to Hooker; petals linear, acute, 4-6 lines long, 1 line broad, not, or but slightly, longer than the calyx-lobes, white. Stamens white. Stigmas ovate. Nectar-forming the stamens. Capsule 10-11 lines in diameter, obconic, 3-angled; valves spreading 2½ lines long, and 2-3½ lines broad at the base, deltoid, smooth and creamy-ochraceous within; cells about half-an-inch deep, with thin and stiff villous cell-epidermis, rising perfectly erect in the form of an acute cone, and entirely without cell-wings. Seeds one line long, tuberculate, black, otherwise as described under the genus.

*C. trinodium*, Linn., Sp. Pl. ed. 1. r. 461 (1753), founded upon Dillen, Hort. Tllth. p. 320, t. 179 f. 220; Rev. Obs., r. 132 and 443, Misc., r. 49, Synon., r. 247, and Rev., r. 167; Salis Dyck, Mes. 64, f. 1; Berger, Obs. r. 42 and 43, f. 5. (The fruit figured as *P. trinodium* in Crispi, Guide to Brit. Herb., r. 12, belongs to *Carr utanius* nomos.) And that figured in The Garder, 1905, Vol. IX, r. 547, under the same name is *C. contospermum* avicennae, C. Hoefn., the well-known "Rose of Jericho"). N. expanuital, Thunb. Pl. Int. p. 415, not of Linne.

Cape Division: In damp sandy places in various parts of the Cape Peninsula. Wollers Doda 7509, Bolus 7870, Illiams, Fiequetberg Division, Pickleberry Foss, Pearson 5290, Gillwilix Division: Olhahota River Valley, near Yarmouth, Stephens 7176.

According to information received from Mr. Illiams and recorded upon labels with specimens, this plant grows in damp places and in sandy soil, so that under cultivation it should receive more water than most of these plants require, and probably a good sandy loam would suit it best. As it is a biennial, it must be propagated from seeds.

N. E. Brown
(To be continued.)
6. P. Dekenchi, N. E. Br.--Leaves 1-3 pairs to a growth, ascending - spreading, or at spreading, 14-3 inches long, 2-13 lines broad at the middle, 4-6 lines thick at the base and curved to one side, so that the flat or slightly concave upper side is more or less falcately sub lanceolate (or less commonly straight and lanceolate) in outline, acute or obtuse, rounded on the back at the base, strongly keeled and compressed, and with slightly concave sides at the apical part, where, in side view, one leaf is more obtuse or rounded into the apex than the other of each pair; smooth or slightly pubescent, revish-green, slightly tinged with rose on the angles on the imported plant, and thickly dotted with dark green, the dots not being prominent. Flowers solitary, not seen. Pedicels of capsules 5-8 lines long, with a pair of bracts at the base, which are probably partly included between the bases of the leaves when in flower. Capsule, when closed, 5-6 lines in diameter, herispherically obovate, partly superior, slightly depressed on the flattened torus, with the sutures of its 10-12 valves slightly raised, dull brown; when expanded about an inch in diameter, with the valves slightly recurved, and the whole interior dull blackish-brown; expanding-kels standing apart and slightly diverging, or suberect, scarcely half as long as the valves, stout, with rounded edges, acute (but not apex) at the apex, not winced; cells acutely rove with very stiif cell-wings that are turned back at the opening like the mouth of a trumpet, and the opening partly or nearly closed by a blackish-brown, compressed tubercle. Seeds few in a cell, about 1-2 line in diameter, compressed, roundish in outline, with a small point, microscopically tuberculate, blackish-brown.


Described from a living plant sent to me in November last by Dr. J. Nuir. I have not yet seen its flowers, but they will be described later. This new discovery, however, is easily distinguished from its allies by its falcately curled leaves.

In the Zeitschrift fur Sukkulantenkunde, 1907, p. 22, Schwantes has united the genus Punctillaria with Pleiosilos, because he states that the capsules of these two genera do not differ, and that in those of Pleiosilos Bolusii and P. simulans there is a small tubercle present at the opening to the cells, but that it is hidden by the cell wings, and that I am mistaken in supposing it to be absent. But here, as in so many other cases, I find he is for more eager to claim authorship than to make careful investigations, and so has created much useless synonymy, for besides the fruit I previously examined, I have before me as I write between twenty and thirty capsules of P. Bolusii and several of P. simulans, that I myself picked from living imported plants, not one of which possesses any tubercle, small or large, such as is found in the capsules of Punctillaria (ortetia, magnunpotato, Rodice, Dekenchi) that I have examined. From this, I can only suppose that the capsules examined by Schwantes were either from hybrid cultivated plants or from some that were wrongly named, they certainly could not have been from any true Pleiosilos, if his statement is correct. Besides the character
of the absence of a tubercle at the opening to the cells, the capsule of Pleiosrilos also differs from that of Lunatillaria by the much longer two to the expanding-keels and the manner in which the marginal wings extend alone it, as is clearly shown in my illustrations of the generic characters in The Gardeners' Chronicle, 1926, Vol. LXX, p. 20, f. 50, as compared with those of Lunatillaria on p. 218, f. 104, of the same volume. There is also the difference in foliage.

P. compacta, L. E. Br., in the Gardeners' Chronicle, 1926, Vol. LXXI, p. 882. In Dryander's manuscript notes at the British Museum, I find it recorded that Pleiosrilos compactus, L. f. flowered at Kew in November, 1761, that its flowers are yellow, and the leaves as long and as thick as a finger. Dryander's MSS. description, translated, reads as follows:—"Sterile; Leaves coriaceous, dotted, serparate, tricuerous and somewhat reflexed at the apex, acute. Flowers sessile; calyx subcylindric, six-lobed." All this quite agrees with the plant I have described as P. compacta which is also cultivated as P. nobile. But Schwantes, without giving the slightest reason for so doing or indicating how they differ or can be identified, has given them separate names. Therefore to the synonymy of this plant must be added: Pleiosrilos compacta, Schwantes and P. nobile, Schwantes, in Zeitsch. f. Sukk. 1927, p. 23.

N. E. Brown
(To be continued.)

PSE BRYANTHELIUM,
(Continued from page 216.)

12a.—DILLCOOT, SCHWANTES.
251

Small, succulent perennials, stemless and deciduous, without evident rootstock, but with numerous short, fibrous roots from a dense cluster of sessile growths. Each growth formed of two opposite leaves, which are both sub-horizontally directed, and shortly and very obliquely united at the base and along the basal part of one margin, with the free parts diverging, soft and pulpy, withering completely away annually. Flowers solitary, terminal, sessile between the bases of the leaves, bractless. Calyx unequally 6-7-lobed. Petals numerous, in two series. Stamens numerous, erect, surrounded by staminodes. Stigmas 7, erect, filiform. Caryes inferior, flat at the top.—Schwantes in Zeitsch. f. Sukkulent, Vol. II, p. 170 (April, 1926).

Species two, native of South Africa, the type of the genus being D. retroversum, Schwantes.

The derivation of the name is not stated, but is doubtless from the Greek, dillcos, double, and son, a body, in allusion to the two-lobed body formed by the partial union of the basal part of two leaves. The author of this genus has founded it without giving any generic characters or the slightest indication of how it differs from other genera, and evidently he has never seen the genus, and evidently he has never seen the plant he founds it upon. But as it is a good genus, I have done the best I can to formulate generic characters for it from Mrs. Bolus' description and figure of the type species, and from a living plant of a second species of which I have
251 not seen flowers. As the description of the flower of both species is very incomplete, and (apart from stating that the cells have no cell-wings and the placentas are on the outer wall) the structure of the fruit is undescribed, its real affinity is not certain, but as in general appearance it more nearly resembles the genus Clotti-

rhynchium than any other at present known, I place it next to that genus, from which the filiform stigmas and the presence of staminodes exclude it.

If I am correct in assuming (as from the evidence I have seen I believe I am) that the leaves of this plant die away annually, it is the third known genus in this group of plants that is known to be deciduous, or in which the leaves die and either annually, even if they do not fall off, the others being Phyllologus, N.E. Br., and Dactylomisia, W. E. Br. There are, however, also members of the genera Mesembrianthemum, Delosperma, Psilocaulon and Sceletium in which the leaves die and persist or are deciduous annually; while in one species of Amoebophyllum they persist as stamines.

Leaves united at the base on one side for nearly half their length, 2½-4 lines broad, marked with a few pellu-
cid dots.

1, retroversum.

Leaves united at the base on one side for not more than one-quarter of their length, about 3 lines broad, marked with some linear blackish lines.

2, Leipoldtii.

1. D. retroversum, Schwantes, in Seitzschr. f. Suidulent, Vol. II, p. 170 (1923).-- Plant scarcely an inch high and as described in the generic characters. Leaves two only to a growth, 9-

11 lines long, 3½-4½ lines broad and 2½ lines thick, sub-terete, but slightly concave or flattened on one side, with rounded edges, slightly narrowing to the very obtuse apex, smooth, glabrous, green, with a few scattered pellucid dots. Flowers sessile, soli-
tary, terminal. Calyx unequally 7-lobed (always?): ovary part de-

pressed, sub-globose, constricted under the lobes, 2½ lines in diameter; the larger lobes about 2½ line long, acute; the other 1-

½ line long, with broad membranous margins, obtuse. Corolla repre-
sented as about 5 line in diameter; petals numerous, in 2-5 series, ¾ lines long and ½-line broad, linear, acute, rosy-purple. Stems

and staminodes numerous, up to 2 lines long. Stigmas 7, erect, 2

lines long, filiform. Ovary flat and 2 lines in diameter on the top.

Mesembrianthemum retroversum, Kemsit in Trans. Roy. Soc. S.


Flowers in Division: Near Endekuil, Pillans 995.

This curious little plant at present seems only to be known from

the above description and figure.

2. D. Leipoldtii, L. Bolus, in South African Gardening, 1927, p. 832, f. 1, ½. -- Resembling D. retroversum in general habit, but the unequal leaves are narrower, 8-12 lines long, 2½-3 lines broad and nearly as thick, and are only very slightly united along one margin at the base above the sheath (not for nearly half their length), somewhat semi-terete, concave or flattened on the face, with blunt edges, very obtuse at the apex, slightly twisted, soft and purplish, smooth, glabrous, green, with a few scattered, short, linear, blackish-green markings. Flower not seen, but according to L. Bolus, solitary, sessile or sub-sessile. Calyx unequally 6-lobed,
251 two of the lobes 5-6 lines long and the other four about 2 lines long, terete. Corollas about 10 lines in diameter. Stigmas represented as 7, subulate, acute, erect. Top of the ovary flat. The cells of the capsule are stated to have no cell-wings, and the placentas on the outer wall. No other details are mentioned or figured.

Tietzeberg Division: Between Endekuil and Grey's Pass, Leinoldt and Vaughan.

I received a living specimen of this very remarkable plant from Professor R. H. Compton in 1896, which, when it arrived, was at rest and entirely without any trace of leaves. It consisted merely of a dense cluster of dead sheaths surrounding a mass of short, fibrous roots. After some days, however, it put forth several pairs of leaves as described above which differed distinctly from those (as figured).

352 of D. retrosorum, by being more slender, less united at the base, slightly twisted and marked with short, blackish streaks, neither the twist of the leaf nor the blackish streaks upon it are mentioned by Dr. Bolus, whether D. retrosorum is so marked I do not know, no mention being made of the, but in my experience no other plant in the whole group of genera has such peculiar marks as this species has upon it. They are not the usual dots, but whether idioblasts or not I did not determine, as the plant unfortunately died without flowering; now that it is dead I realise that I killed it by keeping it too dry. It has very short roots and is evidently a surface feeder, obtaining, under natural conditions, sufficient water from the heavy dews to prevent its roots from drying up during the time it is at rest and leafless. When growing and flowering, however, it evidently requires a fair amount of water, and by treating it as I did my species of Conophytum I evidently did not supply it with sufficient amount, so that a brave struggle it died. Examination after death proved that I had allowed its root-tips to become too dry. From this I infer that its purplish leaves evaporate much more water than a Conophytum or a Lithops does, and consequently the soil requires to be kept in a moister condition for this Diploma during its vegetative period. This experience may be useful to future cultivators who may obtain plants of this singular and interesting species, and I would recommend that the pot be stood in a saucer and watered when required by putting water in the saucer, so that there is always moisture ascending from the lower soil to the roots.

N. E. Brown
(To be continued.)

HERBERT BROWN
(Continued from page 262.)

121.—STEIRROPTALUM, N. E. Br.

266 Stemless, perennial, tufted. Leaves opposite, shortly united at the base, sub-terete or somewhat semi-terete, smooth and dotless. Peduncle solitary, terminal at the side of a new pair of leaves, 1-3-floread, the lateral flowers also on short, short after it has once expanded; petals numerous, in several series and passing into staminodes, narrow and stiff to the touch, all shortly united into a ring or tube at the base. Stamens connivent for half their length with the upper part, abruptly deflexed and tortuous, bearded at the basal part. Stigmas 5, ascending-preuding. Ovary inferior,
flattish or very slightly convex on the top, 5-celled, with the stamens on the floor of the cells. Capsule shortly obconic, flattened at the top, and the sutures slightly raised at the central part only, with five valves and cells; valves recurved when expanded, with the expanding-keels contiguous into a very stout, convex, central keel, with broad marginal wings that are not united in pairs between the valves; cells imperfectly roofed with small, membranous and flexible cell-wings, whose edges do not meet, and without a tubercle on the outer wall. Seeds not seen.

The only known species is S. illiensii, R. Br., a native of Little Moreuand.

The name is derived from the Greek, ste ros, stiff, and petalon, a petal, in allusion to the stiff petals, a character that is otherwise only known to occur in this family of plants in the genus Dactylorhiza, near which for the present I place it, although its foliage is quite different in type from the leaves of that unique plant. Fig. 131 represents a diagram of the structure of the flower, but with only two series of stamens shown in order to make their arrangement clearer.

1. S. illiensii, R. Br. (Fig. 131.)—Plant tufted, 2-3 inches high, alleugine. Leaves in 2-3 pairs to a growth, sub-erect, to ascending-spreadling, 12-20 lines long, 3-5 lines broad, and 3-4 lines thick at the base, slenderly sin er-like, slightly narrowing upwards to a very obtuse apex, slightly convex on the face, with obtuse or rounded edges, very rounded and scarcely at all keeled on the back, nor compressed at the apex, firm, smooth, not dotted, glaucous-green or whitish-green. Peduncle erect, 1-1 inch long, compressed and 3-edged, about 1½-line broad, of a much paler green than the leaves. Bracts about six lines long, united at the base, resembling reduced leaves. Pedicels about 3 lines long, erect. Calyx produced above the ovary into a slight tube about ½-line long, with the ovary-part somewhat ovoid-conical, and the lobes like reduced leaves, the two longer are 5-6 lines long and the others 3-4 lines long, all ascending-spreadling when expanded. Corolla 6-9 lines in diameter, not closing after it has expanded, but remaining open day and night, for three weeks or more, not scented; outer petals about ¼ lines long and ½-line broad, arched-spreadling and shorter than the calyx-lobed, narrowly linear-cuneate, sub-acute or obtuse with a small point at the apex; the inner gradually shorter, narrower, filiform and acute, less spreading, and the innermost constricting, filling up the central part of the flower so as to make it flat at the top and concaving the stamens, all of them quite stiff to the touch and united at the base into a very short tube about ¼-line long, white, with a faint yellowish tinge at the central part of the flower; the innermost or staminodes are densely bearded and matted together at the middle. Stigmas 1½ lines long, filaments very slender at the deflexed tortuous part, white, anthers yellow. Stigmas 1 line long, stout, subulate, smooth, and green. Glands none or obscure. Ovary green on the top. Capsule 5-3½ lines in diameter when closed and 5 lines when expanded, dull brown within, with the keels and marginals wings of a lighter brown, otherwise as described under the genus.


This plant was sent to England in 1910 or 1911 by Professor Pearson, but never flowered. Last year I received it from Mr. R. S. Illens, and as it has flowered, I am now able to describe it. In
Dwarf succulent perennial, forming clumps, very pulpy. Leaves two or three to each growth, alternate, terete, very stout, with large, tubular sheaths clasping one another closely and concealing the short stem, soft and pulpy, dotless, withering completely and disappearing when at rest. Flowers terminal, solitary, sessile. Calyx produced above its union with the ovary into a short tube, equally 5-lobed above. Petals a short tube, numerous in several series, the inner (staminodes?) concealing the stamens, linear, stiff, united into a tube at the base and arising in the angles where the calyx unites with the ovary. Stamens numerous, erect, in 4 series, arising from the tube of the corolla and not exserted from it. Stigmas 5, subulate, acute; style none. Ovary half-superior, 5-celled; locules exiled; ovules numerous in each cell. Capsule half-superior, sub-globose, with the 5 sutures raised into grooved ridges on the top, 5-celled; valves deltoid, with the expanding-keels continuous at the lower part and these forming the cell-partitions, more or less diverging at the apical part, and there bearing broad, membranous, marginal fins or flaps that are united in pairs between each pair of valves; cells open, without cell-wings or tubercles; the central axis ends in 5 short, hard rays arranged in a small star; these rays may possibly be abbreviated cell-partitions, as each ray arises from between the bases of a pair of expanding-keels, and occur in other genera. Seeds very small, many of them in each cell, compressed, ellipsoid, somewhat pointed at each end, and with a minute nodule at one end, smooth.—M. E. Br., in The Gardener's Chronicle, 1925, Vol. LXXVIII, p. 413; and in Phillips' Gen. of S. Afr., T1, 11, p. 244.

Species 1, D. digitata, M. E. Br., native of South Africa.

The name is derived from the Greek, dactylos, a finger, and oris, appearance or likeness, in allusion to the finger-like leaves of the plant.

The very remarkable plant that constitutes this genus is distinguished from all others of the group, not only by its appearance, but by its very stout and very pulpy alternate leaves, which are absent or completely withered when the plant is at rest; by its petals being remarkably stiff and united at the base into a tube,
and by the character of its ovary and fruit. Fig. 160 represents
Diagrammatically the floral structure made from a living flower.
Fig. 161 is from a photograph of my plant in a state of rest, with a
dead flower upon one of the growths, natural size, taken by my
dughter. In this state it somewhat resembles the pseudo-bulbs of
an Orchid. Fig. 162 is from a photograph by Mr. T. K. Leslie of
the plant as it grows in South Africa (and with myself) in flower,
natural size.

It is interesting to note how completely this plant changes its
appearance, as is shown by these figures. When in vigorous growth
and flowering its appearance is as shown in Fig. 162, but when it
goes to rest the stout pulvinate leaves and their sheaths dry up and
disappear, becoming a mere brown skin enclosing the short pulv
stem of each growth, as shown in Fig. 161.

1. D. digitata, N. E. Br. (Figs. 160, 161 and 162).--Plants
with age, forming large clumps up to a foot in diameter. Stock
and its fleshy roots descending deeply, stout, divided or branching
above, the branches being mostly underground, and 6-8 lines thick.
Each growth, 1½-3 inches high and ½-1½ inch thick, soft and fleshy,
with 2-7 alternate sheathing leaves that are very unequal, 1-3 inches
long and 1-10 lines thick, terete or finger-like, very obtuse,
smooth, pubescent, very pulvinate, green or glaucous-green, the under
continued sunshine tinted with purple at the tips. Flowers solitary,
septate, terminal. Calyx not exerted, from the leaf-sheath, about
4 lines in diameter, sub-oblanceolate at the lower part, green; tube
above its union with the ovary 1½-2½ lines long; lobes 2-2½ lines
long and 1-2½ lines broad, ovate to rounded, obtuse, sub-membrane.
Corolla 7-9 lines in diameter, remaining continually extended for
3-4 weeks irrespective of cloud or sunshine; tube about 3 lines long;
petals very numerous, in several series, linear-flabellate, rather
stiff; the outer about 7-10 lines long, recurved-spreading, pure white;
the inner about 1½-2½ line long, erect or incurved, concealing the
stamens, white or pale yellowish. Stamens in 4 series, included in
the corolla-tube, creamy-white, very soft or rather more than half-
superior, superior, conical, tube, creamy-white. Stigmas 5, erect,
1½ line long, stoutly subulate, acute, creamy-white. Capsule
sub-oblanceolate, with 5 converging natural ridges on the top, 2-4 lines
in diameter, when closed, and 5-6 lines in diameter when expanded, with
the whole inner surface creamy-white or pale ochreous. Seeds 2½
line long, light brown.

Mesembryanthemum digitatum, Nut. & Hort. Soc. ed. 1, Vol. II,
Fig. 161 (1792); Haw. Obs. n. 190 (1795), Disc. Bot., p. 27, Synops.
II. Succ., n. 311, and Iev. Fl. Succ., p. 32; Lager., Ling. und
Fort., p. 228, t. 47 (copied from a drawing by Jesson). D. digitat
formose, Flora, ed. 3d. Lieb., t. 6 (1791), and Fl. Cr. ed. Schultes, t. 11;
Engelm., Fl. 3: fr., vol. 1, p. 201, t. 49, Fig. C, and in Trans. Roy.
102 (section of flower very inaccurate); R. T. Br. in Bothan 11. vol.
1, p. 152.

Van Buresch Division: Herero between the Okavango River and
the Potkeveld Mountains, Dunbar, Jesson, Tomson, 141, Dr. Good
Wetlooth.

This singular plant was introduced into England by Francis
Jesson in 1775, but seems soon to have died out of cultivation, for
Haworth stated that he had never seen the plant. Recently nothing
has been known of it in Europe for over 130 years. Therefore
only those who are really fond of plants may sense or understand
the delight and satisfaction I felt upon receiving unexpectedly
from Mrs. E. Rood a living specimen of this very remarkable plant,
of which I had read and have seen a drawing, but never hoped to
possess. Only they may realize the very great disappointment it
was to me to find that the bulk of the plant, although preserving
its shape, was a mass of rotten pulp. However, as I noticed that
two of the growths had firm central cores, I kept the plant under
running water-tap, and with a soft brush cleared the whole of the
rotten part away, dried the remainder of the plant with a soft cloth,
and then placed it in a corner of the warm tiled hearth in front
of the dining-room fire and kept it there for three days. Finding
the cores were then dry and firm, I planted it in dry sand in a small
pot, and observed that not half-buried in a larger pot of earth. The
core in the outer pot was watered from time to time, but I never
watered the sand in which the plant was actually planted. The
moisture from the outer pot supplied all that the plant needed, and
in a month it had put forth roots, when I repotted it in a different
soil, and in due course it developed leaves and flowered. From
this plant I have therefore been able to give particulars of the
structure of its flowers and fruits. Also, that plant only lived
to flower once, the damp atmosphere of a sunless, cold and wet
year proved to be fatal to it.

At the British Museum and at Kew there are fine drawings (both
like) made by Hesse's of the plant as he found it growing in South
Africa. These drawings represent a clump of the plant thirteen
inches in diameter, of which a small portion has been copied and re-
produced on a reduced scale by Borger, as above quoted. Hesse's
drawing has been thought to be an exaggerated representation of
the plant, but my plant and one of which I have a photograph taken in
South Africa had had leaves as long and as thick as those represented
by Hesse, so probably the plant he portrayed had received a
larger amount of rainfall that year than usual, thus inducing a
luxuriant growth. Hesse figures the flowers of normal size.

This plant is remarkable in several of its characteristics.
In the first place, when the plant goes to rest, the leaves and their
thick pulpy sheaths either and shrivel to a mere skin, soft and
friable, and brown in colour, through which, after a period of rest, the
new growths burst. The distinctly stiff petals and the long
duration of the flower's (3-4 weeks) so far as known to me, are almost unique in this group of plants, only one other genus (Terro-
retum), having these characters. Another interesting feature is its peculiar anatomical structure. Each growth consists of a short stout stem, 1-3 inch's long, enveloped by the thick sheaths of the
leaves. The central part consists of a stout cylinder of dense,
fleshy tissue composed of minute cells, and is somewhat firmer than the
other parts of the plant. This cylinder is surrounded by a
single layer of large
elongated cells, colourless and watery, all arranged at right angles
to the axis, and all so large as to be clearly visible to the naked
eye, a type of structure I have not seen before. This layer of
large colourless cells is represented at a in Fig. 16. The whole
of this is enclosed in the tubular sheath of the leaves so as to be invisible without dissection. A transverse section of the leaf
is quite circular in outline, the central part of it consists of a mass of clear, watery tissue, with air cavities and slender vas-
cular fibres scattered throughout it. At the outer edge of this
410 clear tissue, where it unites with the chlorophyll (or green) tissue, the vascular bundles fork and unite with other fibres, so as to form a network. The chlorophyll tissue forms and outer layer of several cells in depth, but the cells are irregularly intermingled, not disposed in regular layers. The epidermis smooth, becoming slightly glaucous, but under a microscope the outer surface of each cell is convex.

N. E. Brown

(To be continued.)

MENEBRYANTHEMUM


(Continued from page 340.)

14.—SPALONIA, N. E. Br.

419

Succulent, perennial, bushy, branched. Leaves more than two to a branch, some alternate and others opposite, sessile or sub-truncate, always with a tubular sheath, embracing the branches or the sheath, above, and nearly or quite as long as the internodes. Flowers terminal, solitary. Calyx produced above its union with the ovary into a distinct tube, unusually 4-5-lobed above, with a lobes leaf-like, the other shorter and more membranous. Petals numerous, linear, in 2-3 series, apparently united into a short tube at the base. Stems and staminodes numerous, erect, possibly connivent into a cone? Stigmas 4—, subulate. Corymbs conical at the top, (probably half-superior, but too crushed to decide), 4—, cellular, placenta's axile. Carsules not seen.—N. E. Br., in The Gardener's Chronicle, 1825, Vol. LXXVIII, p. 417, and in Phillips, Gen. of S. Afr., Pl. Fl. n. 264.

The only species is ... amuletens, N. E. Br., the type of the genus, a native of Namaland region.

The generic name is derived from the Greek, amulet, to embrace, in allusion to the tubular sheaths of the leaves which embrace the stem.


This is a remarkably distinct plant of dwarf, bushy habit, quite unlike any other in the group. I have not seen it alive.

15.—MOEBPHYLLUM, N. E. Br.

Perennial succulents, with distinct internodes. Leaves alternate, sessile, withering and persisting as sharp spines, or the basal part only persistent as hardened fragment. Flowers terminal in lax bracteate cymes, radicellate. Calyx slightly produced above its union with the ovary into a short tube, 4—, above. Petals numerous, united at the base into a short tube, and arising around
the tor of the ovary, not at the tor of the calyx-tube. Stigmas numerous, collected into a cone, surrounded by spreading staminodes, arising from the tube of the corolla and deciduous with it. Stigmas 5, subulate. Every half or less than half-superior, 5-called; placenta ovate. Capsule half or more than half-superior, with 5 valves and cells, only an immature specimen seen; valves with the expanding-keels continuous into a central keel, and with a broad, marginal, inflexed wing on each side. Seed: several in a cell, immature in the specimen seen, compressed, minutely tuberculate. - H. E. Br. in The Gardener's Chronicle, 1925, Vol. LXXVIII, p. 734, and in Phillips, Gen. of S. Afr. Fl., p. 244.

Species 5, natives of Southland and Yemanjaland, the type of the genus being P. angustum, H. E. Br.

The name is derived from the Greek, amoibe, alternation, and phyllon, a leaf, in allusion to the leaves being alternate. H. E. Br. in South African Gardenia, 1927, Vol. XVII, p. 367, gives a different derivation, as if seeking to claim the genus as her own, since no mention is made of its place of publication or its author.

In the Genera of South African plants, my description of the corolla, stamens and stigmas were partly based upon the flower of P. rensei, in as I have not seen P. angustum with these organs in perfect condition, but H. E. Br. in the same volume, another note, I have slightly modified the above description in accord with her figure of the living plant, but there seems to be no difference of generic import. Also, upon further examination, of the only fruit I have not seen, I am doubtful if my statement that the wings of the valves are really united in pairs is correct; the fruit is a capsule one and glued to the sheet on which it is mounted, and by repeated setting the vints have either become free or were only held together by a little glue, as I now suspect. As I have not seen any living plant of this genus I am unable to illustrate it.

1. Leaves 5½-9½ lines broad, ovate-lanceolate, acute; green parts coarsely pubescent.

2. Gurichia num.

Leaves ½-2½ lines broad, linear, linear-lanceolate or subulate and drying spine-like.

2. Leaves ½-1 line broad, sub-terete or subulate, very acute, persistent or stiff spines; calyx-lobes spine-tipped; green parts minutely or finely pubescent. 1, angustum.

Leaves 1½-2½ lines broad, linear or linear-lanceolate, and in the specimens seen only the basal part persistent as stiff broken fragments; calyx-lobes not spine-stipped; green parts coarsely pubescent.

2. Rensei.

1. A. angustum, H. E. Br., in Phillips, Gen. of S. Afr. Fl. Fl., p. 245. - A bushily-branched plant, probably about a foot high; branch stiffly erect, those seen (dried) 3-7 inches long and about 2-2½ lines thick, slightly zigzag, with internodes 3-4 lines long, glabrous and minutely pubescent on all green parts. Leaves alternate, 2-1½ lines long, ½-1½ line broad or thick, subulate or sub-terete, very acute, and persistent as sharp, stiff spines, spreading and uncurred, usually with leafy buds in their axils. Cyme terminal, lax, up to 2½ inches in diameter, 3-5-flowered, bracteate. Pedicels 6-9 lines long, ½-1½ lines thick below, enlarging upwards. Calyx with the ovary-part obconic, ½-5 lines in
dilated 2^Hanaiei perennial, 15.
lines "filifoirr. S. S, brofrfl, fila-
coarsely think it. tube, near fevr hich other A. ^ trpjislation, larrer A. living stiff, Br. stated 133 364 line lines coarsely about lines 6-7 larger

Damarfland: 3.65, Damarfland: 2,800 line

Little Fenesqualand: near Silverfonetain, 2,500-3,000 feet alt., Drene 2,935. Cornerberg, Hllens 5,741.

A remarkably distinct plant, distinguished from all others of this alliance by its m the stout, stiffly erect branches and alter-
ate, sessile leaves, which wither and become spines.

I think the two following species belong here, but until all
three have been examined and compared in a living state, their
position cannot be definitely det rained.

2. A. Rensei, H. E. Br. -- A perennial, bushy succulent, up to
one foot high, coarsely applicate on the green parts; branches erect, stout, about 3 lines thick (dried), apparently somewhat twisted the upper part, alabrous. Leaves alternate, only a few of the under-
most seen, sessile, about 6-8 lines long and 1½-2½ lines broad,
linear or linear-lanceolate, acute, apparently camouche-channels above, and slightly convex on the back, after withering, apparently only the basal part persists as a stiff, broken fragment. Flowers
in loc terminal comes about three inches in diameter. Pedicels
about 2 lines long. Calyx-tube obconic, produced above its union
with the ovary into a very short tube about ½-line long, unequally
5-lobed above, the 3 larger lobes 5-7 lines long and 2½-3 lines broad at the base (dried), ovate, tending to an acute or sub-obtuse
point: the 2 other lobes with broad, membranous margins and a dorsal, acute point 1-2 lines long. Corolla apparently, about 1 inch in
length; petals numerous in 2-5 series, about 3 lines long and less
than ½ line broad, narrowly linear, united at the base into a tube,
1½ line long, possibly white? Stigmas numerous, in several series,
crailing from the tube of the corolla and not longer than it. Fille-
ments short, apparently incurved. Stigmas 5, about ½-line long, sub-
ulate. Every petal superior.

Great Fenesqualand; near Fuhar-brand, about 3,600
feet alt., Drene, 1,050.

A, Curicium, H. E. Br. -- Plant strongly or coarsely
parillate. Leaves alternate, 6-14 lines long, 5-9 lines broad,
linear-lanceolate, acute. Flowers on terminal branchlets, reacu-
culate. Calyx 5-lobed; lobes very unequal, 3 larger than the others, all acuminate. Corolla 7 lines or more in diameter; st. 1½ ros.
Stamens numerous, included. Stigmas short. Ovary ovoid, half-super-

Damarfland: near the river Ub, Curic 70.

This species is only known to me from the very imperfect descrip-
tion of which the above is a translation, from which I think it must
Succulent perennials, pubescent on all the green parts. Root-stock tuberous or fleshy. Stems rostrate, herbaceous, or becoming woody at the base. Leaves alternate or opposite, or those on the flowering part alternate and the remainder opposite, sessile, semi-terete. Flowers solitary and terminal, or by the growth of an axillary branch or branches, 2-6 to a stem and becoming one by one lateral and opposite the leaves, or in 8-6 terminal leafy or breast-cate cymes, pedicellate. Calyx produced above its union with the ovary into a short tube, or subequally 5-lobed nearly down to the ovary; lobes with leaf-like tips. Petals numerous, in 3 or more series, united into a short tube at the base, passing into staminodes. Stamens numerous, arising from the tube of the corolla, erect, in several series. Style none; stigma 4-5. Ovary partly superior, or inferior, 5-celled with axile placentae. Capsule half superior, the upper part very convex or dome-like, with much raised sutures; when young smooth and transparent so that the seeds within it may be seen in the type (but seldom not in all) species, with usually 5, sometimes 4, valves and cells; valves widely spreading or recurved; expanding-keels, continuous, forming a central keel, united at the base to the style and so forming the cell-partitions, with broad, erect and leaf-like marginal wings unfolded upon them; cells open without cell-wings or tubercles. Seeds compressed, rounded or horse-shoeshaped in outline, minutely tuberculate (? always).—E. E. Br. in The Gardeners' Chronicle, 1925, Vol. LXXVIII, p. 553.

Species 17 or more, natives of South Africa. The type is S. canaliculatus, E. E. Br.

The name is derived from the Greek, sphalne, a mistake, and anthos, a flower, because these plants have mistakenly been placed in the genus Hemorrhysanthum.

Sphalantonthus differs from Bryophyllum by its perennial habit and tuberous rootstock, and from Crinaria by its tuberous rootstock, rostrate stems, more pubescent leaves, which are mostly alternate on the flowering part, and rather different flowers, otherwise the general structure of these three genera is similar. I do not know if the unarmed fruit of all the species is transparent so that the seeds may be seen within it, as it is in S. canaliculatus, but if it is, this very remarkable character will be an additional distinction.

As the species of this genus are seldom cultivated, I am not able to make a workable key of them, and may only indicate them by the colour of their flowers, which is variable in some species, and as I have not a living flower of the type species, my sketch (Fig. 2) of the flower structure is made from one of S. fragilis.

Petals entirely white or whitish.

1. S. canaliculatus, S. salmeus, and see 10, S. commutatus.

Petals white at the upper part, purple at the base.
Petals pink or purplish, or salmon-coloured.

1. *S. canaliculatus*, L. E. Br.—Stems prostrate, sometimes rooting at the nodes, and up to two feet or more long; 1-1 line thick, with internodes 1-2 inches long, terete, papillose, producing short leafy branchlets or short or elongated flowering branchlets or short or elongated flowering branchlets, but commonly bearing the flowers in a terminal cyme. Leaves 4-8 lines long, about 1 line thick, semi-terete, channelled on the upper side, not at all united at the base, sub-acute, glabrous, papillose; crowded on the short branchlets, distant on the main stems. Flowers in terminal cymes 2-3 inches across, or solitary, or scattered along the branches opposite the leaves, or axillary. Pedicels 2-7 lines long. Calyx more coarsely papillose on the lower part than on other parts of the plant; upper part 3-4 lines in diameter; lobes 3-6 lines long, two of them leafy from an ovate base, the others with broad, membranous margins and shorter points. Petals 6-8 lines long, 1/3 line broad, linear, obtuse, varying from white to pink. Stamens about two lines long. Stigmas usually 5, sometimes 4, erect, 1-2 lines long, filiform. Capsule 2-3 lines in diameter when closed, and 4-5 lines when expanded, entirely pale ochrous within, otherwise as described for the genus, and before it is ripe smooth and transparent, so that the seeds may be seen within it, as indicated by Haworth.


At first there is an excellent drawing of the type of *H. calycinum*, Haw., from which I find that the plant Salis. *Duck* has figured as being *H. canaliculatum*, and that all subsequent authors have mistaken for that species, is distinct from it. I also find that the plant figured by Salis. *Duck* as being *H. salmonenum* is really the same as the true *H. canaliculatum*, Haw. From which I think it most prob-
able that the two plants figured by Salm Dyer really represent the two species S. canaliculatus and S. salmonifolium, but that the names in some way were transposed when they were figured. There is no figure of the type of S. salmonifolium, but Salm Dyer's figure of S. canaliculatus agrees fairly with Haworth's description of S. salmonifolium, and differs from S. canaliculatus by its Fear-shaped, not sub-

lobose ovary.

R. E. Brown.

(To be continued.)

HISTORY, 1825.

Gard. Chron. III. 84: 34. 1825

(Continued from page 13.)

SALMONIFOLIUS.


The flowers of this species are stated to be "at first fulvous or salmon-coloured, yellow at the base, afterwards paler to rosy, and finally rosy outside and more or less whitish within."

3. S. tenuiflorus, N. E. Br. = Leaves 11-21 inches long, spreading or recurved; calyx-lobes longer than the petals; corolla purple, closing every evening. = S. tenuiflorus, "ed. 3. Br., t. 52, f. 3 (1804 or later); Haw., Suppl., p. 94, and Rev., p. 177.

Sonder, and Berger following him, have considered this and 3. viridiflorus to be one species, apparently without paying any attention to the distinctive characters represented or given to them by Jacquin, which I here add.

4. 3. viridiflorus, N. E. Br. = Leaves 2-11 inch long, ascending or ascending-spreadin. calyx-lobes shorter than the petals, corolla green, remaining open day and night. = S. viridiflorus, "ed. 3. Br., t. 447, t. 52, f. 3; Rev., t. 138; Bot. Mag., t. 426; Salm Dyer, "ed., t. 54, f. 5.


6. S. oculatus, N. E. Br. = S. oculatus, N. E. Br. in Journ. Linn. Soc., Vol. XLV, p. 120.

7. S. fraxinifolium, N. E. Br. = Rootstock more or less tuberous or thick and fleshly, divided. Stems prostrate, 1-2 inches long, 1/4 line thick at the younger green parts, with internodes 5-9 lines long, and when young and on all other green parts papulous, becoming greyish and withered in appearance when old, papulous, very brittle.
Leaves alternate or some of the lower opposite, ascending-spread-
ing, 6-10 lines long, 1 1/2 lines broad and 1-1 1/3 lines thick, gradually tapering from the base to an acute or obtuse point, flat with obtuse edges on the face, rounded on the back, not keeled, soft and wavy with the nervules often linear-oblong in outline as seen with a lens, green. Flowers 3-6 or perhaps more, in lax terminal cymes. Pedicels 4-6 lines long, uncurved, terete, thickening into the o-vary. Calyx 5-lobed, with the nervules coarser in the ovary part than on the lobes, glabrous, the longer lobes 4 1/2-6 lines long, 1-1 1/2 line thick, and usually longer than the petals, the others shorter, all leaf-like. Corolla 8-9 lines in diameter, expanding in the morning loosely irrespective of sunshine if warm enough, closed at night; petals loosely arranged in 3-4 series, forming a flat-tish flower, the outermost about 5 lines long and 1/3 lines broad, the inner gradually shorter and narrower, passing into staminodes; linear, the outer obtuse or truncate, the inner acute, all of a peculiar pale buff or between pale straw and pale buff colour. Inner staminodes erect, closely surrounding and overtopping the stamens in 3 lines long, slightly recurved at the tips, pale yellowish. Stamens in several series one above another in a cone within the staminodes; the inner about 1-line long; stamens not bearded, about white; anthers bright yellow. Stigmas 5, about 1-line long, terete, erect and recurved at the tips. Every inferior, shortly convex at the tor, 5-celled; nectaries axile.

Little Namaqualand: In the Richtersveld, Hillans, 5736.

Described from a living plant sent to me by H. S. Hillans. My sketch of the floral structure of the genus (Fig. p. 19) was made from this species.


11. S. longisirminulun, N. E. Br. -- Tubes growing partly above ground, 9-10 lines thick. Stems 4-6 inches long, procumbent. Leaves alternate, 9-10 lines long, and about 1 line thick, semi-
terete or channelled above, vary acute or almost spine-pointed, absolutely pubescent, green, withering into small spines 3-4 lines long on the basal part of the branches. Flowers terminal, solitary, or stout pedicels 3-4 lines long, thickened upwards. Calyx 5-blotted; ovary part 5 lines long, 1 1/2 lines in diameter; lobes sub-oval, varying in different flowers from 2 1/2 lines long, leafy. Corolla 12-14 lines in diameter, expanding in the morning; petals very numerous, in several series, narrowly linear, passing into staminodes, light yellow. Stamens slightly and exsually spreading, of a darker yellow than the petals. Stigmas 5, erect, shorter than the stamens, dark yellow. Every 5-celled.


As this plant has been misunderstood by all authors, I give the above description of it, partly compiled from Haworth's original description and partly from a good coloured drawing of the type.
35 plant reserved at Kew and labelled "Raised in 1924 from seeds collected at the Cape of Good Hope by Mr. Bowie," and named "esem. longispinulum, New. in Phil. Soc." This drawing represents a plant that is probably four to five years old, and is most probably made from the very plant that Lewworth described, for it quite corresponds with his description. But there is also another drawing at Kew bearing the record "esembr. longispinulum, New., in Phil. Soc., p. 426. Raised in 1924 from seeds brought from the Cape of Good Hope by Mr. Bowie." This latter plant has long leaves and very different whitish flowers from those of the true P. longispinulum and may possibly be a fellow seedling to the plant Mr. Bowie has described as P. longispinulum (L.c., § 54, f. 4), which was evidently sent to him by Leonti under that name instead of the true P. longispinulum. The colour of the flower probably varies, as in other species, for the yellow colour depicted by Mr. Bowie is of a much deeper tint than I have ever seen it, or than in the Kew drawing, which represents the flowers as creamy-white. This drawing with whitish flowers was probably not made until 1825 or later, as Bowie did not return from the Cape until August, 1825, and the plant being raised in 1824 (when Lewworth published his description) would not be likely to flower in that year.


13. S. crossus, N. E. Br. -- This has a stout, ovoid, tuberous base, from which arise stout, succulent branches 1½-4 inches long and 2-3 lines thick, with a mass of densely crowded leaves and flowers at their ends. Leaves 5-12 lines long and ½ line thick, sub-terete, but flattened on the face, incurved-spreading, obtusely pointed or subacute, papulose. Flowers subsessile or on pedicels 1-2 lines long. Calyx unequally 5-lobed, papulose; lobes 1½-3 lines long, sub-acute. Petals numerous, in 2-3 series, united below into a short tube, linear, obtuse, yellow. Stamens numerous, arising from the corolla-tube. Stigma 5, spreading, 1-line long, rather stout. Ovary half-superior, 5-cleft. Young fruit dark red at the top. S. crossus cit. Hort. Lew., ed., 1 Vol. II, p. 191, not of other authors.

The above description is compiled from drawings made in 1776, preserved at the British Museum, which demonstrate that it is a totally different plant from that which Leworth and others have mistaken for it.

N. E. Brown
(To be continued.)

REMEMBRANCE TO E. U.
(Continued from page 75.)

17. — JYOPHYTTA, N. E. Br.

Annual or biennial herbs, one species perhaps perennial, covered with white and often shining papulose. Stems and branches with distinct internodes, often prostrate. Leaves alternate on the flowering branches and opposite at the base, or all opposite, sessile or retiolate, flat or sub-terete. Flowers solitary and opposite; the leaves scattered along the branches, or axillary, or
Species several, natives of South Africa, the Mediterranean region, Asia, Persia, Baluchistan, Turkestan and Atlantic islands, and naturalised in California.

The generic name is derived from the Greek, 

Species several, natives of South Africa, the Mediterranean region, Asia, Persia, Baluchistan, Turkestan and Atlantic islands, and naturalised in California.

The generic name is derived from the Greek, 

Species several, natives of South Africa, the Mediterranean region, Asia, Persia, Baluchistan, Turkestan and Atlantic islands, and naturalised in California.

The generic name is derived from the Greek, 

Species several, natives of South Africa, the Mediterranean region, Asia, Persia, Baluchistan, Turkestan and Atlantic islands, and naturalised in California.

The generic name is derived from the Greek, 

Species several, natives of South Africa, the Mediterranean region, Asia, Persia, Baluchistan, Turkestan and Atlantic islands, and naturalised in California.

The generic name is derived from the Greek, 

Species several, natives of South Africa, the Mediterranean region, Asia, Persia, Baluchistan, Turkestan and Atlantic islands, and naturalised in California.

The generic name is derived from the Greek, 

Species several, natives of South Africa, the Mediterranean region, Asia, Persia, Baluchistan, Turkestan and Atlantic islands, and naturalised in California.

The generic name is derived from the Greek, 

Species several, natives of South Africa, the Mediterranean region, Asia, Persia, Baluchistan, Turkestan and Atlantic islands, and naturalised in California.

The generic name is derived from the Greek,
Bothlie, D. 134. M. *murciellii* specimen 2, p. 45, C. with S. shrve 1^3 up^l. lanceolat, p. 45, Synor., 2^4, and Rev. 15, including varieties; Berger, Ses. und Port., p. 75. 3. crystallorhizes, Ech. and Herb. Enum., p. 322; Salm Duckles., & 60, f. 2.  


Introduced into cultivation by Lasson in 1795.  

2. C. Burchellii, M. E. Br. -- Levort gives the following description of this plant, which is at present unknown. -- Root sub-biennial. Branches suberectly decumbent, raniculate, with the branches scarcely spreading and rather semibent ascending. Leaves ovate, reticulate, the uppermost subalternate, lanceolate, glinting-serrate, especially beneath. Flowers raniculate, small, sessile, white. Described from a plant raised by the traveller W. Burchell from seeds he collected in South Africa.  


**Cape Point Division:** by the Sundays River, near Donkey Ford, Burchell.  

No specimen or drawing of this plant appears to have been reserved. Berger (Les. und Fort., p. 84) places it as a synom of *E. clandestinum*, but it is obviously quite distinct redicellate flowers and different leaves.  

