

Gaultonia

Newsletter of the
Manchester Branch
of the
British Cactus and Succulent Society

Spring 2005.



Cereus jamacaru

Officially Brazil's largest cactus plant

Near Morro do Chapéu, Bahia state

Photograph by I Crook

Branch News and Activities.

Branch Show,

Don't forget the branch show is on

Saturday 9th July 2005

During the July meeting

Entry forms from Peter need to be returned by Thu 7th July

Zone Symposium,

Tickets will be available shortly for the zone symposium on

Saturday 24th September 2005

Speakers are now confirmed as;

Graham Charles, Louise Bustard and Susan Carter-Holmes

For tickets see Phillip, Ivor or Peter.

Manchester Branch Open Day

The Manchester Branch Open Day will be on

Sunday 14th August 2005.

Starting at 1pm at Brian Darnell's collection then on to Ivor Crook in Audenshaw then Harry Mak and Peter Bint in Middleton.

Further details from any branch committee member.

Liverpool Branch Open Day

Sunday 28th August 2005.

At the home of Ray Alcock.

See Peter for map and details.

LITHOPS, LIVING STONES, LITTLE GEMS

INTRODUCTION

Plants have produced a host of ways to deter animals and insects from eating them. These methods include poison, spines and mimicry. In this look at Lithops we will see how they utilise the latter.

Cacti and succulents are a hugely diverse group of plants, noted for strange forms and adaptations. Amongst these, Lithops stand out as extreme. These marvellous, though curious, plants, rarely green in colour, adopt the demeanour of the ground in which they grow. Growing amongst stones of many different hues, they have evolved to imitate these very stones. With true subtlety they match the colour and shape of their surroundings thus causing grazing animals to overlook them.

Lithops occur in the drier regions of Namibia and South Africa, with just a toe hold in Botswana. They grow predominately in areas of summer rain and winter dryness, though a few species are to be found in the winter rainfall regions of the western and northern Cape. Lithops are large genus belonging to the huge group of the daisy family, the Mesembryanthemaceae.

As we know the term succulent is used to describe any plant that has tissue modified to store water. This is an essential ploy for cacti and succulents to enable their survival in the harsh climate of seasonal or unreliable rainfall. Whereas cacti store water mainly in the thick, modified stems, succulents have resorted to more varied means. Lithops have bodies composed of two leaves which have become superb storage organs.

The curious appearance of Lithops has given rise to the popular, vernacular names "living stones" or "flowering stones" in the English speaking nations. In their native lands they have been given more colourful names such as "beeskloutjies" (little cow hooves) and "oogies" (eyes).

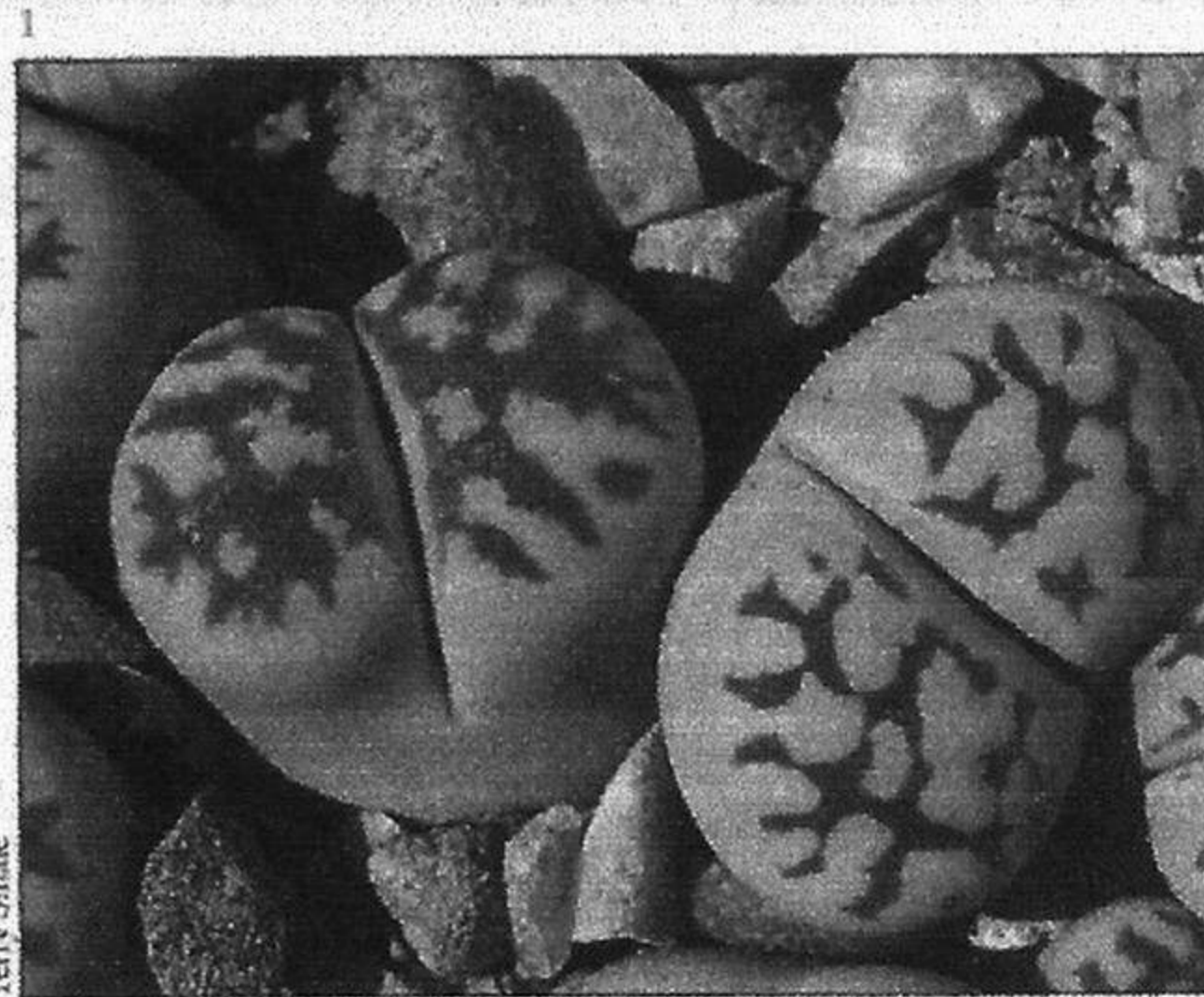
THE PLANTS IN HABITAT

Lithops are unusual plants with an unusual shape. Their bodies resemble an upside down cone, much of which is below soil level. All that is visible is the broad flat or slightly convex upper surface of the pair of fused leaves. There is a fissure across this surface through which the flower can grow. The growth buds that produce both flowers and new bodies are to be found at the very bottom of this fissure, giving them extreme protection.

