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FIG. 70. One of the most easily grown succulents. Flowers and produces seed freely. Mrs. Shields in "Desert Flowers Under Glass" calls this plant *Anacampteros filamentosa*



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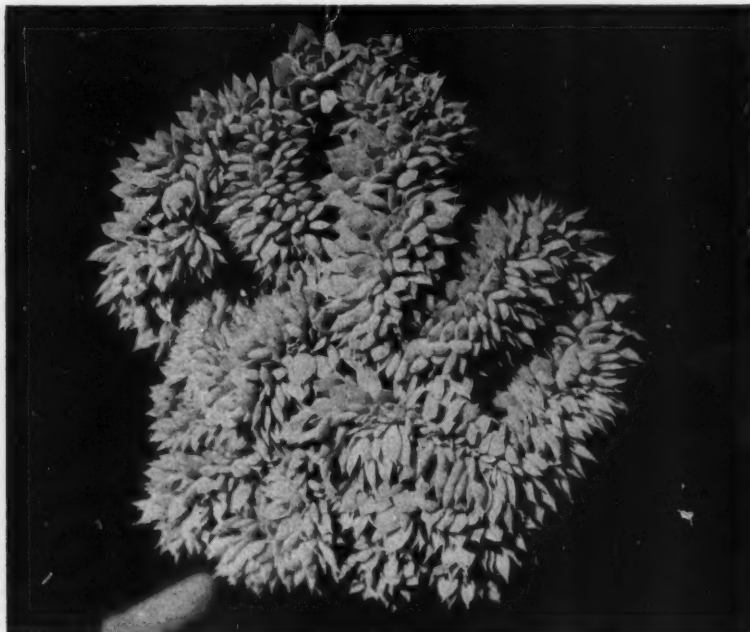


FIG. 71

Crest of *Graptopetalum macdougalii*; cuttings were made during the summer, potted and sold in quantity for the New York market. Another succulent that responds to mass production is *Echeveria macdougalii* (see this Journal May-June 1958, pg 87)

A CORRECTION

In Desert Flowers Under Glass the lower left-hand corner of fig. 38, page 75, of the current volume of the Journal, a plant is illustrated as *Stylophyllum densiflorum*. It should be *Stylophyllum orcuttii* or *Dudleya attenuata* subsp. *orcuttii*. See volume I of the new English edition of Jacobsen, figure 374.

FROM TAMPA BAY, FLORIDA

The meeting of the Mr. and Mrs. Cactus Club of

the Tampa Bay area was held on August 22 at the Leisure House, Tampa Electric Company on Dale Mabry Highway. Mrs. Alfred Patterson gave an interesting and informative talk on the Aloe species and Mr. E. R. Carter talked on Ferocactus. Mrs. Ferrell, the president of the club, presented species of Aloe and Ferocactus donated by members.

E. R. CARTER

206 South St., Tampa, Florida

DESERT FLOWERS UNDER GLASS

The story of my experiences and delight in growing and flowering Cacti and Succulents in a small glasshouse in Christchurch, New Zealand

By MARJORIE E. SHIELDS

CHAPTER 8

When last we met we saw some of the largest cactus flowers, now we will see some of the smallest amongst the succulents. These belong to the Crassulas, that large family of opposites; for the plants, leaves, flower heads or sprays may be either very large or quite minute. The individual flowers composing the heads or sprays may be star-like, opening flat, or bell-shaped with the tips opening only enough to show the colour of the flower. They are usually white or pink in various shades through to red, but we may find an odd yellow or mustard coloured one.

The majority have a strong odour of ammonia, almost too strong to be pleasant at times. Most of them are easily grown when once their preference for either sun or shade is known. Some do not take kindly to glasshouse culture at all, preferring a rockery or a sheltered corner. They are easily classified if two points are remembered. 1. They must have five stamens. 2. The leaves must be in opposite pairs. If in the form of a rosette then the paired leaves appear on the flower stalk. Each season has its quota of flowers, though some never seem to be without a blossom



FIG. 72. Upper left: *Crassula rupestris*. Upper right: *C. namaquensis*. Lower left: *C. namaquensis*. Lower center: *C. sarmentosa*. Lower right: *C. marginalis*.

or two. Their native habitat is South Africa, though a few are found in Tropical Africa, while others are distributed throughout the world. Here, in the glasshouse, we will find them on the bench, on the shelf above, hanging from the shelf or even from the roof, in all kinds of containers except the conventional flower pot.

We shall commence as usual with the spring flowering ones and follow through month by month. One of the loveliest in real spring-time apple blossom pink and white is *C. rupestris*. This plant freshly dusted with meal has powder blue short fleshy leaves, a perfect foil for the heads of pink tinted little blossoms, with petals curled under enabling us to see the deeper pink centres more clearly. Handle it carefully as the slightest knock will dislodge the fat leaves and spoil the beauty of the plant.

Two others flowering in August are these somewhat similar plants right in the front. This one with the tight heads of tiny white flowers is *C. tecta* and the other with the small branched heads is *C. namaquensis* from Namaqualand. A strange characteristic of the latter is, that when the leaves become too crowded, they are pushed out by the others, each discarded one equipped with tiny rootlets ready to start its life elsewhere! They both form clumps; the leaves are thick, smallish and covered with microscopic hairs. *C. tecta* is white and very beautiful, the other green and velvety. They prefer full sunshine.

Hanging from the roof, almost hidden by its sprays of tiny star-like pale pink flowers is *C. spatulata*, looking so dainty with its small heart-shaped leaves on long, thin, angled, trailing stems. Over on the trellis is *C. sarmentosa*, very similar, but much more robust, with thicker, round stems, larger heart-shaped leaves, and with both flowers and sprays larger. The stems are brilliant red, as also are some of the leaves. This plant is a climber and with its sprays of starry pink and white flowers and red stems it looks very showy as it clambers over the trellis.

Another early spring one is *C. multicava* "with many cavities." It makes a charming basket plant, for at this time of the year the leaves are a glorious red and the exquisite sprays of dainty pink star-like flowers stand out in a cloud of glory all around the plant. These sprays last well when picked, but why pick them, when if grown in a suitable container the whole plant makes a delightful indoor decoration. Hanging in the small green bucket is *C. marginalis*, also with very red leaves, well spotted with brown around the edges. It looks superb as it has draped itself over the side of the bucket displaying its many sprays of white flowers to perfection.

These last four sound somewhat similar, as

they all have more or less heart-shaped leaves and sprays of pink and white flowers. But they are very different really, as two are trailers, one a climber and the other a little shrub. Of the two trailers one has much larger leaves than the other, and differently marked leaves. The colour is the result of keeping them dry all winter and the flowers arrive before the watering can. These are all sun worshippers, although during the hottest weather a little shade is appreciated.

September brings us shade loving *C. rosularis*, which usually lives under the bench during the summer. This is a very different looking plant from those already seen. Its name tells us it is "arranged in rosettes." These rosettes are composed of long, narrow, soft, purplish red and green leaves. From the centre of each the long dainty sprays of flowers arise, each little white blossom with a tiny green centre. They are exquisite.

The majority of *Crassulas* are summer bloomers, and during the hot months of Nov., Dec. and Jan. the group looks very gay. This dish of coral is *C. corallina*. The little rosettes of tiny bronze leaves have thickened and flattened tips reminiscent of *Titanopsis* leaves, but only about a quarter of the size; the flattened top is dusted with thick white meal through which appear minute green and bronze spots. The gold flowers in the centres of the rosettes are very tiny, covering the plant with golden stars. It needs plenty of sun to colour the leaves and produce the meal.

This quaint one is *C. cordata*. It makes a pretty pot plant with its green heart-shaped leaves—cordate means "heart-shaped." The reverse of the leaf is pale purple but so thickly powdered it is almost white and around the edges is a thick spattering of red, while on the upper surface they are spotted with a slightly darker green. After the tiny white flowers fall, they are replaced by miniature plantlets which form along the fine white branching stems, giving the plant the appearance of being surrounded by pale green *gypsophila*.

C. hemisphaerica is different again, and is one of nature's wonder plants. The rounded flat leaves, edged with fine white hairs, are packed one above the other, each a little smaller than the one below, rising until they form the shape of a half sphere. Its beauty lies in the perfect symmetry of the plant, not in the flower, which is merely a solitary stem about 8 inches long, growing through the centre of the sphere and carrying small white flowers.

What strangely fascinating plants these *Crassulas* are. We have already seen how *C. namaquensis* shoots out unwanted leaves (Are they really unwanted? I wonder!) equipped with roots and ready to start life afresh in pastures

new, and how *C. cordata* decorates her flowering stem with tiny plantlets which so readily fall and root, and now here is *C. orbicularis* with yet another method of insuring her stock will increase. This plant is a flat rosette of thin, bluntly pointed, wide leaves edged with a row of tiny white hairs. From between the leaves, fine thread-like stems, each with a tiny plantlet attached, arrange themselves at equal distances around the plant. These little plantlets cannot stray very far, they are well attached to mother's apron strings. Grown in the open ground the plant would soon travel a considerable distance as the plantlets forming the ring around the main plant, in turn also send out thread-like stems, each equipped with a tiny plant; so the mother plant would soon be the centre of ever widening circles of plant children. The flowering stem appearing from the centre of the rosette sends out small flowering branches completely encircling the main stem. These are all covered with tiny pale green flowers. A red mid-rib colours the backs of the petals; a tiny cream stamen between each petal looks like a spot light and five red stigma lobes form a bright centre, making a sombre coloured inflorescence look quite gay.

C. cooperi in a rounded red bowl is a mass of tiny dark green leaves spotted with red. The flower buds are red also, opening into tiny white stars. Don't they look snowy against that red back ground? *C. justus corderoy* has been in flower on and off since early spring, but is at its best now in mid summer. It has much larger greenish gray leaves with veinings of pink. Clusters of deep pink buds open into pretty pink flowers a little larger than most. *C. schmidtii*'s thick spear-like leaves are fast turning red and little clusters of bright pink blossoms are pushing their way through the thicket. These last three plants are surely in every collection and need no further description.

A very different type is *C. odoratissima*. This is a large branched plant with a central stem up which the long stiff blue-grey leaves are arranged in pairs. Each branch terminates in a large head of coral coloured odourless flowers! Surely there must be something wrong here! The flowers are very showy and with the foliage so different it is a grand addition to the *Crassula* collection.

Here is another little plant labelled *C. marginalis* var. *minuta*—very lovely now it is in full flower as it is smothered with tiny white blossoms, each petal outlined with red; even the tiny heart-shaped leaves have an edging of red spots. It has tumbled over the sides of the basket to create a curtain completely hiding the container. It is delightful, dainty and colourful. It is the miniature form of the *C. marginalis* we saw

before. And the name is so descriptive of the little plant as both leaves and flowers have a crocheted red edging.

Hanging from the shelf, its long graceful branches casting a little shade on the plants below is *C. perforata* with a most disappointing flower. The leaves are so beautifully coloured and the long branching stems so artistically arranged, that when the flower sprays form and tiny mustard coloured flowers appear, it seems such an anti-climax. If only they had been pink or lavender a colour to tone with the lovely colouring of the leaves what a glorious picture it would be.

February brings us an entirely different plant from the last, with a somewhat similar name—*C. perfoliata*. "Perforata" means pierced through, but "perfoliata" means having the stem clasped by the uniting base of the leaf. In *C. perforata* the stem pierces the oval leaf but the leaves of *C. perfoliata* are long and narrow, very like these of *C. odoratissima*, only larger and wider, and it is the base of the leaf pairs only which are joined to clasp the stem. This plant has a large head of white flowers, similar to *C. odoratissima*'s coral ones but flowering a month later.

Once again we go from a large plant to a small one; this time to see *C. triebneri* named after Wilhelm Triebner. In its dormant state, the thick green pointed leaves, spotted with a darker shade and packed closely together in opposite pairs form a cross, to give it its common name, St. Andrew's Cross. But now it is flowering the stem has elongated, the leaves rising with it in pairs become thicker, shorter and turn red, all but the finely serrated edges which remain green. So each rounded, fat, little red leaf has a narrow green line running around it, looking as though bound with a green string. As the stem grows, little branchlets appear at the axils of the leaves; these are now adorned with tiny white flowers. This plant is a gem.