3. C. clandestinum, M. E. Br., not of L. Bolus.--This small and rather insignificant species is well described and figured by Salm Dyck and carried by Berger as quoted below, but the fruit has not been described, so I add the following details concerning it.  

Capsule 2-2½ lines in diameter when closed, sub-globosely reniform, half-superior, with 5 valves and cells; when expanded about 3½ lines in diameter, with horizontally spreading valves, entirely rilled within, the structure as for the genus, with the membranous flaps transparent. Seeds less than 1-line long, ovoidly D-shaped, very minutely sub-tuberculate, brown.  


South Africa, precise locality unknown. I have only seen cultivated specimens of this plant.  

M. E. Brown  

(to be continued.)

**17. CRYCHIUM, M. E. Br.**

**153**


Of this species Mrs. Bolus gives no description, and figures
only a seed and two valves of a capsule, which most certainly do not represent the seed and valves of the true C. clandestinum, N. E. Br. I have therefore changed the name, but a proper figure and description of the plant are needed.


South Africa: Occurs in several of the coastal divisions from Cape Division to Uitenhage Division, or perhaps further eastward, where it seems to be a native. It is also found along the coastal area of the Mediterranean, and in the Canaries, but has probably been introduced into these areas. It is stated to have been in cultivation before 1727, and is sometimes eaten as a vegetable or salad.

6. **C. grandiflorum, N.E.Br.** (Fig. 54, p. 126) — Annual or biennial, glabrous, covered with glittering papulae on all green parts. Leaves of the central rosette opposite, in four ranks, those on the branches alternate, all spreading, petiolate; petiole ½-2 inches long, 2-4 lines broad, concave above, not sheathing and very slightly united at the base; blade 1-5 inches long, ½-2⅔ inches broad, ovate-lanceolate to lanceolate, acuminate, sub-cordate or tapering into the petiole at the base, flattish or concave, with red at the apex and edges. Flowering branches axillary from the central rosette, ascending or decumbent, 2-24 inches long, 2-4 lines thick, with internodes 1-3 inches long, and ending in a lax cyme of 2-9 flowers, or the flowers scattered along the branches opposite the leaves, bracteate. Fedicels (above the bracts) 3-18 lines long, ½-2 lines thick. Calyx unequally 5-lobed, with the tube above the ovary 1 line or less long; the three larger lobes 5-7 lines long and 3-3½ lines broad, oblong or ovate, acute, the other with broad, membranous margins. Corolla 1½-2½ inches in diameter, open during the day, closing at night, and having a faint and not quite pleasant odor; petals very numerous, in 5-6 series, irregularly bent or contorted, giving a ragged appearance to the flower, united below into a tube.
153 2\frac{1}{2}-3 lines long, and the outer 10-12 lines long, about \frac{1}{2}-line long, filiform-linear, acute; the inner gradually shorter, passing into staminodes, white, with the basal part and the staminodes lemon-yellow or pale greenish-yellow, giving that tint to the centre of the flower. Staminodes numerous, erect; the outer 4-5 lines long, lax; the inner gradually shorter and connivent, or densely clustered and pressed against the stigmas, the innermost about 2 lines long; filaments very minutely scabrid, not bearded, white; anthers yellow. Stigmas 4-5, filiform, 3-2\frac{1}{2} lines long, erect, with recurved tips, not quite equalling the longest stamens. Every nearly or quite superior, 5-celled, green. Capsule more than half\frac{1}{2} superior, with 4-5 valves, which rise to 3\frac{1}{2}-4 lines above the base of the calyx-lobes, pale ochreous, with the gaping sutures or edges of the valves blackish-brown, uniformly pallid inside, and 6-9 lines in diameter when expanded. Seeds \frac{1}{2}-line in diameter, much flattened, triangular in outline, with a small hump on one of the sides, not tuberculate, of a peculiar and somewhat dull bronzy brown.


South Africa: Prince Albert Division: Near Abraham's Agaal, Mrs. D. van der Bijl. Riversdale Division: Common in the district, Muir 3898, 3982; Zeyher, 2097. Orange River Region, Shaw, Miss Wilman.

B.-- Flowers probably white, but colour not stated.

7.-- C. Fenchelii, N. B. Br.-- A stout herb, probably biennial, glabrous. Leaves in a central solitary tuft, opposite, flat, petiolate, 1\frac{1}{2}-3 inches long and \frac{3}{4}-1\frac{1}{4} inch broad, ovate, acute, papillate. Flowering stems produced from below the rosette of leaves, prostrate or ascending, stout, terete, up to a foot or more long and 2\frac{1}{2}-3\frac{1}{2} lines thick, papillate, ending in lax cymes. Pedicels \frac{1}{4}-1 inch long. Calyx produced above the ovary into a short tube, unequally 5-lobed above; lobes 4-6 lines long, broadly ovate, with acute or subulate tips. Petals very numerous, apparently about 8-9 lines long, but perhaps longer, united into a short tube at the base.


Great Namaqualand: East of Keetmanshoop, Fenchel, 172. And probably the following also belong here:-- Tsoaehaub, Rautenman 41, Belck 69, Dinter 950, Usakos, Schinz 917, as they all appear to be the same species as the type.

The actual type consists of a flowering branch only, which has been browsed by an animal and is breaking again, no radical leaves are present, so that in the above description these organs are described from the other specimens quoted, whose leaves on the flowering branches are identical with those of the type of C. Fenchelii, which was kindly lent to me by Dr. Hans Schinz. According to a label with the type specimens, Berger appears to have mistaken this plant for M. crystallinum var. grandiflorum, Sond., but it is quite distinct from that species, and inhabits a totally different region.

In South African Gardening, 1926, p. 83, a plant from Great Namaqualand is mentioned under the name of C. crassifolium, L. Bol., but as there is no description it is impossible to understand what plant is meant, and according to international rules the name is invalid; probably the plant intended by that name is either C. Fenchelii or C. grandifolium.

8.-- C. grandifolium, N. E. Br.-- A stout herb, probably biennial.
Leaves in a large tuft or rosette, flat, broadly lanceolate, 4-5 inches long and 1-1½ inch broad, narrowed to a sessile or sub-petiolate base, obtuse, wavy, glabrous, papillate. Flowering branches arising from under the rosette of leaves, 4-8 inches long, 2-3 lines thick, two-edged, ascending, sometimes 1-flowered, but usually branching in a cymose manner and bearing 3-9 flowers, and having opposite leaves up to 1½ inch long, and small ovate, obtuse, opposite or sub-opposite bracts 3-6 lines long. Pedicels 4-9 lines long, stout. Calyx papillate, produced above its union with the ovary into a distinct tube about 1½-2 lines long; ovary part half-globose, 6-7 lines in diameter; lobes 3-4 lines long, 2-3 lines broad, ovate, obtuse, with or without a dorsal point. Petals very numerous, apparently 7-8 lines long, united into a distinct tube at the base. Stamens not very evident in the flower examined, but arising from the corolla-tube. Ovary apparently nearly superior, but too much crushed to admit of the determination of its stigmas or cells.


Great Namaqualand: Near Rehoboth, Fleck 241a.

The above description is made from the type specimen kindly lent to me by Dr. Hans Schinz.

N. E. Brown

(To be continued.)

**MESEMBRYANTHEMUM**


(Continued from page 153.)

192

9. *C. orenarium*, N. E. Br. — An annual, 1-9 inches high, branching from the root. Branches alternate, apparently 2-edged on the younger parts, roughish, with pointed papillae. Leaves alternate on the branches, opposite at the very base, ½-1 inch long, 2½-5 lines broad, oblong or ovate, (dried), rounded at the apex, fleshy, glabrous, apparently smooth, but perhaps minutely papillate when alive. Flowers solitary and opposite the leaves along the branches (not axillary), pedicellate. Pedicels 3-7 lines long and, together with the calyx, papillate like the branches. Calyx produced above its union with the ovary into a tube 1½-line long, unequally 5-lobed above; the two longer lobes leafy- 1½-3 lines long and 1 line broad, narrowly oblong, obtuse, the others shorter, broader and membranous. Petals (indried flowers) scarcely exceeding the calyx-lobes, 2½-3 lines long, 1/3-line broad, cuneately linear, rounded at the apex, yellow (ex. Pearson), probably united into a short tube at the base, but from dried material I have been unable to be sure of this. Stamens numerous, erect, nearly or quite as long as the petals, yellow. Stigmas 4-5, scarcely 1/2 line long, oblong, obtuse. Ovary more than half-superior, 4-5-celled; placentas axile. Capsule (closed), 2-2½ lines in diameter, with 4-5-valves and cells; valves 1 line long, whitish, their expanding-keels closely contiguous into one central keel, and their broad marginal wings erect or inflexed; cells open, no tubercles. Seeds several, but not very numerous in a cell, minute, smooth, white.

Great Namaqualand: Klein Kora Mountains, Dinter 3,177 (type
192 specimen) between Nakeis and Klein Krasberg, Pearson 8,215
Eanes, Schinz 920, Orange River, Steingrover 113.

19.—C. sessiliflorum, N. E. Br.—Annual, coarsely papil-
late. Branches prostrate, divaricate. Leaves opposite, 1½-
inches long, 3½-6 lines broad, lanceolate, narrowed below into a pet-
icle, subacute or obtuse. Flowers solitary, perhaps at first er-
meral, but by the development of a branch become axillary, or in forks
of the stems, on pedicels up to 6-7 lines long. Calyx unequally
5-lobed; lobes 3-6 lines long and 2-3 lines broad, subspathulate
or leaf-like, two of them longer than the other, spreading much be-
yond the petals. Corolla 6-8 lines in diameter; petals in about 1
series, acute, light yellow. Stamens about 20, in one series, lax,
erecely spreading, with their filaments dilated at the base in a
subglobose or disk-like manner, yellow. Stigmas 5. Ovary evidently
nearly superior, depressed. Fruit about 5 lines in diameter, acu-
tely 5-angled or ridged on the top, purplce.

(1789); Kew. Obs. 116, Misc. Nat. 46, Synop. 247 and Rev. p. 156,
Sond. in Fl. Cap., p. 454; Berger, Mes. und. Port., 37; Britton in
Journ. Bot., 1917, p. 69; N. E. Br. in Journ. Linn. Soc., Vol. XLV,
p. 184.

South Africa: Locality unknown; introduced into cultivation
by Masson in 1774.

The above description is compiled from a drawing of the plant
by Simon Taylor, made probably about 1777 or 1778, and preserved
in the British Museum Herbarium; see Journal of Botany, as above
quoted.

All that has hitherto been known of this plant is that Aiton
placed it among those having yellow flowers and described it as
follows:—"Leaves flat, subspathulate and together with the stems
papilose; branches divericate; flowers sessile. Flowers July and
August. Native of the Cape of Good Hope. Mr. Fr. Masson. Intro-
duced 1774."

With the exception that the drawing does not represent the flow-
ers as sessile, it agrees with Aiton’s description. But viewed from
above as they nestle among the leaves they might appear to be ses-
sile, and there can be little doubt that the drawing is correctly
named. Heworth states that he never saw this species, so that
it probably died out of cultivation.

The dilated, subglobose base of the filaments of the stamens
is a very remarkable character, and I refer this plant to Cryophy-
tum with some doubt, but until rediscovered, nothing more can be
done with it.

N. E. Brown
(To be continued.)

MESE BRYANTHEMUM.
(Continued from page 192.)

17.—CRYPHTUM, N. E. Br.

D.—FLOWERS RED.

211

11.—C. Barklyi, N. E. Br. ex L. Bol. in S. Af. Gard.,
1928, p. 83 and 84, f. 35. = L. Barklyi, N. E. Br. in Hook Fl.

Little Namaqualand. Aondelip Bay, Barkly and Fillans.

This plant has the stoutest stems and largest leaves of all the known species in any genus of this order of plants. The square stems attain to an inch in thickness, and the leaves up to as much as 15 inches long and 6 inches broad, and are very thick. Sir Hansy Barkly, who discovered this fine species, informed me that the inhabitants of the region where it grows squeezed the water out of its leaves and used it for washing and drinking purposes in times of drought.

II.-Leaves narrowly spathulate or linear-spathulate; flowers rosy or colour unknown.


Great Namaqualand: Sand-dunes at Inachab, Dinter 952.

13.—C. paulum, N. E. Br.—Plant in flower less than an inch high, with a few perfectly prostrate stems 1-4 inches long and up to 1 line thick, radiating from a central root, which is not more than 1 line thick, and apparently not descending more than 2-3 inches into the ground. The stems are terete, with internodes 1½-6 lines long, minutely papulose, green or purplish, bearing several very short axillary leafy branchlets 3-6 lines long scattered along them. Leaves opposite or some on the flowering part alternate, small, those on the main stems 5-9 lines long, 1-2½ lines broad and ½-1 line thick near the apex, those on the branchlets smaller and crowded, flattish, usually spathulate, obvate to elliptic-oblong, shortly petiolate, sub-acute or obtuse, faintly channeled down the face, slightly or indistinctly keeled on the back, minutely papulose, green, tinted with red. Flowers in lax, terminal, few-flowered irregular cymes, or on weak plant solitary and terminal. Pedicels about 1 line long. Calyx unequally 5-lobed nearly down to its union with the ovary, papulose with much larger papulae than those on the stem and leaves; ovary-part hemispherical, sub-globose in every young fruit, 2½ lines in diameter; lobes 3-4 lines long, the outer about 1 line broad and linear-oblong, the inner 2½ lines broad, elliptic or elliptic-oblong, and with broad, membranous margins, all obtuse. Corolla apparently not more than 4-5 lines in diameter; petals numerous, in 5-4 series, united below into a tube about 1½ line long with the free part about 2 lines long and ½ line broad, linear, obtuse, white, or very pale pink at the apical part. Stamens arising from the corolla-tube in about 4 super-posed series, the upper at the mouth of the tube. Stigmas 4-5, erect, 2½ lines long, filiform, apparently pale yellow. Ovary partly superior, 4-5-celled, with the conical upper part slightly 4-5-angled and minutely papulose, the papulae being a very triking character on the young purplish-tinted fruit; placentas axile. Capsule when closed sub-globose, ½ line in diameter, with very prominent sutures and 4-5 valves and cells; when expanded about 5 lines in diameter; pallid within, structure as for the genus. Seeds ½ line in diameter, compressed, circular in outline, tuberculate, dark grey or fuscous when dry, blackish when wetted.

Riversdale Division: In grassy meadows near the Vet River, Muir 4145.

14.—C. Rodgersii, L. Bol. in S. Afr. Gard., 1928, p. 84.

The flowers of this species are rosy according to a note on the label of Bolus 11907.

III.--Leaves sub-terete or probably flattened or concave on the face; flowers white.


Not common in South Europe, North Africa, Arabia, Persia, Baluchistan, Kurdistan, Madeira and the Canaries, here it is probably a native, and as it seems scarce in South Africa (from whence I have seen specimens from Little Namaqualand, at Walle Areal, Fillans 17906; Ven Rhynsdorp Division; Eekokerboom, Schlechter 11088; and Cape Peninsula, Wolley Dod 2106, 3666) it has probably been introduced there, as it has been also into California. According to Aiton it was in cultivation in 1739.

16.--C. neglectum, N. E. Br.--Plant apparently about 4-6 inches high, glabrous, papulose. Branches erect, terete, 1-1 ½ lines thick. Leaves alternate, ascending, incurved, 4-9 lines long and 1 line thick (dried), sub-terete or probably slightly flattened or hannelled down the face, obtuse. Cymes terminal, 1½-2½ inches in diameter, 3-9 flowered, bracteate. Pedicels 1-2 lines long. Calyx unequally 5-lobed; ovary part hemispherical, 4-4½ lines in diameter; the longer 3-4 lines long, with leaf-like tips. Corolla probably 10-12 lines in diameter; petals of the dried flower about 4-4½ lines in diameter; petals of the dried flower about 4-4½ lines long and ½ line broad, apparently white.

Worcester Division: Near Worcester, Cooper 1660, 1745.

17.--C. Maxwellii, L. Bol. in S. Afr. Gard., 1928, p. 84, name only; it may be a synonym of one of the above species.

18.--C. Wilmaniae, L. Bol. in S. Afr. Gard. 1928, p. 84, f. 33. South Africa: "Without precise locality, but probably from De Aer" ex. L. Bolus. N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM

(Continued from page 212.)

Owing to the unscrupulous manner in which the usual courtesy and code of honour maintained among scientific workers has been disregarded, and the way results of my own investigations are being persistently published elsewhere, in spite of protest, for the purpose of claiming priority of authorship for name combinations that must
CONICOSIA, N. E. Br.

C. affinis, N. E. Br. (M. elongatum, Salm Dyck, not of Haworth); C. brevicaulis, N. E. Br. (M. brevicaule, Haw.); C. capensis, N. E. Br. (M. pugioniforme, Haw., not of Linne); C. elongata, N. E. Br. (M. elongatum, Haw.); C. fusiformis, N. E. Br. (M. fusiforme, Haw.); C. Moirii, N. E. Br. (Root fleshy, longated, leaves trigonous, Muir 4126, will be fully described later); C. pugioniformis, N. E. Br. (M. pugioniforme, Linn., M. capitatum, Haw.); C. Roodiae, N. E. Br. (root fleshy, elongated; capsule 1\(\frac{1}{4}\) - 1\(\frac{3}{4}\) inch in diameter); C. robusta, N. E. Br. (M. pugioniforme, L. Bol., not of Linn. Leaves on the flowering branches 6-8 inches long and 3-3\(\frac{1}{2}\) lines broad when dried.)

HYMENOGYNE, N. E. Br.


OPOPHYTUM, N. E. Br.


PHYLLOBUS, N. E. Br.

P. Lesliei, N. E. Br.; will be described later, but differs from P. resurgens by its longer pedicels and larger flowers; P. pubicalyx, N. E. Br., calyx pubescent; P. resurgens, N. E. Br. (M. resurgens, Kensit. Aridiaria resurgens, L. Bol.).

PSILOCaulon, N. E. Br.

P. absimile, N. E. Br.; P. acutisepalum, N. E. Br. (M. acutisepalum, Berger); P. album, L. Bol.; P. arenosum, L. Bol. (M. arenosum, Schinz, and M. gymnocoléum, Schlecht, and Diels); P. articulatum, N. E. Br. (M. articulatum, Thunb., and M. scundum, Thunb.);

254 P. asperulum, N. E. Br. (erect; branches cowered with minute blunt points, not granules, Van der Bijl 31); P. Bijliæae, N. E. Br. (erect; branches 1\(\frac{1}{4}\) - 2\(\frac{1}{2}\) lines thick, microscopically granulate, Van der Bijl 30); P. caducum, N. E. Br. (M. caducum, Ait., not of L. Bol.); P. clavulatum, N. E. Br. (M. clavulatum, Berger.); P. corallinikum, N. E. Br. (M. corallinikum Thunb.); P. coriarium, N. E. Br. (M. coriarium, Burch.);

P. densum, N. E. Br. (flowers in dense leafy masses, Schlechter 1); P. dimorphum, N. E. Br. (M. dimorphum, Welw.); P. Dinteri, N. E. Br. (M. dinteri, Engl.); P. diversipapillosum, N. E. Br. (M. diversipapillosum, Berger); P. fasciculatum, N. E. Br. (branches bunches together in clusters on the main branches; petals
254 magenta-pink); P. fimbriatum, L. Bol.; P. Gessertianum, N. E. Br. (M. Gessertianum, Dint. and Berg.); P. glareosum, N. E. Br. (M. glareosum, Berger.); P. granulicaule, N. E. Br. (M. granulicaule, Haw.).


P. salicornioides, N. E. Br. (M. salicornioides, Pax.);

SYNAPTOPHYLLUM, N. E. Br.

S. Jutté, N. E. Br. (M. Jutté, Dint. and Berg.); S. Sladenianum, N. E. Br. (M. Sladenianum, L. Bol.).

N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM.

(Continued from page 254.)

18.—PRENIA, N. E. Br.

Suculent perennials, papillate, either with short branching main stems bearing tufts of crowded leaves at their ends, from which decumbent flowering branches arise, or with long, prostrate stems having distinct internodes. Leaves opposite, sessile, several times longer than broad, linear-lanceolate, flat or channelled above and keeled or rounded on the back. Flowers in terminal, lax, few-flowered cymes or occasionally solitary. Calyx produced above its union with the ovary into a short tube, 4-5-lobed above. Sepals numerous, in 2-3 series, united at the base into a short tube, arising just above the union of the calyx with the ovary. Stamens numerous, arising from the tube of the corolla, erect; staminodes none. Stigmas 5, filiform and as long as the stamens. Ovary partly superior, 5-celled; placentas axile. Capsule (where known) obconic, half-superior, with 5 valves and cells; each valve with the expanding-keels closely contiguous, forming one acute central keel, and with large marginal, wing-like, sub-membranous flaps standing erect or infolded towards the keel; cells oren, without cell-wings or tubercles. Seeds compressed, somewhat D-shared in outline, minutely tuberculate.—N. E. Br. in The Gardeners' Chronicle, 1925, Vol.
Species 2, natives of South Africa; the type of the genus being P. rallens, N. E. Br.

The name is derived from the Greek, prenes, prone or bent forwards, in allusion to the decumbent flowering branches.

As the two species comprising this genus are well figured and described, and as I have no living material of them, I merely distinguish them by the colour of their flowers and give references to their places of publication.

1. P. rallens, N. E. Br. — Petals white or pale yellowish white.


Cane Division: Near Keitland, Wolley Dod, 2131, Papendorp, Parpe, and Clanwilliam Division, Leipoldt 353. Introduced into cultivation by Masson in 1774.

Sonder, in the Flora Capensis above quoted, refers specimens from Zwartkors River, Botahesberg, Fish River and Kat Berg to this species, but I believe that they are wrongly named, and that possibly they may belong to P. relaxata.

On what ground Mrs. Bolus refers this plant to the very different genus Platthyra is unexplained.


South Africa: Locality unknown, only known to me from cultivated specimens.

19. — HYDRODEA, N. E. Br.

Annuals, extremely succulent and watery, minutely papulose. Stems and branches prostrate, with distinct internodes, very stout. Leaves opposite at the base, alternate or occasionally opposite on the stems, sessile, stout, cylindrical or oblong, obtuse. Flowers sessile, alternate. Calyx produced above its union with the ovary into a short tube, subequally or unequally 5-lobed above. Corolla small, not exceeding the calyx-lobes, arising from around the top of the ovary; petals united at the basal part into a tube. Stamens numerous, arising from the corolla tube, erect; filaments not bearded. Stigmas 5, erect, slenderly subulate, flatish; no style. Ovary half-superior (not inferior as figured), 5-celled; placentas axile. Capsules half or more than half-superior, really 5-valved, but as each valve separates into two segments it falsely appears to be 10-valved; the valves separate and stand erect, because the expanding-keels, instead of being hygroscopic so as to cause the valves to spread out flat, are converted into stiff, thin plates of parchment-like texture, that are contiguous at the lower part but separate above, and have inflexed acute points, and the valves have
membranous marginal wings, infolded and united in pairs between the
valves and connecting them together. Seeds very small, ovoid,

Species 2, natives of the Island of St. Helena and Great Namaqualand. H. cryptantha, N.E.Br., is the type of the genus.

The name is derived from the Greek, hydrodes, watery, because the St. Helena plant is stated to be "so very succulent that it will not support its own weight when held up from the ground, and water is seen to drop from it when simply carried in the hand without any pressure," according to "Ellis, St. Helena, p. 241.

1. H. cryptantha, N.E.Br. — Annual; branches prostrate, 4-6
   lines thick, terete, very succulent, glabrous, papillate, bright
   green, changing to yellow as it gets old. Leaves alternate or oc-
   casionally opposite, ½-2 inches long, 3-6 lines thick, somewhat
   fusiform-cylindric, obtuse. Flowers arranged in an irregularly
   cymose manner. Pedicels about 6 lines long, stout and stem-like,
   and together with the calyx-tube selling in fruit to an ovoid form
   until 9 lines in diameter. Calyx-tube continuous with the pedicel,
   and above its union with the ovary about 2 lines long; lobes at
   first (according to the figures) 1½-4 lines long, becoming much
   enlarged in fruit, terete, obtuse. Corolla 3-4 lines in diameter
   (according to the figures); petals apparently about 3-4½ lines
   long, united below into a distinct tube about 2 lines long, white.
   Stamens 1-1½ line long (only 2 seen), filaments filiform, white,
   anthers apparently yellow. Stigmas not seen, all destroyed by in-
   sects. Ovary nearly superior, conically ovoid. Fruit about 7-8
   lines in diameter on the living plant according to the figured, the
   actual dried capsule being 4 lines in diameter. Seeds 1/3 -line
   long, obloid, brown.—

   (1868); Ellis, St. Helena, p. 242, t. 26; excluding the dissections
   from both plates. Berger, Res. und Port. p. 42.

Island of St. Helena: On a plain at prosperous Bay, Burchell

115. "It grows on the hottest parts, in the most barren, arid, rocky
   soil near the sea, in the neighbourhood of Sandy Bay beach and
   Turk's Cap Bay, and is to be met with generally on the southern
   and eastern outskirts of the island." (Ellis)

Of this very remarkable plant only a single specimen (which
was collected by Burchell) exists in the "ew Herbarium. From this
specimen the artist (W. Fitch) made the dissections which appear
upon the plates quoted, the originals of the drawings being made
upon the sheet containing the specimen. I have carefully examined
the dissected flowers from which Fitch made those analyses, and also
two flowers upon the specimen without damaging flowers upon the
specimen without damaging them, and find to my surprise that all
his drawings of the flower-structure are absolutely wrong. For the
sepalis are not free to the base nor gibbose on the back as repre-
sented; the petals are not free to the base; the stems do not arise
from the top of the ovary around the thickened base of a style;
there appears to be no stile at all, so far as I can discover, but
the stigmas, free parts of the petals and the stamens seem to have
been eaten by mites in the flowers examined; the ovary is not infe-
rior and is only 5-celled, not 10-celled, as represented in the dis-
sections. I believe that Mr. Fitch's drawings were partly concocted
from the descriptions given in books of the structure of the genus
Mesembryanthemum. They certainly do not represent the floral struc-
This genus differs from all others not only in its vegetative character, but also by the valves of the capsule being distinctly bifid, and the thin, stiff keels on the valves are not hygroscopic, a character that also occurs in Onicosis.

2. Helene Brown

(To be continued.)

302

Mesembryanthemum.—Mr. N. E. Brown asks us to state that "Phyllobus" (p. 253) should read Phyllobolus.
Petiolate, ovate or lanceolate, flat. Flowers solitary, axillary or in the forks of the branches pedicellate, bractless. Calyx produced above its union with the ovary into a short tube, very unequally 4-lobed above, two of the lobes being large and leaf-like. Petals very much shorter than the calyx-lobes, linear, united into a short tube at the base, arising at the middle of the produced calyx-tube. Stamens numerous, in many series, arising from the corolla-tube, erect. Stigmas 4, small, stout, obtuse; no style. Ovary partly superior, 4-celled; placentas axile. Capsule with 4 valves and cells; valves recurving when wetted, very broad, each with 2 thin and deep parallel (or sub-contiguous?) expanding-keels toothed all along their tops, and with an inflexed thin membranous flap or wing turned back from their tips and attached to the valve about midway between the keels and margin of the valve and forming a sort of pocket on the outer side of each keel; cells open, no cell-wings or tubercles. Seeds moderately shaped large for the group, reniformly D-shaped, minutely tuberculate.—N. E. Br., in The Gardener's Chronicle, 1925, Vol. LXXVIII, p. 412.

Species 1, P. Haeckeliana, N. E. Br., a native of South Africa. The name is derived from the Greek, platys, broad, and thryis, a door, in allusion to the broad valves of the capsule.

By its habit and petiolate leaves this genus bears some resemblance to Aptenia cordifolium and Cryophytum Aitonis. From the former, however, it differs by the calyx being produced into a shorter tube above the ovary and by the presence of infolded membranous flaps to the valves of the capsule. From the latter by all the leaves being opposite and the flowers seated in the forks of the branches.

1. P. Haeckeliana, N. E. Br.—Plant forming a flat carpet 3-5 feet in diameter of prostrate herbaceous branching stems. Leaves all opposite, and, including the petiole, 1-2 inches long and 3-9 lines broad; lanceolate, subacute, cuneately narrowed into a petiole, not or scarcely united at the base, flat or slightly concave above and with a stout, rounded keel or midrib on the back, glabrous. Flowers terminal in the forks of the branches or sometimes in leafy cymes. Pedicels 6-13 lines long. Calyx with the two larger lobes leaf-like, 6-11 lines long and 3-4 lines broad. Petals apparently about 4-5 lines long, with their united part about 1 line long, pale yellow. Stigmas scarcely 1 line long, stout. Capsule about 3 lines in diameter when closed. Seeds about 2-line in diameter, compressed, minutely tuberculate, brown.


A succulent herb, perennial, but of short duration; branches elongated, with distinct internodes, prostrate. Leaves opposite,
Flowers solitary in the forkings of the branches, pedicellate. Calyx unequally 4-lobed down to its union with the ovary. Petals numerous, united at the base into a short tube. Stamens many, but not very numerous, erect, arising from the corolla-tube; filaments not bearded. Stigmas 4, minute; no style. Ovary inferior, 4-celled; placentas axile. Capsule with 4 valves and cells; valves broader than long, the apical part so abruptly thickening that the basal termination of the thickening is quite vertical; expanding keels closely contiguous, forming one central keel with its end united to the sub-vertical base of the thickened apical part of the valve, no marginal wings or flaps to the valves; cells oren, without cell-wings or tubercles. Seeds compressed, circular in outline, tuberculate. N. E. Br. in The Gardener's Chronicle, 1925, Vol. LXXVI I, p. 412, and in Journ. of Bot., 1928, p. 139. Litocarpus, L. Bol., in Fl. Fl. of S. Afr., Vol. VII, t. 261, f. 11.

Species 1, A. cordifolia, N. E. Br. (Mesemb. cordifolium, L.). A native of South Africa, but naturalised in many of the warmer parts of the world.

The name is derived from the Greek, apten, wingless, in allusion to the absence of wings of the valves of the capsule.

1. A. cordifolia, N. E. Br. in Journ. of Bot., 1928, p. 139. -- A prostrate, glabrous herb, minutely papulose on all green parts. Leaves 1/4-2 1/2 inches long, including petiole, 2-15 lines broad, cordate-ovate, acute. Pedicels about 6 line long. Calyx with two of the lobes large and leaf-like, 5-10 lines long, 3 1/2-7 lines broad, ovate or elliptic, acute or subacute, the other two about 4 lines long or less and subulate. Corolla 6-8 lines in diameter; petals cuneately linear, obtuse, bright magenta-purple or rosy-purple, the inner passing into staminodes. Stamens with white filaments and bearded anthers. Stigmas about 4-line long, oblong, obtuse. Capsule with valves about 2 lines long and 3 1/2 lines broad, broadly deltoid-ovate, uniformly pallid or cream-coloured. Seeds uniformly pallid or cream-coloured. Seeds about 2/3-line in diameter, compressed, sub-circular, tuberculate all over, blackish-brown.


A native of the eastern coastal districts of South Africa, whence it was introduced into cultivation by Kasson in 1774, and has now become naturalised in several of the warm parts of the world.

N. E. Brown
(To be continued.)
22. -- DINTERANTHUS, Schwant.

Stemless perennials. Each growth with one pair (or when making new growth, two pairs) or very thick and fleshy leaves, which are united at the base for one-third to two-thirds of their length and are convex on the face, causing them to be united higher up at the middle part than at the edges, distinctly dotted, and with a very minutely granulated surface. Flower solitary, terminal, appearing sessile, the flat and acutely two-edged pedicel, which is visible in the fruit, being entirely concealed between the united part of the leaves. Calyx subequally 6-8-lobed; some of the lobes having membranous edges. Petals numerous, free, spreading horizontally. Stamens numerous, erect, exposed to view from their base; filaments bearded at the base. Stigmas 6-9, subulate, diverging. Ovary inferior, flattish at the top, 6-9-celled; placentas on the outer wall of the cells. Capsule shortly and broadly obovate, flattish with slightly raised sutures on the top, with 6-9 valves and cells; valves widely spreading or recurved when expanded; expanding-keels closely contiguous into a central keel, with broad membranous margins; cell open, without cell-wings and without a placental tubercle. Seeds very numerous in a cell, very minute. -- Schwantes in Zeitschr. f. Sukkulantenkunde, 1926, p. 184, and in Kollers Deutsche Gartner Zeitung, 1927, p. 223.

Species 3 (one may not belong) native of Great and Little Namaqualand, the type of the genus being D. microspermus, Schwant.

The name is given in honour of Professor K. Dinter, the suffix being derived from the Greek anthos, a flower.

When this genus was originally published, no character was mentioned by which it could be distinguished from Rimeria, and as I had not seen any specimen of the type of the genus, and only a seedling of one of the other plants placed with it, I referred D. microspermus to Rimeria. But now that I have obtained adult living plants with ripe fruits attached to them of both D. microspermus and D. Margaretae, I find that they are quite distinct not only from Rimeria, but also generically from each other, as, indeed, Schwantes himself considers them to be (Kollers Deutsche Gartner Zeitung, 1927, 223-223), for he places D. Margaretae in a sub-genus which he calls Lapidaria, and quotes the plant as Lapidaria Margaretae, Dint; and Schwant., but still gives no definite structural characters by which these genera can be distinguished from Rimeria. Upon comparison, however (including a difference in habit, which, taken alone, of course, is of no generic importance), I find the following distinctions, which I here put in tabulated form for comparison, and probably, when contrasted alive, the flowers will furnish further distinctive character.

1. Leaves dotted, their surface microscopically granulate; old plants with only one or (when making new growth) two pairs of leaves present on each growth at the same time; petals in about two series, widely spreading from their base, so that the basal part of the column of stamens is fully exposed to view; cells of the fruit open, without cell-wings, and the expanding-keels contiguous into a central keel; stigmas 6-9. Dinteranthus.
Leaves not dotted; petals in 3 or 4 series, ascending-spreadi ng so as to form a sort of cup in which the bas al part of the stamens is more or less concealed; cells of the fruit roofed with membranous cell-wings and the expanding-keels diverging, at least at the upper part; stigmas 6-11.

2. Surface of leaves microscopically granulated; old plants with 3-4 pairs of leaves always present on each growth at the same time, and the leaves, when not at rest, more or less separated; flowers yellow. Lapidaria.

Surface of the leaves smooth, not microscopically granulated; old plants with only one or (when making new growth) two pairs of leaves present on each growth at the same time, and the leaves (when not in flower), more or less closed together; flowers white or pink. Rimaria.

The following are the species of Dinteranthus at present known.


This plant was fully described under Rimaria at the place quoted.

GreatNamaqualand, Dinter. Little namaqualand, Laughan Brown 709.

2. D. ruberulus, N. E. Br.—Growth 9-18 lines high, with the two leaves united for one-third to one-half of their total length, the free parts diverging, 6-10 lines long, 6-8 lines broad and 4-6 lines thick, oblong, obtuse, slightly convex on the face, rounded on the back and bluntly keeled at the apex, microscopically granulated-ruberulous, and velvety to the touch, greyish-green, dotted with darker green. Flowers not seen. Capsule, when closed, 1½-5 lines in diameter, shortly when broadly obconic, flattish or slightly convex, with 6-7 raised sutures on the top, and with 6-7 valves and cells; when expanded, 5-8 lines in diameter; expanding-keels contiguous into a stout central keel, brown, with broad membranous marginal wings; cells open, without (or in the largest capsule seen with rudimentary) cell-wings. Seeds about 1/6-line long, tear-shaped or sub-globose with a point, smooth, brown.

LittleNamaqualand, Laughan Brown 703.


Freska Division: Precise locality unknown. McLeod.

I placed this doubtfully under Rimaria, as I had not then, and have not now, been able to examine flowers and fruits of it, nor does Schwantes appear to have done so.

Under this genus is also enumerated D. inexpectatus, Schwant.
Sukk., 1926, p. 184, and 1927, p. 30, without a description or reference, but evidently founded upon M. inexpectatum Dint. in Dinter's Sukk. in Sudwestafrika, p. 106, which again is only mentioned by name, without any description, and therefore both names are invalid, and the plant intended may not belong to this genus.

N. E. Brown
(To be continued.)

MESEMBRANTHEMUM.

(Continued from page 472.)

LAPIDARIA, Schwant.

Stemless, perennial. Each adult growth with 3 or 4 pairs of crowded leaves always present at the same time, shortly united at the base, flat or slightly concave on the face, not dotted, with a minutely granulated surface. Flower solitary, terminal, pedicellate, but with the pedicel concealed in the bases of the leaves. Calyx somewhat compressed and 2-edged, sub-equally 7-lobed nearly down to its union with the ovary; lobes ovate, all but the two outer with membranous edges, dotted. Petals numerous, "loosely united at the base" ex Dinter, ascending-spreading so as to form a cup. Stamens numerous, erect, the inner much shorter and more inflexed than the outer, partly concealed in the cup of the corolla; filaments bearded at the base. Stigmas 6-7, subulate or filiform, ascending, with recurved tips, as long as or exceeding the stamens. Ovary inferior, flattish at the top, 6-7-celled; placentas on the outer wall of the cells. Capsule shortly and broadly obconic, flat, with raised sutures, at the top, with 6-7 valves and cells; valves at the widely spreading or recurved when expanded; expanding-keels contiguous below, diverging at the apical part, with broad membranous margins; cells roofed with membranous cell-wings, without a tubercle at the opening. Seeds.

A monotypic genus, native of Namaqualand.
The name is doubtless derived from the Latin, Lapidarius, stony probably in allusion to the stony ground in which it grows.

1. L. Margaritae, Schwant., in Moller's Deutsche Gartner Zeitung, 1927, p. 123. Old plants about 1\(\frac{1}{2}\)-1\(\frac{3}{4}\) inch high, formed of a clump of densely crowded growths, each with four pairs of thick, fleshy leaves present at the same time; leaves 6-9 lines long, 7-12 lines broad, 3-7 lines thick, oblong in young plants, broadly ovate in old plants, obtusely pointed, flat or slightly concave above with sharp edges, and keeled at the apex, of hard or firm substance, glabrous, with a smooth microscopically granulated surface, of a peculiar rusty-ochreous colour in imported plants, but in cultivated plants whitish, with a rosy tint or in sunless years becoming greenish, with yellowish or ochreous edges and keel. Flowers terminal, appearing sessile, but with a pedicel concealed between the basal part of the leaves. Calyx sub-equally 7-lobed, ruberulous; lobes about three lines long, 1\(\frac{1}{2}\)-2 line broad, oblong or ovate-oblong, obtuse, three with membranous margins. Corolla 1-2 inches in diameter; petals numerous in 3-4 series, the outer 6-9 lines long, 1\(\frac{1}{2}\)-2\(\frac{1}{2}\) line broad, the inner gradually smaller, cuneately linear, obtuse or sub-acute, yellow. Stigmas 6-7, about 3-4\(\frac{1}{2}\) lines long, filiform, acute, greenish-yellow. Capsule as for
492 the genus. Seeds scarcely 1-line long, pale brown.


The adult, native-grown, living plants of this species, for which I have to thank Dr. I. B. Pole Evans, are very different in appearance from the young plants I have hitherto seen, and which were raised in Europe. These old plants have their leaves much shriveled, on account of the great drought to which they have been subjected during the last few years, but even when in proper growth after a supply of rain, it is evident that they would be very crowded. For want of knowledge of its flowers and fruit, I had wrongly referred this plant to Argyroderma, because, having to place it somewhaere, the vegetative characters appeared best to accord with that genus, and the flowers had not then been described.

GIBBACEUM, Haw.

G. Marlothii, N. E. Br.-- Growth, when at rest, obliquely ovoid, something like those of G. gibbosum in form, but smaller, and the leaves less unequal, 12–15 lines long, composed of two unequal or sub-equal leaves united for 3–4 lines at the base; when the leaves are unequal, the free part of the larger leaf is 7–10 lines long, trigonous-ovoid, slightly compressed and bluntly keeled at the apical part, obtuse; the smaller leaf being 1–2 lines shorter in the specimen seen, and under cultivation the leaves are mostly sub-equal; when at rest the leaves are pressed together, when in active growth they are ascending-spreadin; surface smooth, glabrous, green, or under natural conditions "yellow and brown," according to Marloth. Pedicels compressed and more or less 2-edged, glabrous. Calyx 6-lobed, glabrous; lobes about 2 lines long, ovate, two of them slightly keeled. Corolla 9–12 lines in diameter, expanding in sunshine, petals in one series, 4–5 lines long, 4-line broad, linear, obtuse or notched at the apex, magenta-purple. Stamens and staminodes about 1½ line long. Stigmas 6, spreading, 1 line long, plumose subulate, acute. Ovary partly superior, broadly dome-shaped on the top.


The only known glabrous species with which this can be confused is G. gibbosum, from which the smaller size and much less unequal leaves are readily distinguished it.

FUNCTILLARIA, N. E. Br.

In the Zeitschrift f. Sukkulentenkunde, 1927, pp. 22–23, the species of this genus have been referred to Fleiospilos, N. E. Br., by Dr. Schwantes, who states that the fruit is alike in both genera. This is, however, a mistake, for in Fleiospilos Bolusii and F. simulans no tubercle is present at the opening to the cells, while in the fruits of all the species of Functillaria that I have examined there are very evident tubercles, and this, together with a
small difference in the marginal wings and the different leaves, I have considered as being of sufficient importance to separate them generically. In my original MSS. and keys, before I had examined the fruits of Fleiospilos Bolusii and F. simulans, I had also placed these two species under Functillaria, and that is why the genus Fleiospilos does not appear in Phillips' Genera of S. Afr. Flowering Plants for I has sent the MSS. of the genera published in that work to South Africa at least a year before it was printed or my final keys finished. But from discoveries I have sence made, I think it probable that this and one or two other fruit characters cannot always be accented as absolute, for I find that the tubercle is present, rudimentary, or absent in different specimens of Disphyma australie, N. E. Br., and in different species undoubtedly belonging to the same section of Mesembryanthemum, it is also absent or present. So that if Fleiospilos and Functillaria are hereafter united, then in accord with the rules of nomenclature, Fleiospilos, being the smaller genus, must be made a synonym of Functillaria, which I had (in MSS.) founded many months before I had a change to examine the fruits of P. Bolusii and F. simulans, and it is therefore really the oldes genus of the two as well as the largest.

Schwantes also states that P. compacta, N. E. Br. (m. compactum, Ait.) is distinct from M. nobile, Haw., but gives no reason for their separation, nor any description by which they can be identified, and I doubt very much if he has any knowledge of the plant I feel sure if he has any knowledge of the plant I feel sure is M. compactum, Ait., since it quite accords with such description as Aiton (and Dryander in his MSS.) gives, and has also long been cultivated (probably for over one hundred years) in England as M. nobile. I have myself known the plant for over sixty years by that name, for I first saw it in Mr. W. W. Saunders' fine collection about 1865, and as that collection contained some of the remnants of Haworth's type of M. nobile, and I also many times saw the plant in the collection of Mr. T. Cooper. At the same time forms of P. magnipunctata are also in cultivation under the name of M. nobile.

In Dryander's notes at the British Museum, I find it recorded that M. compactum flowered at "ew in November, 1781, that its flowers are yellow, and the "leaves as long and as thick, as a finger." Dryander's Lating description of it, translated, reads as follows: "Sternum. Leaves connate, dotted, semi-terete, triquetrous and somewhat reflected at the apex, acute. Flowers sessile; calyx sub-cylindric, six-lobed." All this, except that he does not say that the leaves are concave on the upper side, as Haworth describes them to be, well agrees with the plant known as M. nobile.

F. compacta is not common, and to judge from the utterly different plant Mrs. Bolus has figured under the erroneous name of P. compacta, I believe that the true P. compacta is unknown in South Africa. See also Rollers Deutsche Gartner Zeitung, 1928, p. 400.

P. sesquiuncialis N. E. Br. This is the plant figured as P. magnipunctate var. sesquiuncialis, L. Bol. in S. Afr. Gard., 1927, p. 326, f. 13. There is no description, except that "The dots are not so marked as those of P. compacta, and the petals are narrower." By "P. compacta" Mrs. Bolus means P. magnipunctate, as it is evident she does not know what P. compacta is. But the figure represents a plant with a pair of short and thick leaves similar to those of Fleiospilos Bolusii; they are about 1½ inch long, ⅔ inch broad and 1-1½ inch thick, according to the figure, obtuse at the apex and
493 bluntly keeled. The flower is represented as about 1½ inch in
diameter, with lax and narrow petals. It is certainly very dis-
tinct from P. magnipunctata, and bears no resemblance whatever to
P. compacta.

Prince Albert Division: Hills near Prince Albert, Bolus.

P. Purpusii, N. E. Br.-- Plant similar to P. magnipunctata,
but the leaves are often less stout, and are more acute, and the
solitary and sessile flowers are quite different. Calyx cylindric,
sub-equally 6-lobed; lobes 4½-6 lines long, lanceolate, acute,
with narrow membranous edges. Corolla 2½-3 inches in diameter,
expanding in the afternoon irrespective of sunshine and closing be-
tween 5 and 6 p.m., pleasantly scented; petals numerous, in 2-3
series, sometimes widely spreading, at other forming a somewhat
funnel-shaped corolla, somewhat lax, 18-21 lines long, 2/3-¾ line
broad near the tips, thence gradually tapering downwards into a
long, claw-like part, mostly more or less acute, sometimes obtuse,
white for 8-9 lines of their length at the base, bright yellow at
the upper part, and whitish-yellow, sometimes tinged with red, at
the tips on the back. Stamens about 6 lines long, the central col-
lected together, the outer gradually separating and loosely erect;
filaments not bearded, white; anthers yellow. Glands very small,
yellowish. Stigmas 10, about 8 lines long, filiform, with short
hairs on the inner surface, exceeding the stamens and slightly
recurred over them, yellow. Ovary flattish on the top.

Pleiospilos Purpusii, Schwant., in Rollers Deutsche Gartner
Zeit., 1929, p. 46. Mesemb. nobile, Purpus in Monasschr.
N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM
(Continued from page 493, Vol. LXXXIV.)

PUNCTILLARIA, N. E. Br.