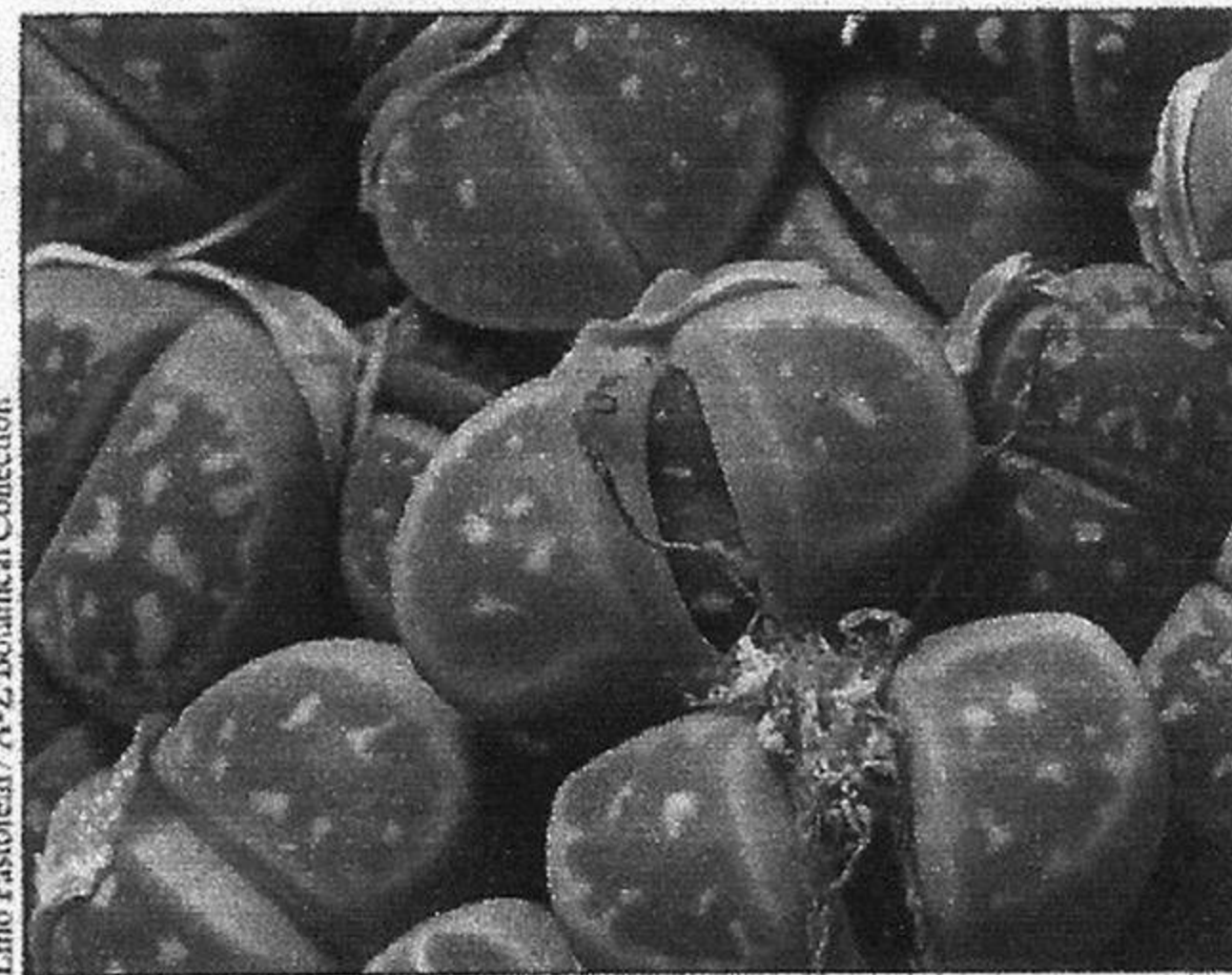
Lithops are small, slow-growing and long lived. They have adapted to marginal areas such as stabilised stony flats or rocky slopes where they are to be found growing in association with many other dwarf succulents. Strong growing plants needing greater resource requirements are unable to grow in such harsh surroundings. In more fertile areas Lithops cannot compete against the strong growing types of plants.