Autumn now, in New Zealand, and March brings a fine splash of colour to the door way, due to *C. falcata*. Much too large for the bench, a biscuit tin sunk into the ground provides a good home. The flower heads being so large and heavy and the long stems not strong enough to hold them upright, they bend to hang gracefully over *Echinocactus grusonii*. These heads are composed of dozens of tiny brilliant red blossoms, each with protruding golden stamens so that the flower appears to be sprinkled with gold dust. This is the third of these large *Crassulas*, all of which have similar flowers, varying only in colour. In January it was *C. odoratissima* with its thin upright leaves and coral flowers; as these faded *C. perfoliata* opened its white blossoms

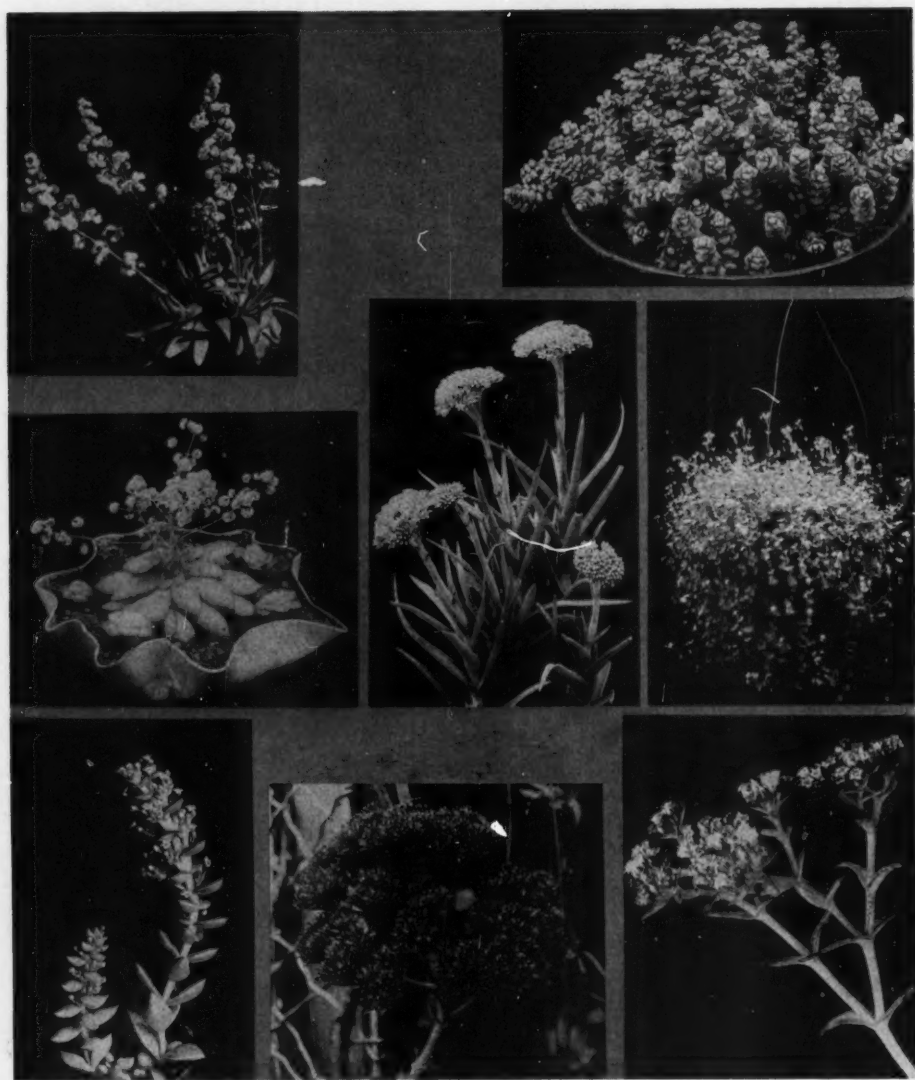


FIG. 73. Upper left: *Crassula rosularis*. Upper right: *C. corallina*. Center left: *C. orbicularis*. Center: *C. odoratissima*. Center right: *C. marginalis* var. *minima*. Lower right: *C. triebneri*. Lower center: *C. falcata*. Lower right: *C. sanguinea*.

and now a month later we have *C. falcata* the showiest of the three, with its broad aeroplane wing-like leaves and scarlet flowers. Three plants to add beauty to any collection and with flowers not here for a day only, or for a week; their beauty lasts from a month to six weeks at least.

Back to the group now where we will find still more in bloom. This one with rosettes of longish, wide, green pointed leaves, so densely spattered and blotched with red that at a glance they

look red, is *C. sanguinea* meaning blood-red. When flowering time approaches the rosettes elongate, as do so many *Crassulas* until there is no rosette at all, but instead a long stem with colourful leaves in pairs and a flower head developing at the end. And strangely enough the flowers forming the head are composed of white, pale pink, deep pink and red flowers all in the one cluster! These heads or clusters can be anything from four to six inches across. A well

grown plant is a picture. After flowering the stem dies, but new rosettes have already formed at the base.

One of the loveliest blooming this month is *C. corymbulosa*, known in New Zealand as *C. resida*, a symphony in red, green and white. In its dormant state it is a compact plant with rosettes of long, thick, spikey leaves—rather like *C. schmidtii*'s only larger. As the summer advances the rosettes elongate, the edges of the leaves turn red, and as the stems lengthen they become branched, the last four or five inches turning bright pinkish red, almost magenta. At the axils of each leaf pair red branchlets appear smothered with small white star-like blossoms. These look very showy against the red stems. It is a delightfully dainty plant, brightly coloured if given a position in full sun.

As March draws to a close and April is ushered in *C. corymbulosa* (*C. resida*) looks a little faded, but another form of it is now in full bloom to take its place. This is much the same type of plant, also sun loving but lacking the daintiness and colour of the other; the sprays of flowers, the leaves and the stems are all much heavier and coarser. The flower heads are so heavy the branches are not strong enough to hold them upright, so they droop around the sides of the container. Were this plant in the ground as nature intended, the branches, with the support of the good earth would be able to lift the heavy flower sprays on which the little white blossoms are so tightly packed, it would then not have this droopy appearance.

This other little plant with its leaves forming a St. Andrew's Cross is another, miniature form, of *C. corymbulosa*. It really looks more like *C. triebneri* doesn't it? Especially as it also forms the cross. The elongated stem has insignificant white flowers. This one differs from the other two forms in that it prefers a little shade whereas they revel in the hot sunshine. There is yet another form of this versatile plant but I do not know it.

This little white *Crassula*, *C. punctulata*, is a picture of daintiness with its "minutely punctured" leaves so thickly powdered they look silvery. It forms a small shrub 4 to 6 inches high and when in bloom closely resembles a heath. The tiny white bell-shaped flowers in clusters of three or four on the ends of the short stems have a black spot on each petal. A magnifying glass will show these are the stamens. This plant grows in the winter so a little water is needed during the cold months.

The large saucepan contains a collection of mimicry *Crassulas*. *C. cornuta* and *C. decepatrix* are both in flower, but these blossoms add nothing to the attractiveness of the plants as they are

just small heads of tightly packed cream flowers, each head being about half an inch across. But the plants—! *C. cornuta* has tightly packed wide fleshy triangular leaves, forming a solid square block. *C. decepatrix* is rather like it but the triangular leaves are different, being more fleshy, more sharply keeled on the back, and not having such a sharp point, also the leaves are heavily pin spotted. Both plants are white with powder and look rather like concrete blocks. *C. pyramidalis* is making good growth; the tiny hard triangular leaves in four rows, tightly overlapping each other form a three-inch high green square column. *C. teres*, about the size of a small marble with green overlapping leaves, is not so happy, having a great struggle for existence. *C. arta* on the other hand is growing profusely. This also has overlapping rounded green leaves, each one fitting perfectly over the other; it has even branched and is forming quite a clump. These three have yet to flower.

May brings us *C. rupestris*. We saw a *C. rupestris* in the spring, do you remember, with the powdered leaves and pink and white flowers? This is the pink form. It is hard to say which is the prettier of the two. This one with its short, fat leaves, as broad and as thick through as they are long, are flattened on the upper surface and keeled below, spotted with deep green and flushed with red around the edges, ending with a bright red tip. The bright red stems bear clusters or heads of brightish pink flowers deepening in colour towards the centre. The plant is like a small tree covered with pink blossoms and makes a charming picture; its beauty lasting for about 6 weeks. As it fades *C. lactea* is ready to take its place. This plant has heart-shaped solid green leaves, hemstitched around the edges, and large sprays of cream flowers very like white lilac. The "milk-like" colour of the flowers gives the plant its name. It is a grand addition to the winter floral display. Here is one you have probably been thinking is *C. perforata*, but now it is in flower it obviously is not, as *C. perforata* has long sprays of mustard coloured flowers whereas this one has larger white ones on a much shorter, more solid red stem, making a perfect background for the white flowers. Here is *C. perforata*, notice the difference between the two sets of leaf pairs? *C. perforata*'s are so completely joined they form one leaf, with nothing to show the joint, but *C. conjuncta*, which means "joined together" perfectly describes these leaves, which literally are two leaves joined together with a definite mark to show the joint. It is a beautiful *Crassula* and has just what *C. perforata* lacks—a flower to complement the foliage. These winter flowering *Crassulas* are well worth cultivating as they make useful house plants.

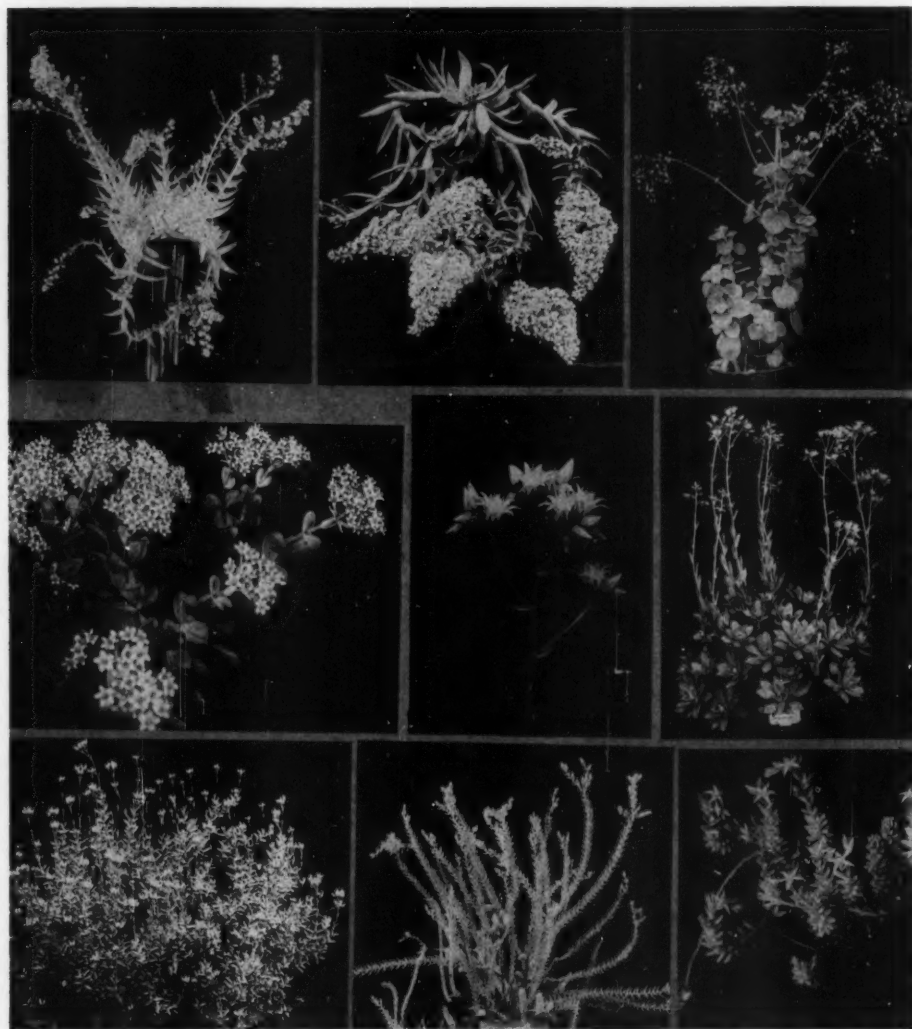


FIG. 74. Top left: *Crassula corymbulosa*. Top center: *C. corymbulosa*, second form. Top right: *C. cordata*. Center left: *C. rupestris*. Center and center right: *Aeonium decorum*. Bottom left: *Crassula punctata*. Bottom center: *Altimiranoa elongata*. Bottom right: *A. mexicana*.

A small but interesting plant *Altimiranoa mexicana* is often included amongst the *Crassulas*. Its name tells us from whence it comes. The tiny cylindrical leaves are delicately tinted and flushed with pale pink; the plant grows about 4 inches high, the older stems trailing over the sides of the container—these are better pruned back. In November little pink buds open into starry white flowers with red anthers. Another *Altimiranoa* is that plant with the long whippy stems covered with tiny green leaves, aptly named *A. elongata*. This one flowers in the

autumn, small cream bell-like blossoms appearing on the ends of the long stems. A little later the leaves turn a brilliant red and together with the cream flowers look most attractive. See the red catkins it is producing, some so small they look like cones? Most intriguing aren't they? These will eventually elongate and become next year's branches, this year's flowering stems being pruned back to the catkin like growths.

Here is a highly decorative plant from the Canary Islands, with a truly descriptive name—*Aeonium decorum*. The plant is like a small tree



FIG. 75. *Crassula conjuncta*

about 8 inches high, with many twiggy branches each ending in a rosette of leaves so colourful as to be almost like flowers themselves; the outer leaves being pink and the new growth in the centre a delicate green. The deep pink flower stems arising from the rosettes terminate in sprays of eight petalled flowers; each white petal brushed with rose pink on both surfaces; longish white stamens add the finishing touch to this most adorable and colourful flower.

Hanging on the end of the shelf is a tin basket containing *Anacampseros filamentosa* from South Africa; we are lucky for the flowers are open. Many who have this plant have never seen it flower but say it must have done so because it has seed pods. It has even been said to be night flowering! But here are flowers now in the middle of the afternoon; but it is elusive, only occasionally will flowers open. A purple tip does

not mean there will be a bloom. If it is hard, then there will be no flower; it has already set seed and dried without opening. It has what is termed cleistogamous flowers, that is, fertilisation takes place within unopened flowers. When a flower does open it is about the size, and is rather like a small single geranium, and in colour a beautiful bright violet. It has five broad petals with no shading and no mid rib, while the stamens and stigma lobes are white. As the flower stems with the exploded seed pods wither, they turn straw colour and overhang the edge of the pot; they cannot be broken off as is usual with dried flower stems but have to be cut as they are so tough and stringy. However it is really preferable to leave them on as they are quite attractive and add to the appearance of the plant. The name *filamentosa* means "with abundant filaments."