34 P. Purpusii, N. E. Br. (continued.)-- Mes. nobile, Purpus in
Monasschr. f. Kakteenkunde, 1907, p. 23 and 25, with fig., and in
Rollers Deutsche Gartner. Zeit., 1911, p. 386 and 387, with fig., not
of Haworth. M. magnipunctatum, Schwant. in Zeitschr. f. Sukk.,

Willowmore Division: Near Miller, Frith. Marloth 6, 831.
Described and from living plants. It is one of those mentioned
in the Gardeners' Chronicle, 1926, Vol. LXXX, p. 213, under P.
magnipunctata, as being cultivated under that name. Its leaves,
however, are usually less stout and more acute, and the long,
slender, white bases of the petals give the flower a distinct ap-
pearance.

P. magnipunctata, N. E. Br.-- To this should be added as a syn-
12, which bears no resemblance to P. compacta, N. E. Br. (= M.
compactum, Ait.), and is merely a small form of P. magnipunctata.

P. optata, N. E. Br.-- To this, I think, must be referred the
plant wrongly identified with Mesembryanthemum canum, Haw., and
figured as P. canum, Haw., by Mrs. Bolus in S. Afr. Gardening, 1927,
Perennial succulent, stemless or tufted. Leaves opposite, obliquely and clavately trigonous, strongly keeled, whitish. Peduncle not exerted from between the leaves, 1-3-flowered, bracteate. Flowers pedicellate. Calyx sub-equally 5-lobed. Pedals 2-seriate, free, cuneately linear. Stamens numerous, in an erect column, exposed to view to their base. Stigmas 5, filiform. Ovary inferior, 5-celled; valves on the outer wall of the cell. Capsule shortly and broadly obconic, flattish, with raised sutures on the top, with 5 valves and cells; valves of expanded capsule inflexed and separating but slightly from one another, not spreading; expanding keels small, slightly prominent, about half as long as the valve and without marginal wings; cells acutely roofed with slightly stiff cell-wings, with acute depressions between the ridges, and the opening nearly closed by a large tubercle. Seeds several in each cell, ovate, pointed at one end.—N. E. Br. in Journ. of Bot., 1928, p. 267.

A monotypic genus native of South Africa.

The name is given in honour of Mrs. L. vander Bijl, who has very kindly sent to me specimens of this and other novelties. This genus is distinct in appearance, but more nearly allied to Cerochlamys than to any other genus.

1.—B. cona, N. E. Br.—Plant 1½ inch to 2 inches high, forming clumps. Leaves opposite, in 1-3 pairs to a growth, incurved-squinting, and as received, 9-18 lines long, 4-6 lines broad and 3-4½ lines thick at the base, and 5-9 lines broad and 4-8 lines thick near the apex, where the keel is dilated, clavately and often obliquely trigonous, obtuse, not toothed, flat on the face and often on one of the sides, the other side being (or sometimes both sides are) convex, strongly and usually obliquely keeled on the back, with somewhat sharp angles, firm, glabrous and smooth, whitish or whitish green, not shining. Cymes 1-3-flowered, with the peduncle not visible. Pedicels 1½-3 lines long. Pedicels 1-3 lines long. Calyx-lobes about 2½ lines in diameter; petals numerous, about 6-8 lines long and ½-1 line broad, cuneately linear, obtuse or notched at the apex, yellow. Stamens about 4 lines long, yellow. Stigmas 5, as long as or exceeding the stamens, filiform. Capsule as described for the genus, when closed 3-4 lines in diameter, and scarcely more when expanded, as the valves separate but slightly and remain inflexed, with the openings between them only ½-1½ line wide (not widely spreading as represented by Mrs. Bolus). Seeds 1 line long, smooth, light brown, with a darker point.


Prince Albert Division: Among rocks near Prince Albert. Mrs. Tugwell, Mrs. D. van der Bijl. Introduced into cultivation at Kew by Masson in 1792, but soon died out.

Living specimens of this very neat and distinct-looking plant
were sent to me by Mrs. D. van der Bijl early this year, and I at once recognised it as being the long lost M. canum, Haw., and also as the plant Mrs. Bolus has figured and described as M. Tugwelliae without having identified it with the plant Haworth described as M. canum in 1785, and which soon died out of cultivation, and appears not to have been refound for over 120 years.

Mrs. Bolus, however, as mentioned under Punctillaria optata, has wrongly identified a Punctillaria as being M. canum, Haw., which is quite incomprehensible, for the species of Punctillaria have dull, gryeish-gren or brownish-green leaves that are conspicuously-dotted, never "hoaryish" nor yet at all like "stunted toothless leaves of M. canum." Haworth makes no mention of dots, and he certainly would have done so if they had been present. His description is as follows: -- "Plant apparently stemless. Leaves 2 inches long, crossing each other in pairs, hoaryish (ilw., whitish), sub-acinaciform, rather hard to the touch and turgid; triquetrous, compressed, attenuate from the middle downwards; sharply keeled; keel hunching out towards the point, which is roundish, with a sharp keeled edge. The full-grown leaves resemble the stunted, toothless leaves of M. canum exceedingly." This description exactly accords with Bijlia cana, and as M. canum was discovered by Messon, who certainly collected in Prince Albert Division, it may even have been found by him in the same general locality as that from which Mrs. Tugwell and Mrs. van der Bijl obtained it.

Mrs. Bolus has placed the plant under the genus Hereroa, to which it bears no resemblance. And Schwantes, apparently without having seen the plant, first places it in the genus Juttaedinteria, where it does not belong, and after I had already published the genus Bijlia, founded the genus Bolusanthemum for its reception, possibly unaware that there is already a well-known genus called Bolusanthus, with which it would probably be confused. And later, in Die Gartenwelt, 1928, p. 644, he appears to want to chop the poor plant in half and call each half a different species, since he states that the plant I have described is not the same as that Mrs. Bolus has described and figured as M. Tugwelliae. A view that no one who has the plant is likely to endorse.

N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM,
(Continued from page 34).

17.—CRYOPHYTUM, N. E. Br.

84 C. gibbosum, N. E. Br.—Annual, 4'-1½ inch high, with 2-3 pairs of opposite and widely spreading branches ½-2 inches long, each bearing 1-4 flowers at the end; whole plant glabrous and papulose, with about 4 navelae in the space of a line. Branches about 1 line thick at the upper part, fleshy, tending downwards and becoming dry and rigid below, with internodes opposite 2-6 lines long, green or dark red. Leaves opposite, all withered on the specimens seen, 2-10 line long, ascending or spreading, apparently terete, obtuse, distended into a flattened sheath and scarcely united at the base, papulose, and with or without marginal cilia at the base. Flowers bracteate, sessile. Calyx-tube above its union with the ovary, ½-line long, unequally 4-5-lobed above; lobes 1½-2½ lines long, subulate from a dilated base, which is more or less membranous and ciliate at the
margin, and with a stout and very conspicuous hump or compressed
gibbosity 1/2-3 line long, spreading horizontally from the base of
each. Corolla apparently 3-4 lines in diameter; tube about 1/4
line long; petals about 1 1/2 line long, white, sometimes tinted with
lilac at the tips. Stamens few, 1-1 1/3 line long. Stigmas 4-5,
erect, about 1/6-line long. Ovary half-superior, 4-5-angled, with 4-
5 cells; placentas axile.
C. nodiflorum. L. Bol. in S. Afr. Gard., 1928, p. 84, f. 34, as
to No. 3 only.
Piquetberg Division: Eendekuil, Naughtan Brown.
The gibbosities on the back of the calyx-lobes are remarkable,
and unlike anything I have yet seen in this group.

C. nemum, N. E. Br.--Annual, 1-3 inches high, branching from
the base, coarsely papillate with glittering watery papillae, glab-
rous. Branches 1-3 inches long. Leaves opposite, petiolate, 4-2
inches long, 1/2-1 inch broad, spatulate-ovate or rhomboid-ovate,
acute or acuminate, flat, more or less undulated, rather abruptly
narrowed below the middle into a petiole 4-1 inch long and 2-4 inches
broad, thick and fleshy, with a prominent midrib beneath, and much
more coarsely papillate on the lower than on the upper surface, with
the papillae 1/2-1 line in diameter, green or reddish. Flowers soli-
tary or 2-5 in a cyme, terminal. Pedicels 1 line or less long,
1/2-2 lines thick. Calyx produced above the ovary into a tube about
1 line long, sub-gradually 5-lobed above, covered with large, glitter-
ing papillae 1/2-1 line in diameter, ovary, part sub-globose, 3 1/2-5
lines in diameter; lobes apparently erect, 2-3 lines long and about
the same in breadth, sub-ovate, obtusely rounded at the apex.
Corolla apparently not more than 6-8 lines in diameter; petals
united below into a tube 2 lines long, with the free part 1 1/2-2 lines
long, with very slenderly filiform-linear, lilac-pink at the apical
part, white at the basal part. Stamens in several series, the long-
er about 2 lines long, creamy-white. Stigmas 4-5, erect, with re-
curved tips, 2 lines long, filiform, white. Ovary half-superior,
4-5-celled. Capsule half-superior, 3-2 1/3 lines in diameter, 4-5-
angled, with 4-5 raised and goring sutures, with blackish-brown
edges.
Malmesbury Division: Region of Saldanha Bay, Naughtan Brown.
This species seems to be allied to the giants of the genus,
C. Berkleyi, C. grandiflorum and C. grandifolium, but is very much
smaller than any of them.

C. Bijliae, N. E. Br.--Annual, about 6 inches high, glabrous,
papulose. Stems several from the base, erect, cymosely branching
at the top, apparently somewhat angular, with internodes 1/2-1 inch
long, 1-1 1/3 line (or perhaps more when alive) thick, with distinct
watery papulae. Leaves opposite on the stems, alternate on the
flowering part, 1/2-2 inches long, 2-8 lines broad, 1 line thick,
the lower more or less spatulate-ovate or spatulate-lanceolate,
cuneately tapering into a retiole, the upper more or less cuneately-
lanceolate or linear-lanceolate, obtuse or acute, slightly channel-
led above, keeled beneath, minutely papulose under a lens, green,
often reddish at the edges. Flowers usually alternate and opposite
a leaf along the branches of the cyme. Pedicels 2-5 lines long.
Calyx acutely 5-angled on the ovary-part, somewhat unequally 5-
lobed, minutely papulose; narrowly spatulate, obtuse. Corolla
only seen in withered condition, with the tube 1 1/2-line long, and the
free part of the petals 2 lines long, less than \( \frac{1}{2} \) line broad, linear, obtuse, stated to be creamy white, slightly tinted with pink at the tips on the under-side. Stamens in 4-5-series, white. Stigmas 5, erect, 1 line long, filiform. Ovary half-superior, conical and 5-angled at the top, papulose, 5-celled. Capsule 2\( \frac{1}{8} \) 3 lines in diameter, when closed, 5-angled, of generic structure. Seeds less than \( \frac{1}{8} \)-line in diameter, compressed, D-shaped, minutely tuberculate, brown.

Kosses Bay Division: Near Great Brak River, Mrs. D. van der Bijl, 44.
Allied to C. Rogersii, L. Bol. and C. Wilmaniae, L. Bol., but with broader leaves, and an angular calyx, which is not nearly so coarsely papulose.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM,
(Continued from page 84, Vol. LXXV.)

MONILARIA, Schwant.

Dwarf, bushy, succulent plants, two to four inches high, with crowded, erect, stout branches, constricted at the nodes into short and often bead- or button-like joints. Leaves opposite, of two kinds, and only one pair of each kind produced annually; the first pair to appear when growth commences are rudimentary and sometimes scarcely more than a short, fleshy sheath, with its semi-circular lips closed together into a bag-like or globular body, but by the growth of the second pair of leaves the lips are pushed apart and remain surrounding the base of the joint formed by the second pair, which are long and nearly cylindrical, and more or less flattened on the upper side, and very short and united at the base, papulose. Flowers solitary, terminal; pedicels long, papillate, with a pair of rudimentary leaves sheathing the base. Calyx papulose or papillate, unequally 5-lobed down to its union with the ovary, with the ovary-part shallow and convex beneath. Petals numerous, erect in a column, or later becoming more or less loose; filaments not bearded at the base. Stigmas 5-7, stoutly ovoid-subulate, acute. Ovary inferior, shallow, 5-7-celled, with 5-7 sutural ridges on the flat top; placentae on the floor or outer wall of the cells. Capsule shallow, very shortly and broadly ovoid-conic, with 5-7 very prominent and thin sutural ridges on the flat top, and 5-7 valves and cells; valves reflexed or widely spreading; expanding keels more or less widely diverging, broad and flattish at the basal part, with the inner edges raised, and with narrow marginal wings; cells shallow, somewhat acutely roofed with membranous cell-wings; no placental tubercle. Seeds numerous in each cell, ovoid, pointed at one end, smooth.—Schwantze in Gartenwelt, 1925, p. 69.

Species 3; natives of Little Namaqualand and Van Rhynsdorp Division of South Africa and type of the genus is M. moniliformis.
The name is derived from the Latin, monile, a necklace, in allusion to the manner in which the stems are constricted into bead-like joints.

The remarkable group of plants comprising this genus is among those I intimated in The Gardeners' Chronicle, 1925, Vol. LXXVIII,
32 p. 412, that would probably have to be separated generically from Mesembryanthemum when better known. But as at that time I had not seen flowers or fruits of any species belonging to the group, I was unable to assign characters whereby to separate it; and previously I had associated the species with those now placed under the genus Mitrophyllum, in which I was at first followed by Schwantes, who enumerated the species under a section of that genus, but without a work of description by which it could be identified. Recently, however, he has separated it as a distinct genus, in which opinion I agree with him, for having been able during the past four years to study living plants in the adult and seedling stages of Monilarea and Mitrophyllum, I find they differ so conspicuously in vegetative characters, long pedicels, stout stigmas, and slightly in fruit, that I no longer hesitate to consider them as distinct genera, especially as Monilarea is easily distinguished from all its allies by the stems and leaves alone.

From Mitrophyllum it differs in its peculiar mode of growth, as follows:—The first of the two annual pairs of leaves is rudimentary, consisting of a pair of very short, fleshy, hemispherical lobes united at their base and at first closed together into a small hemispherical body (see Fig. 14, p. 29 of M. moniliformis commencing to vegetate), which become separated as the second pair of leaves develop. This second pair are long and sub-terete, and are but very shortly united into a sheath at the base above the short, bead-like internode from which they arise. This short sheath ultimately either decays or hardens into a short, free, cup-like, dark brown sheath terminating the internode and enclosing the next pair of rudimentary leaves, which ultimately disappear and leave the sheath surrounding the base of the internode above it, as is well seen in the stems of M. pisiformis and M. chrysoleuca. In Mitrophyllum the first pair of leaves are long, not sub-terete, and free except at the very base; and the second pair are united into a long cone with free, leafy tips or short, blunt points.

The following are the first complete and illustrated descriptions of these very curious and interesting plants that have ever been published.

Key to the Species.

1. Joints of the stem twice or more than twice as thick as long, button-like or depressed-globose, not produced above into a short sheath, greyish; petals white; filaments and anthers yellow. 
   
   M. moniliformis.

2. Joints of the stem usually (but not always) as long as or longer than thick, more or less bead-like, produced above into a short sheath enclosing the base of the joint above it, smooth and hard, dark brown.

   Joints of the stem ellipsoid or sub-globose; petals stated to be yellow at the tip, then white, and pink at the base; stamens with red filaments and yellow anthers.

   M. pisiformis.

3. Joints of the stem somewhat compressed and obscurely 4-angled; petals white; filaments and anthers deep yellow.

   M. chrysoleuca.

M. moniliformis, Schwant. in Gartenwelt, 1929, 60. -- Plant
33 much branches, 2-4 inches high when at rest; branches erect, often crowded, 5-7 lines thick, constricted at the nodes, with short, depressed-globose or button-like joints, 1\(\frac{1}{2}\)-3\(\frac{1}{2}\) lines long, greyish. Primary leaves 1\(\frac{1}{2}\)-2\(\frac{1}{2}\) lines long, 4-6 lines broad and 2-3 lines thick, semi-circular in outline, with a minute point at the rounded apex, flat above, convex beneath, smooth, glabrous, not papulose, green. The second pair of leaves 2-3\(\frac{1}{2}\) inches long, 2-2\(\frac{1}{2}\) lines thick, slightly flattened on the upper side, densely covered with minute, glittering papule, somewhat bluish-green. Fidicels 2\(\frac{1}{2}\)-3 inches long, coarsely papillate. Calyx flattened at the base, coarsely papillate; lobes 4-8 lines long, the outer 2\(\frac{1}{2}\)-3 lines broad, ovate, with leafy tips, the inner 3\(\frac{1}{2}\)-4\(\frac{1}{2}\) lines broad, elliptic, with broad, membranous margins. Corolla 1\(\frac{1}{2}\)-2\(\frac{1}{2}\) inches in diameter, opening between 11 and 12 a.m. and closing between 2 and 3 p.m.; petals in about 3 series, 6-9 lines long, \(\frac{1}{2}\)-1 line broad, linear, obtuse and more or less notched at the apex, pure white, shining. Stamens about 2 lines long, at first in a column, afterwards loosely separating; filaments and anthers deep yellow. Stigmas 5, about 1 line long, stout, ovoid-subulate, acute, erect or ascending, yellowish. Ovary with 5 wing-like sutural ridges on the flat top, green. Capsule when closed about 7 lines in diameter and when expanded 10-11 lines in diameter, inner edges of the expanding-keels fringed with fine teeth. Seeds nearly \(\frac{1}{2}\)-line long, pale brown with a darker brown point.


Van Rhynsdorp Division: On hills near Olifants River, towards the north, Thunberg, Mrs. E. Rood.

This curious plant was introduced into New Gardens by Nason in 1794, but appears to have soon died out. The above description was made from living plants and withered flowers sent to me by Mrs. E. Rood, for Thunberg's type is both leafless and flowerless having collected when in a state of rest. The illustrations are from photographs kindly sent to me by Mr. T. N. Leslie. Fig. 14 and Fig. 19 the same plant when in flower.

M. visiformis, Schwant. in Gartenwelt, 1929, 69-- Plant compactly much branched, 2\(\frac{1}{2}\)-4 inches high when at rest and leafless. Branches erect, 3-4\(\frac{1}{2}\) lines thick, constricted at the nodes into bead-like, sub-globose or ellipsoid joints, varying from 2-5 lines long, glabrous, smooth, brown or greyish-brown. Primary leaves 2-3 lines long, 3-4 lines broad, semi-circular in outline, flat above, convex beneath, glabrous, smooth, green. The second pair of leaves 1-3 inches long, 2-2\(\frac{1}{2}\) lines thick, sub-terete, slightly flattened on the upper side, very rounded on the back, very obtuse, minutely papulose and glittering, green. Fidicels 2-3 inches long, papillate. Calyx coarsely papillate; lobes 4-8 lines long; the outer ovate at the base, with leaf-like tips; the inner elliptic or elliptic-ovate, with broad, sub-membranous margins. Corolla 1\(\frac{1}{2}\)-1\(\frac{1}{2}\) inch in diameter, open in the afternoon; petals in about 3 series, 7-8 lines long,
34 linear, acute, obtuse or slightly toothed at the apex, they are stated to be "top yellow, then white, then pink". Staminodes about 2 lines long; filaments red; anthers yellow. Stigmas 5-6, about 1 line long, erectly spreading, stout, ovoid-subulate, acuminate, yellow. Ovary with 5-6 wing-like sutural ridges on the flattened top. Capsule 4½-6 lines in diameter and 2 lines deep when closed, 6½-8 lines in diameter when expanded; inner edges of expanding-keels entire. Seeds about 4-line long, pale brown with a darker brown point.


Van Rhynsdorp Division: Van Rhynsdorp Karoo, Mrs. E. Rood.

Described from living plants, which I owe to the kindness of Mrs. Rood. It differs from M. moniliformis by its brown (not greyish) stems, rather smaller flowers, with the petals less crowded, and the red filaments of the stamens. The figures are from photographs sent to me by Mr. T. N. Leslie. Fig. 20 represents the plant at rest, and Fig. 21 when in flower.

M. chrysoleuca, Schwant. in Gartenwelt, 1829, p. 69.—Plant 3-4 inches high, compactly branched. Branches [compressed and obscurely 4-angled, 4-6 lines broad and 3-4 lines thick], with joints 2-4 lines long, each joint with a hard and somewhat rigid, dark brown skin or adherent sheath having its upper part feebly ridged, and forming a cup-like sheath surrounding the base of the joint above it. Primordia of leaves about 1½-2 lines long, [fleshy and somewhat hemispherical when alive, united into one body for half of their length and closed together]; from between them the second pair emerges, borne on a short, compressed joint or internode; these leaves are 2-3 inches long and 2-2½ lines thick, sub-terete, slightly channelled or flattened on the face, obtuse, papulose. Pedicels 2-3 inches long, papulose. Calyx papulose, the longer lobes 6-7 lines long, lanceolate or oblanceolate, obtuse, and the shorter lobes about 4 lines long, with broad, membranous margins. Corolla about 1½ inch in diameter; petals in 3-4 series, 7-8 lines long, ½-1 line broad, cuneately linear, acute, obtuse or slightly toothed at the apex, white. Stamines about 2-2½ lines long; filaments and anthers of a rich deep yellow. Stigmas 5, about 1-1½ line long, stoutly subulate. Fruit not seen.


Van Rhynsdorp Division: Karee Bergen, Schlechter 8,292.

Little Namaqualand: near compile "Real", Pillans 17,794.

I am indebted to Mr. T. N. Leslie for a living plant, flowers and photographs of this interesting species. Mr. Leslie's plant, here figured, was received from Mr. Pillans and is his No. 17,794, which has been described by Mrs. Solus as Mesembryanthemum scutatum, but I am unable to distinguish it in any way from M. chrysoleucum. The words in the description that are between square brackets [ ] are
34 from this living plant, but all the rest of the description is made from a type specimen of Michrysoleucum, which has been so crushed in pressing that the stem and leaves do not show their true form. Fig. 12 p. 25 represents the plant just commencing to produce its leaves, and Fig. 13 p. 27 the same plant when in flower.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM,
(Continued from page 34.)

MITROPHYLLUM, Schwant.

208 Shrubs or rarely stemless perennials, of remarkable habit. Stems all with distinct internodes, or with internodes only developed on the flowering stems, the vegetative shoots then being without developed internodes, or in two species (of one of which the flower and fruit is unknown) apparently entirely stemless. Leaves opposite, two pairs only produced at the first pair free except at the very base, flat above, rounded or keeled on the back; the second pair united from a third part to nearly all of their length into a conical or rarely cylindrical body, minutely crystalline-papulose, especially at the tips. Flowers solitary or developing to lax cymes when in fruit, terminal, pedicillate, with or without bracts. Calyx sub-equally 5-lobed to its union with the ovary. Petals numerous, free, in 3 or 4 series, linear. Stamens numerous, erect, in a column. Stigmas 5-7, subulate. Ovary inferior, with 5-7 sutural ridges on the flat top and 5-7 valves and cells; expanding-keels usually diverging from the base, with incurved tips, sometimes sub-parallel, broad and flat, with the inner edge raised, with membranous margins; cells shallow, with or without membranous cell-wings. Seeds ovoid or pear-shaped.—Schwantes in Zeitschrft f. Sukkulentenkunde, 1926, p. 181. Conophyllum, Schwantes, in the same volume, p. 321.

Species several, natives of Little Nambqualand. For the type of the genus see later.

The name is derived from the Greek, mitra, a mitre, and phyllon, a leaf, in allusion to the shape of the united pairs of leaves.

The plants comprising this genus are among the most remarkable of flowering plants, and very interesting on account of their vegetative peculiarity. When in a state of rest each growth or branch terminates in a conical or rarely cylindrical, fleshy body. Within this cone, during the months of rest, a pair of leaves, free almost to the base, is being developed, quite invisibly, at the expense of the tissue of the cone, until finally the substance of the latter is all absorbed, except a thin skin that covers and conceals the leaves inside. When the growing period arrives, these leaves burst the skin, increase in size, and spread widely, and from between them arises another pair of leaves united for part or nearly the whole of their length into a cone or cylinder. This cone is sometimes supported upon an internode of stem and sometimes sessile between the spreading leaves, and when the dry season comes the latter wither and dry up, and the cone persists, to repeat the development above described.
This mode of growth is, of course, only a modification of that of the genus Cheiridopsis, to which Mitrophyllum seems to be in some way allied, for the genus comprises two groups, one in which the vegetative and flowering growths are both alike, are permanent and have distinct internodes, and another group in which the permanent vegetative part of the plant is practically stemless and sessile on the ground, without internodes, but produces tall flowering stems with distinct internodes, which die after fruiting. A vegetative growth of this latter group with its free leaves spreading close to the ground, and the cone of united leaves arising from between them, in habit is so very similar to Cheiridopsis peculiaris in the same condition of growth, that without seeing flowers and fruits most people would probably consider them to belong to the same genus.

This remarkable group is one of those I alluded to in The Gardeners’ Chronicle, 1925, Vol. LXXVIII, p. 412, as being left under Mesembryanthemum when my key to the genera was constructed, because I had no fruits or adequate material by which to separate them. Schwantes, however, has rightly separated the group and founded the genus Mitrophyllum for its reception at the place above quoted, under the following structural characters:—Flower solitary, terminal, bractless, sometimes breaking through the body of the cone, with shorter or longer pedicels. Calyx 4-5-lobed. Petals in several series, linear, white or pink. Stamens numerous, spreading. Stigmas 7, subulate, as long as or shorter than the stamens. Capsule 7-celled; cells with cell-covers; placentas parietal, without placental tubercles; expanding-keels diverging upwards, with moderately broad wings. Seeds unknown.

It is not stated from which species these characters were derived nor which is the type of the genus. But in the very same volume, p. 321, he divides Mitrophyllum into two genera, and states that M. mitratum is the type of that genus, which he there defines as follows:—“Pedicel with two short, thick bracteoles at the base. Petals and stamens numerous. Stigmas 5, filiform. Capsule 5-celled, without cell-covers; expanding-keels parallel, not touching one another, with small, marginal wings. Seeds Pear-shaped, slightly papulose.”—Hence, these characters, stated to be derived from M. mitratum, are so different from those of his original description (quoted above), that it is obvious that both sets of characters could not possibly have been made from the same species, and, have been made from the same species, and, therefore, M. mitratum cannot be the type of the genus as originally established. For it is those original characters that must be maintained for the genus, as it is not permissible and is against all rule and precedent to deliberately change the characters of a genus in this way, unless it can be demonstrated that a mistake has been made. But here is no mistake, for the characters of his first description do apply to certain species, and, moreover, we also find that Schwantes actually uses them (at the same place quoted) to found his genus Conophyllum, which must, therefore, rank as a synonym of Mitrophyllum.

With reference to M. mitratum, the only claim to generic distinction is that the cells of its fruit have no cell-wings and the expanding-keels are parallel instead of divergent, for there is no other difference. I regard this as merely a structural variation among species belonging to the same genus, because among the large number of fruits I have examined I find that although fruit-structure is fairly constant and reliable (in conjunction with vegetative char-
for distinguishing genera, yet here and there among species that unquestionably belong to the same genus variations occur in fruit-structure that must be disregarded from a generic point of view; such characters as the presence or absence of placental tubercles, presence or absence or rudimentary development of cell-wings and the contiguity or separation and divergence of the expanding-keels, are all liable to variation occasionally. Therefore, I regard M. mitratum as not generically distinct from the others enumerated here, but it cannot be accepted as the type of the genus, as the structure of its fruit is stated to be different from that originally assigned to Mitrophyllum. I have only seen fruit of M. grande, which was attached to the plant and exactly conforms with the characters of the fruit as described originally by Schwantes, and as he has not mentioned which of the known species is the type from which the characters of his original description were made, I propose that M. grande be taken as the type of the genus.

N. E. Brown
(To be continued.)

MITROPHYLLUM, Schwant.
Key to the species.

1. Plants in flower not more than about 1-1½ inch high.
   8. nanum and Schickianum.

2. United pairs of leaves forming conical bodies stouter than the branches that they terminate.

3. Internodes distinctly developed on both vegetative and flowering parts of the plant and varying from ½-1 inch long and 1½-3 inches thick.

4. Internodes of the vegetative growths suppressed and crowded together or not more than about 1-1½ lines long; those of the flowering parts elongated and ½-3 inches long.

5. Internodes 1-2½ inches long, and their terminal cone separated from the lateral cones next below it by an internode 1-2½ inches long; free leaves 4-6 lines broad at the base; petals yellow.

6. Dissitum.

7. Internodes ½-1 inch long, and the terminal cone sub-sessile among the lateral cones or only separated from them by an internode 2-6 lines long; free leaves 4-7 lines broad at the base; flowers unknown.

8. Proximum.
5. Vegetative cones 2-3 inches long and an inch or more thick, all basal and practically stemless, being permanently clustered close to the ground; flowering stems arising from vegetative growths and 6-16 inches high, with internodes 4-5 inches long, dying after fruiting; free leaves 1-1½ inch broad at the base; petals white.

Vegetative cones 9-16 lines thick at the base, not basal, mostly solitary at the ends of branches and mingled with the flowering growths on various parts of the shrublet; free leaves 6-12 lines broad at the base.

6. Cones 1½-2½ inches long; internodes of the flowering branches 3-12 lines long and the lower one not resembling a long peduncle; pedicels about 6 lines long; petals white at the base, pale pink at the upper part.

Cones 2-3½ inches long; lower internode of the flowering branches 4-5 inches long, about half as thick as the internode below it and resembling a peduncle; pedicels an inch or more long; petals pure white.

7. Stem and branches more or less distinctly constricted at the nodes; flowers and fruit unknown.

These plants are not exactly easy to cultivate. They require a good sandy soil and are best watered from below, by standing their pots in saucers of water occasionally, and when the vegetative season commences their roots should not be allowed to completely dry up, at the same time they must not be overwatered, for in the region they inhabit they only receive three or four inches of rain per annum, and subsist for the greater part of their life upon dew or moisture condensed about their roots. Cuttings of some species do not root very readily, but in my experience the best time to take cuttings is in July.

1. M. grande, N. E. Br. (Fig. 112).--Plant with basal vegetative growths all without internodes and seated on the ground and persisting, each growth finally producing a branching stem with elongated internodes, which dies after flowering and fruiting. In the axils of the leaves at the base of the flowering stem are a pair of sessile leaf-cones that carry on the vegetative growth. When at rest, the vegetative cones are 2-3 inches long, an inch or more thick at the base, and somewhat resemble the pseudo-bulbs of an Orchid in appearance; the free leaves are 3-4 inches long and 1-1½ inch broad at the base, thence tapering to an obtuse point, flat on the face, rounded at the back, glabrous, light green in colour. Flowering stem 6-16 inches high, with internodes 4-4 inches long and 1½-4 lines thick, somewhat compressed and 2-edged, branching in a forked manner, with the branches erect and bearing reduced leaves at the nodes, and a flower in each fork or at the apex. Pedicels 2-5 lines long on native plants, about 1½ line thick,
thickening upwards, compressed, papulose. Calyx (only seen on a withered flower) sub-equally 5-lobed, with the ovary part very shallow and broad, and lobes 4-5 lines long, 2½-3½ lines broad, probably larger then alive, oblong, obtuse, 3 of them with a short dorsal point. Corolla 2-2½ inches in diameter, expanding after noon; petals in about 3 series, 9-12 lines long, about 1 line broad, linear, white, shining. Stamens about 2 lines long; filaments white; anthers yellow. Stigmas 5, subulate, about 1½ line long. Ovary with 5 ridges on the flat top. Capsule when closed 5-5½ lines in diameter, very shortly and broadly obovate, with 5 valves and cells, grey; when expanded about 8 lines in diameter; valves spreading horizontally, deltoid; expanding-keels broad and flattish, elevated at the inner edge, diverging from the base, with incurved, awn-like tips and broad membranous margins; cells somewhat acutely roofed with membranous cell-wings. Seeds nearly ½-line long, Pear-shaped, smooth, light brown.

Mesembryanthemum proximum, L. Bol. in S. Afr. Gard., 1927, p. 239, Fig. 3, and Notes on Mesemb., I., p. 70, Fig. 3, not of N. E. Br.

Little Namaqualand: On hills north of Brakfontein, Pillans 4,933.

So far as known to me, this fine species stands alone among those in this genus that have tall flowering stem in having its vegetative growths seated on the ground without internodes between the successive growths. It is incomprehensible how it could possibly have been mistaken either for M. proximum, as it in no way agrees with either my figure or description of that species, which bears its growths in clusters at the ends of the branches. Fig. 112 represents a 4 two growths from a clump with a flowering stem derived from a previous sessile cone arising from between them, of which a portion is omitted from the drawing. This flowering stem is probably two or three years old, its lower part bears fruit, and the terminal part has a withered flower and two flowering cones.

Seedlings of this species have the cotyledons as presented at Fig. 112 C, and the succeeding stages as shown in the same figure at D-G; D and E represent seedlings of one year's growth preparing to go to rest; F, a seedling at rest, but about to resume growth in the second year; G, the same at a later date when forming a fresh cone, and with the remains of the skin of the old cone (F) clinging to it. These young cones are of a somewhat translucent light green, and glitter as if covered with minute, watery papulæ, but under a lens the cells are seen to project as papulæ only on the lobes, elsewhere they do not project into distinct papulæ.

2.— M. Pillensii, N. E. Br.— Plant 12-16 inches high. Branches 5-6 lines thick, with the internodes on the vegetating parts 2-3 lines long, crowded, and on the parts about to flower longer and up to 14 lines long, the vegetating and flowering parts intermingled. Cones 2-4 inches long, 1-1½ inch thick at the base. Free leaves 4-4½ inches long, 2½-1 inch broad and 1½-2 inch thick at the base, thence tapering to a sub-acute point, very minutely papulose. Flowers solitary, terminal, the first one on a peduncle 4-5 inches long and 2-2½ lines thick (equivalent of the lower part of the flowering branches in the other species), with a pair of reduced leaves or bracts at its apex, from the axils of which small secondary flowering cones arise. Pedicel about 1½ inch long. Calyx
with the longer lobes 8-9 lines long, and the three shorter lobes with membranous margins. Corolla 1½-2 inches in diameter, opening in the afternoon, scented; petals in 3-4 series, 5-9 lines long, ¾-1 line broad, linear, subacute or obtuse, white. Stamens in a column about 4-4½ lines long and 5-6 lines in diameter, with the outer spreading away from the rest; filaments white, anthers yellow. Stigmas 5, about ¼ inch long, exceeding the stamens, subulate, green. Ovary conical and stoutly 5-ridged on the top. Capsule shortly and broadly obconic, about 7 lines in diameter when expanded; expanding-keels closely parallel or nearly contiguous, with narrow marginal wings; cell-wings rudimentary.

M. mitratum, L. Bol. in Fl. Po. of S. Afr., Vol. VII, t. 274, not of Schwantes, nor Mesembryanthemum mitratum, Marl.

Little Namaqualand: On hills about six miles north-east of Oograbies Poort, Pillans 4,690.

Although figured as being M. mitratum, Schwant., this plant conspicuously differs from that species by its larger vegetative cones, the much more slender and very long and peduncle-like lower part of the flowering branch, longer pedicels and much larger and differently-coloured flowers.

3. -- M. mitratum, Schwant. in Zeitschr. f. Sukkulent, 1926, p. 192, and 1928, p. 321; not of L. Bol.-- A shrublet about 1-2 feet high, with vegetative and flowering growths intermingled on the branches. Vegetating branches 6-7 lines thick, with very short, crowded internodes 1-2 lines long, and the flowering branches about 3 lines thick, with internodes ½-1 inch long, dark brown. When at rest a vegetative one is represented as about 2½ inches long and about an inch thick at the base, and a flowering cone about 1½-1½ inch long and ½ inch thick. Leaves not represented nor described. Pedicels represented as less than half-an-inch long, and as arising from the axil of the one of the old leaves of a flowering cone, but the flower is described as forcing "its way out through a slit at the side" of the cone. Calyx 5-lobed, three of the lobes with membranous margins. Corolla represented as about ⅛ inch in diameter; petals linear, white at the base, pale pink at the upper past.


Little Namaqualand: Sandy deserts east of Fort Noloth, Alston, in Herb. Marlston 4,690.

This species is unknown to me and evidently it is not the same as the plant figured by Mrs. Bolus under the name of M. mitratum, its cone being smaller, flowering in a different in colour.

N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM,


(Continued from page 228.)

MITROPHYLLUM, Schwant.

4. -- M. proximum, Schwant. in Zeitschr. f. Sukkulent., 1926, p. 182.-- A shrublet 8-12 inches high (Fig. 122), which branches 2-3 lines thick, terete, slightly thickened at the nodes and with in-
ternodes ½-1 inch long, glabrous, dark violaceous-grey. Vegetative and flowering growths intermingled on the branches, and the main or terminal cones clustered among the lateral cones at the ends of the branches and sub-sessile, or supported upon an internode 2-6 lines long. Cones 1½-3 (rarely 4) inches long, 5-9 lines thick at the base; free leaves ½-3 inches long, 4-7 lines broad at the base, thence tapering to an acute or sub-acute apex, concave, flat or slightly convex on the face, obtusely keeled on the back, light green, minutely papulose as in the other species. Flowers and fruit unknown.


Little Namqualand: Without precise locality; Pearson.

Fig. 117 represents a branch of the type plant when first imported. Fig. 12 represents a similar cluster of growths eighteen months after the branch bearing them had rooted, both figures of natural size, which clearly show how very different it is from M. grande, which has been mistaken for it in S. Africa.

5. -- M. dissitum, Schwant. in Zeitschr. f. Sukkulent, 1926, p. 182 (Fig. 123). -- A shrublet 12-18 inches high, with vegetative and flowering growths on the same branches, which are permanent. Branches 1½-2 lines thick, or thicker under cultivation, with internodes 1-2½ inches long, and a distinct and long internode always separating the main cones from the free pairs of leaves from which they arise, glabrous, reddish-brown, becoming dark grey with age. When at rest the vegetative cones are 1-2 inches long, 3½-5 inches thick; the free leaves are 2-2 inches long, 4-6 lines broad at the base, thence tapering to an acute apex, flat or slightly concave above, obtusely keeled or rounded on the back; both pairs of leaves are glabrous and in their earliest stages minutely crystalline-papulose, with longer and acuter papulose along the edges at the tips, which at length disappear, green, or with reddish tips. Flowers solitary, terminal, becoming lateral in fruit. Pedicels about 6 lines long, papulose. Calyx-lobes 5-8 lines long. Corolla 1½-1½ inch in diameter, expanding in the middle of the day; petals numerous in 3-4 series, linear, sub-acute, light yellow. Stamens about 2½-3 lines long, at first collected into a cylindrical column; white, with pale yellow anthers. Stigmas 5, about 3 lines long, slenderly subulate. Ovary raised and 5-ridged on the top. Capsule when expanded about 10-11 lines in diameter, with 5 valves and cells; expanding keels flat, diverging nearly or quite from the base, with the inner edges toothed and with rather narrow marginal wings; cells somewhat acutely roofed with membranous cell-wings. L. Poll in Fl. Fl. of S. Afr., Vol. VII, t. 272.

Mesembryanthemum dissitum, N. E. Br., in Journ. Linn. Soc. Bot. Vol. XLV, p. 114, t. 5, Fig. 9, and t. 6, Fig. 11. Conophyllum dissitum, Schwant. in Zeitschr. f. Sukkulent, 1928, p. 32.

Little Namqualand: Among bushes on the upper slopes of hills above Dainabibis; Pearson, 6,116.

This very distinct species is easily recognised by its long internodes. Fig. 123 represents a rooted cutting in its resting stage, from which it will be noted that the central cone is formed at the end of a long internode.

6. -- M. cognatum, Schwant., in Zeitschr. f. Sukkulent, 1926,
A much-branched shrublet about a foot high (Fig. 124). Main stem 5-7 lines thick, branches 3-4$\frac{1}{2}$ lines thick, with internodes 3$\frac{1}{2}$-1 inch long, and more or less thickened at the nodes, glabrous, brown under cultivation, pale grey when imported. United pairs of leaves forming cylindric bodies 7-15 lines long, similar to and continuous with the stem or very slightly thicker than the latter at their base, ending in a pair of widely spreading or recurving leafy tips, 1-2$\frac{1}{4}$ inches long, about 2 lines broad at the base, thence gradually tapering to a sub-obtuse apex, channelled down the face, obtusely keeled down the back; the free leaves $\frac{1}{2}$-1$\frac{3}{4}$ inch long, 3-4 lines broad at the base, thence tapering to a sub-obtuse apex, channelled down the face, flat or slightly concave on the face, keeled on the back, strongly recurved; all when young minutely papulose, with those on the margins and keel acute and tooth-like, which dry up and disappear with age; grass-green. Flowers and fruits unknown.


Little Namaqualand: Upper slopes of hills south-west of Chubiessis; Pearson, 6, 179.

The figure represents a rooted branch of the type of a state of rest.

7. -- M. clivorum, Schwant., in Zeitschr. f. Sukkulent, 1926, p. 182. -- A shrublet 10-12 inches high. Stems and branches 3-7 lines thick, with internodes 5-13 lines long; and constricted at the nodes, glabrous, at first green or reddish-brown, becoming pale grey with age. United pairs of leaves forming cylindric bodies 6-14 lines long, similar to and continuous with the stems, ending in a pair of horizontally spreading or recurving leafy tips 1-2 inches long and 2-3 lines broad at the base; the free leaves 3-2 inches long, 3-5 lines broad and 3-4 lines thick at the base, thence tapering to a sub-obtuse point, slightly concave above, obtusely keeled beneath; all when young covered with minute, glittering, waxy papulæ, those on the keel and edges larger than the rest and obtuse (not pointed), of a rather dark, dull green. Flowers unknown.


Little Namaqualand: Mountain slopes between Stinkfontein Plateau and Chubiessis; Pearson, 6, 200.

This species is somewhat like M. cognatum, but more lax in habit, and with a constriction at each node, that is quite wanting in M. cognatum.

N. E. Brown
(To be continued.)

MESEMBRYANTHEUM
(Continued from page 249.)

MITROPHYLLUM, Schwant.

8. -- M. nanum, N. E. Br.-- Plant dwarf and tufted, less than
264 an inch high. When at rest the flowering growths are covered below with 2-4 coriaceous, blackish sheaths, that are often oblique and longitudinally rugose. Growth, when at rest, half-moon-shaped, 2-2½ lines broad and 1-1½ line thick, length not stated. Free pairs of leaves sub-clavate; the second pair united to their tips. Flowers sessile. Calyx 6-lobed, with the ovary-part globose pear-shaped. Petals white, only a very old flower examined. Stigmas 6, twisted together, nearly 2½ lines long. Ovary slightly depressed at the centre on the top. Capsule 3½-4½ lines in diameter; valves blackish within; expanding keels sub-triangular, adpressed and flattened, with toothed edges and broad marginal wings; cells roofed with cell-wings. Seeds ½ line long, globose obovate, pallid.


Clanwilliam Division: Between Twenty-four Rivers and Porterville, on clayey soil. Leipoldt.

I have not seen this plant, but it seems to be closely allied to one that Dr. Tischer has described or is about to describe, under the name of M. Schickianum, Tisch., which is a stemless species about 1½ inch high, with the cone-leaves about 5 lines thick, tipped with leaf-points 5-6 lines long. N. E. Brown

(To be continued.)

MSEMBRYANTHEMUM.


(Continued from page 264, Vol. LXXXVI.)

13 Since the publication in The Gardeners' Chronicle, 1925, Vol. LXXVIII, p. 412 and 453, of the provisional key to the genera into which I had divided the old genus Mesembryanthemum, errors in it have been discovered which I wish here to rectify. For, as might be expected, in constructing for the first time a key to such a very complicated group of plants as this is, it would be scarcely possible to avoid errors, especially as the material available for the purpose was often incomplete. Most, however, are but trivial mistakes that do not affect the general accuracy of the key, but there are two that require explanation. They were not discovered until long after the key was published, and I had not intended to correct them until dealing with the genera concerned, but as one has been much exploited by other writers, it is deemed better to correct them now and explain how they were made. One error concerns:—

Mesembryanthemum, Linn. (emended).

When I emended the genus Mesembryanthemum, as detailed in The Gardeners' Chronicle, Vol. LXXVIII, p. 232, I selected, on the usual logical principle as there stated, A. umbellatum, Linn., as the type of the reformed genus, and explained why. Yet it most unfortunately happens that the structural characters belonging to that species and its allies are not included in the published key, but only those belonging to other species that I had associated with it, although its own characters were also set down in my original key. This error of omission was certainly made during the copying of one of the earlier of the many keys constructed, because it appears in Phillips' Genera of S. African Flowering Plants, and the MSS. for that work I sent to South Africa either in 1924 or early in 1925, months before the key in The Gardeners' Chronicle was published. As the MSS.
14 for Dr. Phillips' book was urgently requested, it was prepared as rapidly as possible, and in the hurry of doing this, that part of my key containing the characters of the typical species of the genus Mesembryanthemum was, by some oversight, omitted from both key and description, and only the characters of the species I had then associated with the typical species were included. For in my earlier keys the genus Mesembryanthemum was entered in two places: (1) in the group of genera having a placental tubercle in each cell of the fruit and (2) in the group having no placental tubercles. It was the entry under the first group that by mischange was omitted from the key and descriptions sent to Dr. Phillips, and as that key was made the basis of all the subsequent keys, which were copied and re-copied as new genera were added, the error was not noticed until long afterwards.

However, it follows from my statement that M. umbellatum, Linn. (an old and correctly understood species) was to be taken as the type of the reformed genus, and must be retained as such, for it would be obvious to any botanist that some mistake has been made, which could easily have been corrected to conform with and include the type by the addition of the italicised words to the description, noted hereafter, or for them to be included in the key, as they were in with or without membranous wings on their outer margin," and "with or without tubercles at the openings to the cells."

I find, however, that Dr. Schwantes has either overlooked that statement or ignored it without inquiry, because, instead of correcting, he has founded his genus Ruschia upon the identical type of structure possessed by M. umbellatum, Linn., and has selected another species to be the type of Mesembryanthemum.