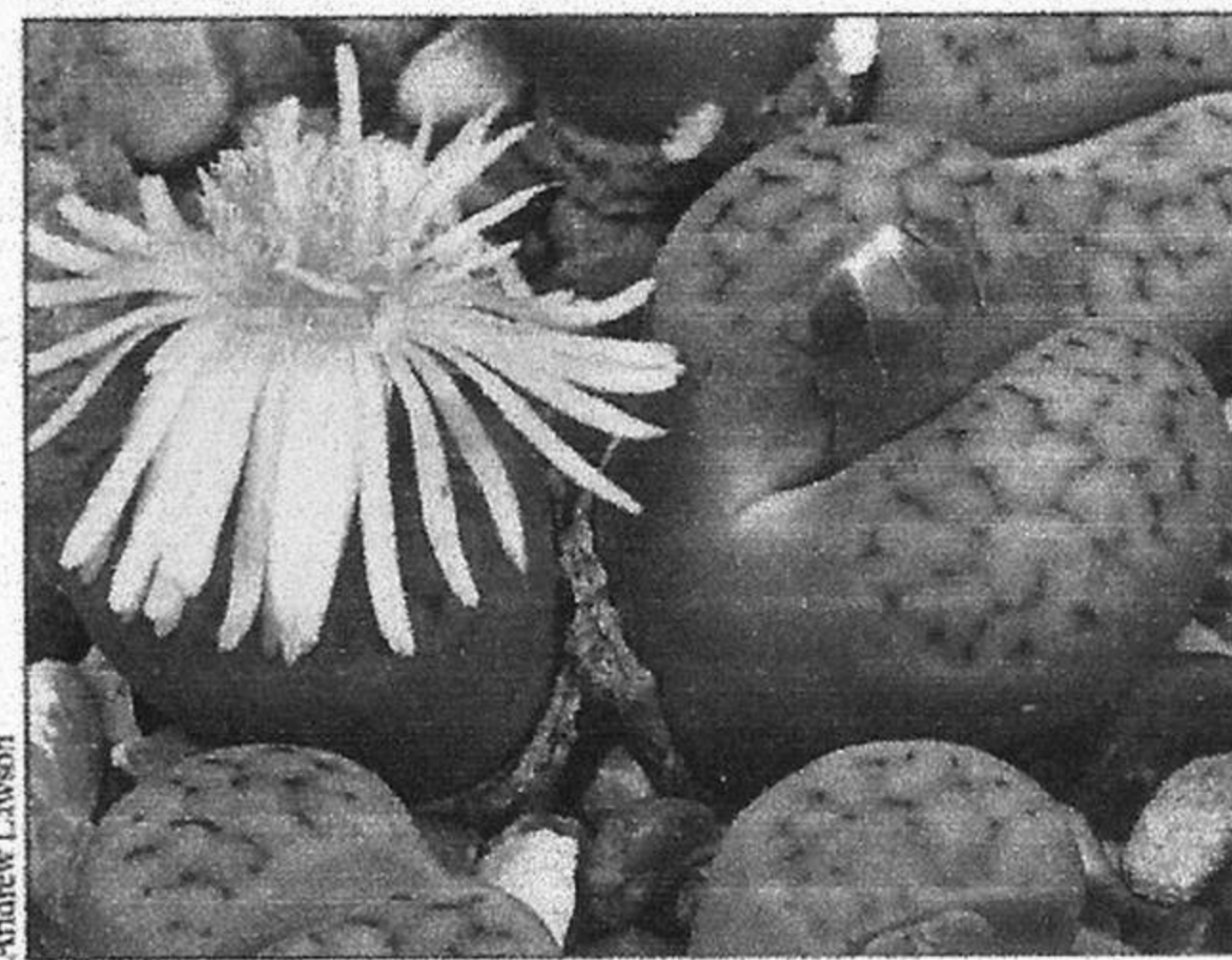
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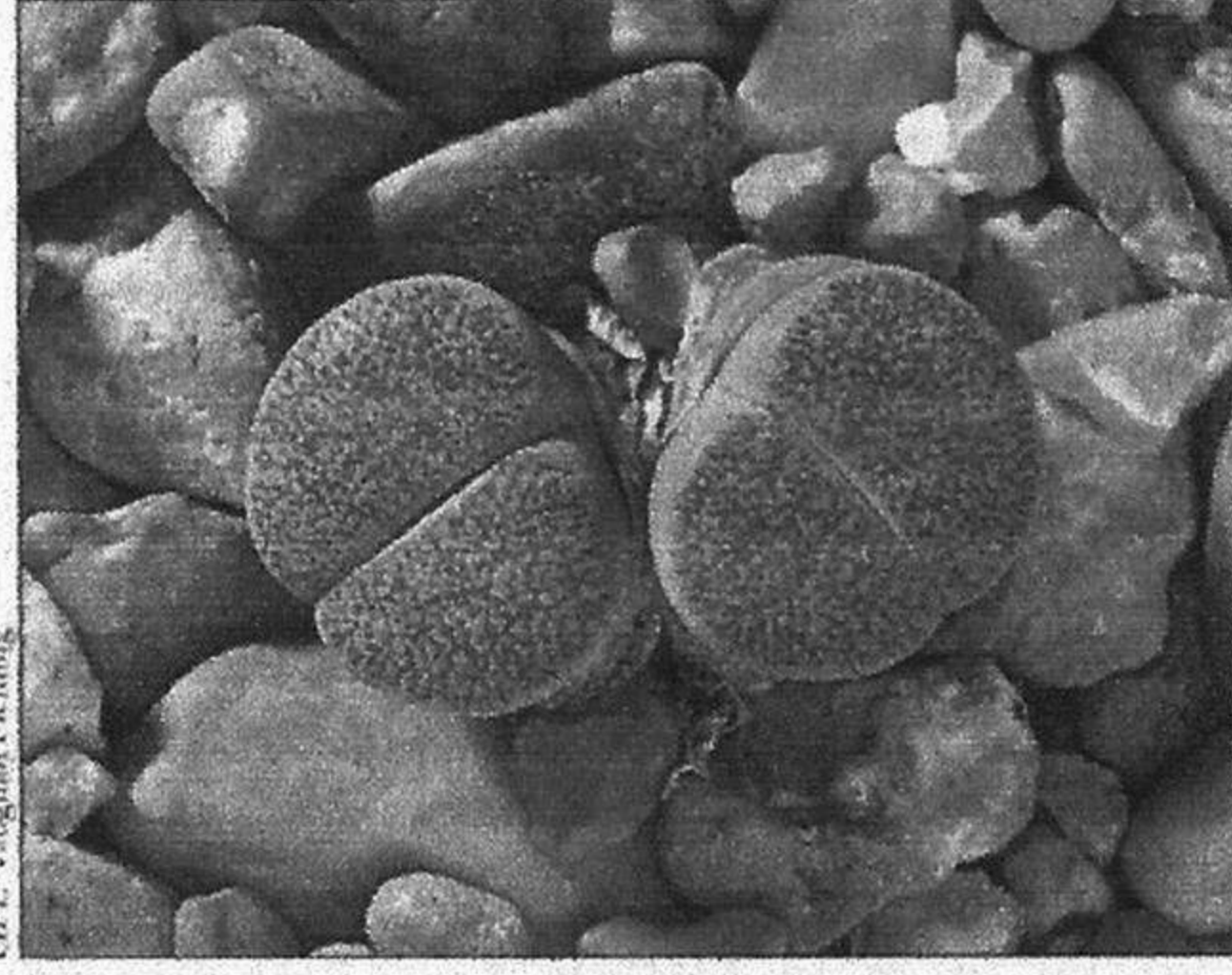
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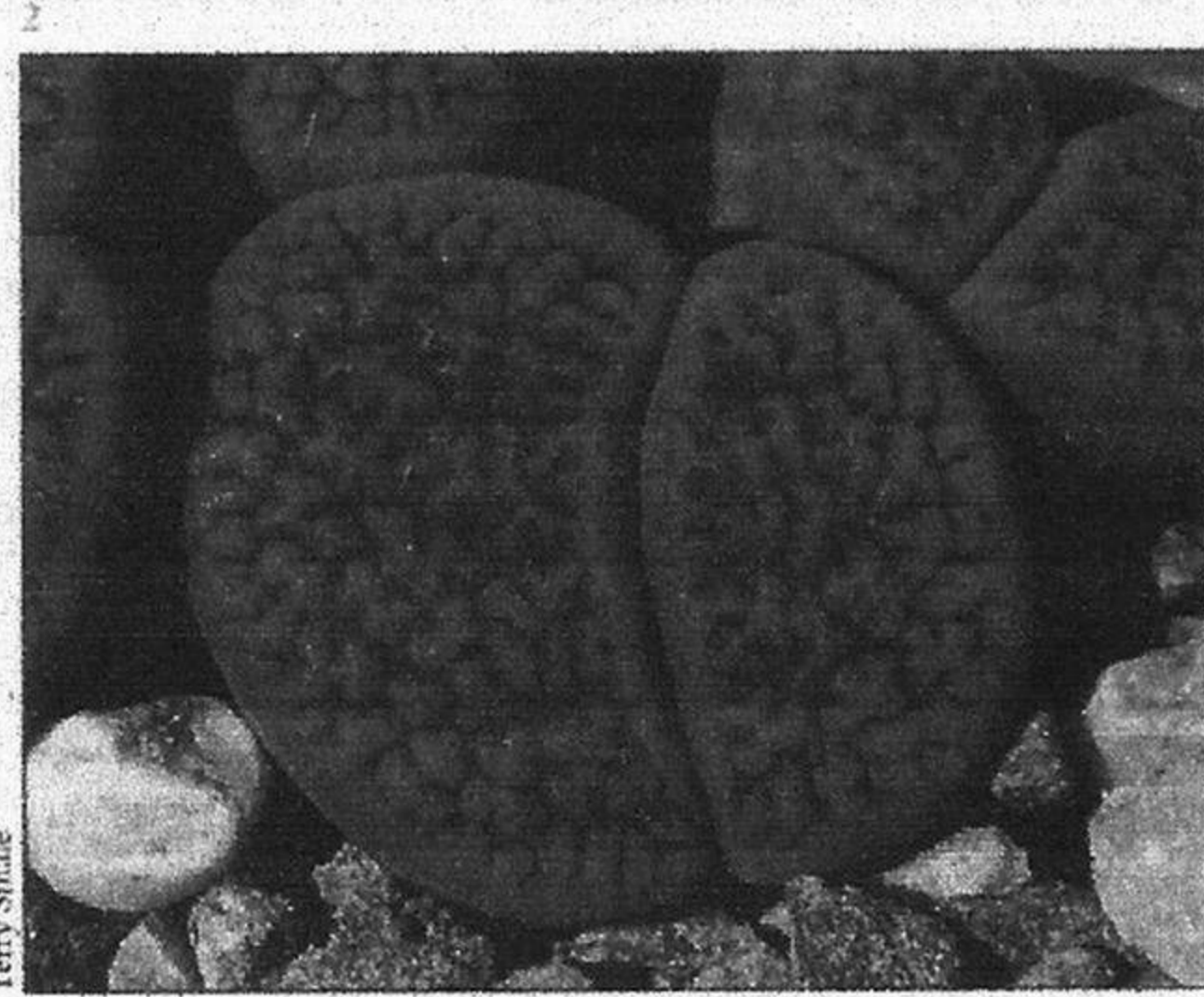
Lino Pastorelli / A-Z Botanical Collection