SPOTLIGHT ON ROUND ROBINS

With the coming of summer Robins seem to have a change of pace. Some must have gone off on vacation for there were fewer of them. However, new members continue to inquire for Robins, and Robins, in due time, are being formed to take care of them. The list of latest members includes Mrs. M. H. Pruett, Houston, Texas; Mrs. Richard Pfeil, Elkhorn, Wisconsin; Mrs. Anne W. Jones, Claremont, California; Mrs. Frank Hayden, Wood Dale, Illinois; Mrs. Lucretia K. Smith, Sewell, New Jersey; Mrs. Alayne Apple, Morris Plains, New Jersey and Mrs. Warner Dodd, Jr., Phoenix, Arizona.

I also regret to report the death of one of our good Robin members, Fred G. Knowlton, Bayfield, Colorado. Fritz, as he was known to friends, died early in June in a fire which destroyed his home. His knowledge of cacti, particularly the hardy ones, was considerable, and his death is our loss in Winter Hardy Cactus Robin No. 2 in which he was a new member.

The latest Robin to fly has been C. & S. Robin No. 5 which has seven members, and this brings our total to twenty-one Robins, almost all of which have been reported at some time. Happy flying to No. 5.

An invitation is extended to those interested in the Robins mentioned in the July-August issue, as several of these need a number of additional members before they are ready for flight. The Tree-type Cactus Robin could use three more members and the Euphorbia Robin No. 2 could use two more at least. Those who love the larger bush or tree cactus or Euphorbias should find either of these excellent Robins. To join now means you begin with the first flight. The Decorators' Robin, which is under the directorship of Mrs. Norma Lee Cole, still needs members. If arrangements are your forte and your pleasure, why not join. This Robin discusses plants as well as their decorative uses. There is still room in the Epiphyllum Robin and the International C. & S. Robin No. 4 if these appeal to you. The Hybridizers' Robin which was off to a start earlier in the year has been filled with enthusiastic members and will be making a trip across the Atlantic for one of its members. I have been asked if a Robin on Echeverias or one on succulents to include Echeverias might not be organized. If any of you would like such a Robin let me know, and if enough are interested, one might be formed. Tell me whatever Robin you want, whether listed or not, and I'll see what might be done about it. Do write, please.

Now to the correspondence of Robins. John Bock, in C. & S. Robin No. 3, wants to know

(as do we all) "What is that white material which plants are potted in from California?" Several others have mentioned it also, and it appears like cement but is porous when water is applied. Kathy Beirman has had a nice surprise—*Chamaecereus silvestrii* had seven brilliant blooms. "I had decided," she said, "it would never bloom as a house plant since I have had it eight years. It was out during the early fall frosts until November. Then I set it in a south basement window and ignored it until I found buds. Moved it upstairs to a south window and gave it a little H₂O. I thought it might drop its buds but I was lucky." John Bock called attention to the speed with which blossoms open, as in the case of his *Notocactus rutilans* and *Gymnocylidium baldianum* which had buds that looked as if they were ready to open but by noon had not done so. "Later in the afternoon I went into the greenhouse," he said, "and there sat the plants with flowers completely covering them." Some flowers are very fleeting, as he comments, "*Echinopsis mirabilis* opens about 10 or 11 p.m. and is gone by 7:30 a.m." Glenn Webb finds "my cactus grafts are more often unsuccessful, but I believe the more practice one gets, the better. Stock and scion should be in active growth. My successful grafts were made thusly: A strong sprout of *Nyctocereus serpentinus* was topped about 9" from the ground. Then I matched a twig of *Aporocactus flagelliformis* (scion) with a slightly larger sized twist drill. I drilled into the stem of the *Nyctocereus* about an inch deep, and sharpened the cut end of the scion, forcing it in the hole and leaving about a half inch of the tip exposed. I dripped hot wax on the cut surface of stock to seal the edges; covered the plant with a plastic bag; watered stock; kept indoors, then out in semi shade, then in strong sun which both stock and scion like. The scion sprouted immediately and grew like a weed."

In reply to a question as to when the fruit of *Hamatocactus setispinus* is ripe and may be removed from the plant, Arthur Wells in an earlier edition of International Robin No. 1 said, "The fruit of *H. setispinus* is ripe when the fruit is red. I crush my fruits when the bright red color faded, let the pulp dry and then separate the tiny black seeds by rubbing the mixture of dried pulp and seeds between the palms of my hands, after which it is easy to separate the seeds. I use the same method for fruits of *Lobivias*, *Echinopsis* and *Gymnocylidium* and other cacti with pulpy fruits." Along with Agnes Hirshinger he adds, "I have had trouble with *Gymnocylidium* too. It forms offsets instead of flower buds and the base is turning brown. I do not know what to do about it." Billie Marie Anderson, who has a new lath house and a wonderful long list of bloom-

ing cacti also, speaks feelingly of her plant situation when she says, "I am jammed and crammed in the lath house and still not all the plants are in there. Thought 10 x 12 would do the job but not sure now." Mary Anderson, mentioning Mrs. Shields' article on *Mammillarias*, finds "her chapter on Mams. with the illustrations helpful to me in identifying mine."

Lib Swain, in C. & S. Robin No. 8, has discovered for herself what to do to make *Lobivias*, *Notocactus*, *Echinopsis* bloom. She says, "I put them out in the laundry where the temperature goes down to 40°, along with the *Crassula argentea*, aloes, *Opuntias*, etc. and kept them pretty dry, and lo and behold, they have buds for the first time since I have owned them. The Rat Tail cactus was up in a cool room with sun all winter, now has thirteen blooms. I have given manure water once a week until the buds set." Frances Anderson has been having her usual wonderful success with plants. Her *Rebutias* have had 25 to 30 blossoms each. Most of her cacti are flowering later this year. She says her *Gymnocalycium mihanovichi stenogonum*, a seedling four years old, has bloomed for two years each summer and fall.

As Agnes Hershinger writes in C. & S. Robin No. 1, it is helpful to beginners to know how old and how large a plant has to be before it will produce a ring of flowers. She says, "The books never tell you anything about how long you must wait for results." So she was pleased to have Mary Karr write of her *Diadem Mammillaria*, "For the first time it has a ring of those lovely deep rose flowers. I have had it six or seven years and it is four inches tall and three inches wide." Ella Nipper said *Cereus peruvianus* bloomed for her after six years, when it was about 24 inches tall.

When Warner Dodd, in International Robin No. 3, mentioned *Opuntia maxonii* for grafting stock, few of the members had ever heard of it. He describes it as "a very thick padded *Opuntia*, being $\frac{3}{4}$ inch-thick, with the pad from 3 to 5 inches wide and from 6" to nearly two feet long. Fruit and flower are similar to *O. ficus-indica*. It has been called a Burbank hybrid but also said to come from Mexico. This *Opuntia* has been used by Mr. Paradine as grafting stock for about ten different *Echinocereus*, a *Notocactus*, one of our *Lophophoras* and for crests." Stanley Dedman, over in England, remarked, "Something that worries us over here is the brown spotting on *Opuntia* pads. The spot will go quite dead and brittle. Nobody has been able to tell what causes it. Do you find the same sort of thing and have any of you an explanation or possibly a preventive measure?" He also says of *O. salmiana*, "that prolific little flowerer. How I wish other *Opuntias* were as easy to bloom."

The Hybridizers' Robin has not had much of a report on it since it was started in February 1958, but since it is a specialized Robin it may not be as interesting to everyone as to a few. Glenn Webb is its director. He said in his first letter, "Last summer I tried to hybridize my cacti as the various plants bloomed. To keep track of the fate of particular blossoms I tried running a colored thread through the petals of the flower being careful to not pierce the pistil or stigma. Usually the petals shrivel and remain atop the pod, holding the thread. I keep a notebook of all bloomings, or try to, and at least record hybridizing attempts. Anyhow, things didn't turn out quite as easy as it might seem. One difficulty is the color-fast threads are not color fast out-of-doors in sun or wet. This did present a nice detective story atmosphere as I sorted out the seeds. The main problem in hybridizing is to have two different flowers open at once. If there is a choice, related genera are more likely to hybridize but science has no way to predict hybridizability among the wonderful array of cacti and succulents." Nona B Mott said in reply, "I have been having trouble identifying crosses of seed pods. It is hard to label them if there is more than one to a plant. I like your idea of the thread and think I'll hang a tiny numbered tag on the thread too. I use parchment paper and a black crayon pencil—the kind grocers use to mark their produce. The rain, sun or wind doesn't destroy them."

In the Small Cacti and Mimicry Succulents Robin, Midge Wihtol had enclosed a clipping of an article on her greenhouse which had been written for another magazine. One of the interesting items was this: "A little less than half of my greenhouse is shaded by green nylon netting which is tacked to the cross pieces of the ceiling, and in other spots plants themselves provide shade." Roy Strange, in his letter, said, "I noticed buds forming on *Rhipsalidopsis rosea*. This is the first one I have bloomed, but I have seen some in collections a mass of flowers. I have two plants, both different in appearance. One has flat pads like a *Zygocactus*, the other has three or four-sided growth." Someone mentioned the "Sea Onion" and he commented, "It is *Ornithogalum longibractium* or of the Star of Bethlehem family. It has quite showy flowers." Doreen Murphy happily said, "My plants all wintered well. The flowers promise to be the best I've had. *Pelecophora valdeziana* is flowering for the first time." Having read Roy's note on *Rhipsalidopsis* she went out to see what hers was doing, "and sure enough mine was thick with buds." Bruce Cutler finds plastic excellent as he says, "I have several frames covered with Windowlite—the stuff like fine wire mesh with plastic in the holes. It is the goods for a year or so, then it begins to

flake away and leaks. I believe it would be economical enough to renew it for frames say every two years. Plants really leap ahead under it and the bugs don't like it." In another part of his letter he went on to say, "I have found time to repot my entire collection. What a job! Twenty-nine of my thirty-one *Conophytums* have flowered this year and some forty different *Lithops* also. I have found that seedlings do much better in this climate (New Zealand) when sown into boxes instead of clay pans and I use considerably more humus than I used to. This retains the

moisture and I do not have to water so often. Next job for these winter evenings is to replant baby *Lithops* into boxes. Reckon there are at least thirty thousand to move."

While this brings the news of Robins to a close this time, remember you can join a Round Robin and take part in it if you just take time to write me. I shall be very happy to hear from any of you, and I know a Robin will bring you much pleasure.

(MRS.) GLADYS H. PANIS
P. O. Box 705, Falmouth, Massachusetts



FIG. 76. Cactus and Succulent Society of California exhibit at the Oakland Flower Show

Oakland Garden Show

The Annual Spring Garden and Home Show, at Oakland, California drew one of the largest crowds on record, and the exhibit by the Cactus and Succulent Society of California proved to be one of the outstanding exhibits. In our display, over 1100 square feet were planted out in cacti and succulents, many of which were large specimens.

The front of the exhibit (about 700 front feet) was enclosed by a four deep row of *Echeveria elegans*. Over 30 flats of plants were used in this planting. A pathway through the center of the exhibit was lined on both sides by a row of *Sedum rubrotinctum*, and over 12 flats of plants were used for this. Four large banana boxes of the hybrid *Crassula triebneri* were also used for mass planting effect. At the close of the

show, a quantity of succulents was sold, the proceeds being donated to the East Bay Garden Center for their building fund.

Our exhibit was awarded the Abe P. Leach Trophy, named for the president emeritus of the original Spring Garden Show, as the amateur winner of the highest horticultural merit award. Rod McLellan Orchids received a trophy as professional winner of the same award. In addition a first prize was awarded which netted a substantial sum over and above expenses.

Indoors, another exhibit of rare potted succulents and cacti took another first. A unique feature of this exhibit was that it was protected from damage or loss by a glass enclosure. Overhead lights prevented the plants from becoming etiolated.



Fig. 77. The prize winning exhibit of the Cactus and Succulent Society of California

Ralph E. Hillary, was chairman of the committee responsible for this exhibit and an outstanding job was the result.

President Ann Genasci reports that the family recently took their vacation and visited many spots of interest in Arizona. A highlight of their trip was a visit to the Desert Botanical Gardens at Tempe, Arizona where they received an out-

standing welcome by Mr. Hubert Earl, the Director in charge. They were much impressed with the plants displayed and the amount of work that has recently been accomplished there.

J. W. DODSON
Affiliate Secretary
921 Murchison Drive
Millbrae, California

An Introduction to Stapeliads

By EDGAR LAMB

From *The National Cactus and Succulent Journal* (England)
with photographs by the author of plants in his own collection

The fascination of growing Stapeliads is something which needs to be experienced to be fully appreciated. Once the collector has attained some measure of success with a few varieties, there is usually no stopping him (or her) from seeking out more and varied species.

The tribe of Stapeliads contains 20 known genera, a few of which are either so rare as to be practically unknown in collections or possibly extinct. About 14 genera are left for us to concentrate on within which over 300 species and varieties can be regarded as 'possibles' to be sought out and eventually added to our collections.

While there are, of course, exceptions to any rule, a very large number of species can be grown and flowered successfully by the average

collector in greenhouse or conservatory.

Perhaps the main point of appeal is that these plants can be grown from seed and flowered in two or three seasons, sometimes the period may be less according to the species, OR stock from established flowering plants may be rooted in the spring and flowered the same year.

In addition, these plants branch freely and can form very handsome groups within a reasonably short space of time, producing more blooms as the size increases.

Flowers are normally five-lobed and vary in size from a fraction of an inch to perhaps 12" across (flowers are known even larger than 12"). I am confining my remarks to species which the collector may obtain and successfully grow without much difficulty.

Freak flowers occur at times as can be seen in the photograph of *Piранthus pillansii* var. *inconstans*, where a four-lobed flower is seen along with the normal five-lobed ones. Sometimes we may have a freak flower with six or more lobes but the plant may produce the normal flowers as well and not necessarily the freak flower next season.