This attempt (in consequence of an obvious error) to replace the genus Mesembryanthemum, Linn., as emended by myself, by another generic name of his own not only does not conform with the code of honour held among scientific workers, but is contrary to all rule and precedent, and the science of botany would soon become very chaotic if proposed types of genera that have been examined by authors were allowed to be changed in this way at the will of every writer.

Schwantes is right, however, in separating from Mesembryanthemum as distinct genera some of the groups I associated with it at the time of revision of the genus.

The association of the groups alluded to was made because I found that while fruit characters are generally constant for each pronounced vegetative type, yet in some cases they vary very considerably among species that unquestionably belong to one genus. The most remarkable case of variation noted is in the group separated by Schwantes to form the genus Drosanthemum, wherein there are species in which the expanding-keels of the fruit are contiguous into a central keel, others in which they diverge; some with well-developed cell-wings, others in which they are rudimentary; some in which a placental tubercle is present some large or small or double, other in which it is absent; some with long, others with short stigmas. I will also mention that in Disphyma australe the placental tubercle is present in some specimens and absent from others.

It was this variation that caused me to place under Mesembryanthemum the plants Schwantes has separated from it, and for which I had originally provided by placing that genus in two parts of my key. But I agree with Schwantes that some should be separated. For having again examined all available material, I now note that with
very few exceptions the above mentioned variation seems to be chiefly confined to the plants forming the genus Drosanthemum, and among them may possibly be due to hybridisation, and that among the many hundreds of fruit-capsules examined the presence or absence of a marginal wing or flap to the expanding-keels does not seem to vary among plants having the same vegetative type, and is therefore a more important and trustworthy character than the absence or presence of cell-wings or a placental tubercle. Therefore, it is evident that taken alone and unaccompanied by some floral or very definite vegetative character, the full development or rudimentary nature of the cell-wings, or the presence or absence of a placental tubercle, cannot always be regarded as of generic importance. If, however, consistently accompanied by a floral or very pronounced vegetative character, then I consider that they should rank as of generic value. Because, in a vast and very complex group such as this is, where the affinities of species are often very indefinite, it is of the first importance to the botanist to have some definite structural character or characters whereby the generic affinity of a plant may with certainty be recognised, and as during the very elaborate examination I have made it has been noticed that whenever the vegetative characters are of a very pronounced type, they are usually accompanied by some difference in floral or fruit structure, great prominence is therefore given to vegetative characters for the purpose of distinguishing the genera in the key to them hereafter to follow.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM
(Continued from page 14.)

I do not agree with Schwantes, however, in founding genera upon vegetative characters alone, as in the case of Eberlanzia, which is identical with Mesembryanthemum in fruit and floral characters, merely differing in being spiny, and one species (L. triticiforme, L. Bol.) is spiny or spineless. And Oscularia, Echinus, Trichodidemae and Drosanthemum, which all differ from Mesembryanthemum by the presence of marginal wings to the expanding keels, as well as in vegetative characters, have scarcely any structural characters that can be set down in words to distinguish them for one another, on account of the same characters being represented in the variable genus Drosanthemum, but as their vegetative characters are so strikingly distinct from each other and from the vegetative characters of other genera, I think it of more convenience to retain them as four genera than as four sections of one genus, and therefore propose to retain and characterise them. But Euschia, even if limited to the type species R. rupicola, Schwant. (M. rupicolum, Engl.) and its allies, only differs from Mesembryanthemum by having a tooth or teeth on the keel of the leaves, for there is no structural difference in either flowers or fruits, while in the remainder of the species placed under Euschia in the foliage is not toothed, although variable in form, and leaf-characters alone, without some structural difference, are admittedly invalid for generic separation. Of vegetative variation in the same genus we have good examples in Crassula, Acacia, Euphorbia and Veronica, where it is more diverse
than in Mesembryanthemum in the restricted sense adopted. I therefore refer all species described under Ruschia that have not already been also placed under Mesembryanthemum to the latter genus in the list that follows, in which I have been obliged to change several of the specific names, because the name given under Ruschia has also been previously used under Mesembryanthemum: --

R. Bernardii, L. Bol. = M. Bernardii, N. E. Br.
R. bicolorata, L. Bol. = M. bicoloratum, N. E. Br.
R. Britteniae, L. Bol. = M. iteratum, N. E. Br.
R. Comptonii, L. Bol. = M. roseum, N. E. Br.
R. connata, L. Bol. = M. connatum, N. E. Br.
R. cymbifolia, L. Bol. = M. deceptum, N. E. Br.
R. glauca, L. Bol. = M. valens, N. E. Br.
R. gracilis, L. Bol. = M. exile, N. E. Br.
R. hamatilis, L. Bol. = M. hamatile, N. E. Br.
R. hexamere, L. Bol. = M. hexamerum, N. E. Br.
R. inconspicua, L. Bol. = M. latens, N. E. Br.
R. incurvata, L. Bol. = M. incurvatum, N. E. Br.
R. mutica, L. Bol. = M. muticum, N. E. Br.
The other important error concerns:—

Thyrasnerme, N. E. Br. and Hymenogyne, Haw.

Under paragraph "4" of the key, I described these as having the fruit "1-celled, seeds large, flat and broadly winged all round, arranged in a single whorl around the central axis." This exactly describes the structure as it appeared to me, and as I believe it would appear to everyone who had only dried ripe fruit for examination. Favorth, however, who described from living plants, states that the ovary is "about 12-celled, but the fruit is 1-celled," and described the seeds as winged. Bolus, who also had living material, figured the plant in Hooker's Icones Plantarum, t. 1, 995, as
71 having the ovary 10-celled, with two ovules in each cell, but does not figure the seeds. Now, strange as it may seem, I have since discovered that all this is quite wrong, and we all have been mistaken. Because I have found that the ovary appears to be composed of a solid mass of cellular tissue with many small cells immersed in it and arranged in pairs in a circle, each filled with one ovule. This tissue, which looks so solid and uniform, is really composed of many carpels fused together into a mess, and in the process of ripening the carpels separate from one another, and the tissue composing them dries up and forms a broad, reticulated wing around each seed. So that, when ripe, the separate carpels, each tightly enclosing one seed, have all the appearance of a whorl of winged seeds around a central axis, as described in the key. Therefore, if the above quoted paragraph in the key is altered to read — "Fruit apparently one-celled; apparent seeds (really 1-seeded carpels) large, flat and broadly winged all around, arranged in a single whorl around the central axis," it will be correct. As this seems to be a very interesting and unique type of structure, it is remarkable that South African botanists have not discovered its true nature long ago. In Europe such a structure would have received much attention.

Key to the Genera.

Restricting Mesembryanthemum to species having the same type of floral and fruit-structure as that possessed by M. umbellatum, Linn., the following key defines the characters of that genus and some other genera that have been or are now proposed for species previously considered as vegetative groups of one genus with a variable fruit structure, or of which the fruit was then unknown to me. With the exception of some species of Mesembryanthemum, Trichodiadema and Mitrophylhum, all are plants having distinct, elongated internodes between their leaf-pairs on the primary branches; and their placentas are on the floor or outer wall of the cells in all the genera here mentioned.

1. Leaves of two kinds, all opposite; those on the plant when at rest, or the lowest of the two pairs on a growth dissimilar from others produced when in active growth or from the next pair developed; flowers solitary, pedicellate or sessile; stamens erect.

Leaves all similar at all times, all opposite; flowers cymose or solitary, usually pedicellate, but occasionally sessile; stamens erect.

2. One pair of leaves when in active growth free to the base, followed by a pair united into a cone or cylinder for half or more than half of their entire length, with spreading tips; internodes of stem evident or none, not bead-like; stamens collected into a column; stigmas, valves and cells of the fruit 5-7; exuding keels of fruit broad and flat, with marginal wings; cells with or without membranous cell-wings; placental tubercle none. (Type. M. grande, N. B. Br.).

One pair of leaves small and closed together at first in ellipsoid or globose form and with or without short, free
tips, followed by a pair of longer, sub-cylindric or semi-cylindric leaves united and often swollen at the base.

Leaf-pairs of small, sometimes not very dissimilar and, when dormant, closed together or enclosed in an entire or frayed and withered skin, or united for part or nearly all of their length, with or without longer free tips; plants tufted, or with railing or matted, elongated stems; leaves sometimes minutely ciliate; stigmas usually 5; expanding-keels diverging from their base, wingless; cells roofed with cell-wings and with a placental tubercle, which is sometimes very small. (Type of genus, \( E. \) umbellatum, Linn., but to this group of the genus belong \( E. \) pulchellum, Haw., \( E. \) pygmaeum, Haw., and \( E. \) evolutum, N. E. Br.).

Mesembryanthemum.

3. Stems erect, with bead-like joints or internodes 3-7 lines thick; stigmas, 6-7; expanding keels of fruit broad and flattish, with marginal wings, and with the inner edges raised; cells roofed with cell-wings; placental tubercle none. (Type \( M. \) moniliformis, Schwant.).

Monilaria.

Stems slender, not more and usually less than 2 lines thick, terete, not at all bead-like.

4. Leaves and all green parts minutely papulose.

Leaves smooth, dotted, not papulose; stamens collected into a cone, concealing the stigmas and surrounded by 2-3 series of staminodes; stigmas 10, erect, subulate; ovary flattish at the top; expanding-keels of the fruit diverging, winged; cells roofed with cell-wings and with a placental tubercle. (Type \( V. \) angustipetala, N. E. Br.).

Vanzijlia.

5. Very dwarf shrublets 3-6 inches high, with erect or ascending branchlets; stamens erect, apparently concealing the 4-7 minute, subulate stigmas; ovary flattish or slightly convex on the top; expanding-keels of fruit contiguous or parallel, with marginal wings; cells roofed with cell-wings; placental tubercle none. (Type \( D. \) Pearsoni, N. E. Br.).

Dicrocaulon.

Main stems more or less prostrate, with short, ascending branchlets; stamens erect in a ring around and exposing the 5 radiating, plumose stigmas; ovary much depressed, crater-like at the tor; expanding-keels of fruit widely diverging, winged at the apex; cells roofed with cell-wings; placental tubercle none. (Type, \( D. \) tinctus, N. E. Br.).

Depacarpus.

5. es. tinctum, L. Bol.).

6. Leaves, all green parts, and often the stems papulose, i.e., the whole leaf-surface densely covered with raised cells, which are like small or minute pimples, or are pointed at one or both ends lengthwise to the leaf; stamens collected into a cone or cylindrical mass; stigmas, valves and cells of the fruit usually 5, or occasionally
4 or 6; fruit with winged expanding-keels and the cells with well-developed or rudimentary cell-wings.

Leaves not papulose as seen by the naked eye, but sometimes with raised, scattered dots, more or less quite smooth. (Some species of *Mesembryanthemum* I have not seen are described as minutely papillate, but I believe this refers only to a microscopic elevation of the surface-cells not distinctly visible to the naked eye, as in the sense above intended.)

7. Leaves tipped with a tuft of small bristles, and the elevated surface-cells often pointed at one or both ends, sometimes entire; stems papulose or sometimes slightly setose; stigmas shorter than the stamens; fruit with the expanding-keels contiguous and without placental tubercles. (Type, *T. barbatum*, N. E. Br. = *T. stelligerum*, Schwant. = *Mes. barbatum*, Linn.). *Trichodiadema*.

Leaves without a tuft of bristles at the apex, surface cells entire; stems papulose or with short bristles or hairs upon it; stigmas usually as long as or longer (but sometimes shorter) than the stamens, not plumose; expanding-keels of fruit contiguous, parallel or diverging; placental tubercle usually absent, sometimes present and small and double, rarely large and conspicuous. (Type, *D. hispidum*, Schwant. = *Mes. hispidum*, Linn.). *Drosanthemum*.

8. Stigmas, valves and cells of the fruit usually 5, occasionally 4, 6 or 7.

Stigmas, valves and cells of the fruit usually 8-12, occasionally 7; erect shrubs or shrublets.

9. Stamens collected into a cone or compact column free from the petals to their base, concealing the stigmas and often surrounded by 1-3 series of staminodes.

Stamens not collected into a cone or compact column, often more or less lax, usually without, but sometimes with staminodes; stigmas not concealed.

10. Expanding-keels of the fruit with marginal wings and more than half as long as the valves, and the cells without a placental tubercle; stigmas equalling or shorter than the stamens.

Expanding-keels of the fruit without marginal wings and only about half as long as the valves, diverging; cells with a placental tubercle, which is occasionally minute and may sometimes perhaps be absent; usually erect shrubs, shrublets, or decumbent or prostrate plants with well developed internodes, but sometimes very dwarf and tufted, without internodes between the leaf-pairs; flowers cymose or solitary. (Type, *M. umbellatum*, Linn.). *Mesembryanthemum*. 
11. Leaves toothed on their margins and often on the keel, united only at the base; expanding-keels of the fruit diverging from the base; bushy, branched, dwarf shrubs, glabrous. (Type, O. deltoïdes, Schwant. = Mes. deltoïdes, Linn.).

Leaves not toothed, united in pairs for ⅓ of their length small shrublets or prostrate plants, glabrous or velvety-puberulous to the touch; fruit with the expanding-keels contiguous or diverging only at the apical part, and with the cell-wings rudimentary or well developed. (Type, E. edentulus, N. E. Br. = Mes. edentulum, Jacq.).

12. Stigmas more or less exosed to view, stoutly subulate or ovate-sululate or plumose; ovary flattish or convex at the top; expanding-keels of fruit with marginal wings; cells roofed with cell-wings, but without a placental tubercle; erect shrubs, shrublets or prostrate plants; flowers mostly solitary, sometimes three together. (Type, L. multiradiatus, N. E. Br. = Mes. multiradiatum, Jacq.).

Stigmas apparently well exposed to view, erect, filiform with the stems in a ring around them; ovary deeply concave on the torm; expanding-keels closely contiguous throughout and reaching to the tips of the valves, entirely without marginal wings; cells open, without or with rudimentary cell-wings and without a placental tubercle; stems slender, prostrate, with distinct internodes, glabrous; flowers solitary. (Type, E. intervallaris, N. E. Br. = Ruschia intervallaris, L. Bol.).

13. Leaves scarcely or but slightly united at the base, distinct from and not continuous with the stem.

Leaves completely united at the base and continuous with the green, fleshy stem, always short and usually less than half-an-inch long.

14. Leaves an inch or more long and more than ⅛-inch thick, trigonous, the keel often dilated near the apex, obtuse, almostl spurred at the base; flowers solitary, too inches or more in diameter; calyx un-equally 4-lobed; outer stamens erect in a ring and the inner crowded togetheř, no staminodes; stigmas 3, short and stoutly subulate; fruit unknown; erect shrub. (Type E. octonaria, N. E. Br. = Mes. octonarium, L. Bol.).

Leaves not more and usually less than an inch long, and not 1/4 inch thick; flowers often 3-4 together at the ends of the branches, about an inch or less than an inch in diameter; calyx sub-equally 5-lobed; in stamens erect in a compact cone or column, with or without a few staminodes; stigmas 10-12, subulate; expanding-keels of fruit winged, the cells roofed with cell-wings and with a placental tubercle; erect or decumbent shrublets with
15. Stamens erect and conspicuous, collected into a compact column or cone, surrounded by a few staminodes not longer than themselves; petals not very slender; stamens 7-10; expanding-keels diverging, with rounded edges and with a large or without a terminal awn, wingless; cells roofed with cell-wings and with a large placental tubercle. (Type, O. octojuge, N. E. Br. = Mes. octojuge, L. Bol.).

Stamens inflexed and more or less concealed by very numerous staminodes much longer than themselves which surround them in 3-4 series and are all inflexed to the centre.

16. Petals \( \frac{1}{2} \) line or more broad; stigmas 7-10, very minute; expanding keels of fruit with rounded edges and diverging, acute or awned tips, not winged; cells roofed with cell-wings, but without placental tubercles; leaves short, deltoid-trigonous, hooked at the tips. (Type, S. viridis, N. E. Br. = Mes. viride, Raw.).
edged, at first green, then purplish or violaceous, finally with a greyish bark. Leaves ascending, scarcely united at the base, 9-18 lines long, 1-2 lines thick, trigonous, acute, flat on the face, with sharp edges acutely keeled and the keel serrate on the back, glaucous-green, pellucid-dotted. Pedicel 1-1½ inch long, thickened upwards. Calyx obconic and two-edged below, unequally 5-lobed, the larger lobes serrulate on the back, pellucid-dotted, the smaller with membranous margins dotted with red. Corolla about 2 inches in diameter, opening in bright sunshine, slightly scented; petals in about 3 series, the outer apparently 7-8 lines long and 1-1 line broad, cuneately linear, obtuse or slightly toothed, flat, the inner smaller concave and slightly unturned, all bright yellow. Stamens exceedingly short, in a ring, fully exposing the whole top of the ovary in view; saffron-coloured; other characters as to the genus.


South Africa: Locality and collector unknown. It was first figured by Petiver in 1709 and afterwards by Dillenius in 1732, who states that it was sent by his friend J. H. de Sprekelsen, but does not say from what locality.

This very distinct plant is only known to me from the type specimen and the Dillenian description, from which it is evident that in floral structure it is entirely different from all other known members of the group, and doubtless, when it is rediscovered, its fruit will be found to differ also.

OCTOPOMA, N. E. Br.

Very dwarf, bushily branched, perennial succulents. Branches succulent when young, becoming woody with age, with distinct, short internodes. Leaves opposite, united at the base and often continuous with the stems, short. Flowers terminal 1-3 to a branch, subsessile or on very short pedicels. Calyx unequally 4-5-lobed down to the ovary. Petals numerous, in 2-3 series, free, cuneately linear. Stamens erect, collected into a compact column or cone and sometimes becoming lax, often surrounded by a few staminodes, not longer than themselves; filaments sometimes bearded. Glands in a crenulate ring. Stigmas 7-10, subulate. Ovary inferior, convex at the top, with 7-10 cells; placentas on the outer walls of the cells. Capsule shortly obconic, convex at the top, with slightly raised sutures; valves and cells 7-8; expanding-keels contiguous at the basal half, diverging above and awned or awnless at the tips, without wings; cells roofed with membranous cell-wings and with a placental tubercle.

Species 3, natives of South Africa. The type of the genus is O. octojuga, N. E. Br.

The name is derived from the Greek, okto, eight, and pome, a lid or cover, in allusion to valves of the capsule, which are frequently eight in number.

This genus is allied to Leipoldtia, L. Bol., from which it differs by its leaves being completely united at the base and more or less confluent with the stem, and by the expanding-keels of the fruit being contiguous at the basal half and wingless, in Leipoldtia they are divergent nearly from the base and are winged at their api-
26 cal part. The pedicels also of Octonopia are shorter and stouter than those of typical Leipoldtis, and apparently two-edged. The habit of the two genera is also different.

Key to the Species.

1. Plant 2-4 inches high; leaves 1½-3½ lines long, smooth, glabrous; the larger calyx lobes 5-6 lines long (ex L. Bolus.); expanding-keels of fruit awned at the tips.

| 1. octojugue. |

Plants 6-12 inches high; leaves slightly velvety to the touch from being covered with microscopic points.

2. Leaves 1-3 lines long, perhaps longer under cultivation, deltoid-ovate, obtuse or rounded at the apex, edges quite toothless; corolla apparently 6-8 lines long (9-12 lines, ex L. Bolus.), in diameter; expanding-keels of fruit awned at the apex; internodes of stem mostly 1-2½ lines long.

| 2. inclusum. |

Leaves 3-6 lines long, trigonous, sub-obtuse, minutely toothed on the edges; corolla apparently about 1½ lines in diameter; expanding-keels of fruit awned; internodes of stems mostly 6 lines or more long.

| 3. abruptum |

1. O. octojugue, N.E. Br. — A very small, bushy shrublet, 2-4 inches high, much branches. Stems erect, terete, ½-1½ line thick, with internodes 1-6 lines long, glabrous, at first green, then greyish, finally brown. Leaves spreading or ascending-spreading, united at the base for about 1½ line, only 1-2 pairs alive on a branch at the same time, the other withered, ½-3½ lines long, 1½-1¾ line (2½ lines ex L. Bolus) broad and 1½-1¾ line thick, flat on the face, slightly keeled on the back, and convex on the sides, obtuse, the edges and keel at the apical part with a few minute prickle-like points, otherwise smooth, glabrous, rather light green, not at all glaucous, pellucid-dotted, often with young branchlets in their axils. Flowers solitary. Pedicels of fruit 1-3 lines long, partly enclosed in the united bases of the leaves when in flower. Calyx obconic below, unequally 4-lobed, the two larger lobes 5-6 lines long, leafy. Corolla about 1-1½ inch in diameter; petals in 2-3 series, the outer 5-6 lines long, ½-1½ lines broad, the inner shorter. Stamens erect in a cylindric mass surrounded by staminodes 3 lines long; filaments not bearded, white; anthers pale yellow. Capsule 3½-4 lines in diameter, obconic, expanding-keels diverging above, ending in fine awns that are pressed close upon the valve and scarcely noticeable, dingy honey-brown; cells somewhat acutely roofed with flexible subfuscous cell-wings and with a large, pallid placental tubercle, on each side of which the outer wall is marked with a large dark spot.

Riversdale Division: Klein Kerroo, Muir 3,9573, 969.

| 2. O. inclusum, N.E. Br. — A. rigid, woody shrublet, 6-12 inches high, densely much-branches, the old stems 3-3½ lines thick, fuscous; internodes of main branches 2-5 lines long and 1-1½ line thick, those on the lateral branchlets often undeveloped and bearing several 1½ and densely crowded leaf-pairs; young branchlets some- |
what two-edged. Leaves spreading, 1-3 lines long (3-4½ lines long ex L. Bolus, and probably under cultivation they would become 4-6 lines long), 2-2½ lines broad and 1-1½ line thick, deltoid ovate, obtuse or rounded at the apex, flat on the face, keeled on the back, somewhat velvety to the touch from being covered with microscopic points, pellucid-dotted, glaucous-green. Flowers 1-3 to a branch, subsessile or on pedicels 1-1½ line long included between the bases of the upper pair of leaves. Calyx shortly obconic below; lobes about 2-2½ lines long, three of them with membranous margins. Corolla 6-7 lines (9-12 lines ex L. Bolus) in diameter, open in day-time; petals in 2 series, obtuse or toothed, 2-3 lines (6 lines ex L. Bolus) long. 1/3-½ line long ex L. Bolus) broad, magenta-pink. Stamens surrounded by staminodes, at first collected, long afterwards lax, 1½ line (3 lines ex L. Bolus) long; filaments nerved above, white below, bearded; anthers whitish. Stigmas 8-10, erect, 1 line (2-2½ lines ex L. Bolus) long. Capsule 2-3½ lines in diameter when closed; with 8-10 valves and cells; valves ochrous within; expanding-keels contiguous for most of their length with diverging tips, awned at the apex, reddish-brown; cells roofed with membranous cell-wings and with a large, whitish placental tubercle.


Little Karasqualand: Slopes south of Hondeklopf, W. Flinders in Bolus Herb. 17,758, Flamink Herb, Halle Kröl, Flinders in Bolus Herb. 17,911.

The leaves are described as scurfy ("lcnidoti") be Mrs. Bolus, but this is not the case, they are covered with microscopic points, just as in O. abruptum, N. E. Br.

3. O. abruptum, N. E. Br.-- A rigid, woody shrublet, apparently 6-8 inches high. Branches erect or ascending, with internodes 4-14 lines long and 4-1½ lines thick, compressed and somewhat two-edged and reddish-brown speckled with whitish when young, becoming terete and fuscos with age. Leaves spreading, 3-6 lines long, 1½-2½ lines broad and thick, trigonous, subobtuse subulate, flat on the face, acutely keeled on the back, minutely toothed on the edges and slightly velvety to the touch from being covered with microscopic points, mostly with short, leafy branchlets in both axils. Flowers 1-3 to a branch. Pedicels 2-3 lines long. Calyx-lobes deltoid, subacute, about 2 lines long and as much in breadth. Corolla apparently about an inch in diameter; petals about 4 lines long and 1-line broad. Stamens 1½ line long. Stigmas 7-9, erect, about 1 line long, subulate. Ovary slightly convex at the top. Expanding-keels of fruit contiguous at the basal half, diverging at the tips, without awns or wings; cells roofed with membranous cell-wings and with a small placental tubercle.


Clanwilliam Division: Brandwine River, Schlechter 10,828.

H. E. Brown

(To be continued.)
A prostrate, succulent, perennial herb, with distinct internodes on the main stems. Leaves opposite, united at the base, trigonous-ovate. Flowers solitary, terminal, on very short pedicels or subsessile between the leaves. Calyx produced into a very short tube or cup above its union with the ovary, sub-equally 5-lobed above. Petals arising at the base of the calyx-lobes and above the top of the ovary, in 1-2 series, shorter than the calyx-lobes. Stems numerous, erect, in a ring around the stigmas no staminodes. Glands forming a shallow cup or bowl on the top of the ovary, with five broad crenations on the margin. Stigmas 5, erect. Ovary inferior, concave at the top, 5-celled. Placentas on the floor of the cells. Capsule small, very shortly and broadly obconic, with five valves and cells; valves closing after expansion; expanding-keels closely contiguous throughout and reaching to the apex of the valves, without marginal wings; cells open or with very rudimentary cell-wings and without a placental tumbcle. Seeds ovoid, smooth.

A monotypic genus, of which the type is *M. intervallaris*, N. E. Br.; native of the Transvaal and neighbouring areas.

The name is given to commemorate Professor C. E. Moss, one of the foremost of South African botanists, whose name I have great pleasure in associating with this very distinct plant.

1. *M. intervallaris*, N. E. Br.—Stems rooting at the nodes, with internodes 3-16 lines long and 4-1 line thick. Leaves 3-5 lines long, 2½-3 lines broad and 1½-2 lines thick, distant on main stems and crowded into small tufts 5-9 lines long on the very short axillary branchlets, trigonous-ovate, sub-acute, narrowed to the base from about the middle, flat on the face, keel on the back, sometimes entire, but often with 1 or 2 obscure and very blunt teeth or slight angles on the edges and keel near the apex, covered with slightly prominent dots, dull sub-glaucous green. Calyx shortly obconic below, produced about ½ line long above the tip of the ovary; lobes 2½ lines long, 1½-1½ line broad, oblong, obtuse, the two outer with a compressed keel at the apex. Corollas about half-an-inch in diameter, expanding at night at about 9.30 p.m.; outer petals about 2-3 lines long and ½-2½ line broad, linear or linear-lanceolate, obtuse or sub-acute, the inner smaller, pale creamy-yellow, almost white. Stamens 1½ line long, whitish. Glandular cur on the top of the ovary about ½ line deep. Stigmas 1 line long, subulate, erect. Capsule about 3½ lines in diameter when expanded, entirely pale honey-coloured within; valves broader than long, otherwise as noted under genus. Seeds 4-line long.

*Mesembryanthemum interveniellare*, L. Bol. in *Ann. Bol. Herb.*, Vol. IV, p. 61. (On p. 71 this name should be substituted for *Ruschia intervallaris*, L. Bol., which was entered by mistake owing to Mrs. Bolus having used the same specific name under both genera).

South Africa: Transvaal; near Johannesburg, Moss 13,670, 17274, near Alberton, Wood, near Lake Christies, Blenkiron in Herb. Moss 16,585, Herschell Division; Sterkspruit, Hepburn.

ENARGANTHE, N. E. Br.

Dwarf, shrubby, succulent monennial, with woody branches and distinct internodes. Leaves opposite, not united at the base, stoutly trigonous, not papulose. Flowers solitary, terminal, subsessile or shortly pedicellate, large and showy. Calyx unequally
161 4-lobes to its union with the ovary. Petals numerous, in about two series, free. Outer stamens erect in a ring, the inner crowded; filaments bearded below; no staminodes. Petals in a crenulate ring. Stigmas 8, short, subulate. Ovary inferior, convex at the top, with 8 cells; placentae on the outer wall. Fruit unknown.

A monotypic genus, of which E. octonaria, N. E. Br., is the type; native of Namacueland.

The name is derived from the Greek, enarges, brilliant, and anthe, a flower, in allusion to its handsome and brilliantly-coloured flowers.

The plant upon which I founded this genus differs from Membrananthemum by having a 4-lobed calyx, its outer stamens in a ring, and 8 stigmas; the leaves also are quite separate, whereas in Membrananthemum they are usually more or less united at the base.

1. E. octonaria, N. E. Br.—A dwarf, woody shrublet, 6-8 lines high, bushily branched, glabrous. Young parts of the branches 2-2½ lines thick, succulent, becoming woody with age and reduced to about 1½ line thick, with a greyish bark; internodes 2-12 lines long. Leaves spreading, 12-16 lines long, 3-5 lines broad and about the same in thickness above the middle, clavately trigonous, being thicker and broader above the middle than at the base, obtuse, flat or slightly convex on the face, obtusely keeled on the back, not united at the base and the keel produced into a short spur adnate to the branch, smooth, green, without dark dots. Calyx-lobes stout, the two larger 7-8 lines long and 5 line broad, leafy; the two smaller with membranous margins. Corolla 2-2½ inches in diameter, expanding in the middle, part of the day, and lasting for several days; petals about an inch long and 1½-2½ lines broad, cuneately linear, obtuse, of a brilliant rose-purple, with a darker mid-line. Stamens 4-4½ lines long; filaments purple, becoming reddish at the base; anthers purple-brown.

Little Namacueland: Between Doornpoort and Brakfontein, Pillans 5,760.

This is an extremely beautiful shrubby species of very dwarf habit, with very stout leaves.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.

(Continued from page 151.)

SYGROSTIGMA, N. E. Br.

A perennial, dwarf, shrubby Succulent. Branches succulent, becoming woody with age, with distinct internodes. Leaves opposite, united at the base and continuous with the stem, small, deltoid-trigonous. Flowers solitary, terminal, subsessile or very shortly pedicellate. Calyx unequally 5-lobed down to the ovary. Petals numerous, free, in about 3 series, cuneately linear, horizontally spreading. Staminodes very numerous, in 3-4 series, filiform, all inflexed and partly concealing the stamens, bearded
Stamens in several superposed series, short, all flexed; filaments bearded. Stigmas 7-10, very short or minute. Ovary inferior, flat-tish on the top, with 7-10 cells; placentas on the outer wall of the cells. Capsule obovate, slightly convex, with 7-10 prominent sutures at the top (which is not cushion-shaped as represented by Mrs. Bolus's figure); valves horizontal when expanded and closing after expansion; expanding-keels with rounded edges, contiguous at the basal part with diverging, acute or awned tips, without marginal wings; cells roofed with flexible cell-wings, without a placental tubercle. Seeds compressed-obovate, with a short point, minutely tuberculate.

A monotypic genus, native of South Africa. The type is *E. viride*, N. E. Br.

The name is derived from the Greek, smikros, short, and stigmas, a point, a allusion to the very short stigmas.

This genus is allied to Polymita in vegetative and floral characters, but differs by the expanding-keels of the fruit being without membranous wings and by the cells being without a placental tubercle at the opening. From *Erepsia*, to which genus the species has been referred, it differs in vegetative characters and in having 7-10 stigmas and fruit-valves, and the expanding-keels of the fruit contiguous at their lower half.

1. *S. viride*, N. E. Br.—A shrublet 6-12 inches high, glabrous. Branches ascending, with internodes 3-8 lines long and about 2 lines thick when young and fleshy, tapering downwards, becoming more slender and woody with age. Leaves 2-4 lines long and 1½-2 lines broad at the base, deltoid-trigonal, with acute, recurved tips, flat on the face, obtusely keeled on the back, smooth and greyish-green like the young stems, with red edges, not marked with dark dots. Calyx with the two longer lobes 3-4 lines long, leaf-like. Corolla 8-10 lines in diameter; petals in about 2-3 series, 2-3½ lines long, and 1½-2 line broad, cuneately linear, obtuse, minutely papulose at the base, dull rosy-purple. Stamens dull rose-purple, bearded at the lower part. Stamens with bearded at the lower part. Stamens with bearded, white filaments and yellow anthers. Stigmas usually 8-10, sometimes 7, subulate, 2-2½ line long. Capsule about 4 lines in diameter when closed, brown within when expanded.


As in the genus *Erepsia*, the flowers, after they once have expanded, do not close again. Dr. J. Muir states of it in a note:—"The flowers open in the forenoon and remain open day and night permanently. On the first day they attain 3½ lines in diameter, which is full size, purplish-pink or rose-purple, some pale pink. Flowering from October to February."

Under t. 270, Fl. Pl. S. Afr., Vol. VII, published in 1927, Mrs. Bolus remarks:—"The only collection I could find, in searching through the large European Herbaria, which closely resembled
our present species (and in a less degree *M. karooicum*, L. Bolus) was *M. campestris*, Burchell (No. 1,340), of which there are two specimens without flowers, but with fruit, in the Kew Herbarium." This statement scarcely agrees with the facts, because when Mrs. Bolus was at Kew in 1885, she found three dried specimens in the Kew Herbarium that were all named by myself, "M. viride, Haw."; two of them I gathered and named from cultivated plants respectively in 1867 and 1880, and another (Bolus, 6,714) was distributed from the Bolus Herbarium as "M. cfr. uncinellum, Haw." These three specimens have all been labelled by Mrs. Bolus "M. integrum," and dated "25-8-25."

N. E. Brown
(To be continued.)

**Mesembryanthemum.**


(Continued from page 186.)

**ANTIMILLA, N. E. Br.**

Very dwarf, succulent, perennial, glabrous, forming clumps of very short, erect branches, with one pair (or when making new growth two pairs) of leaves to each. Leaves united at the base, ascending-spreading, thick and fleshy, ovate-lanceolate, smooth, whitish-green. Flowers green. Flowers solitary, terminal, sessile, bracteate. Calyx sub-equal length to its union with the ovary. Petals free, in about two series. Stamens numerous, erect, in a ring around the large stigmas; filaments not bearded. Stigmas 5, large, stoutly lanceolate-subulate, acuminate. Ovary inferior, flat on the top, 5-celled; placentae on the outer wall. Fruit not seen, but stated to be like that of Mesembryanthemum.

A monotyric genus, of which the type is *A. dualis*, N. E. Br.

A native of South Africa.

The name is derived from the Greek, antimimos = imitating, in allusion to the resemblance this plant has to *Argyroderma* necopinum.

1. *A. dualis*, N. E. Br. (Figure 88).—Plant forming clumps 1-2 inches high, formed of rather closely packed stems covered with the crowded remains of dead leaves which form four very distinct and acute angles, glabrous in all parts. Leaves 7-10 lines long, 4-5 lines broad and 3-3½ lines thick at the base, thence gradually tapering to a sub-acute and shortly arculate apex, slightly convex on the face, obtusely-keeled on the back, with the edges and the keel over the apex cartilaginous, smooth, entirely whitish-green. Flower sessile, with a pair of bracts under the calyx, which is somewhat tear-shaped and 3½ lines in diameter, smooth; lobes 2½-2½ lines long, ovate, obtuse, with narrow membranous edges. Corolla about 1 inch in diameter, but perhaps not fully developed in the specimen seen; petals in about 2 series, 3-3½ lines long, ½-line broad, linear, obtuse, bright rosy-magenta. Stamens about 2 lines long; filaments not bearded, white; anthers pale yellow. Stigmas erect, 2 lines long and 2½-line broad, as long as the stamens, but probably not fully developed, stoutly lanceolate-subulate, acuminate, pale yellowish.

This interesting plant was sent to Kew in 1911 by Professor Pearson and portions of it were given to myself and to Dr. Rodier Heath, and now, after eighteen years, it has flowered for the first time under cultivation in this country with Dr. Rodier Heath, who has very kindly loaned to me his plant to describe and figure. But Fig. 28 represents only one growth of the plant. It so much resembles Argyrodeme neconimum, N. E. Br. that (its flowers being then unknown) I placed it under that genus. But now that it has flowered its structure proves to be so entirely different from that of Argyrodeme that it must be placed in a separate genus. It differs from Argyrodeme by its calyx being lobed down to its union with the ovary and by having 5 large stigmas and 5 cells in the ovary, instead of one sessile, circular stigma and many cells in the ovary.

This is another instance of the curious vein of mimetic resemblance that pervades the whole of the flowering plants. This plant is so like Argyrodeme in appearance, that without examining its flowers no one would hesitate to place it in that genus. There are also several other members of this family whose vegetative characters are quite the same as those of other genera, and we have in the genus Veronica some New Zealand species that resemble a Lycopo-dium, in Viola a Chiliean species that resembles a Sempervivum and numerous other instances which it would appear that there is latent in plants some element that controls the form the vegetative organs shall assume or which may indicate some near or very remote relationship to other and widely different plants. And that when this dormant element asserts itself it causes the plant to assume the appearance of the ancestor from which it was derived. I can think of no other way to account for the very numerous cases of mimetic resemblance that occur among flowering plant, if it be not the possession of some latent element that now and then breaks out, assumes control and reverts to an ancestral type. The cause of such an outbreak may, of course, be induced by external factors.

**LAMPRANTHUS, N. E. Br.**

As it will take some weeks to work out and describe it in detail all the species of this beautiful genus, which I recently separated from Mesembryanthemum, I here give a list of the species that appear to belong to it. Some of the, however, I have not seen, and as the descriptions are incomplete, they may not really belong here, although from the description I judge this to be their right genus. Some also may possibly prove to be synonyms of others. In the synonymy the letter M. stand for Mesembryanthemum.

L. acutifolius, N. E. Br. (M. acutifolium, L. Bol.).
L. aduncus, N. E. Br. (M. aduncum, Haw.).
L. altistylus, N. E. Br. (M. longistylum, L. Bol., not of De Candolle).
L. amoenum, N. E. Br. (M. amoenum, Salm Dyck).
L. aureus, N. E. Br. (M. aureum, Linn.).
L. bicolor, N. E. Br. (M. bicolor, Linn.).
L. brachyandrus, N. E. Br. (M. brachyandrum, L. Bol.).
L. Brownii, N. E. Br. (M. Brownii, Hook. f.).
L. caespitosus, N. E. Br. (M. caespitosum, L. Bol.).
L. calcaratus, N. E. Br. (M. calcaratum, W. Dod.).
L. carillaceus, N. E. Br. (M. carillaceum, L. Bol.).
L. coccineus, N. E. Br. (M. coccineum, Haw.).
L. Comptonii, N. E. Br. (M. Comptonii, L. Bol.).
L. conspicuus, N. E. Br. (M. conspicuum, Haw., not of Salm Dyck or Berger).
L. coralliflorus, N. E. Br. (M. coralliflorum, Salm Dyck.).
L. curvifolius, N. E. Br. (M. curvifolium, Haw.).
L. cymathiformis, N. E. Br. (M. cymathiforme, L. Bol.).
L. debilis, N. E. Br. (M. debile, Haw.).
L. deflexus, N. E. Br. (M. deflexum, Ait.).
L. diffusus, N. E. Br. (M. diffusum, L. Bol.).
L. dilutus, N. E. Br. (M. pullium, L. Bol., not of N.E.Br.).
L. discrepans, N. E. Br. (M. discrepans, L. Bol., not of Linn.).
L. ditinus, N. E. Br. (M. ditinus, L. Bol.).
L. Dregeanus, N. E. Br. (M. Dregeanum, Sond.).
L. drepanophyllus, N. E. Br. (M. drepanophyllus, Berger).
L. Dyckii, N. E. Br. (M. Dyckii, Berger, M. conspicuum, Salm Dyck and Berger).
L. emarginatoides, N. E. Br. (M. emarginatoides, Haw.).
L. emarginatus, N. E. Br. (M. emarginatum, Linn.).
L. erratus, N. E. Br. (M. virens, Salm Dyck, not of Haw.).
L. explanatus, N. E. Br. (M. explanatum, L. Bol.).
L. falcatus, N. E. Br. (M. falcatum, Linn.).
L. falciformis, N. E. Br. (M. falciforme, Haw.).
L. filicaulis, N. E. Br. (M. filicaule, Haw.).
L. flexifolius, N. E. Br. (M. flexifolium, Haw.).
L. flexilis, N. E. Br. (M. flexile, Haw.).
L. formosus, N. E. Br. (M. formosum, Haw.).
L. Framesi, N. E. Br. (M. Framesi, L. Bol.).
L. furvus, N. E. Br. (M. furvum, L. Bol.).
L. gleucoides, N. E. Br. (M. gleucoides, Haw.).
L. gleucus, N. E. Br. (M. gleucus, Linn.).
L. glomeratus, N. E. Br. (M. glomeratum, Linn.).
L. gracilipes, N. E. Br. (M. gracilipes, L. Bol.).
L. Guthriei, N. E. Br. (M. Guthriei, L. Bol.).
L. Haworthii, N. E. Br. (M. Haworthii, Don.).
L. Henricii, N. E. Br. (M. Henricii, L. Bol.).
L. imbricans, N. E. Br. (M. imbricans, Haw.).
L. Immelmaniae, N. E. Br. (M. Immelmaniae, L. Bol.).
L. inaequalis, N. E. Br. (M. inaequale, Haw.).
L. lexifolius, N. E. Br. (M. lexifolium, L. Bol.).
L. leptaleon, N. E. Br. (M. leptaleon, Haw.).
L. Lerouxiae, N. E. Br. (M. Lerouxiae, L. Bol.).
L. longistamineus, N. E. Br. (M. longistamineum, L. Bol.).
L. lunatus, N. E. Br. (M. lunatum, Willd.).
L. macrocarpus, N. E. Br. (M. macrocarpus, Berger).
L. magnificus, N. E. Br. (M. magnificum, L. Bol.).
L. marcidulus, N. E. Br. (M. flaccidum, L. Bol., not of Jacquin.).
L. maturus, N. E. Br. (L. praeco, L. Bol., not of F. Mueller).
L. matutinus, N. E. Br. (M. matutinum, L. Bol.).
L. microstigma, N. E. Br. (M. microstigma, L. Bol.).
L. multiradiatus, N. E. Br. (M. multiradiatum, Jacq.).
L. multiseriatus, N. E. Br. (M. multiseriatum, L. Bol.).
L. mutans, N. E. Br. (M. mutans, L. Bol.).
L. parcus, N. E. Br. (M. tenue, L. Bol., not of Haworth).
L. peuciflorus, N. E. Br. (M. peuciflorum, L. Bol.).
L. paucifolius, N. E. Br. (M. paucifolium, L. Bol.).
L. Feersii, N. E. Br. (M. Feersii, L. Bol.).
L. perspicuus, N. E. Br. (M. perspicuus, Berger).
L. Fittenii, N. E. Br. (M. Fittenii, L. Bol.).
L. platius, N. E. Br. (M. platius, L. Bol.), not of Haworth.
L. Fockeikiae, N. E. Br. (M. Fockeikiae, L. Bol.).
L. polyantho, N. E. Br. (M. polyantho, Haw.).
L. productus, N. E. Br. (M. productus, Haw.).
L. promontorii, N. E. Br. (M. promontorii, L. Bol.).
L. rentans, N. E. Br. (M. rentans, Ait.).
L. rupestris, N. E. Br. (M. rupestris, L. Bol.).
L. Rustii, N. E. Br. (M. Rustii, Berger).
L. saturatus, N. E. Br. (M. saturatus, L. Bol.).
L. scarab, N. E. Br. (M. scarab, Linn.).
L. sociorum, N. E. Br. (M. sociorum, L. Bol.).
L. spectabilis, N. E. Br. (M. spectabilis, Haw.).
L. spiniformis, N. E. Br. (M. spiniforme, Haw.).
L. Stayneri, N. E. Br. (M. Stayneri, L. Bol.).
L. stenopetalus, N. E. Br. (M. stenopetalum, L. Bol.).
L. stensus, N. E. Br. (M. stensus, Haw.).
L. stipulaceus, N. E. Br. (M. stipulaceum, Linn.).
L. swartbergensis, N. E. Br. (M. swartbergense, L. Bol.).
L. tegens, N. E. Br. (M. tegens, F. Mull.).
L. tenuifolius, N. E. Br. (M. tenuifolium, Linn.).
L. tubaghenis, N. E. Br. (M. tubaghense, Berger).
L. turbinatus, N. E. Br. (M. turbinatum, Jacq.).
L. vallis-gratiae, N. E. Br. (M. vallis-gratiae, Schl r. and Berg.).
L. Venzijliae, N. E. Br. (M. Venzijliae, L. Bol.).
L. variabilis, N. E. Br. (M. variabile, Haw.).
L. verecundus, N. E. Br. (M. verecundum, L. Bol.).
L. victorum, f. E. Br. (...) victorum, L. Bol.).
L. Watermeyeri, N. E. Br. (M. Watermeyeri, L. Bol.).
L. Woodburneae, N. E. Br. (M. Woodburniae, L. Bol.).
L. Wordsworthiae, N. E. Br. (M. Wordsworthiae, L. Bol.).
L. Zeyheri, N. E. Br. (M. Zeyheri, Salm Dyck).
L. zygophyloides, N. E. Br. (M. zygophyloides, L. Bol.).
K. E. Brown

(To be continued.)

MENEMBRYANTHEMUM.
(Continued from page 215.)

CONOPHYTUM, N. E. Br.

C. longistylum, N. E. Br. — Growths 4-6 lines high, 3-7 lines in diameter, oboconic, flattish or very slightly convex at the top, which is circular or elliptic in outline; orifice 1-1 line long, almost level with the top; surface smooth, light glaucous-green, evenly sprinkled over the top with small, dark green dots and the orifice outlines with arched rows of more or less confluent dots. Old growths drying up very slowly into sheaths. Calyx 4-lobed; tube very 2-2½ line long, serted ½ line from the orifice, greenish-white; lobes 1½ line long, ascending, not pressed against the corolla-tube, rather firm and green, with membranous edges,
slightly pustulate as seen with a lens, shining. Corolla about 8 lines in diameter, expanding in sunshine, closing between 5 and 6 p.m.; tube about 3 lines long and as long as the entire calyx, whitish; petals in 1 or 2 series, lax, about 4 lines long, \(1/2\) line broad, linear, obtuse, rosy-magenta. Stamens in about three series, all at the mouth of, or exserted from, the corolla-tube; filaments and anthers yellow. Style \(6\frac{1}{2}\) lines long, exserted \(2\frac{1}{2}\) lines beyond the stamens, with 4 stigmas \(1/2\) line long at its apex, yellowish.