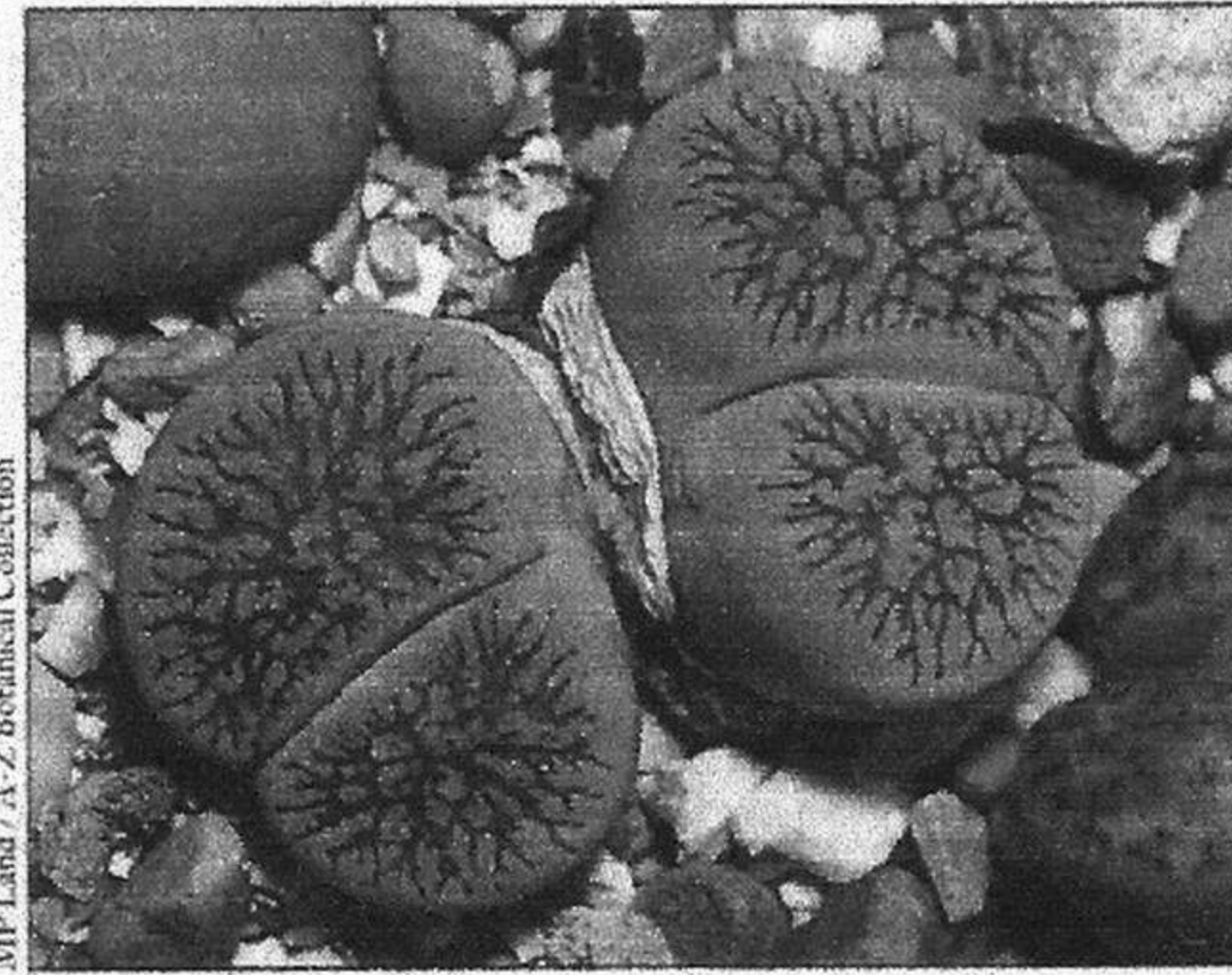
Andrew Lawson



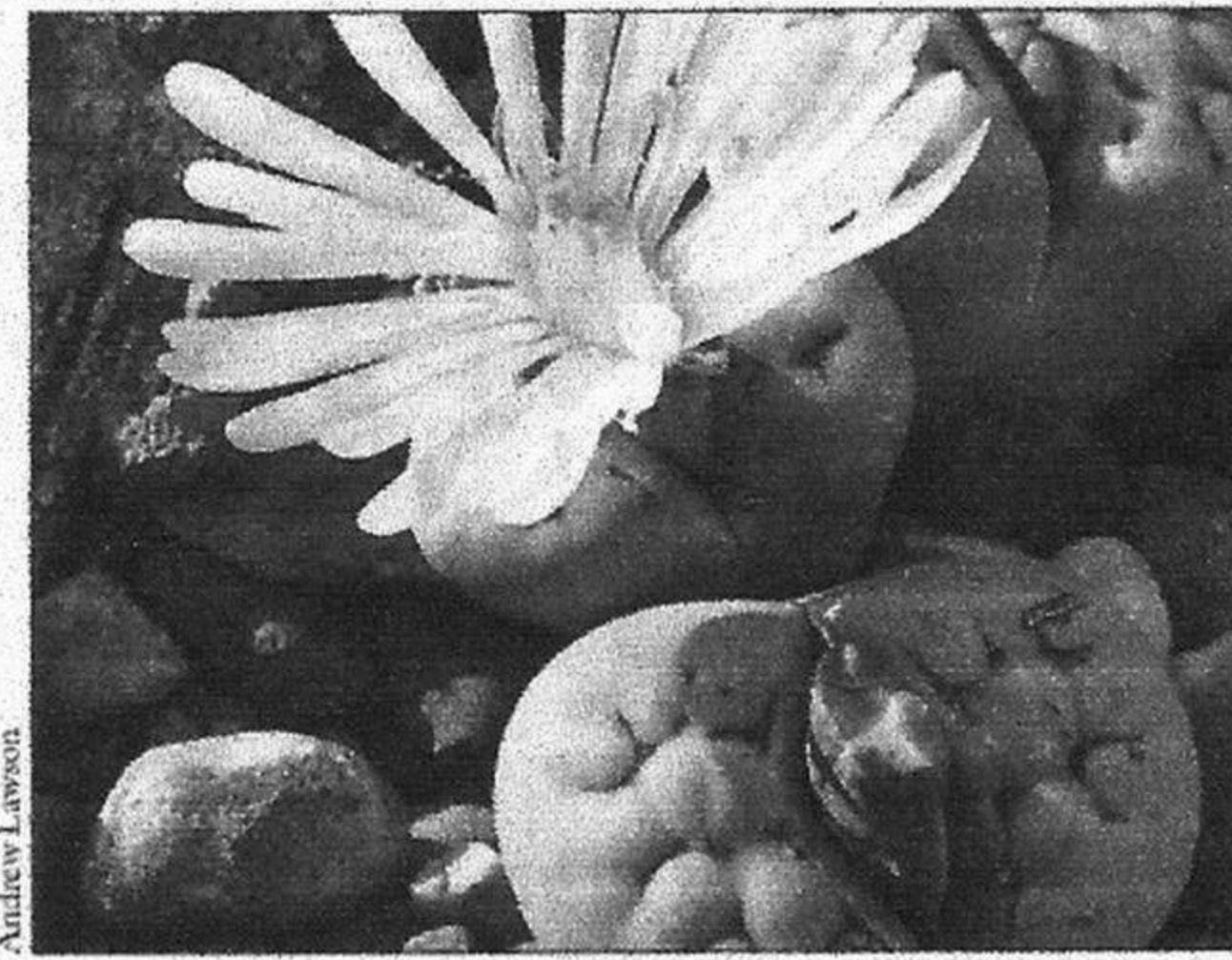
CPL Vaughan Fleming



Terry Smaale



MJP Land / A-Z Botanical Collection



Andrew Lawson

1 Lithops country, South Africa. This area of pale quartz is home to *Lithops meyeri*, a species with white or grey leaves

2 *Lithops lesliei* var. *mariae* differs from the typical variety in its sandy-gold, finely speckled colouring

3 From the northern Cape, *L. dorotheae* has irregular, jagged, dark markings on an olive-green background

4 The pairs of leaves of *L. bookeri* var. *bookeri* are characteristically unequal in size, flat-topped and heavily veined

5 *Lithops olivacea* has particularly large areas of semi-transparent tissue on its leaf surfaces. Known as 'windows', these allow light to penetrate the photosynthetic tissue within. The paler, opaque spots, called 'islands', are portions of the window that extend deep into the leaf. Most *Lithops* have windows but they vary in size and extent

6 Irregular veining found in many *Lithops* mimics the natural variations found in stones, as here with *L. aucampiae* subsp. *euniceae* var. *fluminalis*. Sadly, this variety is thought to be extinct in the wild

7 The yellow flowers of *L. schwantesii* subsp. *schwantesii* from Namibia contrast beautifully with its steely-blue body. A flower bud is just emerging from the leaf pair on the right

8 White-flowered *L. karasmontana* is a highly variable species. This form has particularly pronounced, furrowed veining

Lithops have evolved to perfectly match the colours and patterns on the stones amongst which they grow. They are found on a wide range of rock types, which has given rise to a host of leaf patterns and markings, none of which are ever identical. *Lithops marmorata* has white to pale grey leaves in habitat and grows amongst quartzite pebbles of exactly the same hue.