The use of the word STAPELIAD should not be confused with *Stapelia* as within the tribe of STAPELIADS (please note the spelling) we have the 14 genera referred to in my second paragraph of which 10 genera might well be represented in the collection of anyone keen on these plants.

The following genera can be safely recommended to the average collector as offering a number of species which will thrive and flower well under normal greenhouse conditions in most parts of the country. These are the *Caralluma*, *Duvalia*, *Diplocyathia*, *Echidnopsis*, *Huernia*, *Piранthus* and *Stapelia*. (Note: only one species of *Diplocyathia* exists: namely *Diplocyathia ciliata*, but I include this fairly rare species as it is not unduly difficult to grow.)

When sufficient experience has been gained, later additions might include species to represent the *Hoodia*, *Huerniopsis*, *Pectinaria*, *Tavaresia* and *Trichocaulon*.

Stapeliantbus and *Edithcolea* might also be added at some future date but I regard the latter as difficult and needing much more study before being recommended to anyone but the very experienced.

Comparatively few people are familiar with many species and I have heard it said that when plants are not in flower, they all look alike. This is not so, there is in fact a tremendous variety in form, colour, size and methods of branching quite irrespective of flowering qualities.

To give a few examples: dwarf, medium and fairly large-stemmed species exist, their colour may be blue or bluish, green, grey-green, bronze to reddish or pink. Stems may be quite smooth or they may have a velvety surface, some may grow prostrate, others erect and often quite tall. Branching may be from the base at or near ground level or even near the tops of the stems while others may grow underground before emerging some distance from the main plant to



FIG. 78

Stapelia leendertziae. A beautiful bell-shaped flower rather like a much enlarged *Huernia* flower, this is deep purple-red inside and measures approximately 4 inches across.

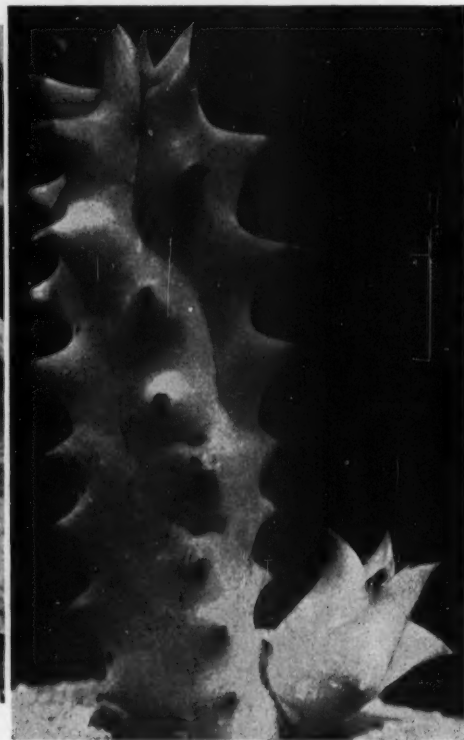
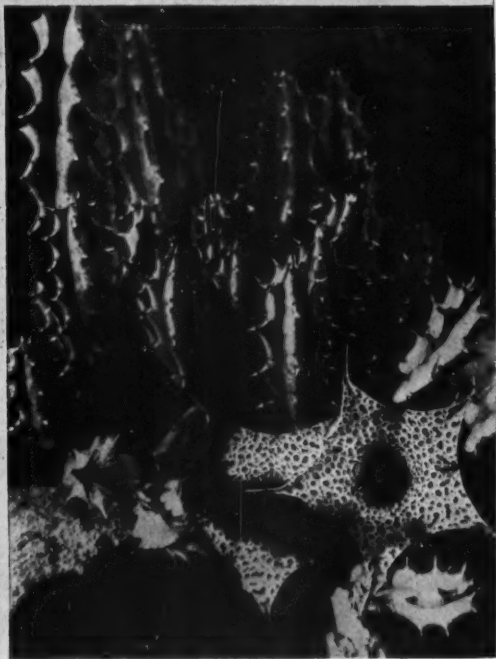
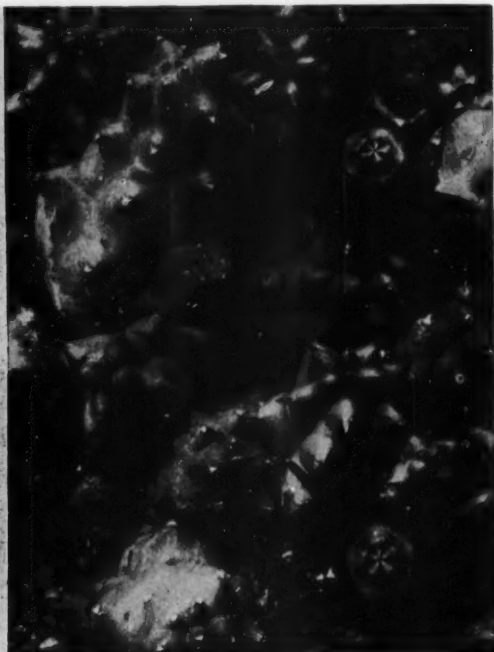


FIG. 79

Caralluma mammillaris showing a young plant and its very thorny ribs at approximately natural size.



Above: *Stapelia pillansii*. Deep purple flowers, fringed as shown and measuring about 6 inches across. At left: *Stapelia flavirostris*. Dull purple-reddish or pinkish flower markings on a yellowish background. This flower is about 5 inches across.



form into a colony of upright stems.

Certain species combine several of these features and are quite amazing in their growing and flowering qualities.

Another outstanding feature is the number which are so thorny and as spiky as many a cactus plant, branching to resemble in many ways but in miniature some large cactus plant from Arizona.

Stems of Stapeliads are not always one colour, some species are most beautifully mottled and may combine various colours in their complicated pattern and all this variety applies to the plants themselves.

Now consider these attractive features along with the many and varied flowers, bearing in mind the flowering period may begin quite early in spring and extends over the whole of the summer months and often well into autumn, and you will see why they can become an important feature in the succulent collection.

In my own collection of about 200 species I am constantly finding new things to attract me, people who have seen my plants have often expressed amazement at the variety of colour, etc., etc., as briefly touched upon in preceding paragraphs.

I am often asked if the green stemmed plant is an indication that it has been in deep shade, while the bronzed or reddish stems show the plant to be in a very hot sunny position. While this may slightly exaggerate the colouring it is not the real reason, for those which have colouring as mentioned above keep their color in different conditions although, as I have said, this can be more pronounced as would be expected.

Over recent years I have grown three collections of species under different conditions to prove or disprove this point and the answer is that the Stapeliad which tends to have a blue stem, will always retain this colouring, the green or the bronzed stems will retain theirs also, varying only in depth of colour when given excessive sun or very deep shade.

Now a word about soil. Many of you will already know that my views on the question of soils for both cacti and other types of succulents are not nearly so rigid as some people would have. I find that we all have our own ideas about

this matter, doubtless after finding what seems to suit our own climatic or other growing conditions. For me to say you must use a certain soil is, I feel, taking the matter too far and may tend to put the beginner off growing something new to him.

Stapeliads can be grown successfully in many soils but there are three very important points to remember: they like a large pot with a lot of room for roots to develop; they like an open soil at the top to prevent moisture remaining around the neck of the main stem, or stems, BUT they do definitely like something well down in the pot which helps to retain moisture for the roots, such as leafmould or peat.

I naturally have my own preference for soil but I would not go so far as to say that unless you use the same soil as I do, you will fail. The only things I would be rather more definite on are their liking for a lot of room to make root, their liking for something which retains moisture well down, in fact deep down, coupled with a well-drained and open soil at least to within one inch depth on the top of the soil.

Given these conditions, not too frequent waterings but a good watering when necessary and slight shade or broken sunlight according to the district in which you live, I think you will soon find these interesting plants will thrive and flower well.

The *Stapelia* is often referred to as a plant whose flower has an evil smell. While this is true of some Stapeliads (other than the *Stapelia* only) it is NOT true of all, in fact there are many species with no smell at all and some have a faintly pleasant odour.

As greenhouse ventilators are usually open at the time when these evil smells might be present, they may go unnoticed unless you seek out the smell as you would a rose or carnation. But the few flowers which may produce the strongest odours may outweigh this aspect by their visual beauty and so should not be regarded as something not to collect. Frankly I think this is often over-exaggerated, particularly as it does not apply to a great many of the tribe, and from observations so far made I am of the opinion that as further study is made we shall find these worst offenders are only a very small minority among an otherwise handsome inoffensive family.

Let me add just one more recommendation in favour of these plants—their flowers last longer than many cacti blooms, I would say on average they last about one week—some a few days less, of course, but some I have noted up to 10-12 days.

EDITOR'S NOTE: The National Cactus and Succulent Journal is a quarterly, published in England. \$3 per year. Can be ordered through Abbey Garden Press.

FIG. 81

Top left: *Diplocyatha ciliata*. Flower slightly off-white with a white fringe is set waving by the slightest movement of air. Top right: *Duvalia compacta*, showing the peculiar "spoke-like" flowers which are of so deep a purple as to appear nearly black. Bottom left: *Piранthus pillansii* var. *inconstans*. Flowers are ochre-yellow with purple-brown markings and golden centre. Bottom right: *Huernia kirkii*. Very beautiful flowers measuring about 1¼ inches across, they are on a sulphur-yellow background with red-purple spots or irregular markings.

FROM MEXICO

Summary from Vol. III, No. 1, March 1958

Cactaceas y Succulentas Mexicanas

At the suggestion and through the assistance of Syntex, S. A., a study was made by Helia Bravo and Don K. Cox of a cactus found in the vicinity of Tehuacán, Syntex being interested in the sapogen and oleanolic acid content. Previous descriptions of this plant contain errors which have led to confusion and it was decided to make a careful study in the field. Based upon this study and the chemical investigations, the authors have agreed with Backeberg's decision to separate the species from the genus *Lemaireocereus*.

The plant is relatively little known, apparently growing at the top of high mountains and in other inaccessible places among tangles of thorn plants such as *Hechtia*, *Agave*, other cacti, *Beaucarnia*, *Bursera* and leguminous shrubs. It is sometimes found with *Polaskia chichipe* from which it is hard to distinguish when not in flower.

The plant was first observed by Leon Diguett during his visit to México in 1901-1904 and was described in 1905 as *Cereus chende* by Gosselin. Britton and Rose classified it as *Lemaireocereus chende*. Previous descriptions agree in general and the one of Gosselin is quite detailed; however, there are errors in all of them. The internal tissues have been stated as intense yellow but this is characteristic of *P. chichipe* with which it is sometimes confused. The fruit has been described as having a white pulp the authors observing a deep purple, so much so that it is used to color soft drinks or ices. The flower is not red but pale rose, only the outside segments having a reddish purple color. The flowers are not nocturnal but were found fully open at midday.

The flowers differ from other species of *Lemaireocereus* of Britton and Rose by having a very short tube, scales on tube and ovary lacking wool or spines but with bristles. When the fruit ripens the tubercles remain well defined and there are persistent spines and wool. In 1956 Backeberg established the genus *Heliabrava* for this species.

Taking into account the rectifications and its new systematic position, the authors consider this plant as follows:

Heliabrava chende. Arborescent cactus about 4 meters high with abundant branching. Trunk about 50 cm. high before branching to 30 cm. thick, woody, gray. Branches erect or slightly arched yellowish green. Ribs 7-8, somewhat wavy. Areoles about 2 cm. apart, blackish. Floral zone near end of branches. Spines usually 5, radial, up to 3 cm. long, subulate; occasionally a rudimentary central spine. Flowers diurnal, soft-

ly perfumed, 5 cm. long including ovary, opening wide. Ovary with numerous small tubercles terminating in a brown pointed scale enclosing 2-3 long bristles and numerous silky hairs. Tube 1 cm. long with tubercles longer than on ovary. Segments of perianth in two series, oblongate, 20-25 mm. long, margins entire, somewhat ciliate at tip. Outside segments purplish red. Interior segments pale rose, style thick; yellowish white, about 12 papillose lobes same color as style reaching height of stamens. Anther bright yellow. Fruit globose, fleshy, spiny, purplish brown, to 4 cm. in diameter, tubercled each tubercle having a small brown scale, two bristles and about 14 spines. Pulp deep purple. Dried perianth persisting. Seeds brown.

Distribution: Southern Puebla and northern Oaxaca, shown on map (Fig. 6), at altitude of 1500 to 2000 meters or higher.

Last spring a rare *Crassulaceae* was rediscovered in the mountains near Tepoztlán, Morelos, which had not been recollected since its discovery by Pringle 55 years ago.

This plant has leaves like a *Pachyphytum* but yellow flowers resembling a *Sedum* and was given the name *Cremnophila nutans* by Rose in 1903. It grows on the cliffs around Tepoztlán, generally out of reach, and attracts attention especially when in flower.

Dr. and Mrs. Meyrán tell of an excursion made to Tecozautla, Hidalgo, last July. This town is about 20 miles north of Huichapan, at an elevation of about 5300 feet.

Huichapan is west of Ixmiquilpan on the old road from México City to El Paso. The country from Ixmiquilpan to Tecozautla is typical of the arid Mezquital Valley although toward Huichapan at elevations near 7000 feet the increased altitude shows in occasional scattered oaks. At Tecozautla one begins to enter the warmer zone. The town is a veritable oasis, nearly every house having its orchard of peaches, figs, limes, avocados and mangoes, truckloads being sent to the insatiable markets of México City.

Near Tecozautla is a red pumice hill which contrasts strikingly with the white spined *Mammillaria compressa*, the green *Opuntia microdasys* and the many other cacti that cover the hill. Just north to Tecozautla in a canyon are geysers resulting from wells intending to find water but which produced steam under high pressure. On the canyon walls are numerous cacti including those of the warmer zone such as *Dolichothele melaleuca* and *Lemaireocereus dumortieri*, *ocotillos* and *Pachyphytum*. The different species found are listed in the article.