Little Namaqualand, Pillans 5, 184.

C. luteum, N. E. Br.—Growths obconic, much resembling those of C. truncatellum, N. E. Br., 6-9 lines high and 41-10 lines in diameter at the top, which is circular in outline, truncate broadly or flatly and rounded into the sides, with the orifice \(1\frac{3}{4}\) line long and depressed in a slight transverse depression or, in larger flowering growths, almost level with the top; surface smooth, glabrous, dull green or greyish-green, sprinkled on the top with separate dots of darker green. Calyx in the only flowers seen not exserted, \(2\frac{1}{4}\) lines long, shortly 4-lobed, whitish, but as it flowered in November without direct sunlight the flowers were probably not properly developed. Corolla 9-10 lines in diameter, expanding in daytime, closed at night; tube partly exserted from the calyx and about \(3\frac{1}{2}\) lines long and \(1\frac{1}{4}\) line in its greater diameter, yellow; petals about 5 line long and \(1\frac{1}{2}\) line broad, obtuse and variably dentate at the apex, clear bright yellow, shining. Stamens numerous, all distinctly exserted from, or the shorter at the mouth of, the corolla-tube; filaments and anthers yellow. STYLE nearly as long as the longest stamens and about \(1\frac{1}{2}\) lines in length, with 4-5 small stigmas \(1/2\) line long at the apex, orange-yellow.

Little Namaqualand? Harloth 11,950.

This species, C. longistylum and C. truncatellum, are all so similar in their vegetative growths that they might easily be mistaken for one another, but the flowers of all three are entirely different.

C. notabile, N. E. Br.—Growths when introduced about 6 lines high, 6 lines broad and 5 lines thick, elliptic in outline viewed from above and slightly ridged on the otherwise flatly top, afterwards becoming 1 line wide, 1 inch broad and 9 lines thick, compressed, keeled over the top and down the sides, without any notch, but slightly flattened at the central part of the top and thence rounded into the sides, smooth, glabrous, of a light and slightly bluish-green, with a lunate purple mark on each side of the \(1\frac{1}{2}\) line orifice, and a purple line along the keel over the top, which is sometimes connected with the lunate, marks and sometimes separate from them, without any other dots or markings. Flowers unknown. Believed to be a native of Little Namaqualand, but locality and collector unknown.

A single growth of this very distinct species was given to me by Mr. D. O'Donohue in 1927, soon after it was imported, and after two years' cultivation has greatly increased in size and atered in shape as above described, but still remains only a single growth, so that it evidently does not increase very rapidly and has not other species known to me that I have no hesitation in describing it.

C. Maughani, N. E. Br.—Growths usually growing singly, and as imported are \(1\frac{1}{2}\) inch high, 3-8 lines broad and \(2\frac{1}{2}\)-7 lines thick,
compressed-cylindric, oblong or quadrat-oblong in side view, notched or shortly 2-lobed at the apex, with the notch gaping and 1-2½ lines deep, and the lobes rounded or somewhat conical on the top, very obtuse and often feintly keeled transversely to the orifice; substance soft and pulpy, smooth, glabrous, uniformly light green to the lower part, with the top of the lobes pallid or semi-transparent, of a pale and slightly yellowish green. Flowers seen only in a withered condition. Calyx 6-lobed, covered with microscopic points, green; lobes about 2 lines long, deltoid-ovate, obtuse, with rather narrow, membranous margins. Corolla apparently about 7-8 lines in diameter; tube 2½ lines long; outer petals in 2 or 3 series, about 3 lines long and 1/3-line broad, cuneately linear, obtusely rounded or notched at the apex; inner petals (or, perhaps, staminodes) 2-2½ lines long, filiform. Stamens numerous, in several series, arising at different heights all way up the corolla-tube, from its base, about 2 lines long and the upper exserted about 1½ line from the corolla-tube. Stigmas 6, arising from the raised central part of the top of the ovary, slenderly subulate and about 1 line long and 1 line broad; expanding-keels contiguous into a stout central keel, honey-coloured, with broad, membranous marginal wings, united in pairs between the valves; cells without cell-wings or placental tubercles. Seeds about 1/5-line long, somewhat pear-shaped, smooth, light brown.


This would appear to be near C. subfenestrum, Schwart., which I have not seen, but according to the imperfect description of it C. subfenestrum differs from C. Leughan by having oblong growths of a bright and shining green, with the lobes marked with large and crowded, pellucid dots, and the capsule with only 4 valves and cells; also it grows in Namaqualand, in a different locality.

N. T. Brown

(To be continued.)

MESEMBRYANTHEMUM.


(Continued from page 516, Vol. LVXXXVII.)

C. rufescens, N. E; Br. -- Growth as received, solitary, 6-13 lines long, 5-7 lines broad, and 4-8 lines thick, since enlarged to 15-13 lines long, 7-10 lines broad, and 6-9 lines thick, cylindric or slightly oblong, notched or shortly 2-lobed at the top and the notch 1-2 lines deep, with the lobes rounded on the top and the orifice between them extending nearly across the top; soft and pulv'ry in substance, glabrous, smooth, dull purplish, not shining, with the top of the lobes pellucid and window-like, and the rest of the body sprinkled with large pellucid dots. Flowers not seen. Capsule 1½ line in diameter when closed, shortly and very broadly oblong, with 6 valves and cells; valves rising into a acute cone, 1 line high on the top and when expanded 1½ line long and 1 line broad; expanding-keels contiguous into a stout central keel, pale honey-coloured, with broad membranous marginal wings that are united in pairs between the valves, but tearing apart sometimes; cells open, without cell-wings. Seeds about 1½ line long, somewhat pear-shaped, smooth, light brown.

Little Namaqualand: Near Pofadder, "Leughan--Brown."
This is closely allied to C. Kaughani, but seems to be distinct by the coloration of the growths and the pointed capsule. When going to rest and the colour of this species sometimes becomes very vivid and brilliant.

C. longum, N. E. Br.--Growth, as imported 1-1½ inch long, 5-7 lines broad and 4-6 lines thick, but since has become 1½-2½ inches long, 7-10 lines broad and 5-7 lines thick, slightly compressed-cylindric, two-lobed at the apex, with the lobes pressed together, rounded at the apex and the cleft between them 2½-3½ lines deep and extending right across them 3½-4½ lines deep across the growth; substance soft and pulpy, smooth, slightly velvety to the touch from being covered with microscopic points; the top of the lobes is pellucid and window-like, pale greenish and separated from the uniformly light green body of the growth by an indistinct band of yellowish-green, and the whole sprinkled with large pellucid dots. Flowers and fruit unknown.


The very elongated growths, velvety surface and coloration distinguish this from all the other pellucid-topped species.

C. praecoxcum, N. E. Br.--Growth forming small clumps, or sometimes grow in singly, and as imported 8-14 lines long, 3½-4½ lines broad and 2½-5½ lines thick, compressed cylindric or oblong in side view, shortly 2-lobed and somewhat truncate at the top; lobes 1½-3½ lines long, pressed together, convexly truncate at the top, their upper part very distinctly window-like and semi-transparent in side view when held against the light; substance soft and pulpy; surface smooth, and when viewed with a strong lens against the light seen to be covered with microscopic points, scarcely pubescent and scarcely velvety to the touch, green, with the upper part of the sides often tinted with brown, and the window part of the lobes pallid. Flowers seen only in a withered condition. Calyx usually 6 (sometimes 5)-lobed, green; tube 3-4 lines long; lobes 2 lines long, 4 of them with white membranous margins. Corolla apparently about an inch in diameter; tuber 4-5 lines long; petals in 1-2 series, 5-5½ lines long, 1½-2½ line broad, cuneately linear, obtuse or slightly notched at the apex, with a few inner ones that are shorter and filiform-linear (perhaps staminodes). Stamens numerous, in 3-4 series in the throat of the corolla-tube, all exserted and the longer exserted about 1 line from the tube; filaments and anthers yellow. Style 3½-4½ lines long and nearly or quite as long as the corolla-tube, filiform; stigmas 5-6, filiform, 4-1 line long. Capsule 1½-2½ lines in diameter when closed, pallid, slightly convex on the top, with 5-6 valves having their tips raised into a short, conical point at the centre; valves almost transparent when expanded, pallid; expanding-keels contiguous into a membranous stout central keel, ochreous, with very broad cell-wings or placental tubercles. Seeds 1½ line long, sub-globose, without a point, smooth, light brown.

Kenhart Division: Near Fofadder, Fuller 18.

This is allied to C. Fritihiiicessa, Schwan., but usually forms small clusters of growths instead of being solitary, the growths also appear to be smaller, and the flowers are entirely different in structure.

N. E. Brown

(To be continued.)
MESEMBRYANTHEMUM
(Continued from page 8.)

When founding the genus Nananthus in The Gardeners' Chronicle, 1925, Vol. LXXXIII, p. 433, I suspected that the plants I included in it might possibly belong to two different genera, because some of the species had all the petals spreading in one plane and the stamens collected into a cone, while others had the petals somewhat laxly recurved, spreading in different planes or series, and the stamens in a cylindric mass. But I did not venture to separate them into different genera because fruit of the latter group was not available. All the fruits (belonging to two species) I then possessed belong to the group with the stamens in a cone. Having now obtained fruit of one species of the other group, I find it so distinctly different in structure that, taken in conjunction with the different floral characters, I now separate it as a distinct genus.

Beside these, there is a small group of plants of the same alliance that have hitherto remained under Mesembryanthemum, or have taken into consideration. These are all more or less similar in habit, being either very dwarf and forming in big clumps, or are stemless or nearly so, with a firm, fleshy rootstock and rosettes of crowded leaves differing in form, and whose floral and fruit characters differ considerably. And it will be convenient to deal with them here as forming one group of nearly allied genera. Therefore a key is here given to the genera into which I now divide this group, followed by a descriptive account of them. In the key, leaf and floral characters are given primary importance, because they are those that the cultivator becomes acquainted with, while fruit is not often seen under cultivation in Europe, although the fruit-characters of each genus distinctly differ from those of the other genera of the group. I regret that some of the descriptions are very imperfect, but as they have never been adequately described, and I have been unable to obtain material to make the descriptions more complete, they must await the advent of the next monographer.

1. Leaves opposite, neither dotted, warted nor pustulate.

Leaves opposite, often crowded in rosettes, either smooth and distinctly marked with immersed dots, or slightly rough from raised dots or small white or greenish warts or pustules, glabrous or covered with microscopic points, and then somewhat velvety to the touch. Flowers expanding in the morning or afternoon.

2. Leaves flattened, smooth and velvety-nuberculare, whitish-green. Flowers expanding after 5 p.m. Calyx sub-equal, 5-lobed. Petals in 3 or 4 series. Stamens erect, not collected into a cone. Stigmas 10-13. Expandine-keels of fruit with awn-like tips and short, broad, marginal wings that are united in pairs between the valves. Cells roofed with cell-wings, no placental tubercle. Delianthe.

Leaves acutely trigonous, very smooth and quite glabrous. Plant forming large clumps with short, stout, densely leafy branches. Calyx sub-equal, 8-lobed and the lobes keeled. Stigmas and valves and cells of the fruit 7 or 8. Expandine-keels narrowly diverging from the base and much raised, thin with acute, minutely-toothed edges and
produced into straight awns, and with irregularly toothed marginal wings below the awns. Perissolobus.

3. Petals in 1 or 2 series, all closely overlapping and spreading in one plane as if in one series. 4

Petals in 2-4 series, spreading or recurving more or less laxly in different planes or series. 7

4. Stamens and staminodes collected into a broad, compact cone that is fully exposed to view to its base. 5

Stamens loosely erect, or the outer more or less spreading, not collected into a compact cone; no staminodes. Leaves somewhat cuneate and semi-terete or trigonous, with blunt angles in transverse section, and with the obtuse-ly rounded apex covered with white warts. Calyx sub-equally 6-lobed. Stigmas 6. Verrucifera.

5. Leaves viewed from above linear-lanceolate and often with parallel sides, or lanceolate, or ovate, acute, keeled and trigonous at the apical part. Calyx 5-lobed. Stigmas 7-10. Ovary inferior. Cells of the fruit quite open, either without cell-wings or with rudimentary cell-wings that stand quite erect back to back; no placental tubercle. (See Fig. 106). Nananthus.

Leaves spathulate, dilated into a more or less flattened blade, very obtuse or rounded at the apex, and covered with white or whitish-green pustules or warts of compound structure under a microscope. Calyx 5 or 6-lobed. Cells of the fruit roofed with membranous cell-wings; no placental tubercle. 6

6. Stigmas 10-13. Ovary and capsule half or more than half-superior, with 10-13 valves and cells. Acaulon.

Stigmas 5-6 (in one species represented as 5 or 9 or 10). Ovary and capsule inferior, with 5-6 valves and cells (Fig. 107). Titanopsis.

7. Leaves with pellucid dots when held against the light. Flowers with 3 or 4 series of conspicuous staminodes (barren stamens). Stigmas and valves and cells of the capsule 6-10. Valves of the capsule with an acute central keel and the expanding-keels about half as long as the valves and diverging from the base, without wings or awns. Khadia.

Leaves with either dark green dots or opaque pustular dots. Staminodes few or none. 8

8. Dots on the leaves often whitish when fully exposed to the sun. Basal part of the stamens partly concealed in the cup formed by the base of the petals. Stigmas 6-10. Rabiea.

Dots on the leaves dark green and the surface smooth and
usually velvety to the touch. Stamens in a very prominent column, with the basal part fully exposed to view by the wide-spreading base of the petals. Stigmas 5-6 (Fig. 108).

N. E. Brown

(To be continued.)

MESEMBRYANTHEMUM.


(Continued from page 279.)

ACAUUCH, N. E. Br.

Stemless, perennial Succulent, with a firm, fleshy rootstock. Leaves opposite, united at the base, spatulate, arranged in a somewhat 4-ranked rosette, very spreading, covered with raised dots or small pustules. Flowers appearing to be axillary, solitary or 2 or 3 in a sessile, bracteate cyme, pedicellate. Calyx subequally 5-lobed, pustulate. Petals numerous, free, all widely spreading and imbricating in one plane, as if in one series. Stamens numerous, all collected into a broad cone, the outer (stamnodes) without anthers; filaments hairy at the basal part. Stigmas 10-13, subulate, laterally compressed and fringed on their inner edges. Ovary more than half-superior, very convex above, flattish-convex beneath, with 10-13 shallow cells; placentas on the floor of the cells. Capsule half or more than half-superior, flattened, about equally convex above and beneath, with 10-13 valves and cells, and with the sutural ridges somewhat elevated and gaping; valves with a thin central keel from base to apex within; expanding-keels adnate only to the base then diverging, with contiguous at their base, then diverging, with membranous martinal wings which at the basal part are broad and united in pairs and stand erect so as to form a thin, wing-like membranous keel between the bases of the valves, and at the apical part taper into a slender linear membranous tips nearly as long as the valve; cells more than half-superior, acutely roofed with membranous cell-wings, rising above the level of the base of the valves into a broad cone terminating in a series of points; no placental tubercle. Seeds globose-ovoid, pointed at one end, nearly smooth to the eye, but microscopically tuberculate, brown.-- N. E. Br. in Journ. Bot., 1928, 77.

A monotypic genus, native of South Africa.

The name is derived from the Greek, acaulos, stemless, because the plant has no evident stem.

This genus is nearly related to Titanopsis, from which it is clearly distinguished by having 10-13 (instead of 6) stigmas, and by its partly superior ovary and biconvex capsule.

In South African Gardening, 1929, p. 245, doubt is expressed as to the correctness of my statements concerning the structure of A. rosulatum, and that drawings possessed by Mrs. Bolus "show an inferior ovary." This statement is quite contrary to the figure of it which Mrs. Bolus published with the original description as I have quoted under the species, where the ovary is represented (wrongly, in my opinion) as being wholly superior and sub-globose. I find it distinctly more or than half-superior, and as represented in Fig. 198, which was made twenty years ago from the plant that flowered at Kew in 1910.
1. -- *A. rosulatum*, N. E. Br., in *Journ. Bot.*, 1928, 77.-- Leaves spatulate, 8-12 to a growth, 1-2 inches long; 6-13 lines broad at the dilated apical part, which is transversely sub-rhomboidal and very obtuse or broadly rounded or sub-acute at the apex, and at 4-7 lines below the tip is suddenly contracted, or gradually tapers into the cuneate petiolar part, flat above, slightly convex on the back, glabrous, densely covered with small and slightly raised, grey-green rust les on a dull green ground, producing a somewhat dull greyish-green appearance, not glaucous. Flowers axillary, solitary or ultimately developing one or two other flowers from a sessile, bracteate cyme. Pedicels 5-7 lines long; stout, thickening upwards and 2½ lines thick at the apex. Calyx-lobes 3-5½ lines long, 2½-3½ lines broad, ovate, obtuse-pointed, very flat, spreading horizontally, pustulate like the leaves, dull green, three of them with very narrow membranous margins. Petals about 40-50- in 1 or 2 series, all horizontally spreading in one plane from the very base, 4-4½ lines long, 2/3-1½ lines broad, linear, acute, light straw-yellow, marked with a central red line on both sides. Stamens about 2½ lines long, collected into a broad cone, the outer without anthers; filaments hairy at the base, narrow, pale straw-yellow, somewhat shining; anthers small, creamy-white. Stigmas about 12, subulate, compressed laterally, fringed along the inner margin, whitish. Capsule as described under the genus.

*Mesembryanthemum rosulatum*, Ham. in *Tr. R. Soc. S. Afr.*, I, 152, t. 21, f. B. (1909); *Aloinopsis rosulate*, Schwant. in *Zeitschr. f. Sukr.*, 1925, 178, and 1927, 105; L. Bol. in *Afr. Gard.*, 1929, 288, with fig. in which the cells of the ovary are represented much too deep. See also N. E. Br. in *Journ. Bot.*, 1928, 72, concerning the invalidity of *Aloinopsis*.


The above description, as previously stated, was made partly from a living plant, collected by Dr. S. Haward during a cricketing tour in South Africa, which flowered at Kew on August 3, 1910, and partly from living and dried material sent to me by Dr. Pole Evans and Professor R. H. Compton. The diagramatic section of the flower (Fig. 198) was made from the Kew flower on the date mentioned.

N. E. Brown

(To be continued.)

**MESEMBRYANTHEMUM.**


(Continued from page 475.)

**VERRUCIFERA, N. E. Br.**

513. Stemless, succulent perennials with a fleshy root-stock. Leaves ovals, densely crowded into a rosette, scened, semiterately or trigonously clavate, with the very obtuse apex covered with crowded white hairs composed of microscopic lime-cells. Flowers solitary. Calyx sub-equal; 6-lobed down to its union with the ovary. Petals in 1 or 2 series, all widely spreading in one plane as in one series. Stamens loosely erect, slightly inflexed at the
base, the outer more or less spreading. Glands connected into a ring. Stigmas 6, filiform or subulate, as long as or exceeding the stamens. Ovary half or more than half superior, with 6 cells; placentas on the floor of the cells. Capsule very shortly and broadly spreading obconic below, slightly convex and with 6 slightly raised valvular sutures above; valves widely spreading or recurved when expanded; expanding-keels with thin edges very closely expanding-keels with thin contiguous into a stout central keel for most of their length, enlarging upwards, then diverging at the tips, minutely toothed on the inner edge, and with broad marginal wings reaching to the tip of the valve and obtusely rounded at the apex; cells roofed with semi-transparent cell-wings; slightly compressed, smooth.

Species 3, natives of South-west Africa. The type of the genus is V. Schwantesii, N. E. Br.

The name is derived from the Latin, versuca, a wart, and fero, to bear, in allusion to the white warts borne at the tips of the leaves.

The species of this genus were included by Schwantes in Titanopsis, but they differ from that genus by the stamens not being collected into a cone, by the half-superior ovary, and by the different expanding-keels of the fruit, while the subclavate, white-warted, more numerous and more ascending leaves offer vegetative distinction that is very obvious.

Key to the Species.

Flowers subsessile, shorter than the leaves, which are covered with warts at the apex for 2-3 lines of their length. Schwantesii.

Flowers on pedicels 6-7 lines long and as long as or longer than the leaves, which are covered with warts at the apex for only about 1½ line of their length. 2. Luderitzii.

Flowers unknown; leaves with fewer and larger warts than in the above species. 3. Hugo-Schlechteri.

1. -- V. Schwantesii, N. E. Br.-- (Fig. 213 and 214, C.). Rosettes, 1½-1¾ inch in diameter. Leaves crowded, ascending, 6-9 lines long, 2½-4 lines broad and 2-3 lines thick at the apical part, cleftly semiterete, broadly rounded at the apex, flat on the face, rounded at the back, glabrous and smooth for most of their length with from 2-3 lines of the apical part covered with white or whitish tubercles or warts composed of minute lime-cells, the smooth part being light green, tinted with purplish at the basal part. Flowers subsessile, shorter than the leaves. Calyx very shortly obconic below; lobes about 3 lines long and 1½-2 lines broad, deltoid, obtuse, with a few small tubercles on the back at the apex like those on the leaves. Corolla 9-10 lines in diameter; petals in 1 or 2 series, about 4-5 lines long, 1½-4 line broad, linear, obtuse, yellow. Stamens 6, subulate, about as long as the stamens. Capsule 4-5 lines in diameter when closed, very shortly and borally obconic below, slightly convex, with six slightly raised sutures above, pale grey outside and pale brownish inside, with ochreous-brown expanding-keels that are contiguous into a stout, club-shaped central keel for three-quarters of their length, diverging at the tips with broad, hatchet-shaped, obtuse marginal wings; cells roofed with semi-trans-
513 parent cell-wings, without a placental tubercle. Seeds 1/3-line long, subglobose, slightly compressed, pale brown with a darker point.


2. - V. Luderitzii, N. E. Br.—(Fig. 214, A and B and 215).
Plant (including flower) about 1 1/2 inch high, glabrous. Leaves ascending-spread and rather crowded, trigonously-clavate, obtusely rounded at the apex, 6-9 lines long, 2 1/2-3 1/4 lines broad and 2-3 lines thick at the dilated apex, flat on the face, very rounded or feintly and very bluntly keeled on the back, whitish-green or greyish-green, sometimes tinged with rose, covered at the apex for 1 1/2 line only of its length with small and rather hard, white warts or rustules, of which some 20-24 are larger than the others, smooth and rather hard, white warts or rustules, of which some 20-24 are larger than the others, smooth below. Pedicels 6-7 lines long and as long as or rather longer than the leaves, 1 line thick, terete, smooth, whitish-green, with a faint pinkish tinge and dotted at the apical part. Calyx shortly conical below, 6-lobed, dotted; lobes horizontally spreading with reflexed tips, 3-3 1/2 lines long, deltoid-ovate, subacute, of a somewhat chalky-green with a finish tinge and with 6-8 small pustules at the apex, and covered with longitudinal rows of microscopic whitish dots, only seen under a strong lens. Corolla 14-16 lines in diameter when fully developed, expanding between 5 and 6 p.m.; retels in about 2 series, widely spreading in one plane, with recurving tips 5-6 lines long, 1-ligne broad, linear, slightly narrowing from above the middle to a very obtuse or rounded apex, bright golden-yellow to the base, without a darker midline, very shining, much paler or whitish-yellow on the back, with the tips in the final stages orange-yellow. Stamens about 3 lines long, loosely erect or but slightly inflexed, the outer recurving or spreading outwards; outer filaments yellow, glabrous; the inner white and bearded at the base, yellow above; anthers white when pollen is shed; no staminodes. Glands connected into a ring, very dark green. Stigmas 6, about 4 lines long, filiform, ascending-spread with their tips curling among the stamens. Ovary nearly superior, conically convex, green, with 6 cells; placenta on the floor of the cells. Fruit not seen.

Titanopsis Luderitzii, Tischer in Zeitschr. f. Sukk., 1927, 156, with fig.

South-west Africa: Region of Luderitz Bay, collector unknown. Described from a living plant kindly lent to me by Dr. I. King, of Pleistow, whose photograph of the plant is reproduced at Fig. 215. I have compared Dr. King's plant with leaves from the type of T. Luderitzii kindly communicated by Dr. A. Tischer, and find that the latter are identical with those of Dr. King's plant. Dr. Tischer has not seen its flowers, but the much longer pedicels as well as the larger characters seem clearly to distinguish this plant from V. Schwantesii.

3. V. Hugo-Schlechteri, N. E. Br.—Plant very similar to
513 T. Schwantesii in general appearance. Leaves described as being 6-8 lines long, 2-2½ lines broad and 1½-2 lines thick, but probably become larger under cultivation, in form like those of T. Schwantesii, but with the triangular rustular part of the apex sloping backwards and making an angle with the smooth upper surface of the leaf, and covered with larger and fewer rustules than occur on those of T. Schwantesii, there being about 6 large and 30 smaller rustules.


South-west Africa: On an undulated plain in the vicinity of Warmbad, Schlechter, Dinter, and the description of it is not very satisfactory, but it certainly seems to differ from V. Schwantesii by having fewer of the larger rustules on the leaf. In the leaf seen there are only two rows of them on the upper side of the leaf, and they are smaller and seem slightly different in microscopic structure from those of V. Schwantesii. The colouring of the leaves is described as brownish-grey-green, shading into dull purple as the base, with pallid rustules at the apex. A variety is described as "var. alboviridis, Dint.," which only differs by having the leaves greenish-white as in V. Schwantesii. But as V. Schwantesii varies from ivory-white to green, with or without a purplish tinge on the very same plant, in different purplish year, according to the amount of sunshine and water it has received. I consider that the varietal name is superfluous. Although the discovery of this plant is claimed by Professor Dinter, I have been credibly informed that it was discovered by Dr. Schlechter before Dinter had arrived at Warmbad.

N. E. Brown
(To be continued.)

(Continued from page 513, Vol. LXXXVIII.)

TITANOPSIS, Schwant.

13 stemless perennials, with a fleshy root-stock. Leaves opposite, crowded in dense rosettes, reniform, covered with raised, whitish or tinted rustules, formed of cells filled with lime. Flowers solitary, subsessile or pedicellate, expanding in the afternoon. (See Fig. 107, p. 278, Vol. LXXXVIII). Calyx subequally 6-lobed down to its union with the ovary, and the lobes rustulate like the leaves, 4 of them with membranous margins. Petals free, in one series, linear. Stems numerous, collected into a cone, filaments bearded at the base. Glands in a crenulate ring. Stigmas 5 or 6, or 10 in one species, filiform. Ovary inferior, flat-tish or conical at the top, 5 or 6-celled; placentas on the outer wall of the cells. Capsule broadly ovoid and shortly obovate, flat on the top, with 5 or 6, or in one species 10, valves and cells; valves as broad as long; expanding-keeled rather stout and sub-contiguous at their base half then widely diverging, minutely toothed on the inner edge, excurrent at the margin about half-way up the valve, and ending in an awn reaching to the tip of the valve, and with a membranous margin to the part below the awn; cells roofed with membranous, semi-transparent cell-wings, and without a placen-

Species few, natives of South Africa. The type of the genus is T. calcarea, Schwant.

The name is derived from the Greek, Titan, the sun, and opsis, appearance, from the sunlike appearance of the flowers.

Key to the Species.

Flowers yellow; stigmas 6; dilated part of leaf densely pustulate all over. 1. calcarea.

Flowers deep rose-pink; stigmas 10; dilated part of leaf with small, scattered pustules that become crowded around the apical margin. 2. cressipes.

Flowers white; stigmas 5, as the fruit has 5 valves; dilated part of leaf covered with small pustules. 3. spatulata.

1. T. calcarea, Schwant., in Zeitschr. f. Sukk., 1926, 172, and 1927, 105. Fig. 8.-- Rosettes 1/2-2 inches in diameter, composed of

14 several crowded, spatulate leaves, 7-14 lines long, 5-10 lines broad at the dilated, triangular-ovate apical part, which is very obtuse, 2-3 lines thick, greyish-green, covered with greyish-white pustules. Flowers subsessile. Calyx equally 6-lobed; lobes about 3½ lines long, 2-2½ broad at the base, ovate-oblong, obtuse, pustulate at the tips like the leaves, dull grey-green, tinged with rurule, the 4 inner with membranous margins. Corollas about an inch in diameter, expanding in day-time; petals between 30 and 40, in one-series, about 4 lines long, 4-1 line broad, linear, obtuse, yellow, with a darker midline at the base. Stamens about 2½ lines long, collected into a broad cone; filaments light yellow, anthers white. Glands connected into a reniform ring, dark green. Stigmas 6, finely 3½-4 lines long, filiform, with their tips recurving over the stamens, yellow. Ovary flattened, or slightly convex at the top, green, 6-celled. Capsule in 4-5 lines in diameter when closed, whitish on the flat top, with 6 valves and cells; valves pale brownish within; expanding-keels chestnut-brown, with pallid marginal wings. Otherwise as for the genus. Seeds 1/3-line in diameter, pale brown.


Griqualand West: near Kimberley, Karloth; near Griquatown, Karloth. Recorded from the "Knave" Division and also found in other parts.

This is one of the plants that so closely resembles its surroundings as to be easily overlooked unless in flower. Dr. Karloth calls attention to this close resemblance at the place cited, and when he first sent a plant of it to my self he also sent with it pieces of the limestone among which he found it growing, and as one of the stones had a bit broken out of it, into which a blade of one of the leaves of this plant just fitted, I placed the stone with the plant
having one of its leaves so fitted into the cavity upon the ground, and standing over it, at my own height, I could not detect where the leaf ended and the stone began, although blessed with good eyesight, so exactly did it match the stone in texture and colour. This indicated to me how very easily this plant might be overlooked, and upon mentioning this fact to Dr. Burtt Davy, he immediately told me that on one occasion, in the area where this plant grows, he passed a dried-up vley, and thinking that there ought to be some plant growing in it, he sat down into the vley, but could not see any plants growing there. However, after sitting down for a few minutes, he presently noticed something that seemed different from the stones covering the ground, and upon examination, found it to be a plant of T. calcarea, which he examined and then examined the place he found that there were hundreds of plants growing there, although at first he had been unable to detect a single plant. Fig. 3, which is from a photograph kindly sent to me by Dr. T. N. Leslie, will give some idea of the manner in which this plant simulates its natural surroundings and illustrates Dr. Burtt Davy's statement.

T. calcarea is easily cultivated if not over watered, and I am informed by Dr. T. N. Leslie that it ought to be quite hardy here if kept dry in winter, as he states that it will withstand twenty degrees of frost without injury.

The pustules or tubercles on the leaves of this plant are very interesting structures and form very charming microscopical objects. Each tubercle consists of a multitude of minute, slightly pointed cells filled with some form of lime (probably oxalate), whose whiteness contrasts with the green colouration of the leaf in a very effective manner. When this plant is cultivated in soil that does not contain much limestone, the tips of the leaves assume a beautiful rosy-murble colour, and when such a leaf is examined under a binocular microscope, the contrast of the white lime-cells with the rosy and green tissue surrounding them make this an exceedingly beautiful object.

2. T. crassipes, K. E. Br.--Habit of T. calcareas. Leaves in 3-5 pairs to a growth, flat, spathulate, ½-1 inch long, 4-6 lines broad at the dilates, transverse and somewhat fan-shaped apical part which is very broadly rounded at the apex and rather abruptly contracted into a cuneate petiole, the dilated part covered with tubercles, that become more crowded along the apical margin, glabrous, greenish-green with the apical edge reddish. Flowers solitary, sub sessile. Calyx sub equably 5-lobed, obconic and smooth below, tuberculate on the lobes which are about 4-5 lines long and 2-3 lines broad, ovate, obtuse. Corolla 11-13 lines in diameter; petals in one series, 4-5 lines long, ½-1 line broad, obtuse or sub acute, rose-rink, apparently raker at the base and raker on the back. Stamens numerous, erect in a mass, 2 lines long; filaments bearded at the base, stated to be rink (incornate) in the Latin description, and white in the English one, but the anthers are figured as yellow. Stigmas 10 in the type specimen, 3 lines long and exceeding the stamens, but are represented on the petal in the entire flowers as 5, and much longer than the radiately spreading over the tip of the stamens, but in the dissection they are represented as 0 and erect, and are described as "5-10 filiform" of the same length as the stamens ("staminibus sacciformae"); top of the ovary conical. Fruit unknown.

Mesembryanthemum crassipes, Karlooth, in Fl. Fl. of S. Afr., II,
Sutherland Division: Waterkloof, near Sutherland, Karloth, 9681, Levyns 1842.

This is evidently closely related to T. spathulata, Schwant., differing by the absence of the abrupt, short point at the apex of the leaves and the colour of the flowers. The above description is made partly from the type specimens and a photograph of the plant that have been very kindly lent to me by Dr. R. Karloth and partly from the original figure and description.

3. T. spathulata, Schwant., in Zeitschr. f. Sukk., 1927, 145. Rosettes with 4-6 leaves to each. Leaves 4-7 lines long, 4-5 lines broad at the apical part, flat above, convex on the back, spathulate-ovovate, very obtusely rounded at the apex, with a short, abrupt central point, and narrowed downwards from about the middle into a stout petiolar part, the apical part on both sides covered with ot-like rustules of compound structure, the lower part smooth, green, with a red margin. Flower solitary, shortly pedicellate. Calyx 5-lobed, lobes 2-3 lines long, ovate-lanceolate, acute, rustules like the leaves. Corolla not seen, stated to be white. Capsule 6 lines in diameter when closed, hemispherical, with 5 valves.


Van Rhynsdorp or Calvinia Division: Intermediate Roggeveld, Thunb.

This plant is known only from the specimen in Thunberg’s Herbarium, which is in fruit only, and from which I have made the above description.

N. E. Brown

(To be continued.)

(Continued from page 14.)

NABIEA, N. E. Br.

Stemless succulent perennials, with a firm, fleshy rootstock, deer-rooting, glabrous. Leaves opposite, united at the base, arranged in dense rosettes of 3-4 pairs to a growth, ascending-spreadling or spreading-lanceolate, linear-lanceolate or ovate, acute, flat on the face, rounded on the back at the basal part and keeled trigonous at the apical part, covered with slightly raised, whitish or greenish rustules or raised dots. Flowers solitary, subsessile or pedicellate. Calyx produced above its union with the ovary into a short cup, subequally or unequally 5-lobed above. Petals numerous, free, in 3-4 series, cuneately-linear or linear, laxly recurving in an irregular manner in different series. Stamens numerous, arising from the top of the calyx-cup and arranged in an erect, columnar mass, with their basal parts more or less concealed from view by the base of the petals. Stigmas usually 9 or 10 (occasionally 6-8), subulate, much shorter than the stamens. Ovary prominent, slightly concave at the top or with prominent raised sutures, with 9 or 10
or occasionally 6-8 rather deep cells; placentas on the outer wall of the cells. Capsule (of R. albinota, the only species of which fruit has been seen) obconic, with elevated sutural ridges on the top and usually 9 or 10 or occasionally 5-9 valves and cells; expanding-keels nearly reaching to the tips of the valves, closely contiguous for half their length then more or less diverging, with acute tips and broad, pallid marginal wings; cells at first roofed with thin membranous cell-wings, which become inrolled as the seeds are shed; no placental tubercle. Seeds compressed-ovoid, microscopically tuberculate.

Species 4. natives of South Africa. The type of the genus is R. albinota, F. E. Br.

The name is given to commemorate the service that Mr. W. A. Rabie, of Pauresmith, Orange Free State, has rendered to the Botanical Survey of South Africa, and who from early childhood has taken an active interest in South African plants, and has localised many rare species that at present are known only from one or rarely two localities, some of which are known to have been formerly common in the region, but from overstocking the area with stock have become nearly extinct.

The species of this genus are distinct, but it is difficult to express in words the distinctions that are easily seen with the eye, especially as one never has all the plants in flower at the same time to contrast their obvious differences.

Key to the Species.

1. Leaves ascending, deltoid-ovate, acute, 9-12 lines long, 5-6 lines broad. Pedicels 5-7 lines long. Stigmas 6-9, exceeding the stamens and about 3 lines long.

1. carolinensis.

Leaves spreading, trigonously-lanceolate, linear-lanceolate or gradually tapering from base to apex, acute, 2-5 lines broad, covered with slightly raised whitish or greenish dots or pustules.

2. Leaves apparently not more than 2-2½ lines broad, 9-12 lines long, linear-lanceolate. Flowers sessile or nearly so, about 14 lines in diameter; petals about 6 lines long, very narrow, about 4-line broad, acute, yellow; stigmas apparently shorter than the stamens.

6. albipuncta.

Leaves 2½-5 lines broad.

3. Stigmas exceeding the stamens when fully developed and 5-6 lines long.

3. tersa.

Stigmas shorter than the stamens and about 1 line long. Flowers sessile or subsessile; petals 6-8 lines long.


3-3½ lines broad. Petals 5-6 lines long. Stigmas 3-4 lines long.  5. cibdela.

5. Leaves 10-15 lines long, 4-5 lines broad, lanceolate, strongly keeled at the apex. Petals ¾-line broad, notched or toothed at the apex, yellow.  2. albinota.

Leaves 9-10 lines long, 3-4 lines broad, gradually tapering from base to apex, obtusely keeled on the back and the keel of one leaf of each pair somewhat dilated at the apex. Petals ½-line broad, obtuse, apparently deep-orange, but seen only when faded, so may have been yellow.  4. Lesliei.

1. R. carolinensis, N. E. Br. -- Leaves 4-8 to a growth, ascending-spreadig, united at the base, ½-1 inch long, 5-6 lines broad at the basal part, somewhat deltoid-ovate, acute, flat or perhaps slightly concave on the face, rounded on the back at the basal part, keeled at the apical part, greyish-green or glaucous-green, marked with whitish or green slightly prominent dots or pustules, glabrous. Pedicels 5-7 lines long. Calyx produced above its union with the ovary into a short cup, subequally 5-lobed and prominently dotted like the leaves; lobes 3-5 lines long, the outer acute, the inner with brown, membranous margins. Corolla apparently about 1-½ inch in diameter; petals numerous in 2-5 series, the outer apparently about 5-6 lines long and 1/4-1/3 line broad, acute or obtuse, white, when dried marked with numerous linear, red streaks. Stamens and staminodes loosely erect in a cylinar mass, white, but when dried, the filaments are reddish. Stigmas apparently 6 in the only flower examined, but some may have been broken off, erect, filiform or subulate, laterally compressed, acute, about 3 lines long and exceeding the stamens when fully developed, orange according to Mrs. Bolus, reddish when dried. Top of the ovary with large, rounded and very prominent sutural humps behind the base of the stigmas.


Transvaal: Crolina, Rogers 19705.

This species was discovered by the Rev. F. P. Rogers in September, 1917, and a specimen of it was sent to Kirstenbosch, from which Mrs. Bolus described the plant. The above description was made from Rogers' dried material, and I find that the figure wrongly named "Nanathus albinunctus" above quoted, so exactly represents this plant that I think it cannot be any other species than R. carolinensis. The stigmas, however, are represented as 10 and shorter than the stamens; but I am not sure of the number of stigmas in R. carolinensis, because, when dissecting dried flowers of these plants, they often break off and get lost among the stamens; and their length often varies according to the age of the flower examined; if young they would be shorter than the stamens. If the figure does not represent R. carolinensis it must be a very closely allied species, and certainly bears no resemblance whatever to "Nanathus albinunctus, N. E. Br."

2. R. albinota, N. E. Br. -- Leaves in 3 or 4 pairs to a growth, spreading, 10-15 lines long, 4-5 lines broad at the middle, thence
rapidly narrowing to an acute point that flat on the face, rounded on the back at the basal part and keeled and compressed at the apical part, and the keel in side view abruptly rounded into the apex, which has a recurved mucro, greyish-green, thickly marked with small, whitish nustules or raised dots, especially on the edges and keel; but the dots are sometimes greenish under cultivation. Flowers sessile or nearly so. Calyx produced above its union with the ovary so as to form with the concave top of the ovary a shallow cup, subequally 5-lobed above; two of the lobes acute and rather longer than the other three, which are obtuse, with whitish, membranous margins. Corolla 11-13 inch in diameter; petals in about 3 series, irregularly arranged and recurved, 6-8 lines long, ½-1 lin broad, linear, very obtuse or subtruncate and toothed at the apex, yellow. Stamens erect in a cylindrical mess, with the basal part partly hidden from view in the cup of the corolla which closely surrounds them, yellow, with darker yellow anthers. Stigmas 9 or 10, much shorter than the stamens and about 1 line long, subulate. Capsule 5-6 lines in diameter when closed, obconic, flattish-conical and with raised sutures on the top, with 9 or 10 valves and cells; valves reflexed when expanded, ralleid within; expanding-keels closely contiguous for half their length then more or less diverging, dark brown, with broad, ralleid, membranous marginal wings; cells roofed with membranous cell-wings, which in old cells become inrolled so as to appear as if incompletely covering the cells; no placental tubercle. Seeds nearly 1 line long, compressed-ovoid, microscopically tuberculate, dark brown.

Mesembryanthemum albinotum, Haw. in Phil. Mag., 1826, 126.
Described partly from Haworth's description and a drawing of the type labelled "Raised in 1823 from Cape of Good Hope seed received from Dr. Bowie," and partly from the material above quoted, which quite accords with the figure of the type and Haworth's description.

I have not seen a specimen of N. Comptonii, but I cannot find any character in the description that will in any way distinguish it from N. albinotus, and as it comes from the same general area as the latter, I have little doubt that it is the same species. Bowie in all probability collected it in Graaff Reinet Division.

R. tersa, N. E. Br.—Leaves about 6 to a growth, ascending-spreadling and superposed in 4 rows, 1-1½ inch long 2½-4 lines broad, and 3-4½ lines thick near the apex, flat on the face and somewhat linear-lanceolate in form seen from above, acute, somewhat acutely keeled at the apical part on the back and the keel distinctly dilated near the apex, with the sides convex at the basal part and flattish or compressed at the apical part, smooth but covered with microscopic points under a lens, glaucous-green, tinged with violet when exposed to the sun, thickly dotted with darker green, the dots not prominent.
 pedicels 6-7 lines long, 1-1½ lines thick below, thickened upwards, slightly compressed, bractless, smooth, glaucous-green. Calyx some-
54 what unequally 5-lobed down to the top of the ovary, coloured and
dotted like the leaves, the longer loves 5-6 lines long and the
shorter 5-6 lines long, 2-3½ lines broad, ovate, acute or subacute,
recurred-spreadling, the outer keeled at the apex. Corolla 1¼-1½
inch in diameter, expanding about 3 p.m., and closing at night,
scentless or nearly so; petals in 3 series, the outer recurved,
the others spreading in different planes, 7-9 lines long, ½-line
broad, linear, acute or obtuse not notched, bright, clear yellow
on the upper face, deep pink on the back at the apical part. Ste-
mens numerous, erect in a cylindric mass, 4-5 lines long, file-
ments and anthers yellow like the petals. Stigmas 8, overtop-
the stamens, 5 lines long, filiform, recurved at the tips, pale
green. Ovary shortly conical at the top. Fruit unknown.

Griqualand West: Near Kuruman, Pole Evans 7623.
Described from a living plant sent to me by Dr. Pole Evans,
which flowered in September, 1923.

4. R. Lesliei, N. E. Br.-- Stemless, tufted, about 1-1½
inch high. Leaves opposite, shortly united at the base, about two
pairs to each growth when in flower, those of each pair unequal
(always?), 9-10 lines long, 3-4 lines broad, at the basal part and
3-3½ lines thick, suberect when received, but possibly sometimes
spreading, flat above and then gradually tapering from the base to
an acute point, obtusely keeled on the base one of each pair viewed
sideways gradually tapering from base to apex, the other dilated
at the keel near the apex and slightly incurved towards the smaller
leaf so as to somewhat resemble a parrot's beak when ore when the
plant is at rest, green, suffused with purplish at the upper part,
marked with slightly prominent dots, not at all glaucous. Flowers
solitary, subsessile, on a pedicel 2-3 lines long that is quite
hidden in the united bases of the leaves, with a pair of leaf-like
bracts 3-4 lines long near its base. Calyx 5-lobed down to its
union with the ovary; tube or ovary part conice; lobes subequal,
2½-3 lines long, 2-3 lines broad, broadly ovate, the outer 2 acute,
the inner 3 obtuse, with a short dorsal point and with broad, mem-
renous margins. Corolla only seen in a withered condition, prob-
ably 1½ inch or more in diameter; petals numerous, free, about 6-7
lines long and ½-line broad, linear, obtuse, entire, apparently of
a rich, deep orange. Stamens numerous, erect, not collected into
a cone, 2-3 lines long; filaments and anthers bright yellow. Stig-
mas 10, about 1 line long, filiform. Ovary apparently flat on the
top. Capsule (unripe) 5-9 lines in diameter, flat on the top.

Frome free State: On hills between Westminster and Ciocolan,
flowering in August and September. T. N. Leslie.

This distinct species was sent to me by Dr. T. N. Leslie.
upon arrival it had upon it an unripe fruit and a withered flower,
that had probably expanded during its journey here, from these I have
compiled the above description, as the plant has not flowered since.

5. R. cibdela, N. E. Br.-- Leaves about six to a growth,
united at the base, ascending-spreadling, 1½-2 inches long, 3-3½
lines broad, 2 lines thick, narrowly-lanceolate, acute, epiculate,
flat or slightly concave on the face, rounded on the lower and keeled,
and more or less compressed at the apical part of the back, dull
gray-green, thickly marked with small, whitish pustules or raised
dots. Flowers nearly sessile of very shortly pedicellate. Calyx
conically obovoid below, subeally 5-lobed, whitish-dotted; lobes
NANCANTHUS, N. E. Br.


South Africa. Locality and collector unknown, see note below.

This plant is only known to me from Salm Dyck's figure and description, and a dried specimen of a plant of it cultivated at Kew many years ago, but of which I never saw flowers or made any note.

Although Salm Dyck has erroneously figured this as being M. aloides, Haw., which is quite a different plant, there can be little doubt, I think, that he obtained it from Kew, and that it is probably one of the plants raised at Kew in 1823 from seeds collected by Bowie and named M. albinotum var. majus by Haworth, as above quoted, but of which he gave no description, for in vegetative characters Salm Dyck's figure quite agrees with the drawing Aiton has made of Haworth's type of that variety. The flower is not represented in that drawing.