For the vast majority of Lithops moisture becomes available in late spring. The existing pair of leaves, which will have become very shrunken through the drought, have passed on their goodness to the new pair of leaves and shrouded them in a papery sheath. The new leaves will now expand breaking the sheath and the flower bud will start its period of growth. At some stage between late summer and winter this single flower will force its way out through the fissure opening to reveal a daisy like flower that will be either yellow or white (in a few species it will be yellow with a white throat). There is only ever one flower per leaf pair (in all my long association with these plants). The earliest flowerer in my experience is from the *pseudotruncatella* group and the latest comes from the *optica* group (July for the former and November to February for the latter *in greenhouse cultivation*). The flower, which can completely hide the body in some species, can last up to a fortnight

Once flowering has finished the new pair of leaves begin their slow development which will continue throughout the winter and early spring, as the old leaves shrink, dry up and eventually decay. Sometimes two new heads will form inside the old one. This is how the plant clumps. In habitat they do not usually form large clumps but in greenhouse culture they are more inclined to do so in the favourable conditions we supply.

Lithops are not self fertile but require cross pollination. The ensuing seed capsules take almost a year to form and ripen being quite woody when fully ripe. Moisture causes them to open. Falling rain dampens the capsule which then opens to a star shaped structure. The rain drops wash out some seed which falls onto suitably moistened soil to germinate. Once the seed capsule dries after the cessation of rain it closes again to wait for the next downpour. In this way seed is doled out sparingly over a period of time.

THE SPECIES AS WE KNOW THEM

According to Professor Desmond Cole, the world renowned expert on these plants there are 37 species of Lithops with a further 74 subspecies and varieties. In the wild as well as in cultivation, there is a wide range of variation both between populations and within single populations. This makes Lithops very popular for hobbyists. Leaf shape is variable from the equally shaped lobed plants to those that are definitely kidney shaped with one leaf larger than its partner. Leaves can be slightly concave, flat or slightly domed. The most variable characteristic is the incredible range of colours and markings found on the upper leaf surface. You can grow 100 plants from seed but no face will be identical to another. Some species produce plants that are close to one another whilst others display huge variation in leaf colour, roughness of leaf surface, island markings and dots. Cristation or monstrosity is virtually

unknown though you will get occasional leaf distortion. Examples of this are: 3 leafed bodies, incorrectly formed fissures which may not fully cross the upper surface or run down the side of the body and again occasions where the fissure may not separate the leaves at all but rather form a tiny 3 pointed star in the middle. However these distortions will last for just that year and then revert to normal next time. Occasional mutations occur in the wild and in cultivation. These mutations have a substantially greater chance of survival in cultivation. They usually take the form of green or red forms of the normal plant probably caused by a rogue gene or a missing gene, though we do not know exactly why at present. Examples of these are: *Lithops lesliei* cultivar *Albinica* which is not only green bodied but also white flowered instead of yellow; *Lithops optica* cultivar *Rubra* which has a red body instead of a grey-green one. There are an increasing number of these cultivars appearing but they take years to become commercially available. In some cases only a single mutation appears and this has to be cross pollinated again and again before any stability becomes apparent.

HISTORY AND CONSERVATION

The first *Lithops* was discovered in 1811 by *William Burchell*, but it was only in the 20th. century that many species began to enter cultivation. The single most important contributor to our knowledge of the genus is Des Cole. He had always had an interest in plants as he was brought up on a remote farm in the south-eastern corner of what was British Bechuanaland Protectorate (now Botswana) but it was only in the late 1950's that he became interested in the genus. He "discovered" *Lithops* when he was living in Johannesburg where he was a lecturer at Witwatersrand University. He found a florist's shop selling a wide range of succulent plants. He bought as many *Lithops* as he could from this source and thus began the fascination with these gems. With his wife, Naureen, he visited and recorded nearly every known wild locality and found many more new ones. Occasional colonies were never found due to incorrect recording of site positions. With official State permission he removed plants from over 375 sites. He would carry 3 bags for every site; one for plants, one for stones at the site and one for soil from the site. These were all returned to his nursery where he repotted the plants in exactly the same soil they had been growing in and put the same stones round the plants thus simulating as closely as possible the conditions of their habitat. He grew them in pans 13 cm deep. Plants were photographed both at their wild habitat and in cultivation.

Production of seed was clinically carried out. Flowers were isolated from pollinating insects using 'lithops contraceptives' made from fine gauze. Groups of plants from single colonies were hand pollinated. Through the years more and more seed became available till most of the plants around the world owe their origin to the Coles. In more recent times other have picked up from where Des and Naureen left off and new sources of seed have arisen. However he has not disappeared from the scene altogether I am pleased to announce.

He has completely lost count of the number of trips made into the wild. Some trips were bitterly disappointing due to incorrect information about sites, poor weather conditions making it impossible to find plants; but most trips were enormously satisfying yielding extremely satisfying results and wonderful surprises. Ultimately the time came to put all this knowledge into concrete form for enthusiasts all over the world to enjoy and study. Thus came about the enormously important monograph *Lithops – Flowering Stones* which appeared in 1988. Now a new book is promised for spring 2005 which will include the two new species that have appeared since 1988 and his "retirement" from Lithops study. He has been concentrating more recently on a dictionary of African languages. However, in mid 2004, he has received some information of a completely new species in southern Namibia as well as a new variety of *L. fulviceps*. These latter two will be published during 2005 in Cactus & Co. so keep yours ears and eyes peeled.

Many Lithops species have very wide populations but other, e.g. *L. viridis*, are known only from a single population. This means that some species are very vulnerable and we should do all we can to produce as many of them in cultivation as possible to prevent them disappearing from the hobby altogether. Agriculture, urban development, mining, and even commercial collecting threaten such vulnerable species.

Two new species since 1988 are *L. coleorum* and *L. hermetica*. The former is now well established in cultivation but the latter still has some way to go before it is readily available. The natural habitat has not had to be 'raided' for seed or plants because of the massive cultivation exercise that went on after the plants' discovery.

CULTIVATION

Generally Lithops are easy to grow. They need bright sunny conditions and excellent ventilation. However, **BE WARNED**. They will scorch if they are not given sufficient ventilation. In summer my greenhouse door and windows are open throughout daylight and often overnight as well. A fan runs continuously, daily, every day of the year.

Lithops should be treated as summer growing. I do not begin watering any of my mature plants until June. The previous year's skins need to have dried back completely. If you water while the previous bodies are still showing signs of 'life' they will take up water along with the new bodies giving you unnatural growth. Most species will dry back with a full winter's dryness but a few, such as *L. marmorata*, *L. herrei*, *L. meyeri* and *L. optica* are very slow to dry back. Immature seedlings are kept moist throughout the first 12 months of growth. They may well go through more than one cycle in that first year but I believe they do not have the strength to withstand a prolonged dry spell at such a tiny size.

Pots should be well watered (make sure the soil is well drained with ample grit) and allowed to practically dry out before the next watering. Any feed

given should be a low nitrogen liquid fertiliser and administered sparingly once they are in full growth.

For most species I stop watering by the end of September but with *L. optica* and cv. *Rubra* I continue till later based on the time of flowering.

Winter temperatures are fine at a minimum of 4-5 degrees Celsius (Centigrade that was) which is around 40 degrees Fahrenheit. They will tolerate temperatures below freezing for short periods but it is not advised to allow them long periods of sub zero conditions. Remember they are small containers of water storage and to allow this to freeze would irreparably injure the bodies.

I replot them either during their dry spell in winter or once the growing period has started. I consider both times have their merits. During winter the soil can be removed from the roots without any fear of rot. The long fibrous roots will break away easily leaving the thicker permanent root. These will grow again very quickly once watering recommences. Make sure you have brought your compost to room temperature or just under if you are replotting in winter, rather than using freezing cold soil. Also make sure it is dry. In late spring I unpot the plants, remove what soil I can (usually most of it) and leave the plants for several days for the root to heal where the fibrous roots have been severed. Pot up in a soil that is slightly damp as an encouragement to the plant to regrow the fibrous feeding roots.