FURTHER NOTES ON ECHEVERIA

By ERIC WALTHER

Research Associate, Department of Botany, California Academy of Sciences

PART IV

17. *Echeveria albicans* sp. nov.

"Pertinens Ser. *Urbinae*; plantae acaules, rosulis tarde caespitosis, foliis albidis, non purascentibus, crassis, obovate-oblongis, mucronatis, ad 5 cm. longis et 25 mm. latis; racemis bifidis vel simplicibus; bracteis oblanceolate-linearibus acutis, adpressis; pedicellis 10 ad 14

mm. longis, turbinatis; sepalis valde inaequalibus, deltoideis, adpressis vel ascendentibus; corollis urceolatis, 14 mm. longis, 10 mm. crassis, rosaceis."

Type: CAS: 408987; from material grown at Golden Gate Park, S.F., originally received from F. Schmoll, Cadereyta, Mexico.

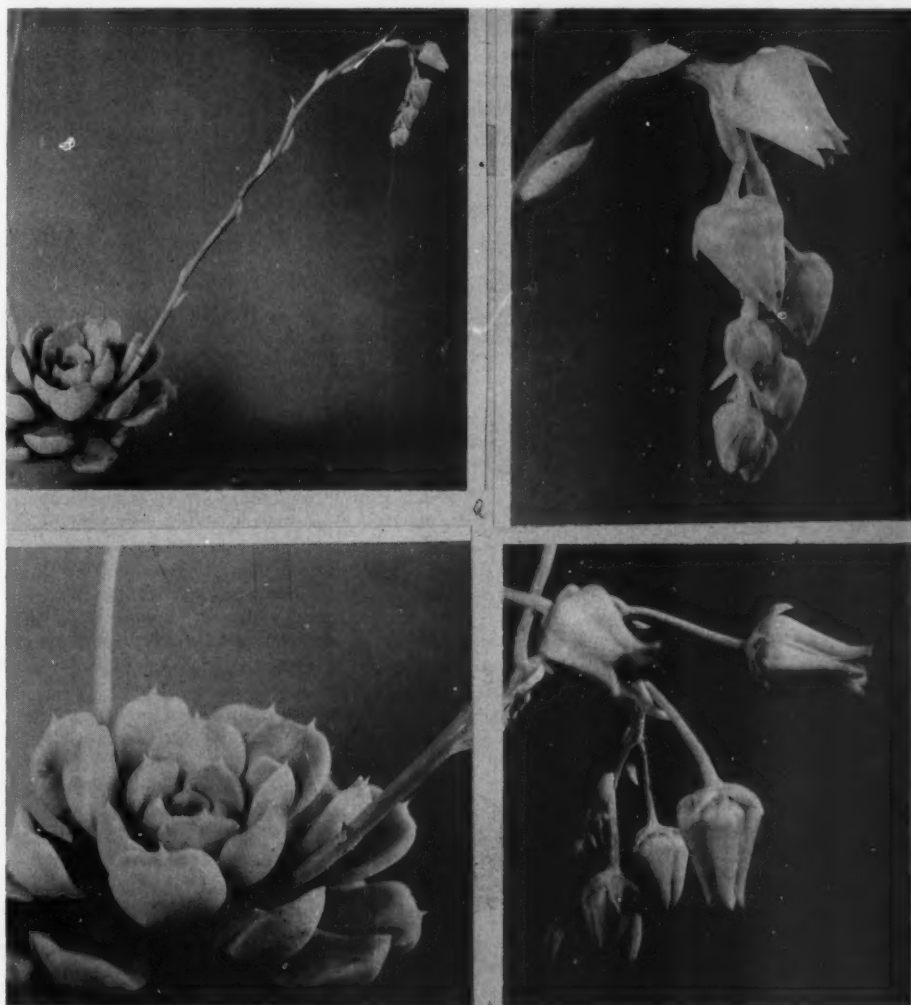


FIG. 82. *Echeveria albicans*. Upper left, flowering plant; upper right, single raceme; lower left, single rosette; lower right, bifid raceme.

Synonym: *E. elegans* var. *kesselringiana* Poellnitz, Fedde Rep., 39:239, 1936. *E. alba* Hort. Calif.

Occurrence: Mexico, without definite locality. (Poellnitz cited Ritter #532 as his type, but without locality.)

Description: Plants glabrous, conspicuously pruinose; rosettes stemless, ultimately cespitose; leaves closely imbricated in bud, crowded, obovate-oblong, 3 to 5 cm. long, 15 to 25 mm. broad, thick and turgid, thickest just below apex, upcurved, obtuse to truncate, with small, slender, whitish apiculus, not purple-tinged but wholly white, margins scarcely pellucid; inflorescence mostly a simple raceme, rarely bifid, to 25 cm. tall; peduncle erect or ascending; lower bracts numerous, 8 to 15 mm. long, appressed, occasionally enlarged and aggregated into an aerial rosette, normally lanceolate, acute, with upcurved apiculus; pedicels slender, to 14 mm. long, conspicuously turbinate-thickened below calyx; sepals unequal, strongly connate at base, longest to 10 mm. long, deltoid to linear-oblong, acute to cuspidate, scarcely spreading; corolla broadly conoid to urceolate, 14 to 18 mm. long, 10 to 12 mm. in basal diameter; petals erect or slightly spreading at tips; basal nectar-cavity shallow; nectaries narrowly-oblong-trapezoid, somewhat obliquely-truncate. Fls. V-VIII.

Color: Leaves kildare green, glaucous-pruinose and so pale-olivine; peduncle grape-green and pruinose; corolla begonia-rose or alizarine-pink, to old-rose at base, viridine-yellow to light-yellow-green at apex, inside at apex oil-yellow; carpels viridine-yellow; styles apple-green; nectaries strontium-yellow.

Remarks: Dr. Rose's original concept of *Urbinia* as a genus was of course untenable, in view of the numerous species of *Echeveria* now known that provide a perfect transition from the type, *E. agavoides*, to say, *E. elegans*. However, the Series *Urbiniae* constitutes a most natural group, to which we here add a further species. This new item has been grown in California collections for some time; and despite lack of information as to its native habitat needs to be placed on record, for it is a mere question of time until this too shall be found wild somewhere in Mexico. Plants seen in cultivation in European Botanic Gardens, under the varietal name cited, appear to be identical with our material. We feel quite certain that this is a distinct species, differ-

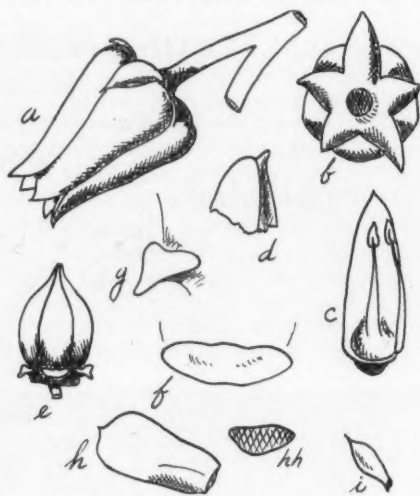


FIG. 83. *Echeveria albicans*

- a. side-view of corolla x 2
- b. base of calyx x 2
- c. inside of petal x 2
- d. petal-tip x 8
- e. carpels x 2
- f. nectary, front-view x 8
- g. nectary, side-view x 8
- h. leaf x 0.4
- i. bract x 0.8
- hh. leaf in cross-section x 0.4

ing from *E. elegans* in its broader, blunter, thicker leaves that are thickest just above the middle, have a more slender apiculus, less pellucid margins, a more whitish color; pedicels usually decidedly turbinate below calyx; more unequal, strongly ascending sepals and a broader, more conoid-urceolate corolla to 14 mm. long and 10 mm. thick; the petals are scarcely spreading at the greenish tips, and the nectaries are broader, obliquely-truncate-trapezoid.

E. simulans has narrower, acuminate leaves; with a stouter mucro; a cylindroid corolla to 15 mm. long, yellowish at apex and narrow nectaries.

E. potosina differs in longer, narrower, usually purple-tinged leaves, an urceolate corolla 12 to 13 mm. long by 9 mm. diameter; nectaries obliquely-truncate. *E. hyalina* has thinner leaves with conspicuously hyaline edges and truncate, strongly cuspidate-acuminate apex; spreading sepals, conoid-urceolate corolla 11 by 8 mm., and obliquely-truncate nectaries.

Since we began writing on *Echeveria*, Eric Walther has visited Mexico four times, has gathered 37 species in their native habitat, most of them at the type-locality, and has published a total of 16 new species. Herewith we offer another three novelties, which we owe to the indefatigable collecting in Oaxaca of Mr. Thomas MacDougal. Several of these are unique, and one at least has promise of becoming a worthwhile ornamental garden-plant. —SCOTT HASELTON



FIG. 84. *Echeveria amphoralis*. Left, flowering plant in the garden of Victor Reiter; center, flowers; right, foliage

139. *Echeveria amphoralis* sp. nov.

"Pertinens Ser. *Echeveria*; (1); puberula, caulescens, ramosa, ad 30 cm. alta; foliis remotis vel subrosulatis, obovato-cuneatis, mucronatis, ad 35 mm. longis, 20 mm. latis; inflorescentiis lateralibus, racemosis, ad 15 cm. altis; bracteis patentibus, obovatis, acutis, ad 30 mm. longis, 14 mm. latis; racemis aequilateralibus, ad 7-floris; pedicellis ad 12 mm. longis, 3 mm. diametro, turbinate; bracteolis 2, fugaceis, linearilanceolatis, ad 14 mm. longis; sepalis subaequalibus, ad 14 mm. longis, lanceolatis, acuminatis, crassis, patentibus; corollis amphoralibus, magnis, ad 24 mm. longis, 14 mm. diametro, coccineis et flavis; ovariis cum stylis 19 mm. longis; stylis tenuibus, viridibus; nectariis transversis, lunato-reniformibus, ad 4 mm. latis, albidis."

Type: CAS:409844. T. MacDougall B-82. (UCBG:56/801-1)

Occurrence: Mexico; Oaxaca, Tlaxiaco, Río de Tablas, 7,000 ft. (type)

Description: (From plant and flowering material furnished by Mr. Don B. Skinner, L.A., 6/18/58.) Plant puberulous on all external parts; subshrubby, to 20 cm. tall or more, with numerous ascending branches; leaves numerous, subrosulate or somewhat scattered, obovate-cuneate, mucronate, to 35 mm. long and 20 mm. broad, thickish, subpetiolate; petiole thick; blade shallowly concave above, obscurely keeled beneath; inflorescences several from below the leaves, erect or ascending, to 20 cm. tall; pe-

duncle stout, 4 mm. in diameter at base; lower bracts obovate, mucronate, 30 mm. long, 15 mm. broad, widely spreading; racemes equilateral, each with 4 to 7 flowers; pedicles stout, to 20 mm. long and 3 mm. thick, bibracteolate, bractlets linear-lanceolate, acute, subterete, to 14 mm. long; sepals subequal, to 14 mm. long, semiterete or somewhat flattened, lanceolate, acute to acuminate, ascending to widely spreading at anthesis; corolla quite large, to 24 mm. long and 14 mm. in basal diameter, 7 to 11 mm. wide at mouth, amphora-shaped, pentagonal; petals sharply keeled on back, apiculate at the somewhat spreading tips, with short basal hollow within; carpels to 18 mm. long with the styles, these last long and slender, to 12 mm. long, somewhat divergent at tips; nectaries transversely-lunate-reniform, to 4 mm. broad; trichomes app. 0.1 mm. long. Fls. VI-

Color: Leaves lettuce-green, kildare-green beneath; lower bracts as the leaves; peduncle cosse-green tinged russet-vinaceous; sepals cosse-green; corolla spectrum-red to scarlet at base and middle, with edges and apex of petals conspicuously lemon-yellow; petals inside pale-lemon-yellow; carpels white at base, above light-yellow-green; styles lettuce-green with faint red lines on inner surface; nectaries white to pale-lemon-yellow.

Remarks: Our present novelty is another of Mr. Thomas MacDougall's many discoveries in Oaxaca; its showy red-and-yellow flowers of good size promise to make it a popular garden-ornament. The specific name refers to the shape of the corolla, closely approximating the classic

(1) Sect. IV. ECHEVERIA: foliis et floribus pubescentibus. Type-species: *E. coccinea* (Cav.) DC. Ser. 12. ECHEVERIA: characteribus Sect. similibus. Type-species: *E. coccinea* (Cav.) DC.

"Amphora". As a species, this comes near to *E. carminea* Alexander, which last differs in having an erect, scarcely branching stem, with longer, thinner, undulate-margined leaves, and somewhat smaller flowers darker-red in color.

Comparisons with *E. macrantha* Standley & Steyermark from Guatemala would also be in order here, except that the latter is not in cultivation at present, and is known to us solely from

the very imperfect type-specimen. About the only critical difference we can be certain of is the ventrally pubescent follicles.

With *E. carminea* and *E. harmsii*, this new species constitutes a group of related forms within our Section, and Series *Echeveria*, characterized by their rather large flowers and simple trichomes.