6. R. albinuncta N. E. Br. — Leaves many in a rosette, ascending-spreadling, 9-12 lines long, 2 lines broad and $\frac{1}{2}$ line thick, semiterete at the lower part, keeled and trigonous at the apex, and fettish or slightly convex on the face, and in both front and side vies tapering to an acute point, greyish-green, thickly marked with small, whitish dots or pustules. Flowers solitary, sessile or nearly so. Calyx not described nor figured. Corolla about 14 lines in diameter; petals numerous, in 1-2 series, lax, recurved-spreadling, very narrowly linear, 2-1.5 line broad, acute, yellow. Stamens numerous, erect in a cylindric mass, represented as yellow. Stigmas not represented so probably shorter than the stamens.


South Africa, without precise locality, Bowie.

Described partly from Haworth's original description and partly from Haworth's original description and partly from a drawing of the type plant labelled "Raised in 1823 from Cape of Good Hope seeds received from Mr. Bowie."

The above is all that is known of this plant as Mrs. Bolus's identification of R. albinunctum, Haw., is entirely wrong.

N. E. Brown

(To be continued.)
Stemless, succulent perennials, with a fleshy rootstock, becoming divided into short branches at the top. Leaves opposite, united at the base, arranged in dense rosettes of 3-5 pairs to a growth, lanceolate, linear-lanceolate or ovate, acute, flat or slightly concave on the face, often incurved at the tip, keeled on the back, often incurved at the apical part, covered with slightly raised dots or small pustules which are often whitish. Flowers solitary by the side of a new growth and so appearing axillary, subsessile or very shortly pedicellate, expanding in daytime. Calyx sub-unequally 5-lobed down to its union with the ovary, some of the lobes with membranous margins. Petals numerous, free, in two series, all closely imbricating and widely spreading in one plane. Stamens numerous, collected into a broad cone which is completely exosed to view to its base. Stigmas 7-10, filiform, nearly or quite as long as the stamens. Ovary inferior, flattish or slightly convex on the top, with 7-10 rather shallow cells; placentas on the floor or outer wall of the cells. Capsule half-globose, slightly convex or flattish-convex on the top, the sutures slightly raised to as to form a very short central cone, with 7-10 valves and cells; expanding-keels either contiguous, except at the tips, and adnate for all their length and nearly as long as the valves, with broad marginal membranous wings that are not united in pairs between the valves, or diverging from their base, not half as long as the valve, but produced into free awns reaching nearly to the tips of the valves without marginal wings; cells open, without or with rudimentary cell-wings that stand quite erect back to back, and without a pellccental tubercle. Seeds either flat and thin, or almost winged, somewhat half-moon-shaped and smooth, or sub-globose with a small plant and microscopically tuberculate.—N. E. Br., in The Gardeners' Chronicle, 1925, LXXVIII, 433. Aloinopsis, Schwant., in Journ. Gard., 11, 177, and see N. E. Br. in Journ. Bot., 1928, 77.

A small genus of about 5 species, native of South Africa, the type being N. vitatus, N. E. Br.

The name is derived from the Greek, nanos, dwarf, and anthos, a flower, in allusion to the dwarf nature of these plants.

In South African Gardening, 1929, p. 244, an attempt has been made to uphold the generic name Aloinopsis, Schwant., and a confused and incomplete account of it given without descriptions of or keys to the species, without citations and with illustrations that are incorrectly names, and an application of the name Nanthus in a sense the author of that genus never intended or indicated. It is much to be regretted that the article upon this group of plants published in South Africa and elsewhere should cause so much confusion. They exhibit for the first time in the history of botany a deliberate departure from the code of etiquette that has hitherto been maintained and respected by all scientists, a code that deems it unseemly for one scientist to systematically anticipate the work of a monographer or other worker for the purpose of claiming priority of authorship.

The upholding of Aloinopsis is contrary to all rules of nomenclature, for it has been clearly all demonstrated in the Journal of Botany, 1928, p. 76, that Aloinopsis is an invalid genus, because:—
(1) It was founded by Schwantes in Journ. Gard., 1891, p. 177, upon the very same plants as those on which the genus Nanthus us had previously been founded. (2) The generic characters ascribed to the fruit do not belong to any plant mentioned by Schwantes as belonging to the genus. (3) The species (Nanthe rosulatum,
The fruit of A. rosulatum was a detached capsule sent to him from South Africa by a distinguished South African botanist as being the fruit of Mesembranthemum Bolusii, it is evident that the supposition that that capsule was the fruit of A. rosulatum was evolved entirely from a vivid imagination, and is not a scientific method of founding a genus. According to the description given by Schwantes, the fruit in question would appear to belong to some species of Kloktellieria. Therefore, as the generic description of Aloinopsis does not accord with the structure of any known plant, and all the plants mentioned as belonging to it, with one exception, are the very same as those on which the genus Monanthus was founded, it follows that Aloinopsis cannot be maintained as a genus. And besides the above, it is evident that the name Aloinopsis (meaning Aloe-like) was intended to be applied to A. aloides and its allies, which have a slight Aloe-like appearance, while A. rosulatum more nearly resembles a Dasy, and it appears evident that but for the possession of a fruit wrongly supposed to belong to A. rosulatum, that A. aloides or some allied species would have been selected as the type of the genus, but of these I believe Schwantes had not seen fruits.

The species of this genus are difficult to distinguish by means of words, as the flowers all except A. aloides are alike, and the vegetative differences are not easy to portray in words.

Key to the Species.

Leaves 1-2 inches long, 4-10 lines broad, lanceolate or rhomboid-lanceolate, acute.

Petals yellow, with a somewhat inconspicuous darker yellow midline.

3. aloides.

Petals yellow, with a very conspicuous bright red midline on both sides.

4. rubrolineatus.

Leaves $\frac{1}{2}-1\frac{1}{2}$ inch long, 2-4 lines broad; corolla about 1 inch in diameter; petals with a bright red midline on both sides.

Leaves under natural conditions 6-10 lines long, ovate or ovate-lanceolate and broadest at the middle, but under cultivation becoming 10-20 lines long and linear-lanceolate, or with parallel sides to the middle then tapering to an acute apex.

1. vittatus.

Leaves 1-1$\frac{1}{2}$ inch long, slightly spatulate-lanceolate, somewhat dilated above the middle, where they are 3$\frac{1}{2}-4\frac{1}{2}$ lines broad and narrowing to the base, or with parallel sides below the dilated part.

2. Pole Evansii.

1. N. vittatus, N. E. Br., in Journ. Bot., 1928, 78. (see
Figs. 48 and 49).--Leaves changeable in form, those of native-grown plants 4-10 to a growth, ascending or ascending-spreading and usually ovate or ovate-lanceolate, acute or sub-acute, 610 lines long, 2\(\frac{1}{2}\)-5 lines broad at the middle, and sometimes with one side more bulging than the other, 2-2\(\frac{1}{2}\) lines thick, flat or slightly concave on the face, rounded on the back at the basal part and keeled at the apical part, and the keel compressed and slightly dilated, so that in side view it is truncate or rounded into the apicula and is also sometimes oblique. Under cultivation these leaves change to others that are 10-20 lines long, 1\(\frac{1}{2}\)-3 lines broad and 1-2 lines thick, linear or linear-lanceolate, tapering from about the middle to an acute point, mucronate, flat on the face, rounded on the back, except at the apex where they are slightly keeled, and in side view with the keel gradually (not abruptly) rounded or narrowed into the apex; all forms of leaf glabrous and slightly rough from being covered with raised dots or small pustules, dull grey-green or whitish, according to sun exposure.

Pedicels 1\(\frac{1}{2}\)-2\(\frac{1}{2}\) lines long. Calyx lobes 3-4 lines long, 2\(\frac{1}{2}\) lines broad, deltoid-ovate, acute, prominently dotted. Corolla about an inch in diameter; petals all spreading in one plane, 4-4\(\frac{1}{2}\) lines long, subacute obtuse, yellow, shining, paler on the back, with a bright red line down the middle on both sides. Stamens collected into a broad cone 2-2\(\frac{1}{2}\) lines long, white, with yellowish anthers. Stigmas 7-10, erect, with recurved tips, compressed-subulate.

Ovary slightly convex on the top. Capsule 3-4 lines in diameter when closed, hemispherical below, slightly convex on the top. Capsule with 7-10 valves and cells, and entirely pallid within; expanding-keels nearly as long as the valve, contiguous into a central keel throughout their length except at the tips, and having broad marginate wings; cells open, without or with rudimentary cell-wings standing rect, back to back; no placental tubercle. Seeds 2-3-line long, flatter and thin, somewhat elliptic in outline, with a point, smooth, pale brown on one half and darker brown on the other part.


This species was originally described from a living plant sent to Kew without information as to locality between 1875 and 1876, by Mr. H. Hutton, whom that time lived at Bedford in South Africa, and he used occasionally to make a journey to the Diamond Field, he probably obtained it during one of those journeys.

*V. vittatum* under cultivation in Europe is quite unlike the same plant in a wild state, as the short ovate leaves represented at Fig. 48, which is from a photograph taken by Mr. C. A. Smith of a Fauresmith plant, change into others that are longer and narrower, and linear-lanceolate in form. The Hamans Krael plant above quoted, when received at Kew in 1929, had leaves like those represented at Fig. 48, but twelve months after introduction it began to change the form of its leaves, both the original ovate leaves and the new
93 linear-lanceolate leaves being present on the plant at the same time, he represented in the reproduced photograph (Fig. 49).

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.
Garôd, Chron. III. 89: 133. 1931.
(Continued from page 93.)

NANANTHUS.

133

2. N. Pole Evansii, N. E. Br.-- (Figs. 64, 65 and 66).-- Leaves 6-10 to a growth, spreading, or ascending-spreading, 1-1½ inch long, 2-4½ lines broad at the dilated part above the middle, 1½-3 lines thick, usually somewhat spatulate-lanceolate as seen above, with parallel sides below the dilated part, or sometimes not dilated above the middle, acute, flat above, rounded on the back at the basal part and keeled at the apical part, and in side view the keel is truncate, rounded into the apex, greyish-green, thickly marked with slightly elevated, pallid green or whitish (or in the absence of sun, dark green) dots or pustules, and on native crown plants slightly velvety to the touch from being covered with soft, microscopic points, which under some conditions of cultivations disappear. Flowers odourless, sessile or nearly so. Calyx-lobes about 5 lines long, ovate, acute, pustulate like the leaves. Corolla 10-11 lines in diameter, opening about midday and closing between 5 and 6 p.m.; petals in two closely imbricating series, widely spreading in one plane, 3-4 lines long, ½-line broad, obtuse, light yellow, with a bright red midline on both sides, shining. Stamens in a yellowish- or creamy-white anthers; filaments bearded at the base. Stigmas 7-10, erect, filiform, slightly longer than the stamens, green. Capsule when closed 4-½ lines in diameter, half-globose, 2½-3½ lines deep, flattish-conical, with slightly elevated sutures on the top, and with 7-10 valves and cells, pale brown, dotted with darker brown outside, pale ochreous within; expanding-keels nearly as long as the valves and closely contiguous except just at the tips, and with broad, membranous, colourless marginal wings obtusely rounded at the apex; cells without or with very rudimentary cell-wings that stand erect, back to back, and without a placental tubercle. Seeds 3/4 to nearly 1 line long and ½ line broad, flat and thin, somewhat half-moon-shaped, almost winged on the curved side, with a short, oblique point at one end, smooth, light brown.

Frieska Division: At Land Vlei, Pole Evans, 6440, the type. Griqualand West: between Kuruman and Takoon, Lobb.

Described from living plants sent to me by Dr. I. B. Pole, Evans.

3. N. aloides, N. E. Br.-- (Figs. 67, 68 and 69).-- Leaves 6-8 to a growth, spreading in a rosette, 1 inch to 2 inches long, 4-7 lines broad and 2-3½ lines thick, lanceolate or rhomboid-lanceolate, often oblique, acute, flat or slightly concave above, keeled at the apical part and rounded at the basal part on the back, grey-green or dull green, thickly marked all over with slightly prominent, whitish dots or pustules, which become green unless fully exposed to sunlight. Flowers sessile or nearly so. Calyx somewhat
unequally 5-lobed, pustulate like the leaves; lobes 3-4 lines long, acute or acuminate, the inner with narrow, membranous margins. Corolla 1-1½ inch in diameter petals in two series, imbricating in one plane and recurving, 5-6 lines long, ⅓ line broad, linear, sub-acute, or tapering from the middle to a sub-acute point, light yellow, with a slightly darker yellow (not red) midline and sometimes tinged with red at the tips. Stamens collected into a broad cone, white. Stigmas 10, filiform, finally exceeding the stamens.


Bechuanaandal : At Katloving River, Burchell, 2197, and Jabiru Fontein, Near Tekun, Bruchell 2249-2; near Postmasburg, Pole Evans 7584.

The above description is chiefly compiled from a drawing of the type plant at Kew, labelled:— "L. aloides, Haw. Received from Mr. Haworth in the year 1828, who obtained it from Mr. Burchell," and from Haworth's description, with a few details added from the Postmasburg plant. According to his lists, Burchell collected seeds only of 2197, but of 2249-8 seeds and a dried specimen were collected, and according to a list of his collection at Kew this particular number was treated as a duplicate and is probably in the Ash Gray Herbarium at Harvard University, Cambridge, Massachusetts, United States.

Plant has not yet been found in the localities where Burchell collected it, but Dr. Pole Evans found what I believe to be the same species near Postmasburg, and which is represented from Fig. 69, from a photograph by Mr. T. A. Leslie. This plant quite accords with the beautiful drawing of the type at Kew, except that its leaves are rather larger on well-grown plants than represented in the original drawing, where they are not more than 1½ inch long and 4-5 lines broad, but when first sent to me the leaves of the Postmasburg plant were scarcely larger and as represented in Fig. 68 which is made from a wild plant. The petals in the drawing as seen with a lens are subacute and red at the tips, and on a few of them a slender line of darker yellow (not red) down the centre of each can be clearly discerned, but is not represented on the majority of the petals, which, from the "high light" upon them are evidently shining. I have seen the flower of the Postmasburg plant and have no recollection of having seen a distinct red line on its petals such as occurs in N. rubrolinatus, nor is a red line represented in the coloured figure of this plant in Fl. Pl. S. Afr., II, t. 54, and in the description accompanying it they are stated to be lemon-yellow without any mention of a red midline. Yet, as photographs (for I have another made from my own plant) represent a darker midline, in all probability there is a slightly darker yellow (not red) midline as is represented in the original drawing at Kew, and which is unnoticeable to the eye, but which the camera easily detects. Irove this details because Mrs. Bolus has also reproduced in S. Afr. Gard., 1930, p. 48, this same photograph of Mr. Leslie's with the name Aloinopsis aloides var. striata, L. Bol., attached to it, without a description. Yet when we analyse the account given with it, we find that the name is actually based upon what is evidently an entirely different species, for Mrs. Bolus states that Mr. Leslie's with the name Aloinopsis aloides attached to it, without a description. Yet when we analyse the account given with it, we
find that the name is actually based upon what is evidently an entirely different species, for Mr. Bolus states that Mr. Leslie's photograph represents a plant that "appears to be the same as one sent from Bultoein and Boetsar in Barkly west, the only difference being that the leaves are shorter and more like those of Burchell's plant as represented in the unpublished drawing at Kew. But the flowers are larger and the petals are banded with red." So that as Mr. Leslie's photograph only "appears" to be the same and yet has characters that are stated to be different, and as the plant comes from another locality, it is in all probability quite distinct from the plant to which Mr. Bolus intends the varietal name "striata" to apply. Therefore, until plants collected at one or other of the localities where Burchell found it have been compared both with the Postma'sburg plant and demonstrate that the latter is distinct, I deem it best to treat it as I have here done.

4. N. rubrolineatus, N. E. Br., in Journ. Bot., 1928, 78,—(Fig. 70).—Rosettes or growths 2-3 inches in diameter, composed of 6-8 spreading leaves, 1 inch to 2 inches long, 4½-10 lines broad, 2½-4½ lines thick, somewhat softly fleshy, oblong-serrulate or lanceolate, acute, flat or the face, obtusely keeled at the apical part on the back, glabrous, greyish-green or tinted with brown or purplish, thickly covered with slightly raised, whitish dots pustules. Pedicel 2-4 lines long, 2 lines thick. Calyx-lobes 4-5 lines long, deltoid-ovate, obtusely pointed, dull green with small, whitish rustles. Corolla 15-16 lines in diameter, expanding before 11 a.m. and closing about 4 p.m.; petals in 2 series, imbricating and all spreading from the base in one plane, 6-7 lines long, 1½ line broad, entire, acute, yellow, with a red line down the middle on both sides. Stamens collected into a cone about 3 lines long, yellow. Stigmas 10, filiform, 2 lines long, about equalling the staminal cone, pale greenish. Capsule 5-6½ lines in diameter when closed, hemispherical, slightly convex above and with raised sutures to the 10 valves, which are pallid within; keels diverging from the base and the adnate part about half as long as the valve, brown, but produced into a pallid awn nearly as long as the valve, not winged; cells open, with the cell wings standing erect, back to back, and at the outer part about ½-line high, pallid. Seeds about ½-line long, globose-ovoid, with a point, microscopically tuberculate, dark brown.


Graeff Reinet Division: Kendrew, Dyer. Described from a living plant sent by Mr. C. J. Howlett, from Graeff Reinet, where it was cultivated, to Kew, in 1908.

I am indebted to Mr. R. A. Dyer for a living plant of Alcinopsis Dyeri, L. Bolus, and find it identical with the well-known N. rubrolineatus.

N. E. Brown

(To be continued.)

Mesembryanthemum.
(Continued from page 134.)

Deilanthae, N. E. Br.
Perennial, stemless or nearly so. Rootstock thick and firmly fleshy, deeply rooting, sometimes with short branches at the top without internodes. Leaves opposite, united at the base, in rosettes, spatulate-ovate or spatulate-lanceolate, dottless, velvety-puberulous. Flowers solitary, pedicellate, bracteate at the base of the pedicel. Calyx subequal to 5-lobed down to its union with the ovary. Corolla expanding in the evening; petals numerous, free, in 3 or 4 series. Stamens numerous, erect, in a loose cylindrical mass. Glands connected into a crenulate ring. Stigmas 10-13, erect, subulate. Ovary inferior, flattish, or slightly convex on the top, placenta on the floor or outer wall of the cells. Capsule inferior, shortly obconic, flattish at the top, with raised sutures and with 10-13 valves and cells; valves narrowly deltoid, with a very prominent, acute keel on the inner face; expanding-keels diverging from the base, about half as long as the valve, each tipped with a pallid awn reaching nearly to the tips of the valves, and with short, broad, membranous marginal wings at the basal part that are united in pairs between the valves; cells acutely roofed with rather stiff cell-wings and without a placental tubercle. Seeds Peper-shaped, smooth.

A monotypic genus, native of South Africa.

The name is derived from the Greek, δρεί̂πε, evening, and ἀνθης, a flower, in allusion to flowers commencing to open in the evening.

This genus is recognisable at sight by its stemless habit and flattened, velvety-puberulous, whitish-green leaves, which spread rather widely.

1. D. Feersii, N. E. Br. (Figs. 127 and 128).--Rootstock usually more or less divided, yet scarcely forming branches under natural conditions, but under cultivation forming short branches without distinct internodes. Leaves on native-grown plants usually in 1 or 2 pairs to a growth but under cultivation forming 2-4 pairs to a growth, spreading, 9-18 lines long, 5-8 lines broad above the middle and 2½-3½ lines thick, spatulate-lanceolate or spatulate-ovate, obtusely pointed, not apiculate, flat on the face, convex, and with a blunt keel on the back, minutely velvety-puberulous, without dots, somewhat whitish-green, or with a bluish tint, not shining. Flowers solitary. Pedicels 6-10 lines long, with a pair of bracts about 3 lines long at the base, velvety-puberulous. Calyx velvety-puberulous; lobes 2-5 lines long, 2-3½ lines broad, deltoid-ovate, acute or obtuse. Corolla 12-18 lines in diameter, expanding about 5 p.m. and remaining open during most of the night, slightly fragrant; petals about 40, in 3 or 4 series, 4-6 lines long, ½-⅓ line broad, linear, obtuse or bluntly pointed, sometimes minutely and irregularly toothed at the apex, clear yellow on both sides, or, according to Mrs. Bolus, dull reddish-yellow, paler at the base. Stamens about 4 lines long, with orange-yellow filaments, bearded at the base, and with cream-coloured anthers. Stigmas about 1½ line long, subulate, erect, green. Capsule as described under the genus, 6-8 lines in diameter when closed, ochreous within, with brown expanding-keels. Seeds ½ line long, smooth, pale brown, with a dark brown point.


Very dwarf, perennial Succulents, tufted, with numerous very short branches arising from a fleshy rootstock. Leaves opposite, united at the base, crowded, semiterete below, trigonous at the tips, smooth, pellucid-dotted. Flowers solitary, pedicellate. Calyx 5-lobed; inner lobes with membranous margins. Corolla with numerous free petals. Staminodes numerous in 3 or 4 series, filiform, recurving. Stamens numerous, the outer spreading and often with white, barren anthers. Stigmas 6-10, subulate or filiform, acute. Ovary inferior, with 6-10 cells; placentas on the outer wall of the cells. Capsule shortly and broadly obconic, convex and with 6-10 raised and glaring sutural ridges on the tor; valves with (always?) a central acute keel; expanding-keels about half as long as the valves, diverging from the base and without wings or awns; cells somewhat acutely roofed with stiffish cell-wings, and with or without small placental tubercles. Seeds slightly compressed-pear-shaped, minutely or microscopically tuberculate.

Species about three or four, all natives of the Transvaal region. The name is given because the root is stated to be used by natives for making a drink called "Khadi." I regret that no material is available for illustrating this genus.

Key to the Species.

Stigmas, and valves and cells of the fruit 8-10.

Leaves in side view somewhat abruptly tapering into the point from a little below the apex; pedicels 2-4 lines long; calyx-lobes 3-5 lines long, broadly ovate; stigmas erect; cells of fruit without placental tubercles; seeds 9-17 in a cell, ½-line long. 1. acutipetala.

Leaves in side view abruptly rounded into the point; pedicels 2 lines long; the longer calyx-lobes 5-6 lines long, leaf-like; stigmas ascending or erect; fruit unknown. 4. Kationae.

Stigmas, 6 valves and cells of the fruit 6; pedicels 2-4 lines long; the two longer calyx-lobes 5-7 lines long, acute or leaf-like.

Leaves inside view somewhat abruptly tapering to the point from a little below the apex; stigmas erect or ascending, with recurved tips; cells of fruit with a small placental tubercle; seeds about 5 or 6 in a cell, ½-line long.
Leaves in side view gradually tapering to the acute apex; stigmas radiating.

1. K. acutipetala, N. E. Br.—Plant 1½-2½ inches high, with crowded branches 3-12 lines long, arising from a fleshy, divided rootstock, glaucous. Leaves 2-6 to a growth, crowded, shortly united at the base, erect or ascending, 6-14 lines long, 3-5 lines broad and 1½-2 lines thick at the basal part, thence (in face view) gradually tapering to an acute and mucronate apex, flat on the face, convex on the back at the basal part and keeled at the apical part, and (in side view) with the keel somewhat abruptly tapering to (not rounded into) the point from a little below the apex, smooth, greyish-green or slightly glaucous, pellucid-dotted, and with the dots on living plants contiguous on margins and keel and forming cartilaginous edges. Pedicels 2½-4 lines long. Calyx-lobes 3-5 lines long, broadly ovate, acute or obtuse. Corolla about 1½ inch in diameter; petals numerous in 3 or 4 series, linear, acute; the inner smaller and gradually passing into 3 or 4 series of filiform, recurved staminodes, bright rose-purple. Stigmata numerous, the outer spreading, 2-6½ lines long; filaments rosy-purpure; anthers yellow. Stigmas 3-10 (not 7 or 8 as originally described), about 2½ lines long, erect, with recurved tips, subulate, acute. Capsule as described under the genus, 3-6 lines in diameter when closed, with 2-10 valves and cells, and, when clean and fresh, bright ochreous-brown on the outside and ochreous within, becoming dark brown or fuscous with age; cells without placental tubercles. Seeds 9-17 in a cell, 2½ line long, somewhat compressed-pear-shaped, microscopically tuberculate, ochreous.


2. K. Beswickii, N. E. Br.—Plant closely resembling K. acutipetala in habit, vegetative characters and flowers, but with pale rose-coloured petals fading into white at the base. Stigmas 6, erect or ascending, about 2½ lines long. Capsule like that of K. acutipetala, but with only 6 valves and cells, and the cells with a small and rather obscure placental tubercle. Seeds about 5 or 6 in a cell, a lens distinctly but minutely tuberculate, the tubercles being larger and more easily seen than those on K. acutipetals, brown.


Dried specimens of this plant in flower only cannot be distinguished from K. acutipetala without dissecting the flowers, but the in fruit the number of valves of the capsule easily distinguishes it. I have not bee able to compare living flowers of the two species, so cannot state if the colour distinction is constant, but the difference in the number of valves to the capsule and the size and number of seeds in a cell is quite constant in the numerous capsules examined, and which were attached to living and dead plants kindly sent to me by Professor C. E. Ross.

According to the original description, this plant differs from
K. acutipetala "by the 6-petalled flowers" and in Latin "6-merous" Other species are described as having "4-merous" or "5-merous" flowers, but no known member of the whole group of Neembryanthema has flowers that are either 5-, 5- or 6-merous.

3. K. Nelsoni, N. E. Br.—Very similar to K. acutipetala in general appearance, but with more elongated growths and with longer leaves, which are 1-1½ inch long on the dried specimen, and in side view gradually taper to the acute apex. Calyx very unequally 5-lobed, the longer lobes 6-7 lines long, leaf-like. Stigmas 6, radiating, 3-½ lines long.

Transvaal: Witte Kopjes, and near Boksburg, Nelson.

I have seen only one plant of this, which was sent to me by the late Mr. W. Nelson, and having unfortunately omitted to make my customary notes of it before it died, I can give no further particulars of it. Mr. Nelson considered it quite distinct from K. acutipetala, and wrote concerning it:—"This will stand more generous soil and more water than K. acutipetala would. It grows here (near Boksburg and at Witkopjes, in Witwatersrand district) in a strong, greasy, loam-country, so you need not fear to treat it liberally. K. acutipetala grows on the dry stony outcrop-country and its locality is south and west of Johannesburg, in Witwatersrand district." From memory, I think. Mr. Nelson informed me that the flowers of this plant were crimson in colour.

4. K. Nationae, N. E. Br.—Plant 2-2½ inches high when in flower. Leaves 1-1¼ inch long, 1½-2½ lines broad on dried specimens, so perhaps rather larger when alive, tapering gradually from the base in face view, and in side view abruptly rounded into the apex. Pedicels about 9 lines long. Calyx unequally 5-lobed, three of the lobes 5-6 lines long, leaf-like, the other two shorter and obtuse, with a dorsal point and broad membranous margins. Corolla an inch or more in diameter; petals 5 lines or more long, ½ line or less broad, apparently rosy or purple. Staminodes filiform, rosy or purple, and the filaments of the stamens probably of the same colour. Stigmas 8, ascending, ½ line long, stoutly filiform, acute, probably prunish.


Transvaal: Near Rustenburg probably, Nation.

This appears to differ from K. acutipetala and K. Beswickii by its longer leaves that are abruptly rounded into the point in side view, longer pedicel, and the longer calyx-lobes being very leaf-like.

H. E. Brown
(To be continued.)
pairs and numerous dead ones to a growth, forming dense clusters, ascending, shortly united at the base, trigonous, acute, with acute edges and keel, smooth and glabrous. Flowers solitary, terminal, pedicellate, with a pair of small leaves at the base of the pedicel. Calyx subequally 8-lobed down to its union with the ovary. Corolla only seen in an undeveloped bud and not properly determinable, but the petals appeared to be united, yet may not be so when fully developed. Stamens very numerous, erect, not collected into a cone; filaments not bearded at the base. Stigmas 7 or 8 subulate, depressions at the top, and slightly 7 or 8-grooved, or floor of the cells. Capsule obconic below, flat-tish, with 7 or 8 much raised and gaping valves on the top, and with 7-8 valves and cells; valves spreading when expanded, and together with the whole inside of the capsule brown; expanding-keels narrowly diverging from the base, much raised, thin, with minutely toothed, acute edges, and produced into straight awns extending to the tip of the valve, and furnished below the awns with irregularly toothed marginal wings; cells somewhat acutely roofed with membranous cell-wings, and with a small placental tubercle that scarcely forms any obstruction at the opening. Seeds not seen.

A monotypic genus, native of South Africa.

The name is derived from the Greek, perissos, exceeding in number, and lobos, a lobe, because the calyx is 8-lobed, the only member of the whole group known to me to have constantly so many calyx-lobes.

I. P. Bijlui, N. E. Br.--Plant and leaves as described for the genus. Leaves 9-12 lines long, 4-6 lines broad and 4-5 lines thick, flat on the face, acutely keeled on the back with sharp edges and keel which is often slightly oblique, and one side flat-tish or slightly concave and the other very slightly convex, rather light green, with the edges often purplish, not dotted, either pellucidly or otherwise. Pedicels 4-6 lines long. Calyx subequally 8-lobed; lobes 4-5 lines long, 2-3 lines broad, ovate, acute, keeled, some with membranous margins. Flower as described under the genus. Stamens with white filaments and rich yellow anther. Stigmas greenish. Capsule 4-5 lines in diameter when closed, and as described for the genus.

Somerset East Division, locality not specified, Drs. D. van der Bijl, 93.

I regret that I cannot be present give a more complete account of the flower of this interesting and very distinct plant, which differs from all others of this group known to me by having an eight-lobed calyx, and by that character should be easily recognised. The appearance of the plant, too, with a mass of hard and rigid dead leaves under the living ones is unusual.

N. E. Brown

(To be continued.)
pecies about 2, natives of South Africa. The type of the genus is P. Orpenii, N. E. Br.

The name is derived from the Greek, unci, to be conspicuous, and petala, a bundle, because the stamens form a bundle conspicuous to the base.

Leaves slightly velvety to the touch. Pedicels 4-6 lines long. Petals not incurved-hooked at the tips. 1. Orpenii.

Leaves glabrous, smooth. Pedicels 12-15 lines long. Petals incurved-hooked at the tips. 2. unci- petala.

1. P. Orpenii, N. E. Br. (Fig. 195).—Plant stemless, about 1½ inch high when in flower. Leaves about eight to a growth, ascending-spread, 2½-3½ inches long, 2½-3½ lines broad and 2-3½ lines thick, with parallel sides broad and nearly to the apex, then abruptly acute, flat on the face, rounded at the basal part and keeled, and the keel slightly dilated at the apical part on the back, acute, mucronate; surface smooth and slightly velvety to the touch from being covered with microscopic points, dull glaucous-green tinted with dull purple or brown thickly marked with dark green dots that are not at all prominent. Flower solitary, terminal. Pedicels 4-6 lines long, 1½ line thick, terete, tinted with reddish. Calyx-lobed recurved, 3-4½ lines long, 2-3 lines broad, ovate, obtuse or subacute, dull dark green or purplish-brown, with darker dots. Corolla 1½-1½ inch in diameter, opening between 3 p.m. and 4 p.m., and closing at sunset, faintly scented; petals numerous, in about 3 or 4 series, 6½-9 lines long, ½-1 line broad, linear, acute or obtuse, the outer series reflexed, the inner series slightly ascending-spreading or subhorizontal, and the others spreading at intermediate angles, all bright, clear yellow and shining on the inner face, whitish-yellow on the back. Stamens in a cylindrical mass 4-5 lines long, filaments slightly bearded and white at the basal part and microscopically rough and yellow at the upper part; anthers yellow. Stigmas 5 or 6, about 2 lines long, erect, with their tips curving among or over the anthers, filiform, slightly plumose at the base, pale yellow.

Recent specimens Orpenii, N. E. Br. in Gard. Chron., 1921, LXXI, 503, f. 133. Aloinos or Orpenii, L. Bol. in S. Afr. Gard., 1929, 282, with fig.

Griqualand West: Near Campbell, Orpen. The above description was made in July, 1921, from a living plant sent to me under number 6916, by Dr. I. B. Pola, Evans, as having been collected by Mr. Orpen, to whom I have dedicated it.

2. P. unci- petala, N. E. Br. (Fig. 196).—Plant stemless, about
2½-3 inches high when in flower. Leaves in 4-6 pairs to each growth, crowded, spreading, 1½-2½ inches long, 3-4 lines broad at the base, thence gradually tapering in a straight line to the apex, 2½-3 lines thick and rounded on the back at the base, compressed, keeled, and the keel dilated to 4-½ lines thick near the apex, flat on the face, smooth, glabrous, light greyish-green, inconspicuously dotted with darker green. Pedicel about ½ inch long and ½ line thick below, thickened above and gradually passing into the obconic ovary, and with light green. Calyx equally 5-lobed, glabrous; lobes revolute when the flower is expanded, 6-7 lines long, 2½-4 lines broad, ovate-lanceolate, obtuse or subacute without or with very narrow membranous edges. Corolla about 2 inches in diameter, commencing to open about 5 p.m., and fully open between 6 and 7 p.m., strongly scented (something like the odour of Coconut), closed during the day; petals in about 4 series, lax, the outer deflexed, the inner ascending-spread ing, and the others in intermediate planes, 9-10 lines long, ½-line broad, acute, all incurved-hooked at the tips, bright yellow, changing to red when faded, shining. Stamens numerous, erect in a columnar mass, 5½ lines long, entirely yellow; filaments bearded at the base. Stigmas 5, filiform, twisted like a corkscrew and in that condition about 5 lines long, pubescent-stigmatic, yellow. Glands 5, large, in pockets at the base of the stamens. Top of the ovary conical, green. Fruit not seen.

Cricualand West: Near Campbell, Pold. Evans, 6 891.

This is a very pretty, night-flowering species and is deliciously scented. The incurved tips of the lax and very numerous petals, and the corkscrew-like stigmas, are characters I have not noticed in any other plant of this group.

In general characters this accords with F. Crrenii, but the leaves are not velvety to the touch as in that species, and I have not seen fruit of either. I therefore refer it to this genus for the present.

N. E. Brown
(To be continued.)

MESEMBRYANTHEMUM.


(Continued from page 389, Vol. LXXIII.)

CONICOSIL., N. E. Br.

13

Perennials or, in one or two species, of but two or three years' duration, either with fibrous roots and a single main stem terminating in a perennial dense tuft of leaves, with flowering branches produced from the basal part of the tuft, or with a long, fleshy or tuberous rootstock emitting from its top a central leaf-tuft and prostrate flowering-branches, or flowering branches only, with opposite or sometimes some alternate leaves scattered along them and a small tuft at the ends, deciduous after fruiting. Leaves in the large tufts crowded and appearing alternate, but in reality opposite in their origin, slightly stem-clasping at the base, erect or ascending except when old, long and narrow, either sharply 3-angled or subterete, and slightly channelled down the face, but in C. fusiformis described as terete, soft, without dots, pellucid or otherwise. Flowers large, solitary, on long pedicels. Calyx
13 subequally or unequally 5-lobed down to its union with the ovary; lobes with broad bases (the three inner with membranous margins) and subulate or tereate tips. Petals very numerous, free, in several series, linear, often ciliate at the basal part. Stamens numerous, filiform or hair-like, at first more or less incurved. Stamens 10-20, filiform; style none. Ovary inferior or partly superior, with a flattish torus rising at the centre into a short cone, 10-20-celled; placentas on the outer wall of the cells; ovules several in each cell. Capsule dry, half superior, with the conical top separating into 10-20 narrow valves or segments, which stand more or less erect, not spreading when wetted and are without expanding-keels, but each valve bears a pair of thin, submembranous, wing-like cell-apparitions on the inner face. Seeds rather large for this group, subelobose or somewhat lenticular, often slightly keeled at the margin, but not winged, smooth.—N.E.Br., in The Gardeners' Chronicle, 1885, Vol. LXVIII, p. 433, and in Phillips' Gen. S. Afr. Fl. Fl., p. 247.

Species 11, and doubtless several more, natives of South Africa, the type of the genus being C. pugioniformis, N. E. Br.

The name is derived from the Greek, koronikos, conical, in allusion to the conical top of the fruit.

Conicosia is easily distinguished from all its allies by its very long and narrow, soft and dotless leaves, which Haworth likened to daggers, and by the peculiar capsule dividing into narrow, erect valves at the top when ripe, instead of remaining closed and expanding when wetted by means of expanding-keels, which are absent in this genus.

On account of the great resemblance most of the the species bear to each other, their flowers especially, being all very much alike except in details, I am disposed to believe that several species yet remain to be discovered that have been mistaken for old species, and have not been collected. For a close study of the characters of the species that have hitherto been described and figured has revealed the fact that several wrong identifications have been made, causing much confusion of nomenclature. Haworth began the confusion by his mididentification of C. pugioniformis, and Salix Dyck and others have followed. But it is quite impossible to understand how Klinsmann, in his Clavis Breyneana, could have identified Breyne t. 80 (which is C. fusiformis) as being C. bicolorum, Hill., a shrubby species, and Breyne t. 81 (which I believe to be C. Huirii) as being C. molle, Spreng. This confusion I have endeavored to disentangle, and have made explanations under the species.

Both Haworth and myself have supposed the leaves of this genus to be alternate, and when a large main tuft of leaves is examined it is difficult to form any other conclusion, but having now observed seedlings of four species develop, I find that the leaves are really opposite (see figure under C. Radiae), but by a mode of displacement by succeeding leaves they become apparently alternate.

The fruit of this genus is very different in structure from that of any other. In the first place the cells or carpels of the ripe fruit are so lightly adherent to the calyx-tube that they can easily be separated from it. When quite ripe the valves slightly separate from each other, and the wing-like membranes (really cell partitions) attached to their inner face also become more or less detached from the central column. As the cells containing the seeds
alternate with the valves, each valve bears upon it (in the wing-like membranes on its inner face) the partitions belonging to the two adjacent cells. The cells themselves are very narrow, and each contains about one to four seeds.

All the species belonging to this genus are glabrous, except on the petals and stamens, and all grow in pure and or in sandy places. Therefore they should be cultivated in a light sandy soil, and the soil not allowed to get too dry at the lower part of the pt. They are best watered from below by standing the pot in a saucer of water. Their flowers are very showy. But I have seen one species growing and flowering most luxuriantly in ordinary garden soil in the open air in south Devonshire, and in climates not too cold for these plants to be cultivated in the open air, the species of this genus ought to find favour among cultivators.

The herbarium material that I have seen is very imperfect, the root, main stem and central tuft of leaves usually being quite absent, while the flowers are mostly badly pressed, and ripe fruit definitely belonging to the same plant as the flowers is usually quite absent. So that the material is difficult to determine, and as the published figures of the species of this genus have been indiscriminately named, much confusion of nomenclature have been made, as no heed has been paid to the few characters which the descriptions and figures portray. These characters I have made use of to indicate the various species in the key that follows. One of the best characters for distinguishing the species is that of the fruit, but this character I have not been able to made use of, as it is known to me only in a few cases, for the collection of the fruit in definite connection with flowering specimens appears to have been entirely neglected.

From the study I have made of this genus, I believe that it will ultimately be found to contain several other species as yet undescribed. I have fruits only of two others that are certainly distinct from any here described, and there are probably others, for in general appearance the species are so similar that their very real distinctions have not been noticed. For example, I find that plants with fibrous roots and a distinct stem under the central tuft of leaves, and others with a tuberous root-stock and a sessile central tuft of leaves have indiscriminately been named in South Africa as being "M. pugioniforme Linn.," which at the present day is unknown to botanists.

In the synonymy of the species, references are to previous monographs are sometimes omitted, because I find that as they quoted other is sometimes a mixture of species that makes the reference worthless and so it is not quoted.

Key to the Species.

1. Roots fibrous; plants developing a single and distinct stem 2-3 inches to 2 feet or more high under the central tuft of leaves, erect or bent down from the weight of the leaf-tuft and flowering branches; leaves sharply triangular in cross-section.

Rootstock tuberous, fleshy, long and cylindrical or spindle shaped or irregularly ovoid, producing either a tuft of leaves without a stem under it, from among which the
flowering branches arise, or one or more prostrate stems bearing leaves and flowers at their ends and becoming deciduous.

2. Calyx-lobes shorter than or about equalling the petals, never exceeding them.

Calyx-lobes always or at first distinctly longer than the petals (sometimes on the third day the petals become about as long as the calyx-lobes), stem enduring for 2-3 years.

3. Stem up to 2 feet or more high, erect, enduring for 6-9 years; corolla 3-4 inches in diameter, with the outer petals an inch or more long and \( \frac{1}{2} - 1 \) line broad.

   1. pugioniformis.  
   Stem under 6 inches high, erect; corolla \( \frac{1}{2} - 2 \) inches in diameter, with the outer petals 9-10 lines long and \( \frac{1}{2} - \frac{1}{2} \) line broad.  
   2. brevicaulis.

4. Inner calyx-lobes with pallid, membranous margins; pedicels terete, smooth; corolla \( \frac{1}{2} - 1\frac{1}{2} \) inches in diameter, expanding in the afternoon.

   3. communis.  
   Inner calyx-lobes with blackish or dark fuscous membranous margins.

5. Pedicels angular at the upper part and slightly roughish to the touch; corolla about 3 inches in diameter; leaves stated to be "nearly a foot" in length.

   4. capensis.  
   Pedicels terete, smooth, not angular.

6. Rootstock tuberous; leaves triangular in cross section, with flat or concave sides and sharp edges and keel; some of the calyx-lobes much longer than the petals.

Rootstock tuberous; leaves subterete or channelled down the face with rounded edges and rounded or obtusely-keeled on the back; membranous margins of the inner calyx-lobes blackish or dark fuscous.

7. Calyx without tubercles under the sinuses between the lobes and the membranes of the lobes whitish or pallid; capsule 13-18 lines in diameter with valves 6-7 lines long.

   Bijlii.  
   Calyx with small tubercles under the sinuses between the lobes at the end of raised ribs radiating from the pedicel (sometimes absent), and the membranes of the lobes blackish; capsule about 12 lines in diameter with valves about 5 line long.  
   Luirii.

8. Calyx-lobes shorter than or about equalling the petals.
Calyx-lobes longer than the petals which are ciliate at the basal part with a few minute or short, straight hairs, often scarcely visible to the naked eye.

Petals ciliate at the basal part with long and conspicuous flexuose hairs; corolla 4-5 inches in diameter, expanding in the morning; tuber irregularly ovoid, "sometimes as large as the egg of a goose." elongate.

Petals ciliate at the basal part with short or minute straight hairs.

Rootstock a deformed or irregularly fusiform tuber 3-4 inches long; corolla about 3 inches in diameter and represented with lax petals.

Rootstock a cylindric or radish-like tuber 6-18 inches long; corolla 2½-4 inches in diameter; fruit very large, 1½-2 inches in diameter.

Leaves on the dried specimens 6-9 inches long and 3-3½ lines thick, obtuse; corolla probably about 3 inches in diameter.

Leaves represented as being 3-5 inches long and about 2½ lines thick, acute.

K. E. Brown
(To be continued.)

MENEMBRYANTHEMUM.
(Continued from page 14.)

1. Conicosia pugioniformis, N.E.Br. in Phillips' Gen. of S. Afr. Fl. t. 247. — No tuber, roots fibrous. Stem up to 2-3 feet high and up to an inch in thickness, erect, and enduring for 6-9 years. Leaves 6-9 inches long on the main stem, shorter on the flowering branches, triangular in cross-section, acute, with the upper or all three sides slightly concave and the angles all acute, of a somewhat glaucous-green, purplish at the base. Flowering branches a foot or more long, drooping, with upcurved tips. Pedicels smooth and rather terete than angular except at the apex. Calyx with the ovary-part somewhat campanulately obconic, and with five prominent ribs extending from the angles between the lobes down to the pedicel, on which they are represented as slightly decurrent; lobes shorter than the petals, the inner with pallid membranous margins. Corolla as represented membranous margin by Dillenius, up to 4 inches in diameter, opening about 8-9 a.m. and remaining open until 4-5 p.m. in sunshine; outer petals, as measured on the dried type specimen in the Dillenian Herbarium at Oxford, about an inch long and 2½ line broad, but probably larger when alive, cuneately-linear, acutely acuminate, sparsely ciliate from the base to the middle pale yellow on the inner face, dull reddish on the back, all the inner ones entirely pale yellow, shining. Capsule 9-10 lines in diameter, dark brown, with 15-16 segments and cells. — Gard. Chron., 1928, Vol. LXXXIV, 253.

South Africa: Locality and collector unknown; introduced into cultivation before 1732.

This species has been long lost to cultivation and so far as I have been able to ascertain is not known to South African botanists, who indiscriminately call several other species by this name. Haworth began the confusion of names by redescribing the Linnean H. pugioniforme, as a new species under the name of H. capitatum, for his description of and nearly all that he states about that species, nearly accords with C. pugioniformis as described and figured by Dillenius that I have no doubt whatever that the two names belong to one and the same plant. For according to Dillenius H. pugioniforme lives for six to seven years, and has a stout, erect stem; while Haworth states in a remark under H. pugioniforme, Haw. (not of Linn.), Synon. p. 229, that H. capitatum "is quite upright (when not overdrawn by a hothouse) and lives near eight or nine years in the greenhouse, and its flowers last rather longer on bloom than those of H. pugioniforme." In contradistinction to this he states that his H. pugioniforme (i.e., C. capensis, M.E.Br.) lives for only two or three years, and is little better than a biennial.

Other authors, without investigation of the description given by Dillenius, have confused other species with this, and have mostly accepted the plant figured by Selim Dyck, Leseb. 16, f. 4., as being H. pugioniforme, but that which in my opinion does not differ from that which he figures (f. 3) as H. capitatum, except in size, which I find in some of these plants varies in accordance with food supply, and both differ from the true H. pugioniforme in having much smaller flowers, with the calyx-lobes longer than the petals, as well as being of shorter duration.