What shall I pot them in? That is not an easy question to answer because it comes down to personal preference. You will recall I stated earlier that Des Cole planted his in pans 13cm deep. That equates to just over 5" in depth. We have no small pots available to us of such depth. When you reach a 4" square pot you have something nearing that depth but you would need, in most cases to put at least 4 plants per container. I have successfully done that in the past and the Lithops have put copious roots right to the very bottom of the pot. There are two downside points. You would need to keep plants of the same species together to allow for watering requirements. For example if you put *L. lesliei*, *L. marmorata*, *L. herrei* and *L. pseudotruncatella* together there is a strong chance that *L. herrei* would not be ready for watering at the beginning of the growing season when the others were. Thus *L. herrei* might grow abnormally. The second problem I have encountered comes with the onset of autumn. Plants can suddenly turn to mush, for no obvious reason, with the onset of damp weather. If you have one plant in a pot you lose one plant; if there are 4 plants in the pot you almost certainly lose all four. You can make some extremely attractive displays by putting many different Lithops together in a circular or square clay pan and many people do. I believe a clay pan to be far better than a plastic one because the soil will dry out more quickly and it is important not to have the centre part of the pan constantly moist. Again, however, you have the problem of watering times at the beginning of the growing season. The method I now use is to pot every plant individually. Thus I have many plants in 2", 2.5", and 2.75" pots, mainly square. As plants get older and clump up, I move on to 3.5" and 4.25" pots. I have nothing in any pot bigger than that nor is it very likely they will grow to a larger size.