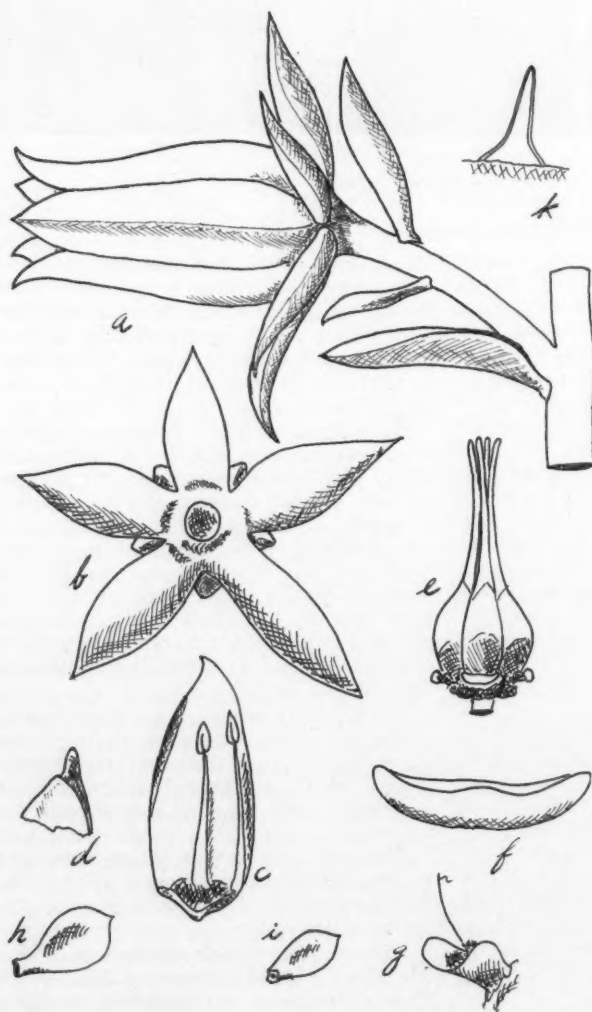


FIG. 85. *Echeveria amphoralis*

- a. side-view of corolla x 2
- b. base of calyx x 2
- c. inside of petal x 2
- d. petal-tip x 8
- e. carpels x 2
- f. nectary, front-view x 8
- g. nectary, side-view x 8
- h. leaf x 0.4
- i. bract x 0.4
- k. greatly enlarged

106. *Echeveria penduliflora* sp. nov.

"Pertinens Ser. *Racemosae*; glabra, caulescens, caulibus ad 30 cm. altis, simplicibus; foliis alternis vel subrosulatis, oblongo-oblancoelatis, ad 15 cm. longis, mucronatis; inflorescentiis racemosis, aequilateralibus vel unilateralibus, ad 30 cm. altis; pedunculis erectis; bracteis inferioribus erectis, oblongo-obovatis, acutis, ad 45 mm. longis; racemis 25 cm. longis, multifloris; bracteis superioribus valde deflexis, linearibus, 10 mm. longis; pedicellis 6 mm. longis, tenuibus, valde reflexis; sepalis linearibus, subaequalibus, ad 6 mm. longis, ascendentibus; corollis pentagonalibus, ad 14 mm. longis, carneis; nectariis 2.5 mm. latis, albis."

Type: CAS:409846. T. MacDougall B-174, San Sebastian Los Fustos, Oaxaca.

Clonotype: UCBG: 56/798.

Occurrence: Mexico; Oaxaca, San Sebastian Los Fustos, at 6,400 ft. alt.

Description: Plant glabrous, caulescent; stem erect, usually simple, to 30 cm. tall or more; leaves scattered alternately or subrosulate at top of stem, thinnish, oblong-oblancoelate, to 14 cm. long and 4 cm. broad, narrowed to 2 cm. at the thick, keeled petiole, faintly keeled beneath, shallowly concave above, at tips upcurved and mucronate; inflorescences 1 or 2, arising from below leaves, to 30 cm. tall; peduncle erect, to 5 mm. thick at base; lower bracts strongly ascending, to 5 cm. long and 15 mm. broad, obovate-oblong, at apex upcurved and acute, shallowly concave above, faintly keeled beneath, spurred at base; racemes many-flowered, unilateral, to 25 cm. long, flexuose, with 60 or more flowers, these strongly pendulous, crowded or remote; upper bracts abruptly deflexed from the spurred base, but becoming erect in fruit, bear-

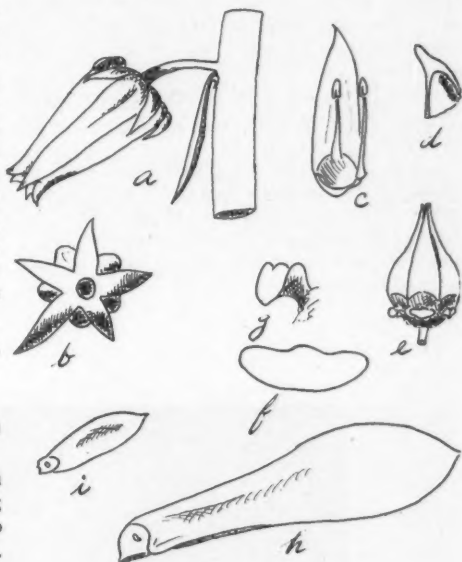


FIG. 87. *Echeveria penduliflora*

- a. side-view of corolla $\times 2$
- b. base of calyx $\times 2$
- c. inside of petal $\times 2$
- d. petal-tip $\times 8$
- e. carpels $\times 2$
- f. nectary, front-view $\times 8$
- g. nectary, side-view $\times 8$
- h. leaf $\times 0.4$
- i. bract $\times 0.4$

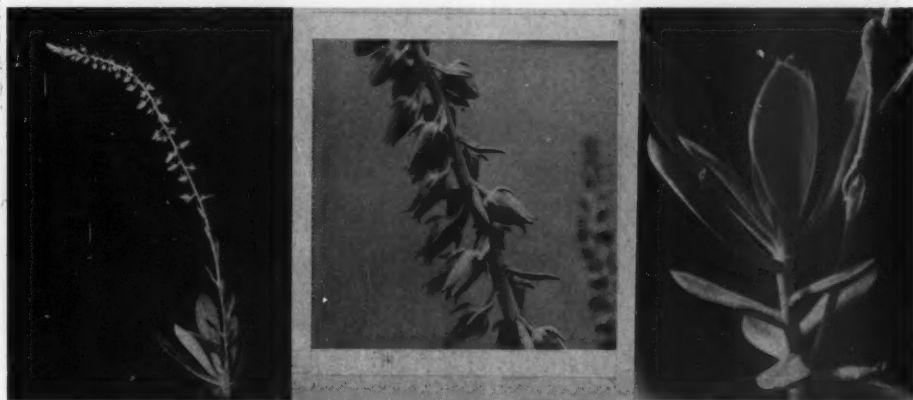


FIG. 86. *Echeveria penduliflora*. Left, flowering plant in garden of Victor Reiter; center, flowers; right, foliage

ing 2 minute, slender, fugaceous linear bractlets less than 2 mm. in length; sepals subequal, longest 6 mm. long, linear-deltoid, apiculate, ascending; corolla to 13 mm. long, 9 mm. in basal diameter, 4 mm. at mouth, bluntly pentagonal; petals with shallow basal hollow within; carpels 9 mm. long; nectaries 2 mm. broad, truncate-reniform. Fls. VI.

Color: Leaves above cerro-green, beneath asphodel-green; peduncle and rachis grape-green; lower bracts as the leaves; upper bracts and sepals pale-violet-gray; corolla geranium-pink to peach-red and jasper-pink, tips of petals in buds noticeable delft-blue; carpels white at base,

above chartreuse-yellow to kildare green; styles dull-indian-purple; nectaries white.

Remarks: This unique new species is easily the most remarkable that has been discovered recently in Oaxaca by Mr. Thomas MacDougall. The species shows some similarities to both *E. atropurpurea* and *E. canaliculata*, both of which have the sepals strongly reflexed, and do not show the strongly deflexed pedicels and upper bracts. In *E. penduliflora* the raceme is actually equilateral, but becomes unilateral from one-sided lighting. While this clearly belongs into our Series *Racemosae*, there the tall caudex and scattered leaves are atypical.



FIG. 88. *Ercheveria sedoides*. Top, flowering plant; lower left, flowering branch; lower right, sterile branch

93. *Echeveria sedoides* sp. nov.

"Pertinens Ser. *Bracteolatae*; glabra, caulescens, ramosa, ad 25 cm. alta; foliis alternis, remotis, haud rosulatis, oblongo-obovatis, clavatis, subtriquetris vel subteretibus, crassis, ad 25 mm. longis, 8-10 mm. latis, 6-8 mm. crassis, recurvatis; inflorescentiis aequilateralibus, racemosis, paucifloris; pedunculis flexuosis; bracteis foliis similibus sed minoribus, recurvatis, ad 18 mm. longis; pedicellis ad 20 mm. longis; sepalis subaequalibus, teretibus, obtusis, reflexis, ad 9 mm. longis; corollis valde pentagonalibus, campanulatis, ad 16 mm. longis, coccineis et flavis; petalis acute carinatis, supra patentibus; carpellis ad 8 mm. longis; nectariis reniformibus, ad 2 mm. latis."

Type: CAS:409843; T. MacDougall B-171 (UCBG:56/792.)

Occurrence: Mexico; Oaxaca, Palacio San Bartolo Yautepec, 4,500 ft., known only from above type-locality at present.)

Description: (From material received through Mr. Don B. Skinner, L.A.) Plants glabrous, shrubby, freely branching, becoming to 25 cm. tall or more; branches spreading to drooping; leaves scattered, usually rather remote, not at all rosulate, oblong-obovate, quite thick, clavate, subtriquetrous, shallowly convex above, rounded and bluntly keeled beneath, somewhat recurved, obtuse, to 25 mm. long, 10 mm. broad and 8 mm. thick; inflorescences several, with 4 to 6 flowers each, equilaterally-racemose; peduncle decurved to ascending; bracts rather few, similar to leaves but smaller, noticeable recurved, 8 mm. long or less; pedicels elongated, to 20 mm. long, somewhat turbinate below calyx, bibracteolate, bractlets spreading, subterete, to 6 mm. long; sepals subequal, to 9 mm. long, terete, obtuse, more or less reflexed; corolla strongly pentagonal, to 16 mm. long, campanulate, to 12 mm. wide at mouth at full anthesis; petals sharply keeled on back, thick, with deep basal nectar-cavity, apex with thick, blunt mucro; carpels to 8 mm. long; nectaries reniform, to 2 mm. wide. Fls. VI.

Color: Leaves cerro-green, as are the bracts and sepals; peduncle viridine-green, but tinged corinthian-red; corolla scarlet-red, with edges lemon-chrome; petals inside apricot-yellow; carpels scheele's-green; styles viridine-green tinged corinthian-red at tips.

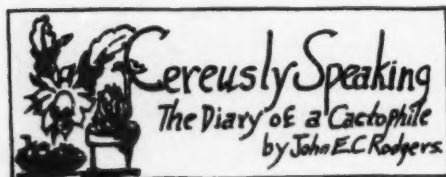
Remarks: *E. sedoides* is another of Mr. Mac-

Dougall's many interesting discoveries in Oaxaca. As the specific name indicates, it greatly resembles members of the group of Mexican subshrubby *Sedum*-species with a lateral inflorescence, at least until its flowers appear. This is one of a number of closely related species revolving about *E. gracilis*, the first of the series to become known. *E. sedoides* differs from its allies in the large corolla, which is to 16 mm. long or more, its rather thick, subtriquetrous leaves and pedicels to 18 mm. long, as well as the terete, somewhat reflexed sepals.



FIG. 89. *Echeveria sedoides*

- a. side-view of corolla x 2
- b. base of calyx x 2
- c. inside of petal x 2
- d. petal-tip x 8
- e. carpels x 2
- f. nectary, front-view x 8
- g. nectary, side-view x 8
- h. leaf x 0.4
- hh. leaf in cross-section x 0.4
- i. bract x 0.4



Each year the old faithfuls bloom and there are always new comers to be recorded. For some I've found the magic formula of light, air, soil, rare elements, position and many other things too recent in experimental notes to be proven by time, etc. But—

Light does have a great deal to do with it for I've kept blooming size *Lobivias*, *Rebutias*, *Echinopsis*, *Mammillarias*, *Selenicereus*, *Epiphyllums*, *Opuntias*, *Harrisias*, *Cerei*, *Pelecophoras*, *Crassulas*, *Sedums*, *Bryophyllums*, *Haworthias*, *Stapelias*, *Huernias* and *Gasterias* in strong light near the glass during the winter and they bloom much better than the same types on the regular benches and shelves. It does not necessarily mean bright sunlight, just plenty of light.

I have checked my records for 25 years regarding light and there seems to be a close correlation between the amount of light the previous year with amount of flowering the following year. There was plenty of strong light in 1957 and the 1958 crop of flowers has been above average. 1958 has been dark, gloomy, and rainy so what can I predict for 1959?

There will be less blooms on the full sun types which are regulars; the same amounts on the shade and less light types with a few off year types such as *Pereskias* (which depend upon more heat), *Nopaleas*, *Mammillarias*, *Astrophytums*, *Stapelias*, *Huernias*, *Harrisias*, *Sedums*, *Pachyphytums*, *Columnar Cerei*, *Epiphyllums*, etc. blooming after one to several seasons of non-blooming. You no doubt will say at this point some of these genera bloom regularly for me. My records show there are some that never miss a single year.

I've been fascinated by *Epiphyllum* No. 72 (from T. MacDougall's introduction). It has bloomed for me since 1952 between June 25 and 28. It has opened the same date for the last three years. The flower is white with a yellow ruff of sepals. The bud before opening is 12 inches long. The ones that open are usually near the root level. It is evidently a hybrid of *Selenicereus* with an *Epiphyllum* since it is much like the *Cooperi* complex. There are many other cacti as well as succulents which never fail.