The description above given is compiled from the description and type specimen of Dillenius, upon which the species was founded by Linne. Upon the sheet of the type specimen in the Dillenian Herbarium at Oxford is preserved the same mixture of fruit as is represented on the Dillenian plat above quoted, where four capsules are figured and numbered 1-4. Of these only Fig. 4 belongs to H. pugioniforme; the others belong to other genera. Concerning the fruit, Haworth's remark about it (under H. capitatum) is a little obscure, for he states: "I dare not cite this figure of Dill. Hort. Elth., t. 210, for this plant (although nearer to it than the next species), because the capsule there delineated is very much less depressed and not so broad as in this species, whose petals and leaves are shorter than those given on his plate." By "next species" Haworth refers to his... pugioniforme which = C. capensis, M.E.Br. But from his statement that the fruit of his H. capitatum was broader and much more depressed was in some way mistaken, and from what I have observed in cultivated plants, I suspect he had only an unfertilised and probably unripe fruit of H. capitatum before him, for all properly ripened and fully developed fruits of this genus have the top rising into a very distinct cone, while when they are unfertilised the cone is scarcely evident and does not develop, and the rim often remains broader than in the ripened fruit.
This is probably the correct explanation of Haworth's statement. The size of the flower as figured by Dillenius may be too large, but dried flowers that I have seen measure three inches in diameter; yet may have become shrunk in drying.

2. C. breviculus, N. E. Br. in Gard. Chron., 1812, Vol. LXXXIV, p. 282. — Habitat as in C. capensis. Stem 8-9 inches high, 3-4 lines thick, simple, erect. Leaves 2-6 inches long, and 2-3 line broad, trigonous, tending to a very acute point, entirely green, not purplish at the base. Pedicels 1-2 inches long. Calyx-lobes about equalling or a little shorter than the petals. Corolla 12-2 inches in diameter; petals 9-10 lines long, 1-2 line broad, linear, very acute, but not hair-pointed, scarcely ciliate at the base, bright sulphur-yellow. Ovary flattish on the top, but with the centre slightly conical.

Hesperhyanthemum brevicaule, Haw., Suppl. Fl. Succ., p. 41 (1816), and Rev. p. 113; D. C. Prodr., v. 7, p. 426; Salm-Dr., Hesper., f. 16, v. 2; Sond. in Fl. Cap., v. 2, p. 409; Berger, Hesper., p. 316; P. E. Br. in Journ. Linn. Soc. Bot., v. 45, p. 128.

South Africa: Locality unknown; seeds were collected by Burchell between the Vaal River and Graaff Reinet during a journey from Cricutown, in 1812, from which plants were raised in England and described by Haworth.

No dried specimen of this plant is known to exist, but there is a drawing of the true plant preserved in the Kew Herbarium, and Salm-Dr.'s figure correctly represents this species.

3. C. communis, N. E. Br. — No tuber, roots fibrous. Stem 4-8 inches long, erect or bending down and of about 2-3 years duration, producing at the base of the central tuft of leaves flowering branches which become deciduous. Leaves of the central tuft 4-6 inches or those 3-4 lines broad and about as thick, those on the flowering branches smaller, linear-trigoniuous, acute, with slightly concave faces and acute angles, smooth, glabrous, green purplish at the base, more or less glaucous. Pedicels 2-5 inches long, little thick, smooth, glabrous, green. Calyx-lobes longer than the petals, suberect or somewhat unequal, 10-15 lines long, terete, acute, abruptly dilated into an orbicular-ovate base, glabrous, green, three of them with pallid membranous margins. Corolla 1-2½ inches in diameter, opening between 3 and 4 p.m., and closing about 7 p.m.; petals in about 6 series, 7-10 lines long, 1-2 line broad, linear, acute, not hair-pointed, ciliate at the basal part with short, straight hairs, bright, clear yellow, the outer tinted with red at the tips and bronzy-yellow on the back, shining. Between the petals and the stamens are 3-4 lax series of filiform, yellow staminodes more or less incurved, a few of them bearing anthers. Stamen numerous at first inflexed closely around the stigmas, but after the third day becoming lax and standing away from them; filaments pale lemon-yellow, with a dense ring of white hairs around their base; anthers of a darker yellow. Stigmas 12-15, at first erect in a bunch with their tips protruding shortly and in this condition appearing filiform, finally becoming revolute from the base and are then flat, linear and nearly or quite ½-line broad, pale lemon-yellow. Top of the ovary broadly and shortly conical, green.

Hesperanthemum capitatum, Edwards in Bot. Reg., t. 494, as to figure only (not as to description which is copied from that of the true M. capitatum, Haw., Misc. Nat., p. 41); Salm-Dr., Hesper.,

M.B.--I have fruits of two species that grow in Cape Division. One has the back of the valves flet, the other has them grooved, but as neither of them are connected with flowering specimens and are without notes, I do not know which of them belongs to this species, therefore do not quote them.

This plant (together with other) has been confused by authors with C. pugioniformis, and in South Africa I believe passes under that name, but is smaller flowers, with the calyx-lobes longer than the petals, narrower petals, and shorter duration, clearly distinguish it from that species.

Salm Dyck's figures of C. capitatum and C. pugioniforme above quoted appear to me to represent only one species, one figure being that of a larger and more vigorous plant than the other, as there appears to be no difference other than size in the figures or descriptions; and neither figure represents C. capitatum, Haw., nor C. pugioniforme, Linn.

The result of all this previous confusion is that the present plant has remained without a name of its own until the present time. It is not improbable that the plant figured in Geononi's Istoria Botanica, p. 35, c. 13 (1675), under the name "Astero aizoide del Cano di Buone Speranze," may be this species. The figure represents a young plant without flowers, with the root and leaves like those of C. communis.

N. E. Brown
(To be continued.)

Mesembryanthemum
(Continued from page 137.)

Caponia

4. C. canensis, H.E.Br., in Gard. Chron., 1928, LXXIV, 253.--To tuber, roots fibrous. Stem six inches or more high and enduring for only about two or three years, or according to Haworth (Synop. 229) "little better than a biennial, and incapable of sustaining itself erect,. Leaves of the central tuft very long, often nearly a foot in length, compressed-triclinetrous, somewhat channelled and angular flowering branches shorter, glaucous. Pedicels 5-8 inches long, angular and rough. Calyx-lobes longer than the petals, three of them with scorched (exustus) membranous margins, probably meaning that they are of a blackish-or dark fuscous colour. Corolla about three inches in diameter; petals shorter than the calyx-lobes, straw-yellow, very shining. Stamens with straw-yellow filaments and darker yellow anthers. Stigmas 15, finally spreading and linear-lanceolate, with the sides somewhat papillose, straw-yellow.

Mesembryanthemum pugioniforme, Haw., Disc. Int., 42, Syn. Fl. Succ., 22?, and Rev., 11?, excluding all synonymy and vars. b. and c., which do not belong to this genus; and var. d., if it was really distinct from var. a., I suspect was intended to represent the plant
here named C. communis. Not N. pugioniforme, Linn.

South Africa: Locality and collector not stated, but see note below.

The above description is translated from Haworth's account of the plant he described as N. pugioniforme, but which on account of its shorter duration, angular and rough pedicels, calyx-lobes longer than the petals and with fuscous membranes, cannot be the same as N. pugioniforme, Linn.

Haworth states that this species is nearly twice as large as, and more glaucous than his N. capitatum (which = C. pugioniformis), and that its flowers open earlier in the morning but do not last so long.

Apparently no type or figure of the original plant has been preserved, and as the locality from which it came is unknown, this species cannot be identified with absolute certainty. But I have a branch of a plant that was sent to me by Dr. Leaughen Brown from the region of Saldanha Bay, which in habit its angular and slightly rough pedicels and fuscous membranes of its calyx-lobes corresponds with Haworth's description Of N. pugioniforme, and as the region is one from which plants were introduced at the end of the eighteenth century, it is not impossible that Haworth's plant may have come from that area. Therefore, in the absence of any evidence to the contrary, I propose that this Saldanha Bay plant be considered as being the type of C. capensis, until proved not to be so, and give the following account of the dried fruiting material I have:

Flowering branches apparently much like those of C. communis and more or less angular. Leaves very shrivelled, but one or two appear to have been acutely trigonoous. Flowers 5 or 6 at the end of the branch. Pedicels 3-5 inches long, distinctly angular at the upper part, and slightly rough to the touch. Capsule (Fig. 138) from edge to edge of rim 1-1. inch in diameter, shallowly hemispherical beneath, with ridges radiating from the pedicel, where they are almost wing-like, to the sinuses between the calyx-lobes, and on the top with about 15 valves raised into a cone 7-9 lines high and 6-9 lines in diameter at its base. Seeds 2/3-ring long, ellipsoid and distinctly much longer than thick, smooth, brown, spotted with darker brown.

M. E. Brown

(To be continued.)

NESEBRVAMTHEUM.

(Continued from page 335, Vol. XC.)

COLOCOSIA.

5. C. pulliloba, N.E.Br.— (Fig. 42). Plant apparently like C. communis in habit, size and general appearance, with decumbent flowering branches up to a foot long, terete, smooth. Pedicels 3-5 inches long, terete, smooth, not angular. Flowers apparently very similar to those of C. communis in size and colour, but with the membranous margins of the calyx-lobes dark fuscous, not pallid. Petals shorter than the calyx-lobes. Stigma about 15. Capsule from edge to edge of the rim an inch or rather more in diameter, and the cone of carpels about six line in height, with the valves groove on the back.

Cape Division: Near Yalmesbury Road through Riet Vley, Wolley...
Dried specimens of this plant are so like those of C. communis that until I noticed the dark fuscous membranes of the calyx-lobes, I had considered it to be that species, but these indicate a difference that would probably be more apparent if living plants of them two species were compared side by side in flower and fruit. In its fuscous calyx-membranes it agrees with C. capensis, but differs from that species in its smooth and terete, not rough and angular pedicels. Mr. T. N. Leslie sent me a photograph of a flowering branch, produced at Fig. 42, together with seeds of this species, from which I raised a plant that dies after flowering. Its origin was unknown to Mr. Leslie.

11. C. luiirii, N. E. Br., in Gard. Chron., 1928, LXXXIV, 253 (Fig. 43).—Rootstock a fleshy cylindric or radish-like tuber, 8-17 inches long and 1-1 1 inch thick, deeply descending and emitting from the top a sessile tuft of leaves and 5-17 radiating, prostrate or decumbent flowering branches 3-15 inches long and $\frac{1}{2}$ line thick; the whole plant (except petals and stamens) glabrous. Leaves of the central tuft 4-7 inches long, 2-3 lines broad and 1 2-2 lines thick, those on the branches smaller, somewhat sharply triangular in section, with slightly concave faces, acute, entirely green or with the basal part dark purple passing into light violaceous, glabrous. Flowers three to several to a branch. Pedicels 2-3 inches long, 1 line thick, terete, tapering upward, smooth, green. Calyx with the ovary-part shallowly hemispherical, 3 lines broad and 2 lines deep, with 5 slight ribs, each ending between the bases of the lobes in a small, blunt tooth; lobes 1 1/2 inch long, much longer than the petals, linear-trigonal from a broad, ovate base, the inner with broad fuscous, or flackish membranous margins. Corolla 1 1/2-2 inches in diameter, opening in daytime; petals in 5-6 series, spreading in different planes, the outer 6-9 lines long, 1/3 - 2/3 line broad, linear, very acute or acuminate, ciliate at the basal part, with short, fine hairs; the inner gradually smaller with hair-like, curly points; all bright lemon-yellow, the outer dull red or purplish-red on the back. Staminodes filiform, bearded at the base, with tortuous hair-like tips intermingling in a web-like manner, lemon-yellow. Stamens about 30-32 lines long, erect, with recurved tips, filiform, male yellow. Ovary flattish at the top with the centre slightly raised, light green. Capsule 11-14 lines in diameter, with the cone on the top about 5 lines high and with 16-20 valves and cells, the rim around the base of the cone about 1 1/2 line broad. Seeds rather more than 1 line in diameter, compressed-globose, smooth, mottled with light and dark brown, not shining.

Riverdale Division: In sandy places to 100-300 feet altitude.

Nuiir 999 and 4128. Flowering from August to December.

To this species I feel almost certain the plant figured as Chrysanthemum eizoides afrixianum triangulari folio, Creyne, Exot. Fl., p. 163, t. 181 (1679), should be referred, as it has the same kind of foliage and flowers, and the root is stated to be like that of C. fusiformis but larger. As it was in cultivation in 1678, this plant is one of the oldest known members of the Chenkirwetheum group, and the second species of Sonicosia brought into cultivation. Creyne's figure is copied in Grison's Plant. Hist., Ill. 13, 107, t. 6, c. 11 (1679), and has also been wrongly identified as being N. molle, Sprengh. (= N. molle, Kit.) by Klinsmann.

Dr. Nuiir informs me that the Dutch name for this plant is
104 "Endiades" or "duck lines," owing to the yellow colour and soft appearance of the flowers. Drs. van der Bijl described the flowers as "like a powder-puff." But as the flowers of all the species of this genus are very much alike, it is probable that several species are called by the above name, just as this and other species have all been names, "G. rutiliforme" by expert South African botanists.

According to Dr. Suir, the root, when transplanted, is apt to rot and not to grow. This has been my own experience with roots of C. Boscia that have been sent to me. Dr. Suir also informs me that this plant can be grown from cuttings, but they are difficult to set to root.

I have been a specimen collected by Mr. Phillips of a plant that seems to be similar to C. Suirii, but yet may be a distinct species, since it has lower calyx-lobes and their membranous margins are wavy. It is stated to be "a succulent herb with yellow flowers and decumbent stems. Frequent in sand between the Dunes at St. Johns River," and that its common name is "St. Johns Caicum."

(To be continued.)

BIBLIOGRAPHY.

Card. Chron. III. 121: 121. 1831.
(Continued from page 105.)

CONTENTS.

121 7. * C. Bijl, N. E. Br.— (Figs. 47 and 48).— Rootstock


Fleshy, Radish-shaped or perhaps cylindrical (not properly examined). Habit like that of C. Suirii, with a central tuft of leaves 5-7 inches long, 2-3 lines broad and 1-4\frac{1}{2} lines thick, tapering from base to apex, acute, and acutely triangular in cross-section, glabrous green. From the base of the central tuft spread several decumbent flowering branches 4-6 inches long, bearing several pairs of opposite leaves smaller than those of the central tuft and 1-2 flowers. Pedicels 2-3\frac{1}{2} inches long, 1 line thick, terete, slightly tapering upwards, smooth, glabrous, green. Calyx with the ovary-ment shallow, hemispherical, 5-6 lines broad and 2-4 lines deep; lobes 9-11 lines long and much longer than the petals, the inner with whitish membranous margins. Corolla 1\frac{1}{2}-2 inches in diameter expanding in the morning in sunshine or dull weather, closing at night; petals very numerous in about 5-8 series and much shorter than the calyx-lobes, 3-8 lines long, 1\frac{1}{3}-2\frac{1}{3} lines broad, narrowly linear, very acute, the inner passing into staminodes, bright lemon-yellow, the outer dull red on the back, shining, and ciliate with short hairs for 1\frac{1}{3}-2\frac{1}{4} of their length. Staminodes many, but not so numerous as in C. Suirii in the living flowers seen, hair-like, contorted, lemon-yellow. Stamens about 2\frac{1}{2} lines long, with yellow filaments not bearded at the base, and light orange anthers. Stigmas 16-20, about 2 lines long, filiform, light yellow, at first
erect with spreading tips and the anthers pressed closely against their basal part; ovary nearly flat on the top; capsule 11-14 lines in diameter, with the cone about 5 lines high and composed of 16-30 valves, arranged on the back. Seeds rather more than 3 lines in diameter, compressed-globose, smooth, mottled with dull light and dark brown, not shining.

George Division: The wilderness, Mrs. D. van der Bijl, L2. Mrs. van der Bijl, when sending this, expressed the opinion that it was an annual, but I think it must be a perennial with a fleshy rootstock and perhaps deciduous leaves and branches. I only succeeded in raising one plant of it which I failed to keep alive through the winter. Fig. 42 represents this plant just coming into flower, with two buds upon it, but I was unable to obtain a photograph of it when in flower. Fig. 47 represents a diascematic section through one of its flowers. It is very like C. huirii, but differs by the membranes of the calyx-lobes being whitish and by the absence of a small tuberole under the sinuses of the calyx-lobes, and the flatter ovary.

8. C. elongata, N. E. Br., in Gard. Chron., 1923, LXIV, p. 253—Rootstock nearly as large as the egg of a goose, thick and irregular in shape according to the figure. Stems few, prostrate. Leaves 8-9 inches long, absolutely trigonous or rarely somewhat terete, channelled above at the basal half, obtuse, laxly crowded into a head, very fleecous, withering and deciduous. Flowers 1-3, terminal on the branches, when 3 the central pedicel is nearly as long as the leaves and the lateral ones much shorter. Calyx very large, subcampanulate; lobes unequal, shorter than the petels, two much larger than the rest, flat and ovate at the base, with elongated filiform tips, and three with pale purple membranous margins veined with fuscous. Corolla 5 inches or more in diameter, expanding in the morning, showy, with an odour like that of a goat. Petals in many-many series, very narrow, very acute and almost hair-like, of a brilliant sulphur-yellow, ciliate from the base to the middle with long and conspicuous flexuose hairs. Stamens very numerous, short, the outer erect, the inner convergent, sulphur-yellow. Stigmas 10-19, as long as the stamens, with recurved tips.


South Africa: Locality and collector unknown. Haworth gives the locality as "Australia," but that is obviously an error.

This plant is only known from Haworth's description, of which the above is a translation. The large size of the flowers and long, tortuous cilia on the petels would seem to be very striking characters.

9. C. affinis, N. E. Br., in Gard. Chron., 1923, LXIV, 253—Rootstock in a deformed or irregularly fusiform or ovoid tuber 3-4 inches long, producing one or a few leafy annual branches at its apex. Leaves lax, 4-6 inches long and 1/4 line broad, linear-subulate, concave-channelled above at the basal part, terete at the apical part, rounded on the back, slightly glaucous green. Pedic-
broad leaves 216, slightly dried. The sepals are thin, green, 6-15 lines long and 1/3-line broad at the base, tapering to hair-like points, ciliate at the base with minute, straight hairs. Stamens and staminodes very numerous, incurved-convex as in other species. Stigmas 16, filiform, recurving.

Seemianthus elongatum, Salm Dyck, 'esemb., § 18, Fig. 1, and Perser, 'esemb., p. 216, not of Haworth.

South Africa: Locality and collector unknown. As Salm Dyck's work commenced publication 1836 and the plate representing this plant was issued in the second fascicle, it was probably introduced before 1836.

N. E. Brown
(To be continued.)

KEBENTY...NYAN.Z.

(Continued from page 141.)

144

10. C. Roodiae, N. E. Jr., in Gard. Chron., 1932, LXXXIV, 252. — Seed Fig. 56. — Rootstock a long, deeply descending white, fleshy fleshy-tuber. 8-18 inches long and about half-an-inch thick, producing one to several leafy stems from its top. Leaves of the central tuft (in the plant seen) about 6-8, erect or descending, 3-5 inches long, 2-5 lines broad and the same in thickness, gradually tapering from above the middle to an acute point, flatly or slightly channelled on the upper side nearly to the apex, obtusely clavate, keeled on the back, the sides convex, smooth, glabrous, glaucous-green, without dots. Flowering branches 5-18 inches long, and 3 lines thick, arising from the top of the tuber at the base of the central tuft of leaves, glabrous, pale green. Flowers solitary. Pedicels 3-8 inches long, 1-3 lines thick, smooth, glabrous, pale green. Flowers solitary. Calyx 5-lobed; ovary-part hemispherical, 6 lines in diameter; lobes 3-16 lines long, shorter than or about equaling the petals, the outer subulate from a broad base, the inner broadly ovate or elliptic or transversely elliptic-oblong, green at the central part, with very broad membranous, fuscous margins, marked with darker transverse veins. Corolla of the cultivated plant, and of a dried native flower seen, 2 inches in diameter, but stated to be "fully 3-4 inches in diameter," expanding in the afternoon and closing at night, lasting 7-8 days, with a slight and peculiar odour; petals very numerous, in 3-4 series, lax, recurved, spreading in different planes, free, 14-15 lines long, 5 line or less broad, linear, very acute, sparingly ciliate at the base, with minute, straight hairs, scarcely perceptible without a lens, sulfur-white in the cultivated plant, but stated to be of a beautiful rich yellow colour on the wild plant, as indeed it appears to be in a dried flower of the wild plant. Stamens very numerous, loose, 3 lines long, at first incurved over and concealing the stigmas, finally spreading and forming a ring around and exposing the tip of the ovary and stigmas; filaments very slender, bearded at the base, whitish; anthers yellow. Stigmas 16-13, nearly 8 lines.
144 long, filiform, pale yellowish, ascending-spread ing, with recurved tips. Every interior, the top at the centre rising into a cone, with the part around its base concave, light green. Capsule very large, 1½-2 inches in diameter, the rim-part shallowly fluted-shaped, with the 10-12 valves, grooved on the back, rising in a cone at about 3 lines within the fruit, greenish, pale brown; each valve bearing on its inner face two large, wing-like, triangular paliald membranes (cell-partitions) closed together, 9-10 lines long, 6 lines broad at the base, narrowing upwards to an acute point. Seeds few in each cell, nearly 1 line in diameter, slightly compressed-globose and slightly keeled all round, smooth, pale brown.

Van Rhynsdorp Div.: near Van Rhynsdorp, Mrs. E. Hood.

This species differs from C. elongata, var. Er., by the tuber being very long and slender, not swelling out into an irregularly ovoid mass, by its leaves being concave above nearly to their tips, by its smaller flowers, and by the petals (which appear to be less hair-like) being very inconspicuously ciliate, with minute straight (not long and flexuose) hairs.

Possibly the plant figured in the Botanical Register, t. 493, as C. elongatum var. minus, Hew., as to the flowering branch only (not the root) may belong here. It is not typical C. elongata, and no description is given of its rootstock, the figure of the tuber on that plate being made from typical C. elongata. The figure is made from a plant raised at Ley from seed in 1819, and was published on November 1, 1820, so could have been only one year old. It agrees with C. Hoodiae in its characters, except that the stigmas are described as being deep yellow. It differs from C. elongata, petals being straight and minute so as to be scarcely visible to the naked eye.

In the Cederberg Mountains, Little Namaqualand, there is a species with a tuberous rootstock stated to be 12 inches long, that has a large fruit very similar to that of C. Hoodiae in size, but the cone of valves is shorter, the valves differently curved and the wing-like partitions adherent to the valves much shorter, so that is probably a different species.

Since the above was in type, I have received from Professor G.C. Bol, a living specimen of the plant upon which the genus Herrea was founded by Schwantes in Hölder's Deutsche Garten-Seit, 1927, p. 436, upon imperfect material and without giving it a specific name. This plant proves to be merely a species of Conicosia and in all appearance is identical with C. Hoodiae, under which I place it as a synonym. Its flower has been described by Mrs. Bolus (Notes on Nectarb. II, 233) without having identified it as being a Conicosia and without a specific name.

11. C. robusta, N. E. Br., in Gard. Chron., 1928, LX.: 253.—Rootstock not seen nor mentioned on the label but judging from the specimens seen) doubtless tuberous. Dried flowering branches only seen. 3½ lines thick. Leaves opposite, 6-9 inches long, 3½ lines thick, the ultimate or so-called bracts 4-4½ inches long, their sectional form indeterminable, but apparently not acutely angular, obtuse at the apex. Each branch seen has three flowers, the central one with a pedicel 4½ inches long, 1¾ line thick; lateral flowers in bud only. Calyx with the longer lobes exceeding the petals and 1½ inch long, the 3 inner with broad, blackish, membranous margins. Corolla probably about 3 inches in diameter; petals very numerous,
144 the outer apparently 12-15 lines long and \( \frac{1}{2} \) line broad, linear, tapering to a very fine point, apparently not ciliate at the base; the inner gradually shorter and narrower, pale yellow. Staminodes hair-like. Stigmas not seen.

**H. fusiformis, L. Bol. in Gard. Chron., 1929, LXIXIV, 25-E.** Rootstock a fleshy, white, fusiform, or reddish-like tuber about 5 inches long and as thick as the finger. Leaves tufted, 3-5 inches long, 2\( ^{1} \) lines thick, terete, acute, yellowish-green, slightly shining. Pedicels about 4 inches long. Sepal-lobes longer than the petals, with leaf-like tips. Corolla about 2\( ^{1} \) inches in diameter. Petals numerous, in 3 or 4 series, about an inch long, linear, acute, not tapering to hair-like points, sulphur-yellow, with the basal part yellow. Stigmas gold-yellow.


Robben Island. Introduced into Dutch gardens about 1667.

This is the first species of this genus to have been introduced into cultivation, and during the 252 years that have elapsed since the publication 1672 of Breyne's account of it (from which the above description has been mode), nothing more appears to have been known of it. For it soon died out of cultivation and no modern collector has rediscovered the plant, which is stated to have been found on Robben Island. In its terete leaves it differs from all others except H. elongatum.

The plant wrongly figured as being H. fusiformis in J. Fl. Grass, t. 72, may possibly belong here, but its leaves are represented as channelled down the upper side, otherwise the characters seem to agree with those of H. fusiformis.

**Excluded Species.**

**H. coruscans, H.** Succ. n. 90. -- Lewworth's account of this is as follows:--

"Leaves of the head or tuft very long, dagger-shaped, glittering; stem perennial.

I have not seen this alive, but my most excellent discriminating friend Mr. John Howard, not of Bristol, in Surrey, in 1813 communicated to me a dead branch, eight inches long, with a ripe capsule and three broadell leaves several inches beneath the calyx, and each two or three inches long. His letter which accompanied it, said it was a new species allied to . . . sanguisanguis, but glittering like H. albo-s. To me it appeared so closely like H. fusiformis in every respect, in its dry state that but for his letter I should have thought it the same. It lives on flowers several years and is yet living. 'Its flower exactly resembled that of . . . podsiculifer of Pot. Flav., with the rounded calyx and leaves similar to that plant,' Dr. Cox's letter."
Frorn dried flowering branch of S. pugioniformis was sent to Kavorth, but in the mind of Mr. Howard was either confused with another plant that had glittering leaves, or else that he merely meant that the petals of the flower were shining, as they usually are. The above is too confused an account to permit of the retention of the specific name.


South Africa: Locality unknown.

Nothing whatever is known of these plants. They evidently do not belong to this genus. I suspect that they may belong to Leucanthemum or Lemprianthus. Breyne does not figure them, and from his brief descriptions it is utterly impossible to form a correct opinion of them. They were two plants cultivated in Holland before 1678, of which Kavorth had no knowledge.

N. E. Brown

(To be continued.)

**NECHEBY LUCHEUM.**


(Continued from page 144.)

**SAPHESSIA,** N. E. Br.

205

Perennial (or biennial?), herbaceous, succulent. Leaves opposite, not united at the base, flat, entire. Stem branching, with distinct internodes, not woody. Flowers solitary, terminal, on long pedicels. Calyx unequally 5-lobed. Petals numerous, free, shorter than a mass, surrounded by staminodes. Stigmas 5, erect, filiform. Ovary inferior, 5-celled, with the placenta's on the floor of the very shallow cells. Fruit unknown.

A monotypic genus, native of South Africa.

The name is derived from the Greek, sarthes, distinct, because the plant is quite distinct from every other known member of the family.

Although only known from Jacquin's excellent figure and a single specimen in the Herbarium, without fruit, this plant is so unlike any of its allies that it cannot be placed in any genus known to me. I therefore make a fresh one for its reception. Its leaves remind me of those of those Frezis, while its long-stalked flowers recall those of Carpenth. but are totally different in structure.

1. **C. flaccida,** N. E. Br.—Plant herbaceous, glabrous, 3-6 inches high. Rootstock apparently perennial, but may perhaps die after flowering, stated to produce during the first two or three years only a rosette of leaves, which fall away when the plant produces flowers. Flowering stems imple or branched, terete, 1-3 lines thick, with internodes 1/2-1 1/2 inch long, and stated to be weak and flaccid, bearing 2-3 pairs of leaves, light green. Leaves opposite or sub-opposite, sessile, not united at the base, spreading and slightly recurved, 1 1/2-2 inches long, 3-4 lines broad, linear-lanceo-
late, acute, entire, flat above but becoming concave at the base, obtusely keeled on the back, green. Pedicels 1½-7 inches long, 1-3 lines thick, terete. Calyx unequally 5-lobed; ovary-part somewhat hemispheric, rather small and shallow; lobes 4-13 lines long, 1-4 lines broad, varying from ovate-lanceolate to somewhat spatulate, acute. Corolla 11-1½ inch in diameter; petals numerous, in 3-4 series, much shorter than the calyx-lobes and 4-6 lines long, less than ½ line broad, linear, very acute, yellow. Stems about 3 lines long, apparently surrounded by staminodes; anthers yellow. Stigmas 5, erect, 2 lines long, filiform. Fruit unknown.


South Africa: Locality unknown, cultivated by Jacquin before 1804; also a specimen at Kew collected by Horn.

M. E. Brown
(To be continued.)

APATHEIA, N. E. Br.

Dwarf annual, branching at the base, and the branches decumbent. Leaves opposite, petiolate, flat or concave like a spoon, with the reticule dilated below into an open sheath, not united in pairs at the base, and not dotted. Flowers solitary, terminal, on long pedicels. Calyx produced a little beyond its union with the ovary into a saucer-shaped limb, unequally 5-lobed above; ovary-part shallowly hemispherical; lobes narrowly spatulate from a broad base, the inner with broad membranous margins. Corolla, staminodes and stamens arising from the saucer-shaped limb of the calyx; petals numerous in 4-5 series, free, widely spreading. Staminodes numerous, hair-like or petal-like at the base and hair-like above, contorted, at first more or less bent over the stamens, afterwards becoming more erect. Stamens numerous, all inflexed, bent down upon the top of the ovary and then uncurved around the style and stigmas; inner filaments bearded at the base. Style stout, with 10-12 short, filiform stigmas radiating from its apex at about the level of the anthers. Ovary entirely inferior, shallow, flat on the top and sunk below the rim of the calyx, with 10-12 cells; placentas on the outer wall of the cells; ovules many in each cell. Capsule shallow, slightly convex beneath, circular in outline, with 10-12 valves and cells; valves horizontally spreading when expanded, narrowly deltoid; expanding-keels about half as long as the valve, ans sub-continuous into a central keel, adnate to the valve throughout their length, without free tips or wings; cells open, without a trace of cell-wings, and no tuberole. Seeds, in the only capsule seen, only one in each cell, globose, without a hilum, smooth, glabrous.


Species 3, natives of South Africa. The type is A. Illancii, N. E. Br.

The name is derived from the Greek, apate-is, deception, because of the resemblance of the plant to the genus Hymenoxyne.

Key to the Species.
1. Ovary perfectly flat and 5-angled beneath; pedicels 6-7 inches long; stigmas long, united below.

2. helianthoides.

Ovary slightly convex beneath and sometimes angular.

2. Pedicels 2-4 inches long; stigmas ½ line long, radiating from the top of a stout style; ovary flat on the top.

1. Pillansii.

Pedicels ¾-5 inches long; style none; stigmas 1½-2½ lines long, filiform; ovary conical at the top.

3. Maughani.

1. -- A. Pillansii, N. E. Br. in Gard. Chron., 1927, Vol. LXXI, 12 and Journ. Bot. 1928, 138. (See Figs. 110 and 111 and 112). -- Annual, 4-5 inches high, glabrous on all parts except the filaments of the stamens, central stem short, with 8-10 pairs of leaves, internodes very short at the base and ½-1 inch long at the upper part, most or all of the leaves producing procumbent or ascending axillary branches up to 6 or 8 inches long, with internodes up to 1½ inch long. Leaves opposite, petiolate, spatulate, on young plants arranged in 4 vertical ranks on the central stem, withering and disappearing as the plant ages, at first erect and with a tendency to turn themselves edgeways to the sky, becoming more or less spreading; petiole ½-1½ inch long, channelled at the upper part, sheathing but not united at the base; blade 1-2 inches long, 5-13 lines broad, elliptic to lanceolate, acute or subacute, tapering into the petiole, entire, flat or more or less concave and on young plants often with the upper part more or less incurved and so resembling shallow spoons, becoming flat on flowering plants, thinly fleshy in substance, flowering plants smooth and cool to the touch, uniformly green, not glaucous, without dots, glabrous.

Flowers terminal, often 3 on each lateral branch, developing successively. Pedicels 2-4 inches long, about 1 line thick at the base, slightly tapering upwards, without bracts, smooth. Calyx unequally 5-lobes, with the united part shortly produced in a flattened (not cup-like*) manner beyond its union with the ovary, where it is shallowly hemispherical and about 1½ line deep, and has 5 small and rather indistinct angles alternating with the lobes at their base, smooth, green; lobes narrowly spatulate from a broad, ovate base, two of the lobes 6-7 lines long, the others shorter, the 3 inner with broad membranous, fuscous margins. Corolla 16-22 lines in diameter, expanding between 1 and 3 p.m., and closing between 5 and 6 p.m., in dull or sunny weather, slightly scented; petals very numerous in about 5 series, the outermost recurved, the others widely spreading, rather loose and not closely overlapping one another when fully expanded in bright sunshine, the outer 8-9 lines long and the inner 5-6 lines long, ½-¾ line broad, linear, very acute, bright lemon-yellow shading into white at the base. Staminodes numerous, the outer narrowly petaloid at the basal part gradually passing into petals; the inner hair-like, curly, whitish, and at first connivent over the stamens. Style nearly 1 line long, stout. Stigmas 10-12, about ½ line long, filiform (not plumose), radiating, creamy white. Ovary flat on the top, 10-12 celled; cells with 5-7 ovules in each. Capsule as described under the genus, 7 lines in diameter when closed, shallow, flattish above, slightly
262 convex beneath, circular in outline, smooth, pale brown with 10 valves and cells; when expanded 9-10 lines in diameter, uniformly pale brown inside; valves 2½ lines long and 1½ line broad. Seeds 1½-2/3 line in diameter, globose, without a nipple, smooth, glabrous, grey.

Cape Division: Growing in white sand at Somerset Strand, near the shore of False Bay, Pillans.

This rare plant was discovered by Mr. N. S. Pillans in September, 1927, who very kindly supplied me with a specimen and a ripe capsule, in which I found only one seed in each cell, although each cell of the ovary has several ovules. From these seeds I raised a few plants from one of which the accompanying figure (Fig. 112) was made.

It seems to be infertile to its own pollen, as I pollinated four flowers with pollen from other flowers upon the same plant, but no fruit resulted. Pollen is shed in abundance among the crowded filaments of the stamens and on the top of the ovary.

Before it flowered I thought the long-lost Mesembryanthemum helianthoides, Ait., had been rediscovered, as the habit and foliage seemed to be quite the same as in that plant, which probably belongs to this genus, but when it flowered it proved to be quite distinct.

2. A. helianthoides, N.E.Br. -- Annual with stems several inches long and 1½-3½ lines thick, terete, with internodes 1-1½ inch long, glabrous, smooth, green, tinted with purple, especially about the nodes. Leaves opposite, not united at the base, 1½-2½ inches long, spatulate, with a flat, ovate, acute blade, 1-1½ inch long, tapering into a petiole ½-1½ inch long, dilated into an open sheath at the base, smooth, glabrous, neither dotted nor papillate. Pedicels at first terminal, becoming lateral, 6-7 inches long, ½-1 line thick, smooth, glabrous. Calyx with the base or ovary-part perfectly flat (truncate) and 5-angular, apparently 5-lobed to the base, glabrous; lobes subequal 10-12 lines long, 4-6 lines broad at the deltoid-ovate base, tapering into linear obtuse points, apparently not papillate. Corolla much like that of Carpanthea pomeridiana, 2 lines in diameter; petals very numerous, apparently in 4-5 series, spreading in different planes, slender, acute, yellow. Staminodes and stamens inflexed to the centre, yellow. Stigmas (according to Haworth) about 10, long, united below, subulate, recurved, puberulous under a lens, pallid. Ovary depressed.


South Africa: Locality unknown, introduced into cultivation by Masson in 1774.

The above description is compiled from a drawing made by Ann Lee in 1776, now preserved in the British Museum, which, with Haworth's description, represents all that is known of this very distinct plant, as Aiton's description is inadequate.

Until it has been rediscovered and its fruit is known its genus must remain doubtful, but as its habit and foliage so closely accord with that of Apatesia Pillansii, I refer it to this genus for the present.

3. A. Maughani, N.E.Br. -- Annual 2½-6 inches high, with short, erect, or ascending branches. Leaves basal, opposite, 1/2-1½ inch long and 1½-4 lines broad, spatulate-obovate or oblanceolate, ob-
tuse, flat or perhaps concave, tapering into a petiole that is
dilated at the base into an open, flat sheath, glabrous, papulose.
Pedicels erect in flower and fruit, slender, 1 1/2-5 inches long, 3-
line thick, glabrous, not papulose. Calyx with the underside of
the ovary-part slightly convex when in flower and flat and smooth
when in fruit, unequally 5-lobed; two lobes entirely green, 3-7
lines long, linear or linear-spathulate from a broad base, the other
three 2 1/2-3 lines long, suborbicular or broadly ovate, with broad
membranous margins, and a dorsal point 2-3 lines long. Corolla
1 1/2-1 1/4 inch in diameter in the withered flower seen; petals numer-
ous, in 3-4 series, 6-7 lines long, 2-1/3 line broad, linear, acute,
yellow. Staminodes hair-like, tortuous, yellow. Stamens about 3
lines long, with yellow filaments and orange anthers. Style none;
stigmas 7-8, about 1 1/2-2 1/2 lines long, filiform, tortuous. Ovary
partly superior, conical at the top, with 7-8 cells. Capsule, when
closed, 5-8 lines in diameter, circular in outline, flat and smooth
beneath, conical above, with 7-8 valves and cells; valves reflexed
when expanded, entirely pallid, or fuscous or brownish at the apical
and blackish at the fleshy part within, including the expanding
keels, which are closely contiguous below and about 1/3 as long as
the valve; their flanks or marginal parts spread out flat and adhere
to the valve up to the margin, where they turn up into a sharp edge,
and except the very short awn-like tips, which are closely applied
to the valve, they adhere to the valve throughout; cells open,
without cell-wings or a placental tubercle; cell-partitions (from
the component parts being separated and inflated between) appearing
very stout, with convex sides and produced at the centre into a
cone of very acute points. Seeds somewhat compressed, roundish,
2/3 line in diameter, microscopically granulate, pallid or greyish,
dotted with darker grey or brown.

South Africa: Piquetberg Division, at Endekuil, Vaughan Brown.
I place this plant under Apatesia with some doubt as it differs
by the absence of a style, the ovary and capsule conical at the top
and the awned expanding-keels. It requires further investigation
when alive, as my description is made from dried material.

N. E. Brown
(To be continued.)

MENSEMBRYANTHEMUM.
Gard. Chron. III. 100; 164. 1936.

MESTOKLEMA, N. E. Br.

164 Shrubs or shrublets, in one species with a treelike trunk,
bushily and often intricately bunched, sometimes (always?) with
a tuberous rootstock, and the young branches minutely papulose,
slightly rought to the touch when dried and pallid, and the flower
cymes persisting, hardening and becoming subspinose, but are not
pungent. Leaves opposite, not united at the base, often leaving a
tooth-like projection on the stem when they fall away, triginous
or subterete, minutely or microscopically papulose and glittering,
bearing leaf-tufts in their axils. Flowers small, pedicellate, in
terminal bracteate cymes that are 2-5-times dichotomously divided.
Bracts small, leaf-like. Calyx subequally 5-lobed, small, leaf
some of the lobes with narrow, membranous margins. Petals in one
series, linear, often little longer than the calyx-lobes. Stamens
numerous, collected into a cone, the inner bearded; no staminodes.
Stigmas 5, erect, shorter than the stamens, subulate, perhaps papillate. Ovary half-superior, conical or convex and ridged on the ton. Capsule small, half superior, with 5 valves and cells; valves recurved when expanded, with the expanding-keels contiguous below, diverging above, usually dull orange or orange-brown, with rather narrow, membranous acutely-pointed wings; cells roofed with membranous cell-wings and without a placental tubercle. Seeds ovoid, smooth, brown.

Species 4.-- Natives of South Africa. The type of the genus being M. tuberosum, N.E.Br.

The name is derived from the Greek, mestos, full, and klema, a small branch, in allusion to the abundantly branched habit of the bushes.

Although I had held the opinion for many years past that the plants here dealt with formed a distinct genus, I was unable to deal properly with it for want of such material as I have through the kindness of Mr. R. A. Dyer, now had access to, and from which I have formulated the above generic characters.

Mestoklema is allied to Delosperma, and the type species (M. tuberosum) was referred to the leteer genus by Dr. Schwantes, but erroneously, as it has not the generic characters of Delosperma, although South African botanists have accepted that generic determinations, apparently without examination. The two genera, however, differ at a glance, for the peculiar habit, very small flowers, and the persistent, hardened and subspinose cymes give the genus a very distinct appearance, while the important structure of the capsule is distinctly at variance with that of Delosperma, in which the cells are open, without cell-wings, and the expanding-keels different.

This genus is difficult to characterise from dried specimens as the species are similar in appearance, although probably easily distinguished when alive. Unfortunately, I have not been able to examine living material of them, so cannot make use of and contrast such characters as would at once appeal to the student having living plants before him. It is not even known if other species than M. tuberosum and its variety have a tuberous rootstock. So that in compiling the key I have had to make use of such small absolute characters as dissection of the dried material afforded.

Key to the Species.

Pedicels 4-7 lines long; petals 1½-1¾ line long, light magenta.

6. albanicum

Pedicels 1-3 lines long.

Ovary-part of calyx about 1½ line in diameter; corolla 4-4½ lines in diameter, with petals 1¼-1½ line long. Cymes ½-1½ inch in diameter, with at about 7-12 flowers.

Petals coppery fulvous or some shade of magenta.

1. tuberosum

1. tuberosum var. macrorhizum

Cymes 1½-3½ inches in diameter, with 15-50 flowers.

2. copiosum
Ovary-part of calyx $\frac{2}{3}$-
$\frac{1}{2}$ line in diameter; corolla about 1-3 lines in diameter, with petals $\frac{4}{3}$-
$\frac{1}{2}$ line long.

Leaves 3-9 lines long.

Petals orange or yellow, Griqualand west and Namaqua-

land.

Petals "purple" (some shade of magenta?). Albany.

4. elatum.

Leaves 1$\frac{1}{2}$-4 lines long; petals light magenta. 5. illepidum

1. M. tuberosum, N.E. Br.—A much branched shrublet, 9-18
inches high, with a large subglobose or lobed tuberous rootstock.
Main branches tortuose, often intricately branched, 1-3 lines thick,
with internodes 2-9 lines long, with young minutely papulose and
pale greyish becoming smooth and purple-brown or brown with age.
Leaves spreading or ascending-spread ing and recurved at the tips,
4-9 lines pressed, subacute, minutely papulose, green. Cy me $\frac{2}{3}$-
inch in diameter. Pedicels 2-3 lines long. Calyx with the shortly
conical ovary part about 1$\frac{1}{2}$ line in diameter; lobes about 1$\frac{1}{2}$
line long, deltoid or oblong, obtuse. Corolla about 4 lines in diameter;
petals about 1$\frac{1}{2}$-1$\frac{1}{2}$ line long, obtuse, reddish-fuscous and reddish
on the back according to Haworth, but according to notes on labels
verifying from "salmony-pink" to "dark magenta." Stamens collected
in a cone about 1$\frac{1}{2}$ line long; filaments reddish, white at the base
and the inner bearded; anthers white, ex Haworth. Stigmas about
$\frac{1}{3}$ line long. Capsule about 1$\frac{1}{2}$ line in diameter, in structure as for
the genus.

271; Misc. Nat., p. 39; Synop., p. 252, and Rev., p. 179 also in
Phil. Mag., 1826, p. 331, under M. macrorhizum; Salm Dyck., Mesemb.,
49, f. 2; Mag. Bot. and Gard., v. I, t. 6; Berger, Mesemb., p.
100, f. 13., III-IV. M. spinosum, 0, Kuntze, Rev. Gen. Fl., v. 3;
p. 109, not of Linne. Delosperma tuberosum, Schwantees in Mollers

Uitenhage Division: Zwartkops River Valley, Zeyher 2609;
Somerset Division: Near Bruintjes Hoogte, Macowan, 2095. Cradock
Division: near Cradock, Cooper, 496. Middlebrug Division: Middel-
burg Road, Kuntze. Orange Free Stage; near Feuresmith, Smith, 3916,
4036.

And probably also belongs here a plant from Albany Division,
collected on Penrock Farm, 10-12 miles from Grahamstown, at 1500
feet elevation, labelled as having "purple or dark magenta flowers,"
Dyer, 1179.

This plant was introduced into cultivation in England over two
hundred years ago, as it was figured by Dillenius in 1732, and was
probably sent from Uitenhage Division. It is still in cultivation,
but probably not very common.

If the figure in De Candolle, Fl. Grasses, t. 78, is a correct
representation of the plant there named M. tuberosum, there must have
been two species in cultivation under that name, because that figure
represents a plant with stouter leaves, flowers that are nearly twice
the size of those of M. tuberosum, and is stated to grow to 2$\frac{1}{2}$ feet
in height.

Mr. C. A. Smith notes on this labels that in the Feuresmith area
M. tuberosum is called "Donkie Vygie" because the tuberous rootstock is pawed out of the ground and eaten by Donkeys, who are fond of it.

\textit{Ver. macrorhizum, N.E.Br.} -- Plant \(1\frac{1}{2}-2\) feet high, with a large subglobose tuberous rootstock. Branches erect nearly straight. Flowers white. Otherwise as in the type.


South Africa without locality, Bowie, who sent tubers of it to Kew in 1820, when he was collecting in the eastern part of Cape Colony, so it may have come from Uitenhage, Albany or Somerset Division.