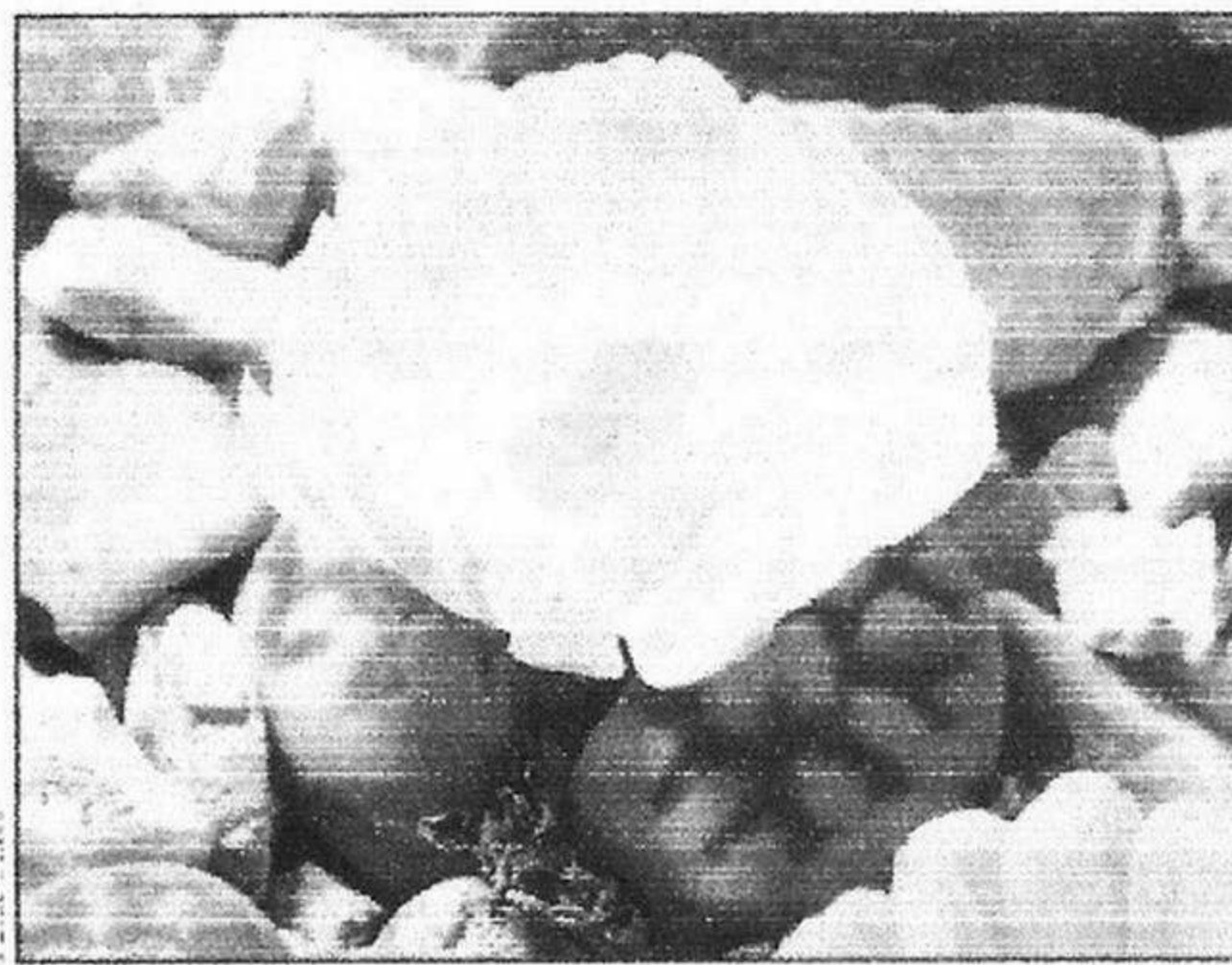
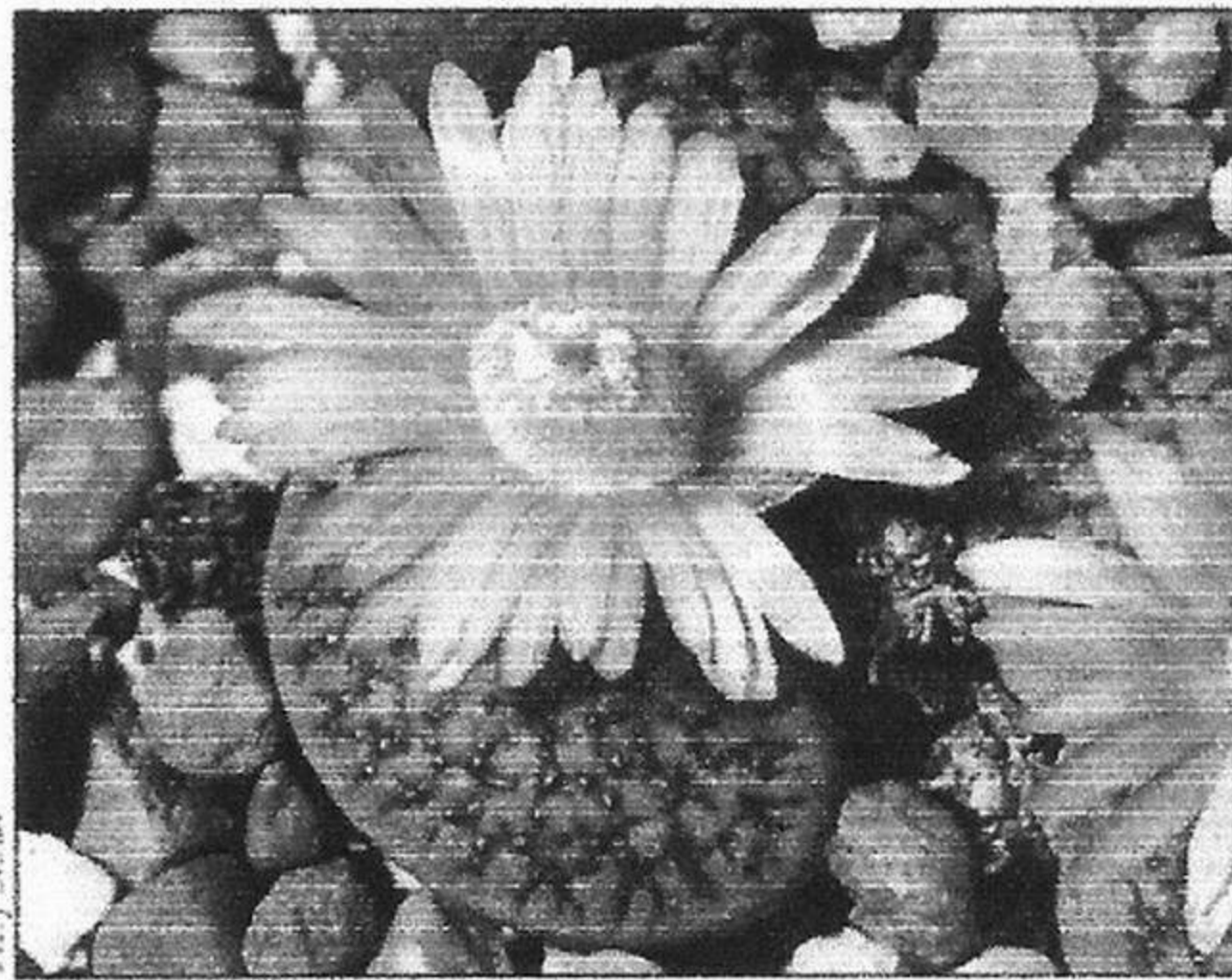
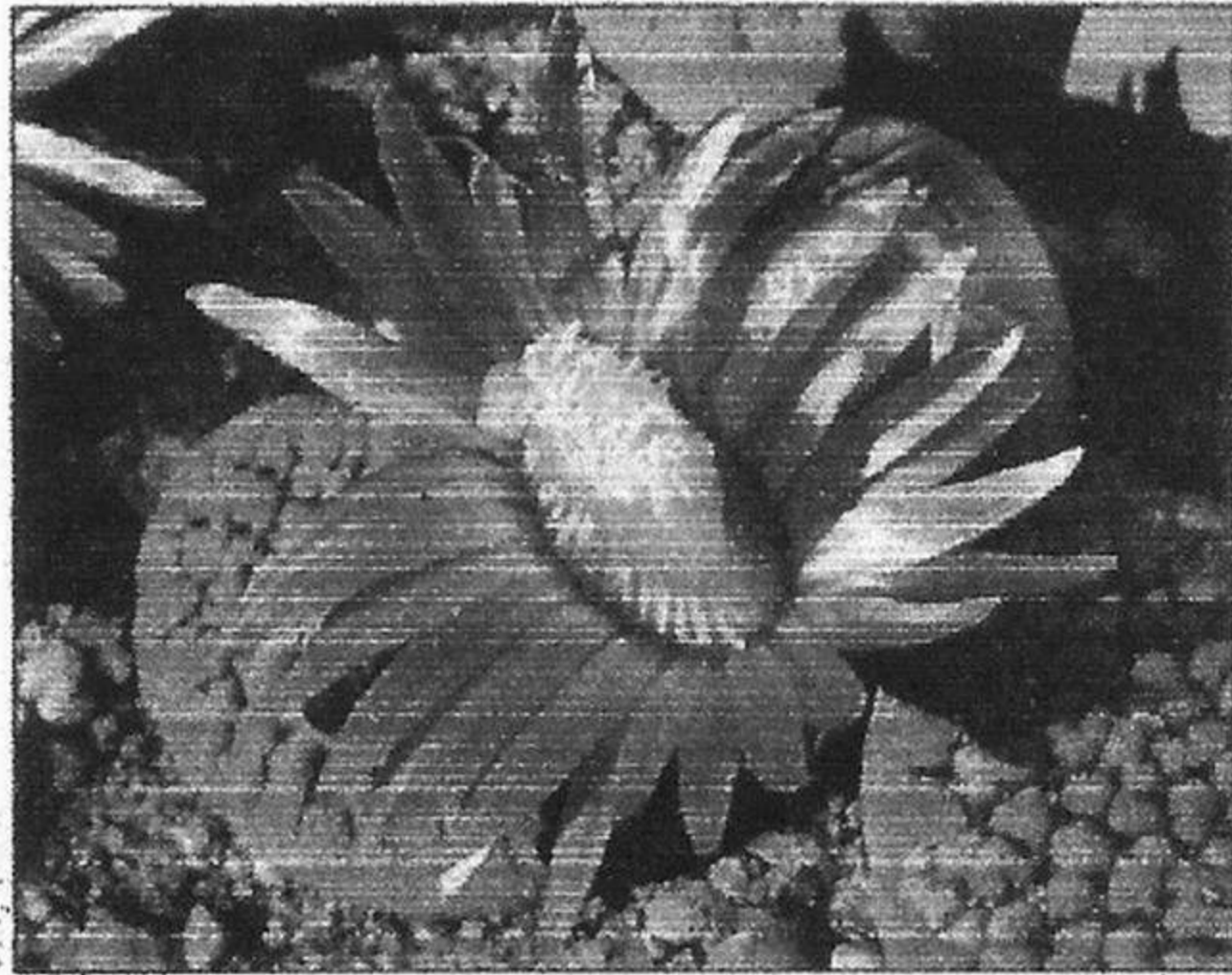
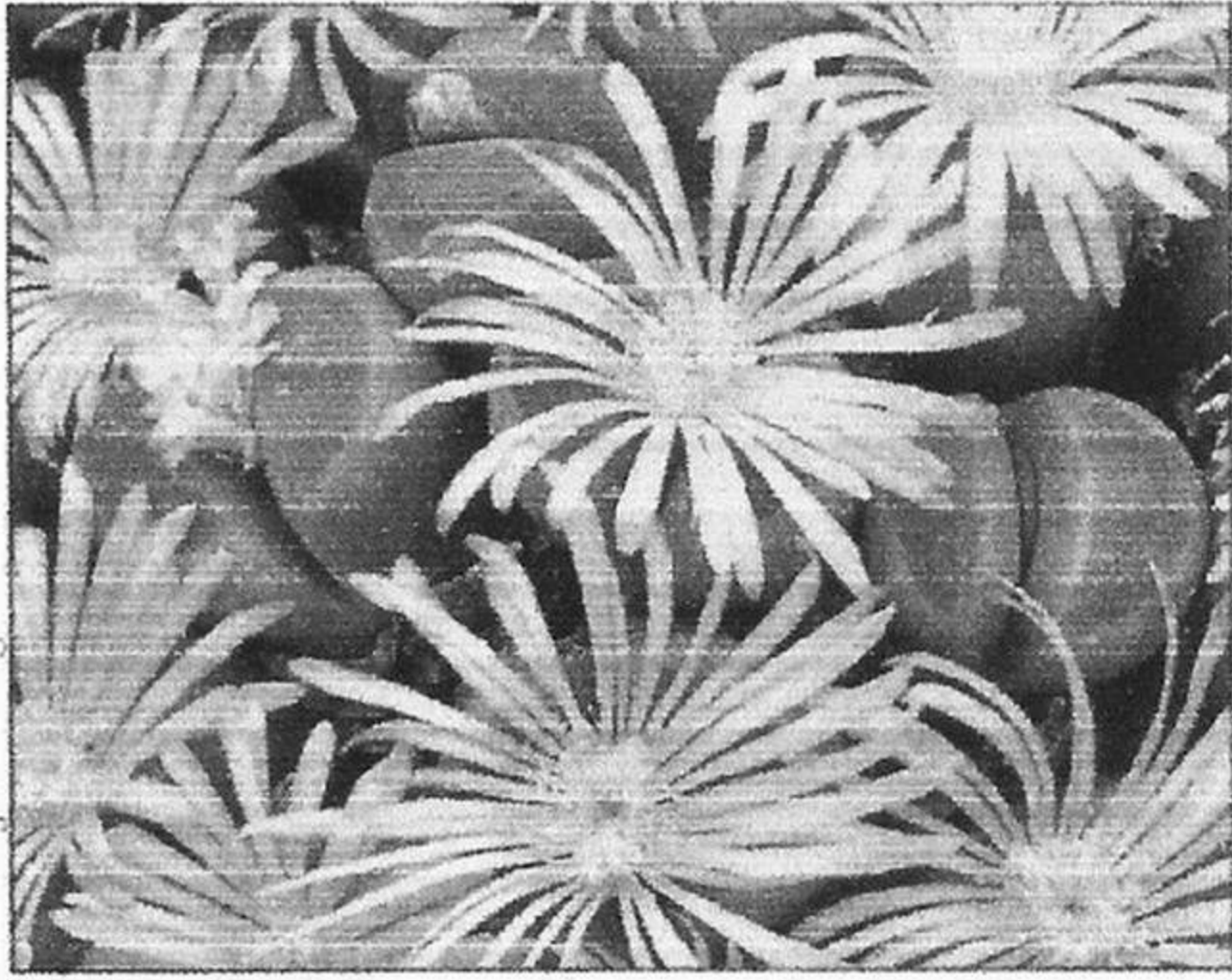
In small pots the resident nutrients found in the soil will be used up over a growing season. If the plants do not need repotting after one season then feeding will be necessary in the next one. I do not move plants on to a larger sized pot unless they really need it but it may be necessary to change the soil in which they have been growing if it smells musty. Soil is a personal choice but I use John Innes no. 3 with added grit, grit sand and perlite, so that soil is about 50% of the mix, giving my plants a very open medium that will never become soggy.