I do not believe that there should be no shade trees near my greenhouse but I do believe that trees that harbor "honey dew-making insects" such as aphids should be avoided. The last few

seasons our maples in this district have been infected with cottony scale, aphids, and leaf-gall insects. The sticky secretions falling on the glass create a dirt catching covering which helps to cut down on the transparency by growing fungus etc. This light barrier seems to make the glass iridescent and with the sulphurous acid from the steam and sulphur dioxide in the air from the National Tube Steel Plant, the light passing qualities are definitely impaired.

I have used detergents, razor blades as well as friction from dry rags to keep the glass clean and even then there is a residue which stays. Rains do not seem to help any. As far as I can tell it is a combination of trees, industry, and time—all of which are culprits.

Wet, cold and gloomy Lake Erie weather has been our lot but it has not damaged any of my plants so far. It may be next year that the damage shows up. I've checked the results of poor light to the etiolation of the following growing season. The plants seemed perfectly formed at the time of purchase but when active grown began the damage appeared. No doubt strong light will give comparable results on shade loving plants in stunted stalks, poor flowers, etc. I'm keeping perfect records of the plants which I hope may help to prove or disapprove my theory.

Most of the letters I receive are enquiries regarding the blooming habits of the smaller types of cacti and other succulents. The Epiphytes are the concern of others. Some have success with the commoner *Epiphyllums* but no apparent luck with the *Orchid Cacti*. Some miss their large *Opuntias* which became too large to manage. There are so many smaller types listed in catalogs that give the same effects but take up so little room. I have to admit that I still have at least 40 species of *Opuntias* from small pots to "back breaker" types. I also collect *Pereskias*, *Pereskioopsis*, etc. in the first family of cacti. Most of mine go into storage in late September and are put outside in late April.

Opuntia compressa (hardy native of the northern USA) likes to grow partly shaded by long grass. In the wild state it grows on thin soil over rocks and in leaf mold and sand deposits. I've had a bed for at least 15 years which originally was in full sun but now is shaded most of the day. Poor drainage, oversized plants, etc. have shut out the light and air circulation and kept the soil moist but they go ahead the same as before. The change has been so gradual that the seedlings have adjusted themselves. Many of our plants seem to grow one place in the wild and in another place which is opposite in cultivation. Perhaps nature is not too choosy about some plants and they grow where she puts them.

The two most interesting collections from the

environmental standpoint are the University of California greenhouses in Berkeley, California, and at the Montreal (Canada) Botanical Gardens. These two collections are living examples of what proper growing conditions can do for desert rain forest and limited rainfall region plants. Both house all types. At Berkeley, a dry hillside is planted to hundreds of sun lovers from Mexico and South America (many in full bloom in July 1957). Both Berkeley and Montreal have superb dry and humid houses. The plants are well labelled and grouped according to families, genera, species, etc. The results are not approximately the wild type but improvements over the wild types. Heat, humidity, rare minerals, properly proportioned soils, water and light have made these two collections superlative.

My western Desert Lilies (Agaves) from Texas, Arizona, and Utah, are taking the wet weather well. I've tried to make the drainage problem as near fool proof as possible. I've kept all the plants I've ever had but to date I've never had one flower (some die after flowering). I have underfed, underpotted and restricted them as much as possible. I like them but not as giants in my cramped conditions. When I see some like mine six feet tall and eight feet across with 14-foot bloom stalks, I'm pleased with my dwarfs (two feet high and three feet across). I still can store them under my benches by sinking the pots in the ground. If they are put out of doors at the end of April no disfiguring etiolation takes place. They are brought in and stored before the first hard freeze which gives them about six months of outdoor treatment.

The Aloes and Gasterias are also given the same treatment with small pots and lean soils. They bloom profusely in the early spring and on into July. The colors are vivid and the growth firm. I've had Gasterias that were two feet across but I can control this if I wish. If you feel that it is not the place of a plantsman to stunt the growth of plants, you are right but I've always contended that I'm an experimenter. I'm merely repeating what nature does to certain plants that are out of their ideal location (through arid, cold, poor soil, restricted root room, etc.).

I have a Joshua Tree which is five feet tall. It has grown 18 inches in three years. It stands my storage room treatment. I'm allowing it to grow but to get it to branch I may resort to lean soil, etc. A Yucca-like plant from White Sands was given me about 10 years ago. It was a thick root section with a foot long, loose thread edged narrow leaf. This died after planting in a loam, leafmold, sand soil. The next year a new shoot came up and it is now 18 inches high with a narrow stem, a rosette of leaves and slow growth.

According to the giver, this plant grows amid drifting sand and often keeps its rosette above the soil on a stem attached to the root 10 to 15 feet down. I'm growing it without any struggle.

I've found that the concrete floor formerly covered by a chicken house makes an ideal summer storage space for Western and South American columnar cacti, Agaves, Stapelias, Huernias, Crassulas, etc. The space is 12 x 12 feet. The concrete, being exposed to the weather retains heat and moisture. These along with sunlight are the three musts for these plants. There is sunlight from early morning to noon, then from two o'clock to sundown. The vine covered fences break the wind and protect them from stray animals. Since the cement floor is dry, most of the time, slugs and other nocturnal foragers are few.

With the long daylight, cement floored enclosure, the grape arbor, my 9 x 15 greenhouse, and my diaries, I've been able to meet most of my problems of culture, season, growth, and study.

John E. C. Rodgers
1229 E. 8 St.,
Lorain, Ohio

FROM MARJORIE WINTOL, NEW JERSEY

Dear Mr. Haselton,

May I suggest something for the Journal, which might be a source of entertainment for your readers, and which might also be productive of information? This being an era of quizzes in magazines, television and other organs, folk seem to be conditioned to sending in answers.

I suggest that the Journal ask one or two questions in each issue, inviting reply from all readers, by postcard; the reply consisting of the name of a single plant. I suspect that this idea derives from a recent invitation in the British equivalent of your magazine, which asked, recently, via a letter-to-the-editor, for votes on the most "boring" plant. I think they printed one or two replies, including mine, but there they stopped.

But I think this would be fun. Good amateurs among your subscribers come up with helpful information not found in the books, as I found to my delight today when a succulent "robin" came in with information on propagating *Kalanchoe beharensis*. I, myself, was delighted to find a bloom on *Kalanchoe tomentosa* last spring, as the NY Botanical Garden magazine (I think) had stated years ago that this plant had not been known to bloom out of its native habitat.

Growing conditions are so different in the various sections of this country and others that this might be an inexpensive and interesting way of collecting information on various plants within the reach of your organ, which might even be of scientific value.

EDITOR'S NOTE: We will try out the above suggestion and ask members to mail a postcard to Cactus Journal, 132 W. Union St., Pasadena, Cal., answering the following questions:

1. Which cactus and succulent flowers the most?
2. Which cactus and succulent is the biggest waste of time?

Please send your questions to Harry Johnson, Johnson Cactus Gardens, Paramount, California.

INTERNATIONAL SUCCULENT INSTITUTE, INC.

ISI

President.....	Al. E. Irving, 2163 Alameda Ave., Alameda, Calif.
Vice-President.....	George Quesada, 321 Union St., San Francisco, Calif.
Secretary-Treasurer.....	J. W. Dodson, 921 Murchison Dr., Millbrae, Calif.
Directors.....	Myron Kinnach, 5918 Jordan Ave., El Cerrito, Calif. Thomas Juul, 795 Foerster St., San Francisco, Calif.

The founders of this society feel that there is an urgent need for a source of new, scientifically or horticulturally valuable plant material, (such as plants, seeds, cuttings, etc.) not available through commercial sources. Only a small portion of the known species or cultivars of succulents are in the trade and these are usually without the source-data needed by those wishing the plants for scientific study. This society therefore, has been formed for the purpose of importing and distributing plant material to fill this scientific need, as well as the need of amateur horticulturists who may desire new species solely for their uniqueness and beauty. This society has also been formed to provide a medium through which taxonomists, field collectors, and others, might distribute, on an international basis, such plants or plant materials as may be described, collected or grown by them, so that these species can be available not only to currently interested persons, but may also be preserved and made available to future generations.

We prefer to remain an independent organization, rather than become a part of a national or affiliate society, for we feel that policies of plant distribution are best administered by those who are actively engaged in such a project. We also wish to avoid embarrassment to any national society, who, in sponsoring us, might be criticized as competing with commercial enterprises.

We have established the following policy regarding distribution:

- 1—Lists of plant material to be distributed will be published in the Cactus and Succulent Journal of America at regular intervals.
- 2—No species or cultivar will be distributed that has been offered in a commercial succulent catalog issued in the U.S.A. within the preceding three years, unless our offering is annotated with scientifically valuable information, such as field collection data, which would not be obtainable from commercial sources. Due to the expense of gathering and furnishing this data, our prices may necessarily be higher than those listed in catalogues. While we shall carefully check the catalogues available, nurseries are urged to furnish to our secretary, their present and future catalogues.
- 3—Each species, variety or cultivar will be listed only once, unless we later obtain it from a different field locality, or unless it remains unlisted in commercial catalogues. Only a few plants of each species will be offered and no more will be available from this society when that supply is exhausted. It is not our purpose, as it is with commercial sources, to supply a species to collectors until the demand ceases, but rather to distribute a few plants of a large number of species. We trust that further distribution may continue as exchanges between collectors and from such commercial sources as may also obtain and propagate these species.
- 4—For those plants collected in the field, or grown from field collected seed, full locality data will be printed in the list of material offered. This valuable information will not only provide a published record as to species distribution, but will provide plants of great value to the taxonomist or other scientists who prefer working with annotated material. It is hoped that those obtaining these plants will retain the accession, collector, or "ISI" number on their label, so these plants will remain of scientific value, even though they may have been acquired solely for horticultural purposes.
- 5—In order that persons in distant states or countries will have an equal opportunity to obtain plant material, which is often in short supply, all orders will usually be held for a period of time so that the plant material may be distributed on a fair geographical basis. It is advisable to include a list of alternate substitutions with each order.

The "ISI" is a non-profit organization, none of whose officers receives monetary compensation. All proceeds will be used to pay such expenses as administration, cultivation, and the importation of new or rare plant material.

Please address all correspondence concerning orders to the Secretary, J. W. Dodson, 921 Murchison Dr., Millbrae, California, U.S.A.

Any of the officers will be pleased to receive suggestions for the improvement of this program.

ADV.

SEPTEMBER-OCTOBER 1958 OFFERING OF PLANTS, AND SEEDS BY THE INTERNATIONAL SUCCULENT INSTITUTE, INC.

Please address all communications to the Secretary, J. W. Dodson,
921 Murchison Dr., Millbrae, Calif.

ISI-9 *Adromischus grandiflorus* Uitew. UCBG 54.324-1. South Africa, 7 miles from Robertson, H. Herre. A large flowering species. Its leaves become easily detached and each leaf can give rise to a new plant. .50

ISI-4 *Adromischus caryophyllaceus* (Burm.f.) Lem. UCBG 56.314-1. South Africa, from the top of a

mountain on the farm of Ebenhaezer (just north of the homestead) on Vanwyksdorp-Calitzdorp road, L. C. C. Liebenberg #6152. A somewhat shrubby species with narrowly tapered green leaves. Though not particularly attractive, it has flowers which are the most colorful in the genus. One of the first species described. .75

ISI-29 *Kalanchoe x dawei*, UCBG 52.1075. Collected by C. H. Lankester in Dawe's garden in Uganda, Africa. One of the most beautiful Kalanchoes, the leaves huge, blue-white, flowers many, white, very large; plant may grow to six feet tall, but remains a good greenhouse plant. Related to *K. somaliensis*. .75

ISI-39 *Coleus* sp. One of two species imported from Mr. Delap, Kenya Colony, Africa, and native to that country. True succulents, in no way resembling the common *Coleus* grown here as house plants. Leaves thick, hairy, aromatic, densely arranged on stem. Succulence is increased by underwatering and bright light. .50

ISI-47 *Coleus* sp. The second species from Kenya. Lighter green than ISI-39, and of more upright growth. .50

ISI-75 *Haworthia limifolia* var. *ubomboensis* (Verdoorn) G. G. Smith. Collected by Captain Keith on the Ubombo Mtns. near Steigi, Swaziland. A very distinctive *Haworthia*, of light, whitish-green coloring, with a most interesting habit of growth. Dodson #L2302. See photograph Cactus and Succulent Journ. of America, 1, Jan.-Feb. 1953, Page 11. .75

ISI-101 *Haworthia monticola* Fourcade. Collected in the Uniondale Division, Fourcade No. 2498. A rather hardy, dwarf species, with interesting recurved leaves. Dodson #M-391. .50

ISI-103 *Haworthia angustifolia* var. *liliputana* Uitew. A very dwarf form of *H. angustifolia* Haw. Each rosette may be from one to two inches in diameter and soon form clumps that usually retain a neat habit of growth. Dodson #A-1901. See photograph Cactus & Succulent Journ. of America, 5, Sept.-Oct. 1957, Fig. 81, Page 134. .50

ISI-104 *Haworthia paradoxa* Poelln. From the farm Vermaaljkheit, Riversdale Division (the type locality). A very attractive little *Haworthia* of the Sect. *Retusae* Haw. A slow growing species that retains its characteristics under greenhouse conditions. Dodson #P-074. .75

ISI-121 *Cotyledon ? ladysmithensis* (Schonl.) Poelln., vel aff. Forming dense masses of fuzzy, red-tipped leaves resembling bear-paws. This species should be grown out doors, in full sun, to bring out its best coloring. It will stand some frost. UCBG 50.2112, Dr. A. L. Geyer, Little Karroo, South Africa, Stellenbosch #6036. .75

ISI-122 *Rosularia pallida* (Schott & Kotschy) Stapf. Long a favorite in English alpine gardens, this Asian member of the Crassulaceae forms cushions of hairy, *Sempervivum*-like rosettes. UCBG 51.1172. .50