I have not seen any wild specimen corresponding with Haworth's description and the drawing of his type of \textit{M. macrorhizum}, which is preserved at Kew. But in 1876 there was a plant at Kew cultivated under that name, of which I dried a specimen for Kew Herbarium, indicating on the label that it was certainly the same as the plant figured by Salm Dyck as \textit{M. macrorhizum}, so that it probably had white flowers, although I have not stated the colour on the label; I well remember it had a very large tuberous rootstock, and its branches are very erect and straight. In 1884 I dried another specimen of a plant identical with that of 1876 in every character, except that I have marked upon the label that the flowers were "coppery-red." This plant was sent to Kew by Mac Owen, and in spite of its erect, straight branches, I strongly suspect is the same as Mac Owen 2095, from Bruinjes, Hoogte, which I have compared with the type of the Dillenian figure from which Linne described the plant and figure from which Linne described the plant and considered it to be identical with the latter. But whether the 1876 and 1884 specimens were from the same individual plant, I cannot now (1933) remember; if so, it indicates that colour of the flower may vary on the same plant; and if they were not it indicates that the straightness of the branches and their erect pose under cultivation is of no specific importance. So, as I have seen no South African specimen that agrees with the type figure of \textit{M. macrorhizum}, I assume it to be only a white-flowered variety of \textit{M. tuberosum}.

2. \textit{M. copiosum, N.E.Br.} -- Probably a small shrub or shrublet, the branches seen being 6-8 inches long, 1\(\frac{1}{2}\)-2 lines thick below, with internodes 206 lines long, minutely papulose and whitish when young, becoming first pale rey and finally smooth and brown with age. Leaves ascending-spread ing, 5-8 lines long and about \(\frac{5}{12}\) line thick, trigonous, obtuse, not or scarcely apiculate, apparently slightly channelled down the face, very obtusely keeled on the back, microscopically papulose. Cymes 1\(\frac{1}{3}\)-3\(\frac{1}{2}\) inches in diameter, four or five times forked and rather densely many (15-50)-flowered. Bracts 1-2 lines long, stout and very obtuse at the slightly recurved apex. Pedicels 1-1\(\frac{1}{2}\) line long. Calyx with the ovary-part 1\(\frac{1}{2}\)-1\(\frac{1}{2}\) line in diameter, very shallowly obconic; lobes about 1-1\(\frac{1}{2}\) line long, deltoid. Corolla apparently about 4 lines in diameter; petals about 1\(\frac{1}{2}\) line long and 1-1/3 line broad, obtuse or acute. Stamens about \(\frac{1}{2}\) line long. Stigmas 5-7, about 1\(\frac{1}{3}\)-1\(\frac{1}{2}\) line long, stout, acuminate. Ovary convex on the top. Capsule 1\(\frac{1}{2}\) line in diameter, obconic. Otherwise as for the genus.

Herbert Division: Mazelsfontein, Anderson 720.
This inhabits the same region as M. arboriforme, and may have been mistaken for that species, but the larger and denser cymes of larger flowers readily distinguish it, and the leaves and bracts also appear to be more obtuse. From M. tuberosum its rather smaller and much more copious flowers at one distinguish it, their colour is not indicated on the label.

3. **M. arboriforme, N.E.Br.**—Plant 9-18 inches in height, tree-like in habit, having a definite trunk “up to one inch in diameter,” much and intricately branched. Main branches 1½-2½ lines thick, with internodes 3-6 lines long, rough from minute papulose and pallid or whitish when young, becoming smooth and purple-brown or blackish-brown with age. Leaves 1½-7 lines long, ½-1 line thick, subteretely trigonous, slightly compressed, obtuse and often slightly recurved at the apex, microscopically papulose under a strong lens. Flowers very small, in terminal, dichotomous cymes 1½-3 inches in diameter. Pedicels ½-1½ line long. Calyx with the ovary-pert shortly obconic and about ½-1 line in diameter; lobes ½-1 line long, deltoid, obtuse, some with membranous margins. Corolla about 3-3½ lines in diameter; petals 1-½ line long, ½ line long, linear, obtuse, on the labels with the dried specimens stated to be "pale orange," "orange-bronze," and "yellow." Stamens about ½-2½ line long, white, with the anthers longer than the filaments. Stigmas ½-1½ line long, subulate. Top of the ovary flattish-conical. Capsule 1½-1½ line in diameter. All other characters as for the genus.


Griqualand West: Hay Division; between Wittewater and Rietfontein, Burchell 2004 (the type); near the Diamond Fields, Shaw, 14; Prieska Division; near Prieska, Bryant 598. Great Namaqualand: Great Karasberg; Narudas Sud, Pearson 8569, and Sandstone plateau on summit of Long Hill, east of Arai Kluff, 6,000 feet. Pearson 8569.

I do not know if this plant has a tuberous rootstock or not, as no collector mentions it on the label with the specimen, nor has Burchell made any note about it in his manuscript catalogue at Kew. Pearson has labelled 8569 as being a "bush 1-3 ft.," so that the Namaqualand plant may grow taller than it does in Griqualand West and Prieska. But I can detect no difference between the specimens, apart from size.

4. **M. elatum, N. E. Br.**—A shrub 2-4 feet high, with the main branches ascending, 2-3 lines thick below, with internodes 5-12 lines long, when young very minutely papulose and pale greyish, becoming smooth and brown with age, but in the dried state the bark is longitudinally wrinkled. Leaves ascending-spreading in or spreading, 4-7 lines long, 2½-3½ line thick, compressed-trigonous, flat or slightly charmed down the face, keeled on the back, recurved at the apex, which is dorsally shortly acute or obtuse as viewed sideways, microscopically papulose. Cymes 1½ inch in diameter, densely 15-20-flowered. Pedicels 1-3 lines long. Bracts very small, about ½-3 line long and apparently soon falling away. Calyx with the shortly obconic ovary-pert 1½-1½ line in diameter; lobes about ½ line long, deltoid, obtuse. Corolla 3½-5½ lines in diameter; petals scarcely 1 line long, obtuse, "purple" probably of some shade of magenta. Stamens about ½ line long. Stigmas scarcely 1/2 line long. Capsule 1½-1½ line in diameter, soon falling.
165 away. In other details as for the genus.

Albany Division: Fish River Valley; between Committees and Hunts Drift, 1,500 feet, Dyer 890 (the type), and Hunts Drift, Rylling, 975.

This is well distinguished from allied species by its taller habit and compact cymes of smaller flowers.

5. *M. illepium*, N. E. Br.—Plant about 9-10 inches high, glabrous, much branched. Main branches 2½-4 lines thick at the lower part, with internodes 3-6 lines long, when young minutely papulose and whitish in the dried state, becoming brown with age. Leaves small, 1½-4 lines long, ½-4 line thick, compressed-subterete, obtuse, somewhat recurved at the apex, microscopically papulose, green. Flowers very small, in terminal bracteate cymes, with bracts ½-1 line long. Pedicels 1-2 lines long. Calyx with the ovary-part 1-1½ line in diameter; lobes ½ line long, deltoid, obtuse. Corolla apparently about 3 lines in diameter; petals 1 line long, 1/5-1/4 line broad, obtuse, "light magenta." Stamens about ½ line long, apparently white. Stigmas approximately ½ line long, subulate. Capsules about 1½ line in diameter. In all other characters as for the genus.

Bedford Division: on the road from Grahamstown to Bedford, in karroid veld, Dyer 2336 (the type). Albany Division: karroid area off the Cradock Road, 7-8 miles from Grahamstown, Britten 38.

In appearance the branches of this plant are much like those of *M. tuberosum*, but the leaves and flowers are smaller. Britten 38 appears to belong here, but sometimes forms a bush 1½ inches or more high. Its rootstock is formed of a cluster of stout, fusiform, tuberous roots, ½ inch or more thick.

6. *M. albenicum*, N. E. Br.—Plant about 9-15 inches high, glabrous. Main branches apparently decumbent at the base, then erect or ascending, branching, 1-1½ line thick below, with internodes mostly 6-9 lines long, minutely papulose and ash-grey when young, becoming smooth and brown with age. Leaves spreading, more or less recurved at the tips, 3-5 lines long, ¾-1½ line thick, apparently flattened or slightly channeled on the face and obtusely keeled on the back, probably compressed, minutely papulose. Cymes 1-2½ inches in diameter, lax. Pedicels 4-7 lines long. Calyx subequally 5-lobed, the ovary-part about ¼ line in diameter, shortly obconic; lobes 1-1½ line in length, deltoid, obtuse. Corolla apparently about 3½ lines in diameter; petals 1½-1¾ line long, linear, obtuse, "light magenta." Stamens about 1 line long. Stigmas about ½ line long, subulate; top of the ovary convex. Capsule 2-2½ lines in diameter. In all others characters as for the genus.

Albany Division: seven miles from Grahamstown along the Cradock Road, 3,000 feet alt. Dyer 1308. MS. of the late Dr. N. E. Brown.
Index to Genera and Species

Acaulon 300, 301
   rosulatum 302
Acrodon 160
   bellidiflorus 160
Aloinopsis 302, 314, 315
   albinota 311
   albipuncta 313
   aloides 318
   aloides v. striata 318
   cibdela 313
   Dyeri 319
   Orpenii 325
   Peersii 320
   rosulata 302
   rubrolineata 319
   vittata 316
Amoebophyllum 82, 226, 232
   angustum 233
   Gurichianum 233, 234
   Rangei 233, 234
   roseum 234
Antimima 292
   dualis 292
Aptenia 79, 253
   cordifolia 254
   cordifolium 253
Argeta 182
   petrensis 183
Argyroderma 37, 40, 51, 81, 84, 128, 293
   crateriforme 129
   duale 39, 130, 292
   Margaretae 171, 258
   Margaritae 130, 258
   necopinum 39, 130, 292, 293
   roseatum 39, 130
   subalbum 38, 39, 130
   testiculare 37, 38, 39, 128, 129, 130
   testiculare v. luteum 38, 130
   testiculare v. Pearsoni 38, 130
   testiculare v. roseum 38, 129, 130
Aridaria 78, 83, 235
   laxa 238
   Rabei 238
   resurgens 248
Aspazoma 82, 232
   amplectens 232
Bijlia 261, 262
Aptesia (Cont'd.)
   Pillansii 159, 342, 343, 344

Apesia 159, 342, 345
   helianthoides 159, 343, 344
   Maughani 343, 344
Bijlia (Cont'd.)
cana 261,262
Bolusanthemum 262
Tugwelliae 261
Carpanthea 80,223,240
pomeridanum 223
Carphobrotus 83
Cephalophyllum 84,85
dubium 76
Cerchlamys 261
Cheiridopsis 80,85,132,133,134,
136,141,147,155,269
bibracteata 134
bifida 134,141
candidissima 134
carnea 134,136
Carol-Schmidtii 135,136
cigarettifera 133,135,137
cuprea 135,138
denticulata 135
denticulata v. glauca 135
difformis 135
inconspicua 135,139
inspersa 135
lecta 135
Marlothii 135,139,142
Meyeri 135,141
parvula 135
Cheiridopsis (Cont'd.)
Pearsonii 135,142
peculiaris 133,135,141,142
pressa 135
purpurascens 135
robusta 135
Roodiae 136,144
rostrata 134,136,141,144
rostratoides 136
tuberculata 134,136,145
ventricosa 132,136,146
Chrysanthemum
africanum triangulari folio 335
aizoides africanum teretifolium 340
aizoides africanum triangulari
folio flore careno 341
aizoides africanum triangulari
folio flore purpureo 341
Circandra 285
serrata 285
Cleretum 80,184
apetalum 184
criniflorum 184
gramineum 184
papulosum 184
pinnatifidum 184
puberulum 184
Conicosia 80,83,158,326,327,335,339
affinis 248,330,337
Conicosia  (Cont'd.)

Bijlii  329,336
brevicaulis  248,329,332
capensis  248,329,331,332,333,334,335
communis  329,331,332,333,334,335
elongata  248,330,337,339
elongatum  340
fusiformis  248,327,330,335,340
Muirii  248,327,329,335,336,337
pugioniformis  248,327,329,330,331,333,334,341
pulliloba  329,334
robusta  248,330,339
Roodiae  248,327,330,336,338,339

Conophyllum  266,268,269
clivorum  275
cognatum  275
dissitum  274
moniliforme  266
nanum  276
pisiforme  267
proximum  274

Conophytum  12,30,31,44,45,47,68
77,81,86,87,99,105,
108,112,113,118,127,
141,158,161,162,174,
184,227
advenum  89
aggregatum  59

Conophytum  (Cont'd.)

albertense  53,96
albescens  100,101,102
altile  64,65
andausanum  162
Angelicae  89
apiatum  66,100
assimile  90
Batesii  90
bilobum  66,67,89,94,99,100,104,
112,113,169
breve  91
Brownii  163
calculus  50,91
catervum  59
cauliferum  67,101,184
cibdelum  88,91
clarum  162
Comptonii  163
dispar  92
diversum  162,163
ectypum  92,163,165
elegans  184
Elishae  67,101,112,113,169
exsertum  100,101,102
fibuliforme  49
ficiforme  63,92
fimbriatum  49
flavum  164,184
Conophytiim (Cont'd.)

fraternum 53
Friedrichiae 298
globosum 46,50
gracilistylum 68,93,94,100,162
gratum 54
hahlenbergense 94,100,102
hians 164
inornatum 93
Johannis Winkleri 93
juncundum 47,49,51
klaverense 93
kubusanum 164,165
labyrintheum 60,61
Leipoldtii 48,94
leviculum 47,55,59,60,94
limbatum 165
longistylum 295,296
longum 298
luteum 296
Marlothii 162,165,166
Maughani 296,297,298
Meyeri 94,99,113,166
minimum 55
minusculum 46,61,98,162,169
minutiflorum 91,93,94,95
minutum 47,49,51,95

Conophytiim (Cont'd.)

misellum 166
Muiri 166
mundum 58,59
Nevillei 47,53,57,96
novellum 162,167
notabile 296
notatum 95
nucifforme 67,100
obcordellum 57,95
obmetale 56
obscurum 167
odoratum 64,65
oviforme 47,49,52,105
Pageae 50,91,95
pallidum 65
parvipetalum 47,53,58
pauxillum 61
Pearsonii 95,96,99
Pearsoni v. minor 96
perpusillum 56
petraeum 62
pictum 60,88
picturatum 167
pilosulum 46,48,87,95,127
piluliforme 54,55
pisinnum 49,98
Conophytum (Cont'd.)

placitum 63,65,96,161,162
polulum 61,161,162
praecinctum 56
praeparvum 162,168
praesectum 298
pubescens 128
Purpusii 96
pusillum 60,61
quaesitum 65,66,100
retusum 168
Roodiae 100,103
rufescens 297
saxetanum 47,49,50,52,53,97,166
scitulum 62
Shandii 128
signatum 47,55,59,60,88
sororium 101,103
spirale 97
subfenestratum 297
subrisum 47,50,51,95
tantillum 97,169
Taylorianum 98
translucens 47,53,54
truncatellum 91,96,161,296
truncatum 54,55
turrigerm 49,65,68,100

Conophytum (Cont'd.)

uvaeforme 63
vagum 62,89
viridicatum 47,49,53
viridicatum v. punctatum 98
Wettsteinii 47,49,51,95,96,99
Whettsteinii 98,113
Wiggettae 99

Cryophytum 78,79,86,223,235,239,245
Aitonis 240,253
arenarium 244
Barkleyi 263
Barklyi 240,245
Bijliae 263
Burchellii 241
clandestinum 241,242
conjectum 241
crassifolium 243
crystallinum 240,242
Fanchelii 243
gibbosum 262
grandiflorum 240,242,263
grandifolium 263
inachabense 246
Maxwellii 247
nanum 263
neglectum 247
nodiflorum 247,263
Cryophytum (Cont'd.)
  paulum 246
  Rogersii 246,264
  sessiliflorum 245
  Wilmaniae 247,264
Dactylopus 82,226,228,229
digitata 222,230
Deilanthe 299,319
  Peersii 320
Delosperma 80,84,181,226,346
tuberosum 347
Depacarpus 282
tinctus 282
Derenbergia 112
Dicrocaulon 282
  Pearsoni 282
Didymaotus 84,114,149
  lapidiformis 150,151
Dinteranthus 171,255,256
  inepectatus 256
Maragaretae 258
  Margaretae 255
microspermus 171,255,256
Pole Evansii 256
  puberulus 256
Diplosema 225
  Leipoldtii 226
  retroversum 225,226,227
Disphyma 84
  australis 259,277
Dolosperma 78
Dorotheanthus 184
  criniflorus 184
  gramineus 184
Drosanthemum 277,278,283
  hispidum 283
Eberlanzia 278
Echinus 278,284
  edentulus 284
Ectotropis 160
  alpina 160
Enarganthe 284,289
  octonaria 284,290
Erepsia 78,80,84,86,291
  viridis 291
Fenestaria 83,107,184
  aurantiaca 185
  rhopalophylla 185
Frithia 83
Gibbaeum 15,40,41,45,61,63,67,95,
  108,114,117,118,120,127,
  178,258
  album 120,121,122,123
  album v. roseum 178
angulipes 178
argenteum 15,41
  dispar 121,123,179
Gibbaeum (Cont'd.)

- geminum 42,120,124,179
- gibbosum 43,44,118,119,122
- luteoviride 122,124
- Marlothii 258
- molle 119,120,124
- Muiri 119,121,125
- perviride 43,118,119,122,126
- perviride v. B.124
- perviride v. luteoviride 43, 124
- pilosulum 120,126
- pubescens 41,42,118,119,121,127,128,180
- shandii 42,43,121,128,180

Glottiphyllum (Cont'd.)

- hamatum 208
- latum 24,25,186,187,192,200,201,211,212,213,214,215
- latum vars. 192
- latum v. cultratum 212,215
- linguiforme 23,186,194,216
- longipes 190,198,199
- longum 22,23,25,26,186,191,200,205,206,207,208,215
- longum v. hamatum 191,204,205,207
- Marlothii 193,194,200
- Muiri 187,193,209,210
- Neilli 194,218
- oblquum 24,25,212,213
- ochraceum 29,85,190,219
- praepingue 27,192,193,199,200,201,203
- proclive 193,205
- pustulatum 22,24,187,188,206,208,209
- regium 221
- salmii 27,192,193,199,200,208
- semicylindricum 28,29,190,196,200
- suave 190,192,194,215,216
- subditum 191,197,201
- taurinum 26,193,204
- uncatum 25,26,192,205

Gymnopoma 222

- tripolium 222,223
Hereroa 262
Tugwelliae 261
Hydrodea 78, 86, 250, 252
cryptantha 251
Hampdenii 252
Hymenogyne 79, 280, 342
calycinus 236
canaliculatus 235, 236, 237
carneus 236, 237
caudatus 236, 239
commutatus 235, 236, 238
fragilis 236, 237
glabra 248
grossus 236, 239
laxus 236, 238
longispinulus 236, 238
oculatus 236, 237
Rabei 236, 238
salmonesus 235, 236, 237
stephensiae 248
tenuiflorus 236, 237
viridiflorus 236, 237
Juttadinteria 262
Tugwelliae 261
Khadia 300, 321
acutipetala 321, 322, 323
Beswickii 322, 323
Khadia (Cont'd.)
Nationae 321, 323
Nelsoni 322, 323
Lampranthus 284, 293, 341
acutifolius 293
aduncus 293
altistylus 293
amoenus 293
aureus 293
bicolor 293
brachyandrus 293
Brownii 293
caespitosus 293
calcaratus 294
capillaceus 294
coccineus 294
Comptonii 294
conspicuus 294
corallilflorus 294
curvifolius 294
cyathiformis 294
debilis 294
deflexus 294
defhus 294
dilutus 294
disgregus 294
diutinus 294
Lampranthus (Cont'd.)

Dregeanus 294
drepanophyllus 294
Dyckii 294
emarginatoides 294
emarginatus 294
erratus 294
explanatus 294
falcatus 294
falciformis 294
filicaulis 294
flexifolius 294
flexilis 294
formosus 294
Framesii 294
furvis 294
glaucoides 294
glaucus 294
glomeratus 294
gracilipes 294
Guthrieae 294
Haworthii 294
Henricii 294
imbricans 294
Immelmaniae 294
inaequalis 294
lexifolius 294
leptaleon 294
Lampranthus (Cont'd.)

Lerouxiae 294
longistamineus 294
lunatus 294
macrocarpus 294
magnificus 294
marcidulus 294
maturus 294
matutinus 294
microstigma 294
multiradiatus 294
multiseriatus 294
mutans 294
parcus 294
pauciflorus 295
paucifolius 295
Peersii 295
perspicuus 295
Pittenii 295
plautus 295
Pocockiae 295
polyanthon 295
productus 295
promontorii 295
reptans 295
rupestris 295
Rustii 295
saturatus 295
Lampranthus (Cont'd.)
saber 295
sociorum 295
spectabilis 295
spinifbrmis 295
Stayneri 295
stenopetalus 295
stems 295
stipulaceus 295
swartbergensis 295
tegens 295
tenuifolius 295
tulbaghensis 295
turbinatus 295
vallis-gratiae 295
Vanzijliae 295
variabilis 295
verecundus 295
viatorum 295
Watermeyeri 295
Woodburniae 295
Wordsworthiae 295
Zeyheri 295
zygophylooides 295
Lapidaria 256,257
Margaretae 255,257
Leipoldtia 285,286,287

Leipoldtia (Cont'd.)
constricta 285

Lithops 30,33,45,77,81,105,107,114,
123,158,169,227

bella 36,37,170
damarana 36,37,109
Eberlanzii 108
Francisci 108
Friedrichiae 32,109,112
Fulleri 169
fulviceps 31,33,109
Julii 109
karasmontana 109,169
Lericheana 109,170
Lesliei 31,34,106,107,108,110
Marlothii 110,184
marmorata 35,111
Munditi 170
optica 31,36,111
pseudotruncatella 34,107,111,171
pseudotruncatella v. alta 170
rubra 111
Ruschiana 111,119
Ruschiorum 119,120,171
terricolor 35,112
turbiniformis 32,106
Vallis Mariae 112
Litocarpus 254
cordifolius 254
Lycoperdiastrum 50
soboliferum altius radicatum 50
Macrocaulon 159
Candollii 159
Valephora 161
mollis 161
Mesembryanthemum
abruptum 288
acineciforme 73
acutifolium 293
acutipetalum 322,323
acutisepalum 248
adscendens 24,26,207,212,213
aduncum 293
aequilaterale 18
aggregatum 59
Aitonis 240
albertense 53,96
albicuta 280
albinotum 311
albipunctum 313
albipunctum v. majus 313
aloides 313,315,318
alsinifolium 241
altile 64

Mesembryanthemum (Cont'd.)
amoenum 293
amplectens 232
amplexum 279
amplexatum 279
androaceum 279
angeiforme 93
Angelicae 89
angulatum 240,253
angulatum v. ovatum 253
angulipes 179
angustum 23,25,204
angustum v. heterophyllum 26,30,186,205,207
angustum v. pallidum 26,204
apetalum 184
apiatum 66
apidiforme 150
aquosum 248
arboriforme 349
arenosum 248
armatum 279
articulatum 248
assimile 90
Astridae 305
 atratum 279
atrocinum 230
aureum 1,293
Mesembryanthemum (Cont'd.)

barbatum 283
Barklyi 245
Barklyi v. obtusifolium 245
Barnardii 279
bellidiflorum 160
Beswickii 322
bibracteatum 134
bicolor 293
bicoloratum 279
bicolorum 327, 340
bicorne 249
bidentatum 29, 196, 197
bifidum 10, 134
bigibberatum 29, 186, 197
Biljiae 279
bilobum 66
blandum 1
Boehmerianum 97
Bolusii 11, 37, 123, 148, 315
brachyandrum 293
brevicaule 248, 332
brevipes 131, 132
Brownii 1, 293
caducum 248
caesitatum 293
calamiforme 10, 73
calceratum 294

calcareaum 2, 304, 306
calculus 50, 91

calculus v. minutiflorum 94
calycinum 236
campestre 292
canaliculatum 236, 237
candidissimun 134
Candollii 159
caninum 262
canum 30, 198, 260, 261, 262, 320
capillaceum 294
capitatum 248, 331, 332, 333, 334
carinans 2, 157, 158
carneum 237
carolinense 310
Caroli-Schmidtii 137
catervum 59
caudatum 239
Chauviniae 93
chrysoleucum 267
cibdelum 313
cigarettiferum 138
ciliolatum 279
clandestinum 241
clavellatum 249
clavulatum 248
cleistum 279
Mesembryanthemum (Cont'd.)
clitorum 275
coccineum 1,19,294
coccinum 304
cognatum 275
commutatum 230
compactum 155,225,259,260
Comptonii 294
comptum 279
concinnum 2
connatum 279
conspicuum 294
Cooperi 4
coralliflorum 294
corallinum 248
cordifolium 254
coriarium 248
coruscans 340
crassipes 307
crassulifolium 279
crateriforme 129
criniflorum 184
cruciatum 26,27,28,198,199
cryptanthum 251,252
cryptopodium 67
crystallinum 19,73,74,242
crystallinum v. annuum 242

Mesembryanthemum (Cont'd.)
crystallinum v. grandiflorum 243
crystallinum v. vienne 242
crystallophanes 241
cupreum 139
culturate 25,212,214
curvifolium 294
cyathiforme 294
dactylinum 248
damarenum 109
damatum 37
debile 294
decuptum 279
decurrens 279
deflectum 279
deflexum 294
Dejagerae 279
deltoides 1,284
denticulatum 135
denticulatum v. candidissimum 134
denticulatum v. glaucum 135
depressum 23,25,212,214
diforme 21,28,29,30,73,135,195,196,197
diffusum 294
digitatum 230
digitiforme 230
Mesembryanthemum (Cont'd.)

- dimorphum 248
- dinteri 248
- displosum 280
- dissitum 274
- diutinum 294
- diversipapillosum 248
- dolabriforme 10
- Dregeanum 294
- drepanophyllum 294
- duale 39, 292
- dumosum 280
- Dyckii 294
- Dyeri 279
- Eberlanzii 108
- edentulum 284
- edule 18, 73
-elineatum 279
- Elishae 67
- elongatum 248, 253, 337, 338
- elongatum var. B. 337
- elongatum var minus 337, 339
- emarginatoides 294
- emarginatum 294
- enormus 280
- evolutum 12, 282
- exacutum 279

Mesembryanthemum (Cont'd.)

- exiguum 135
- exile 279
- expansum 223, 250
- explanatum 294
- faciforme 92
- falcatum 1, 294
- falciforme 1, 294
- familiare 96
- fastigiatum 248
- Fenchelii 243
- Fergusoniae 279
- ferrugineum 110
- fibuliforme 49
- ficiforme 63, 64
- filicaule 294
- filipetalum 279
- fimbriatum 49, 53
- firmum 279
- fissum 115, 116
- flaccidum 294, 342
- flavens 279
- flexifolium 294
- flexile 294
- floriferum 280
- foliis difformeibus 196
- foliis difformibus 28, 29, 195
Mesembryanthemum (Cont'd.)

foliis linguiformi longiore 26

folio linguiforme longiore 213
folio linguiformi angustiore 25, 212
folio linguiformi latiore 24, 212
folio linguiformi longiore 206
folio scalprato 24, 217
formosulum 230
formosum 294
Forskahlii 248
Fourcadei 279
Fragrans 23, 218
Framesii 279, 294
Francisci 109
fraternum 18, 54
Friedrichiae 14, 109
fulviceps 33
furvum 294
fusiforme 248
fusiformis 340
geminum 279
geniculiflorum 73, 74
Gessertianum 249
gibbosum 44, 118, 126
glabrum 5

glabraceum 244

glaciare 242

glareosum 249
glaucoides 294
glaucum 294
glebula 94
globosum 50
glomeratum 72, 294
Goodiae 279
gracilipes 294
gracilistylum 68
gramineum 184
grandiflorum 23, 209
grandifolium 244
granulatum 2, 157
granulicaule 249
gratum 54
grossum 237, 239
Gurichianum 234
Guthriace 294
gymnocladum 248
Haeckelianum 253
hahlenbergense 102
hamatile 279
Haworthii 1, 294
Heathii 6, 75, 115
Mesembryanthemum (Cont'd.)
hebes 280
helianthoides 150, 344
Henricii 294
herberum 3
herbeum 4
Herrei 279
heteropetalum 1
heterophyllum 26, 29, 202, 207, 220
hexamerum 279
hirtum 4
hispidum 1, 283
Hookeri 33, 35
Hugo-Schlechteri 305
Hutchinsoni 279
imbricans 294
Immelmaniae 294
inachabense 246
inaequale 294
inclaudens 19
inclusum 288
incurvatum 279
inexpectatum 257
insidens 279
inspersum 135
integrum 291, 292
intervallare 289
intervallaris 284, 289

Mesembryanthemum (Cont'd.)
iteratum 279
Johannis Winkleri 93
jucundum 51
jugiferum 64
Julii 109
junceum 249
Juttae 249
karasmontana 109
karooicum 292
Kuntzei 249
labyrinthicum 60
lacerum 160
lanceolatum 241
lanceum 250
lacunatum 280
lapidiforme 11, 17
latens 279
 latum 24, 25, 212, 213, 295
latum var. B. 213
latum var. breve 25, 212, 213
laxifolium 294
laxipetalum 279
lectum 135
Leipoldtii 279
lene 279
leptaleon 294
Mesembryanthemum (Cont'd.)

leptarthron 249
Lericheanum 109
Lerouxiae 294
Lesliei 13,14,15,35,107,110
leviculum 59,94
lineare 1
linguaeforme 24,212
linguae forme v. assurgens 212
linguaeforme v. prostratum 212
linguaeforme v. rufescens 214
linguaeforme v. subcoruciatum 212
linguiforme v. attollens 205
linguiforme v. uncatum 205
lingueforme 25
linguiforme 17,21,24,25,26,73,186,217
linguiforme var. d. 206
linguiforme var. g. 212
linguiforme var. y. 25
linguiforme v. adscendens 212
linguiforme v. angustum 204
linguiforme v. cultratum 212
linguiforme v. declive 212
linguiforme v. depressum 212
linguiforme v. flaccidum 214
linguiforme v. fragrens 218
linguiforme v. grandiflorum 209

Mesembryanthemum (Cont'd.)

linguiforme v. heterophyllum 204,205
linguiforme v. latum 24,212
linguiforme v. longum 206
linguiforme v. obliquum 212
linguiforme v. pustulatum 206
linguiforme v. scalpratum 217
linguiformi lingiore 207
locale 31
longipes 279
longispinulum 236,238,239
longistamineum 294
longistylum 293
longum 6,10,26,75,206,207,212,213
longum v. angustius 208
longum v. attollens 205
longum v. declive 25,186,212,214,215
longum v. flaccidum 26,207,212,215
longum v. purpurascens 208
longum v. uncatum 25,205
loratum 250
loreum 73
lucidum 24,26,186,212,213,217,226
lunatum 294
luteoviride 43,118,119,124
luteum 1
macellum 3,4
macrocarpum 294
Mesembryanthemum (Cont'd.)
macrorhizum 347,348
magnificum 294
magnipunctatum 153,154,262
magnipunctatum v. affine 155
magnipunctatum v. duplomis 154
Mahoni 3,4
maleolens 279
malleoliforme 96
Margaritae 130,258
marginatum 36
marmoratum 14,36
matutinum 294
Maxwllii 279
medium 24,210
megarhizum 348
melanospermum 249
mentiens 249
Meyeri 279
micans 340
micranthon 249
micropetalum 279
microspermum 171,256
microstigma 294
minimum 56
minusculum 61,96
minutiflorum 94

Mesembryanthemum (Cont'd.)
minutum 49,53,57,95
mitratum 273
mollle 161,327,335
moniliforme 266
mucronulatum 249
multiflorum 1
multipunctatum 134
multiradiatum 1,284,294
multiseriatum 294
mutans 294
muticum 279
namequanum 280
nanum 54,68,105
Nationae 323
necopinum 39
Nevillei 57
niveum 280
nobile 155,259,260
noctiflorum 73,74
nodiflorum 73,74,247
nuciforme 56,67
oboconellum 57,58,95
obcordellum 57,58
obliquum 25,212
obmetale 56
ochraceum 29
Mesembryanthemum (Cont’d.)

octojuge 285, 287
octonaria 290
octonarium 284
octophyllum 33, 40
octophyllum var. B. 39
octophyllum v. roseum 38
oculatum 237
odoratum 64
optatum 156
opticum 14
opticum v. rubrum 111
Orpenii 19, 20, 325
oviforme 10, 52, 105
Pageae 50
pallens 250
pallidum 65, 294
pansifolium 280
papillatum 280
papulosum 184
parvibracteatum 280
parviflorum 249, 295
parvipetalum 59
parvulum 135
parvum 280
pauciflorum 295
paucifolium 295

Mesembryanthemum (Cont’d.)

pauxillum 61
Pearsonii 38
Peersii 295
pellanum 279
perforatum 280
perpusillum 56
perspicuum 295
perviride 43, 118, 119, 124, 126
perviride var. 43
Pfeilii 249
phylicoides 280
pictum 60
pilosulum 6, 48, 75
piluliforme 8, 10, 54, 59
pinnatifidum 184
piscodorum 280
pisiforme 267
pisinnum 49
Pittenii 295
placitum 65
Pocockiae 295
Pole-Evansii 117, 256
polyanthon 72, 295
polyanthum 1
pomeridianum 6, 69, 74, 75, 248, 340
praecox 294
Mesembryanthemum (Cont'd.)
praepingue 27,197,201,202
pressum 135
productum 295
promontorii 295
pronum 280
prostratum 280
proximum 11,12,272,274
pseudotruncatellum 10,13,14,34,111
puberulum 184
pubescens 15,41,118
pugioniforme 73,248,327,328,331,333,334,336,337,340
pugioniforme florea mplo stramineo 331
pugioniforme v. bienne 333
pugioniforme v. carneum 341
pugioniforme v. purpureum 341
pulchellum 282
pumilum 280
purpurascens 135
purpusii 96
pusillum 60
pustulatum 24,206
pustulatum v. lividum 206
pygmaeum 12,138,282
pyropeum 1
Mesembryanthemum (Cont'd.)
quadridum 145
quesitum 66
remulosum 136
rapaceum 236
recumbens 20,21
reductum 280
relaxatum 250
reptans 295
resurgens 248
retroversum 226
rhopalophyllum 15,36,107,185
robustum 135,142
roseatum 130,279
roseum 72
rostratum 10,73,145,146
rostratum v. brevibracteatum 134
rostrum ardeae referens 145
rosulatum 302,314,315
rubrolineatum 319
rufescens 23,214,215
rupestris 295
rupicolium 278
Ruschianum 111,119,122
Ruschii 111
Ruschiorum 111,120
Rustii 295
Mesembryanthemum (Cont'd.)

Salicornioides 249
salmii 27,188,199,200
Salmii v. angustifolium 199
Salmii v. decussatum 199
Salmii v. elongatum 199
Salmii v. semicru-ciatum 199
salmonium 236,237
saturatum 295
saxetanum 52
saxicolum 280
scabrum 295
scalpratum 24,186,217
Schlechteri 230
Schlichtianum 249
Schwantesii 2
scitulum 63
scundum 248
scutatum 267
semicylindricum 21,28,29,196,197
senarium 280
separatum 279
serratum 24,286
serratum flore acetabuliformi luteo 286
sessiliforum 245
sessiliflorum v. album 241

Mesembryanthemum (Cont'd.)

Shandii 6,42,75
signatum 61
simile 249
simile var. namaquense 249
simulans 11,17,18,123,149
Sladenanum 249
sociorum 295
socium 40
sororium 154
sp. 6, 75
spathulatum 308
spectabile 295,340
spiniforme 295
spinosum 347
splendens 73
staminodes 17
staminodiosum 280
Stayneri 295
stellans 280
stenopetalum 295
stenum 295
stipulaeceum 294,295
styliferum 280
stylosum 66
subalbum 38,280
sublunatum 280
Mesembryanthemum (Cont'd.)

subnodosum 249
subrisum 51
succulentum 280
suppositum 161
surrectum 30,221
surrectum var. B. 221
swartbergense 295
taurinum 26,204
Taylorienum 98
tegens 295
tenue 249,294
tenuiflorum 237
tenuifolium 74,295
testiculare 10,16,18,38,39,40
testiculare var. y. 39
testiculatum 38
thecatum 52
Throthai 249
tinctum 282
tortuosum 73
translucens 280
tricolor 1
triflorum 280
tripolium 223
triquetrum 280
triticiforme 278

Mesembryanthemum (Cont'd.)

truncatellum 31,33,34,49,51,55,99,170
truncatum 33,34,55
tuberculatum 146
tuberosum 347,348
Tugwelliae 261,262
tulbaghense 295
turbinatum 295
turbiniforme 13,32,33
umbellatum 74,276,277,281,282,283
uncatum 25,205
uncinellum 292
unidens 21
uvaeforme 63
valens 279
vallis-gratiae 295
Vallis Mariae 112
Vanzijliae 295
variabile 295
variifolium 279
ventricosum 146
verecundum 295
verruculosum 280
vescum 10,138
viatorum 295
virens 294
viride 285,291,292
<table>
<thead>
<tr>
<th>Genus/Species</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mesembryanthemum</em> (Cont'd.)</td>
<td></td>
</tr>
<tr>
<td>viridicatum</td>
<td>53</td>
</tr>
<tr>
<td>viridiflorum</td>
<td>237</td>
</tr>
<tr>
<td>vittatum</td>
<td>316</td>
</tr>
<tr>
<td>Volckaneri</td>
<td>241</td>
</tr>
<tr>
<td>Watermeyeri</td>
<td>295</td>
</tr>
<tr>
<td>Wettsteinii</td>
<td>51,95,96,99</td>
</tr>
<tr>
<td>Woodburniae</td>
<td>295</td>
</tr>
<tr>
<td>Wordsworthiae</td>
<td>295</td>
</tr>
<tr>
<td>Zeyheri</td>
<td>295</td>
</tr>
<tr>
<td>zygophylloides</td>
<td>295</td>
</tr>
<tr>
<td><em>Mestoklema</em></td>
<td></td>
</tr>
<tr>
<td>albanicum</td>
<td>346,350</td>
</tr>
<tr>
<td>arboriforme</td>
<td>347,349</td>
</tr>
<tr>
<td>copiosum</td>
<td>346,348</td>
</tr>
<tr>
<td>elatum</td>
<td>347,349</td>
</tr>
<tr>
<td>illepidum</td>
<td>347,350</td>
</tr>
<tr>
<td>tuberosum</td>
<td>346,347,349</td>
</tr>
<tr>
<td>tuberosum v. macrorhizum</td>
<td>346,348</td>
</tr>
<tr>
<td><em>Mitrophyllum</em> (Cont'd.)</td>
<td></td>
</tr>
<tr>
<td>moniliforme</td>
<td>266</td>
</tr>
<tr>
<td>nanum</td>
<td>270,275</td>
</tr>
<tr>
<td>Pillansii</td>
<td>271,272</td>
</tr>
<tr>
<td>pisiforme</td>
<td>267</td>
</tr>
<tr>
<td>proximum</td>
<td>270,272,273</td>
</tr>
<tr>
<td>Schickianum</td>
<td>270,276</td>
</tr>
<tr>
<td>Monilaria</td>
<td>264,265,282</td>
</tr>
<tr>
<td>chrysoleuca</td>
<td>265,267</td>
</tr>
<tr>
<td>moniliformis</td>
<td>264,265,267,282</td>
</tr>
<tr>
<td>pisiformis</td>
<td>265,266</td>
</tr>
<tr>
<td>scutata</td>
<td>267</td>
</tr>
<tr>
<td>Mossia</td>
<td>284,288</td>
</tr>
<tr>
<td>intervallaris</td>
<td>284,289</td>
</tr>
<tr>
<td><em>Muiria</em></td>
<td>172</td>
</tr>
<tr>
<td>Hortenseae</td>
<td>172,173,175</td>
</tr>
<tr>
<td><em>Nananthus</em></td>
<td>78,86,299,300,313,314,315</td>
</tr>
<tr>
<td>albinotus</td>
<td>311</td>
</tr>
<tr>
<td>albipunctus</td>
<td>310,313</td>
</tr>
<tr>
<td>aloides</td>
<td>315,317</td>
</tr>
<tr>
<td>Comptonii</td>
<td>311</td>
</tr>
<tr>
<td>Peersii</td>
<td>320</td>
</tr>
<tr>
<td>Pole Evansii</td>
<td>315,317</td>
</tr>
<tr>
<td>rubrolineatus</td>
<td>315,318,319</td>
</tr>
<tr>
<td>vittatus</td>
<td>314,315,316</td>
</tr>
<tr>
<td><em>Octopoma</em></td>
<td>285,286,287</td>
</tr>
</tbody>
</table>
Octopoma (Cont'd.)
abruptum 287,288
inclusum 287
octojuge 285,287
Odontophorus 160
Marlothii 160
Oophytum 81,104,172
oviforme 104,105
Opathalmophyllum 184
Marlothii 184
Opophytum 79
aquosum 248
dactylinum 248
fastigiatum 248
Forskahlii 248
speciosum 248
Oscularia 278,284
deltoides 284
Perissolobus 300,323
Bijlii 324
Phyllobolus 82,226,252
Lesliei 248
pubicalyx 248
resurgens 248
Phyllobus 248,252
Piquetia 84,86
Platythyra 78,79,250,252
Platythyra (Cont'd.)
Haeckeliana 253
pallens 250
Pleiospilos 84,147,152,176,224,258,259
Bolusii 147,148,150,224,258,259
compacta 225
nobile 225
Purpusii 260
simulans 148,224,258,259
Polymita 285
Pearsoni 285
Prenia 79,82,249
intervallaris 289
pallens 250
relaxata 250
Prepodesma 301,324
Orpenii 325,326
uncipetala 325
Psammophora 181
Psilocaulon 82,226
absimile 245
acutisepalum 248
album 248
arenosum 248
articulatum 248
asperulum 248
Bijliae 248
Psilocaulon (Cont'd.)

caducum 248
clavulatum 248
corallinum 248
coriarium 248
densum 248
dimorphum 248
Dinteri 248
diversipapillosum 248
fasciculatum 248
fimbriatum 249
Gessertianum 249
glareosum 249
granulicaule 249
junceum 249
leptarthron 249
Levynsiae 249
luteum 249
melanospermum 249
mentiens 249
micranthum 249
mucronulatum 249
namaquense 249
Pageae 249
parviflorum 249
pfeili 249
pubescens 249

Psilocaulon (Cont'd.)
salicornioides 249
Schlichtianum 249
simile 249
squamifolium 249
subnodosum 249
tenue 249
Trothai 249

Functilaria 81, 85, 151, 157, 224, 225, 259, 259, 262

Bolusii 259
canum 260
compacta 153, 155, 158, 225, 259, 260
Dekenaha 224
magnipunctata 152, 153, 155, 224, 259

magnipunctata v. sesquiuncialis 259
optata 153, 155, 224, 260, 262

Furpusii 260
Roodiae 152, 157, 224
sesquiuncialis 259
simulans 259
sororia 153, 154

Rabiea 300, 308
albinota 309, 310
albipuncta 309, 313
carolinensis 309, 310
cibdela 310, 312
Rabiea (Cont'd.)

Lesliei 310,312
tersa 309,311

Rhinephyllum 180

Muiri 181,182
Pillansii 182

Rimaria 81,113,116,171,255,256
dubia 114,115,116
Heathii 113,114,115,116
microsperma 171,256
Pole Evansii 114,117,171,256
Roodiae 114,116

Roodia 84,130,132
digitifolia 131,132,229

Ruschia 277,278,279

acuminata 279
ampliata 279
androsacea 279
armata 279
atrata 279
Barnardii 279
bicolorata 279
Bijliae 279
brevipes 279
Britteniae 279
calycina 279
cleista 279

Ruschia (Cont'd.)

Comptonii 279
concava 279
concinna 279
connata 279
crassuloides 279
cymbifolia 279
decumbens 279
decurrens 279
Dejagerae 279
diversifolia 279
dualis 293
Dyeri 279
eclineata 279
Fergusoniae 279
filipetala 279
Fourcadei 279
Framesii 279
gemina 279
glaucia 279
Goodiae 279
gracilis 279
hamatilis 279
Herrei 279
hexamera 279
Hutchinsonii 279
inclusa 279
Ruschia (Cont'd.)

inconspicua 279
incurvata 279
insidens 279
integra 291
intervallaris 284, 289
laxipetala 279
Leinoldtii 279
longipes 279
lutea 279
maleolens 279
Maxwellii 279
Meyeri 279
micropetala 279
molle 279
muricata 279
mutica 279
namaquana 280
nana 280
nivea 280
obtusa 280
papillata 280
parvibracteata 280
patens 280
Peersii 280
perforata 280
phylicoides 280

Ruschia (Cont'd.)
Pillansii 280
piscodora 280
promontorii 280
prostrata 280
pumila 280
pusilla 280
radicans 280
rigida 280
rupicola 278
saturata 280
saxicola 280
Schlechteri 280
senaria 280
staminodiosa 280
stellata 280
stricta 280
stylosa 280
subglobosa 280
succulenta 280
translucens 280
triflora 280
triquetra 280
tuberculosa 280
velutina 280
verruculosa 280
versicolor 280
virens 280
Saphesia 341
flaccida 341
Sceletium 79, 226
Semnanthe 160
lacera 160
Smicrostigma 285, 290
viride 291
viridis 285
Sphalmanthus 82, 235
Sterropetalum 227, 231
Pillansii 228
Synantophyllum 79
Jutae 249
Sladenianum 249
Thyrasperma 79, 261
Titanopsis 181, 301, 303, 305, 315
calcarea 306, 307
crassipes 306, 307
Hugo-Schlechteri 305
Ludertzi 304
Schwantesii 304, 305
spathulata 306, 308
Trichocylus 82
Trichodiadema 278, 281, 283
barbatum 283
stelligerum 283
Vanzijlia 282

Vanzijlia (Cont'd.)
angustipetala 282
Verrucifera 300, 302
Hugo-Schlechteri 303, 304
Ludertzi 303, 304
Schwantesii 303, 304, 305
Zeuktophyllum 161
suppositum 161