ISI-125 *Chamaealoe africana* (Haw.) Berger. This very dwarf plant was originally considered as belonging to the genus *Aloe* by Berger. It was later removed to a new genus because of its extremely small size and the general character of the small, erect, pale flowers. Does best when grown indoors and not exposed to too much sun. Recommended for those who are limited in growing space. .75

ISI-102 *Haworthia reinwardtii* var. *chalumensis* G. G. Smith. This is the largest of the *reinwardtii* group and is a beautifully marked and distinct variety. From the type collection of G. G. Smith, Dodson No. R-102. See photo. C. & S. Journ. of America, 2, 1954, Page 51, Fig. 36. .75

ISI-120 *Haworthia turgida* var. *pallidifolia* G. G. Smith. From the type locality, Valsch River, Riversdale, South Africa. An easily grown variety, distinct because of its pallid appearance. Dodson No. T-5701. .75

ISI-137 *Kalanchoe eriophylla* Hils. & Bojer. Somewhat reminiscent of *Kalanchoe tomentosa*, this new introduction differs in its silvery white, smaller leaves

and more dwarf, sprawling growth. Compact growth is encouraged by occasional pinching-back. This will prove a popular species. UCBG 54.1445, collected in the region of Tananarive, Madagascar. 1.00

ISI-151 *Glottiphyllum starkae* L. Bol. One of the rarer species of a genus popular for bright green leaves and yellow flowers. A good pot plant. UCBG 51.500, Avontuur, Uniondale Div., South Africa. .50

ISI-152 *Aloe millotii* Reyn. One of the dwarf Aloes from Madagascar, destined for great popularity when better known. This recently published species, native to arid deserts where it grows on lime-stone, has short straggling stems and grey leaves. UCBG 53.348 leg. M. Saboureaux, Cape Ste. Marie, Madagascar. 1.00

ISI-156 *Kalanchoe laxiflora* Baker. A frost-tender species forming low shrubs with notched leaves. Flowers of a rose-orange color. Madagascar. UCBG 54.1453. .50

ISI-157 *Aeonium urbicum* (C. Sm.) Webb & Berth., Canary Islands from the type locality. UCBG 51.893. Recommended for those who like Aeoniums. .75

ISI-158 *Kalanchoe rosei* Hamet & de la Bathie. A tender species with serrate leaves, and rose colored flowers. Madagascar. UCBG 54.1455. .75

ISI-159 *Aeonium cuneatum* Webb. A nearly stemless species only recently introduced to cultivation. Leg. Sventenius, Taganana, Teneriffa, Canary Islands. UCBG 54.1305. 1.00

ISI-160 *Aeonium castello-paive* Bolle. Blue-green leaves and pale yellowish-white flowers in profusion. The plant up to one foot high, spreading quickly. From the type locality, Canary Islands. UCBG 51.890. .50

ISI-161 *Aeonium balsamiferum* Webb & Berth. One of the most attractive Aeoniums, with its fresh green, densely arranged foliage and tall, shrubby growth, to two feet or more. Reported to have the scent of balsam. From the type locality Canary Islands. UCBG 51.885. .75

ISI-162 *Aeonium virgineum* Webb & Berth. Unusual for the genus in being stemless, this species offsets freely and has rather large hairy rosettes. Has a pronounced pine scented odor which on warm days can be detected from quite a distance. From the type locality, Canary Islands. UCBG 51.891. .75

ISI-166 *Kalanchoe macrantha* Baker. Grown from seed collected by Bally, at Sheik Pass, Somaliland Protectorate. Bally #9657, UCBG 57.112. .50

ISI-167 *Kalanchoe ballyi* Hamet. Grown from seed collected by Bally, (#B8387). A new introduction. We would appreciate comments from those growing this species concerning flowers, time of flowering and cultural habits. Appears to be an interesting species. Irving No. 25. .75

ISI-170 *Puya caerulea* Lindl. A large plant, easily grown, with flowering stalks 6 feet tall and more. Flowers are large, emerald-green, outstanding and always create much interest. Should do well outside as it will withstand low temperatures. A suggested plant for landscaping and background planting. Park and highway departments should be interested in this as quantity of seed is now available. Chile, Prov. and Dept. Valparaiso, Laguna Verde. Seed collected Jan. 1958, by W. J. Eyerdam, #10128. The seeds germinate easily. Quantity seed price upon request. Seed per packet .50

ISI-181 *Crassula colae* Bally. Forming dense, miniature shrubs with dotted leaves and white flowers. Collected at Ngong, Nairobi Distr. Kenya Colony, Africa. UCBG 53.576. .50

ISI-176 *Echeveria crassicaulis* Walther. Plants from seed collected by Gold, Matuda & Walther, at Cima,

between Mexico City and Cuernavaca, at 10,000 ft. alt. Grows near an old volcano, at the edge where the lava flow meets a pine forest. Has fusiform roots, and may be deciduous from October until May, so if leaves are shed during this period it will be a normal condition. The name refers to the exceptionally stout peduncle. A very interesting species. 1.00

ISI-177 *Echeveria chiapensis* Poelln. From seed collected by E. Walsber, on the border between Vera Cruz and Puebla, growing in a tree as an epiphyte. Likes moist conditions, but must be well drained. Very showy flowers with yellow corolla and red sepals. Would make a good hanging basket plant, especially in conjunction with *Sedum morganianum*. 1.50

ISI-178 *Echeveria pumila* Baker. Found on the side of the Volcano Ixtaccihuatl, at about 12,000 ft. alt., on volcanic cliffs. Grown from seed collected by Matuda

& Walsber, at the end of the auto road, at the picnic ground La Joya, high on the sides of cliffs. A dwarf species, as its name suggests. Excellent for those with limited growing space. .75

ISI-182 *Echeveria subrigida* (Robins. & Seat.) Rose. Seedlings from a plant collected by Fritz Schwartz in San Luis Potosi, Mexico. Probably the most beautiful *Echeveria*, hardly obtainable until now. Rosette a foot wide, leaves broad, pure white-powdered and with pink edging; flowers large, red-orange. A frost-tender species which looks its best if grown near the glass of a greenhouse or window in strong light, kept unpotted and watered only when the upper leaves begin to droop. A magnificent introduction. 1.50

Prices quoted include Parcel Post charges. If wanted by air mail, send 15¢ extra per plant.

BOOK REVIEW

Revision der Gattung Ceropegia, by Herbert Huber; in *Memórias da Sociedade Broteriana*, volume 12, 1957; 203 pages, 16 plates; Instituto Botânico da Universidade de Coimbra, Portugal.

Although several *Ceropegias* are popular succulents, their weird flowers intriguing the most blasé collector, useful literature on the genus has always been scarce and incomplete. This has resulted in horticultural neglect of the bulk of species and in misidentification of cultivated plants. The present monograph should adequately correct this situation and is warmly recommended to prospective devotees of this fascinating genus. Unfortunately the text is in German and Latin, but flowers of nearly all the species are illustrated and the nomenclature used will be discernible to all readers.

Huber believes *Ceropegia* to have arisen in southern Asia, where the species are usually jungle vines with large, non-succulent leaves. Those in Arabia and northern Africa show more advanced floral characters and increased succulence, these tendencies reaching a culmination in southern Africa, the home of most of the species familiar to us. The genus, as treated here, consists of 153 species, as well as numerous sub-specific taxa, arranged in 21 sections. The

revision is conservative, and many will be disturbed to find well-known species reduced in rank or in synonymy. Huber points out that closely related species were often published merely because of different leaf-shape or floral length, and that a survey of herbarium material now shows that this range of variation is best included in a single species. Thus, among those cultivated, *C. woodii* and *C. debilis* are considered subspecies of *C. linearis*, with *C. caffrorum* and *C. hastata* mere synonyms of this species, while *C. lugardae* and *C. baygarthii* are subspecies of *C. distincta*. Some of these concepts will be accepted with reluctance, if at all, by horticulturists, but the revision as a whole will doubtless remain the taxonomic standard for many years.

The text includes detailed keys to sections and species, synonymy, descriptions and citations of specimens. Color designations are omitted from the descriptions, but this character is apparently unnecessary for distinguishing species. The floral drawings will astound collectors, for the wealth of fantastic forms and appendages of these flowers has been little appreciated until now.

MYRON KIMNACH



SPINE

CHATS

LADISLAUS CUTAK



Campbell W. Pennington, Assistant Professor of Geography at the University of Utah, has an article on fish stupefaction as practised throughout the year among the Tarahumar Indians of Western Chihuahua in Mexico. The article ap-

peared in the January-March, 1958, issue of *Economic Botany*. In this article Pennington describes 13 different families of flowering plants which provide either piscicidal or stupefaction properties. I was amazed to learn that a few

xerophytes, such as *Yucca decipiens* and several Agaves were employed in catching fish. The article goes on to say that roots and leaves of the *Yucca* are crushed on a stone and dumped into pools or slowly moving water. The hearts, leaves and roots of *Agave lechuguilla*, *A. schottii* and another species—all readily available in the Tarahumar country—were employed in the same fashion.

Franz Buxbaum of the University of Graz (Austria) has a lengthy paper on "The Phylogenetic Division of the Subfamily Cereoideae" in the April 1958 issue of *Madroño*.* The Cereoideae is a large and complex subfamily in the Cactaceae and not too well understood. Most authors, in the past, who attempted subdivisions, worked up more or less schematic divisions which cut across the lines of evolution and united members of very different origin into polyphyletic units. Most of the trouble emanated from ignorance of plant characteristics and inadequate descriptions.

Buxbaum's system is another attempt to bring order out of chaos but there still remains much study before a final knowledge of the evolution of the Cereoideae is established. No doubt further detailed studies will cause more changes in the future. In the above work, Prof. Buxbaum includes eight tribes under Cereoideae, namely Leptocereae, Hylocereae, Pachycereae, Cereae, Trichocereae, Notocactaeae, Echinocereae and Echinocactaeae. Some of the tribes are further subdivided into subtribes and lineae and properly described in Latin to be valid. To the amateur all this seems unimportant but to the serious student of the Cactaceae it has meaning.

The Annals of the Missouri Botanical Garden for February 1958 comprise Part VII, Fascicle I of the "Flora of Panama" by Robert E. Woodson, Jr., Robert W. Schery and collaborators. Of interest is the treatment of the family Cactaceae for that country. There are nine genera involved for a total of nineteen species, but the total number of cactus in Panama must be considerably greater than that of the present account. The cacti in Panama are mostly clambering semilianes on rocks, or epiphytes, with only a few typical desert kinds which possibly are introductions rather than endemics. *Hylocereus polybicus* and *H. costaricensis* are considered conspecific. The genus *Pseudorhipsalis* is relegated into synonymy under the older genus *Wittia*. Accordingly, *Pseudorhipsalis bimantoclada* be-

comes *Wittia bimantoclada*. One new species of *Epiphyllum* is described and given the name *E. gigas* for the gigantic flower which it produces. When Paul Allen collected this species on Cerro Trinidad in 1946 he made the statement that it was a "giant liana to several hundred feet in length." He apparently saw a 'walking epiphyte' which roots at the tips and continues to elongate and grow in this fashion, attaining incredible size.

"Cactus as Hobby" is an attractive new book published by Hajime Oku in the Japanese language. There is a wealth of pictures, both in color as well as in black and white (around 270), so that even if you do not read Japanese it would be worthwhile to have this book on your shelf. Throughout the book there are several tissue paper inserts printed in English explaining some of the more important contents. We learn that there are about 30,000 amateur cactus fans in Japan and the more enthusiastic growers have banded into clubs in various parts of the Empire. From 1905 to 1910 the first wave of cactus craze swept the country and since then four other periods have occurred. Many of the club members possess greenhouses or frames and carry on a methodic program while others grow only a few cacti just for the fun of it. Mr. Hajime Oku is to be complimented on his book. He also edits an interesting well-illustrated bimonthly magazine, "Succulentarum Japonica," which contains short English summaries after most of the articles.

G. D. Rowley describes two new tuberous *Senecios* in the National Cactus and Succulent Journal (England) for June 1958. The first is *Senecio ioseensis*, a dwarf mat-forming perennial with highly succulent berry-like leaves and rayless white self-sterile flowers. It is named in honor of the International Organization for Succulent Plant Research (I.O.S.). The other is *S. ballianus* which resembles the common *S. radicans* but is distinguished from it by the sticky stems and peanut-like tubers grown on long wiry roots. The tuberous *Senecios* grow very slowly and also are more difficult to grow. They are of botanical interest.

As you all know, the next cactus convention will be held in St. Louis in July, 1959. I'm interested in making it one of the best ever held and particularly enlist your aid in working out a highly hilarious fun session, which is a highlight of each biennial gathering. I will appreciate your suggestions very much. Start sending them in to me now.

*Available from Abbey Garden Press, 132 W. Union St., Pasadena, Cal. \$1.00



CACTUS MONOGRAPH

"Die Cactaceae"—Handbuch der Kakteenkunde, Vol. I (Einleitung und Beschreibung der Pereskioideae und Opuntioideae) by Curt Backeberg. pp. XVI plus 638 and appendix. 618 text figures (12 in color) plus 35 in Appendix. (In German.) \$18.00. (Order may be placed with Abbey Garden Press. First of three to five volumes planned in the series.)

The first chapter is devoted to historical and economic considerations, and the principal workers on cactaceae, distribution, cultivation, grafting and distribution. 221 genera are recognized as valid and are described in detail with many fine photos. The author has spent a lifetime in preparation of this undertaking and although the first volume deals with Pereskias and Opuntias, it is essential for those who plan to obtain the complete work.

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