Pests and diseases are relatively few. The main pest is mealy bug which will hide itself inside the dried sheaths where it is impossible to see. Carefully remove these sheaths as soon as they will detach to prevent this happening. They also like to secrete themselves in the fissure but they are more obvious there and can be easily removed. Some people report trouble from the western flower thrip though, thankfully, I have not been troubled thus far. Careful removal of the dead flower eliminates their food source. There are proprietary insecticides available commercially to deal with both these pests. Fungal rotting is a problem in the autumn period and may well be linked to poor ventilation and inadequately drained soil. Overwatering also leads to plant loss.

PROPAGATION

Propagation is normally achieved by sowing seed. Spring, around April, or early September are the best times to sow I have found though they will easily germinate anytime in between. Seed can be obtained from cacti and succulent seed specialists, the BCSS seed list or through membership to the MSG (Mesemb Study Group) where a seed list is produced with the first bulletin of the year in February. Seeds are inexpensive to buy.

Sow the seed in well drained, fine textured compost such as John Innes Seed Compost with added sharp sand and perlite. Moisten the compost thoroughly and apply the seed to the surface, being careful not to cover the seeds as this will inhibit growth. Seal the pots in polythene bags to preserve an even moisture. Soil dryness is a killer at this stage. No extra heat is required for Lithops. I keep my seed sowings in a shaded environment, as they will not be able to stand direct sunlight, and at a temperature of not less than 60 degrees Fahrenheit. Bear in mind that there will be natural day/night temperature fluctuation in habitat so it will not matter if night temperatures are below 60 degrees but do not allow a drop below 45 degrees. Germination will occur within the first month, usually after 7-10 days. Once good growth has been achieved remove them from the bags to avoid damping off, keep them moist and shaded. They should not need moving on into trays or pots for at least 12 months. I have been known to leave them in polythene bags for the whole of their first 12 months without noticeable problems but that is a decision you must make. Regular checking is vital whichever method you choose. Propagation vegetatively is possible but would normally only be used to rescue plants that are not growing because of root failure. In cases like that remove the bodies from the root stock, either by twisting off or by cutting with a sharp knife, trying to leave a tiny piece of the root if possible. Place the



Suppliers

Some of the *Lithops* described are available from specialists such as (please telephone for opening times):

Seeds:
Doug and Viv
 Rowland, 200 Spring Road, Kempston, Bedford MK42 8ND.
 Tel: (01234) 358970.
 Mail order available.
 List on request

Seeds and plants:
Parkways Lithops,
 10 Parkways Avenue, Oulton, Leeds, West Yorkshire LS26 8TW
 Tel: (0113) 2828111.
 E-mail: vinny@dial.pipex.com
 Mail order available.
 Catalogue: 2 x 1st-class stamps

Plants:
Southfield Nurseries,
 Cactusland, Bourne Road, Morton, Bourne, Lincolnshire PE10 0RH.
 Tel: (01778) 570168.
 Mail order available.
 Catalogue: 1 x 1st-class stamp

As this group of *L. olivacea* shows, the flowers of *Lithops* are often larger than their leaf pairs

Lithops verruculosa 'Rose of Texas' is a cultivar selected for its large, pink-orange flowers

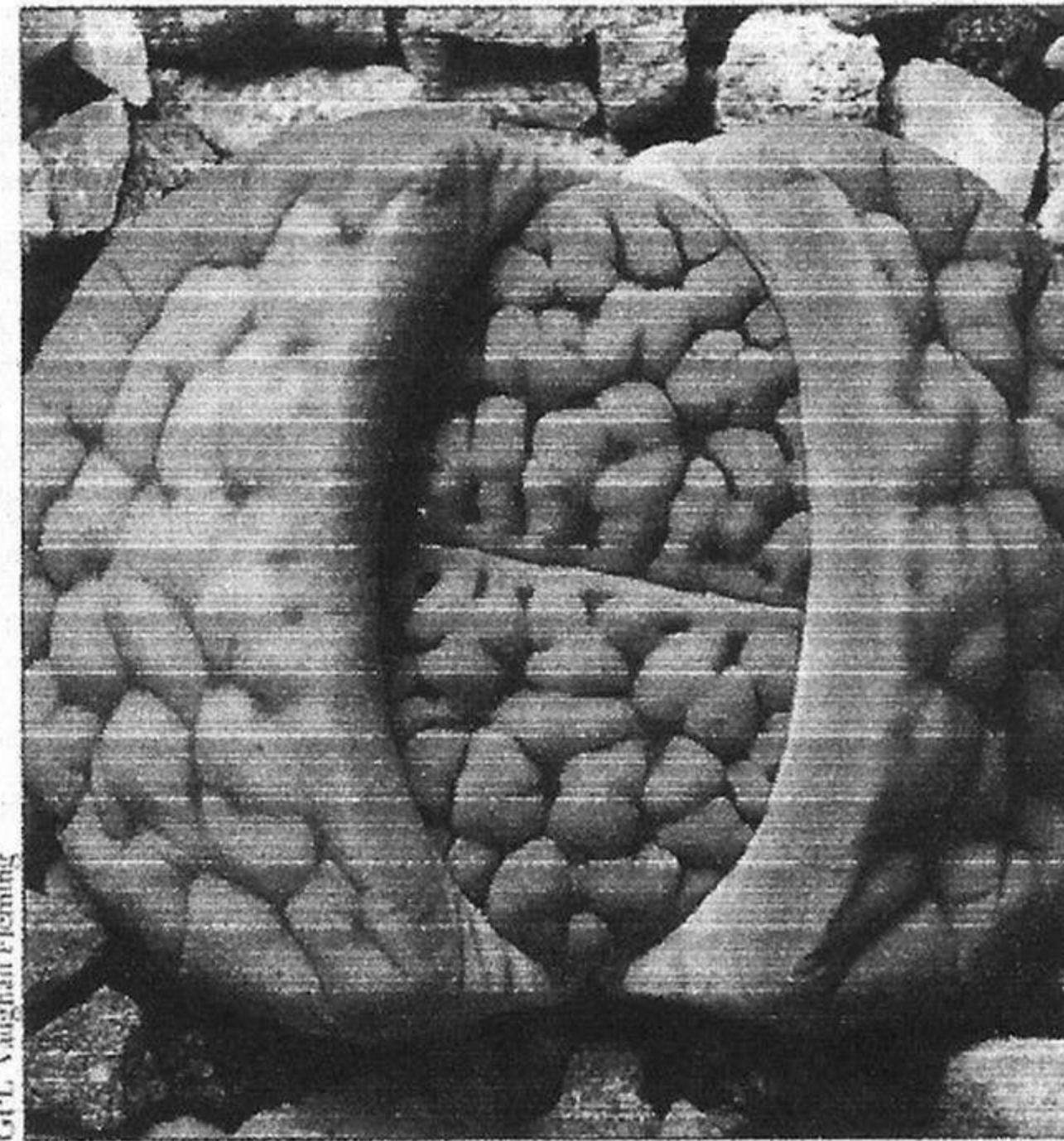
An orange-flowered clone of *L. verruculosa*

The flowers on this specimen of *L. karasmontana* subsp. *bella* have unusually wide, overlapping petals and appear almost cup-shaped

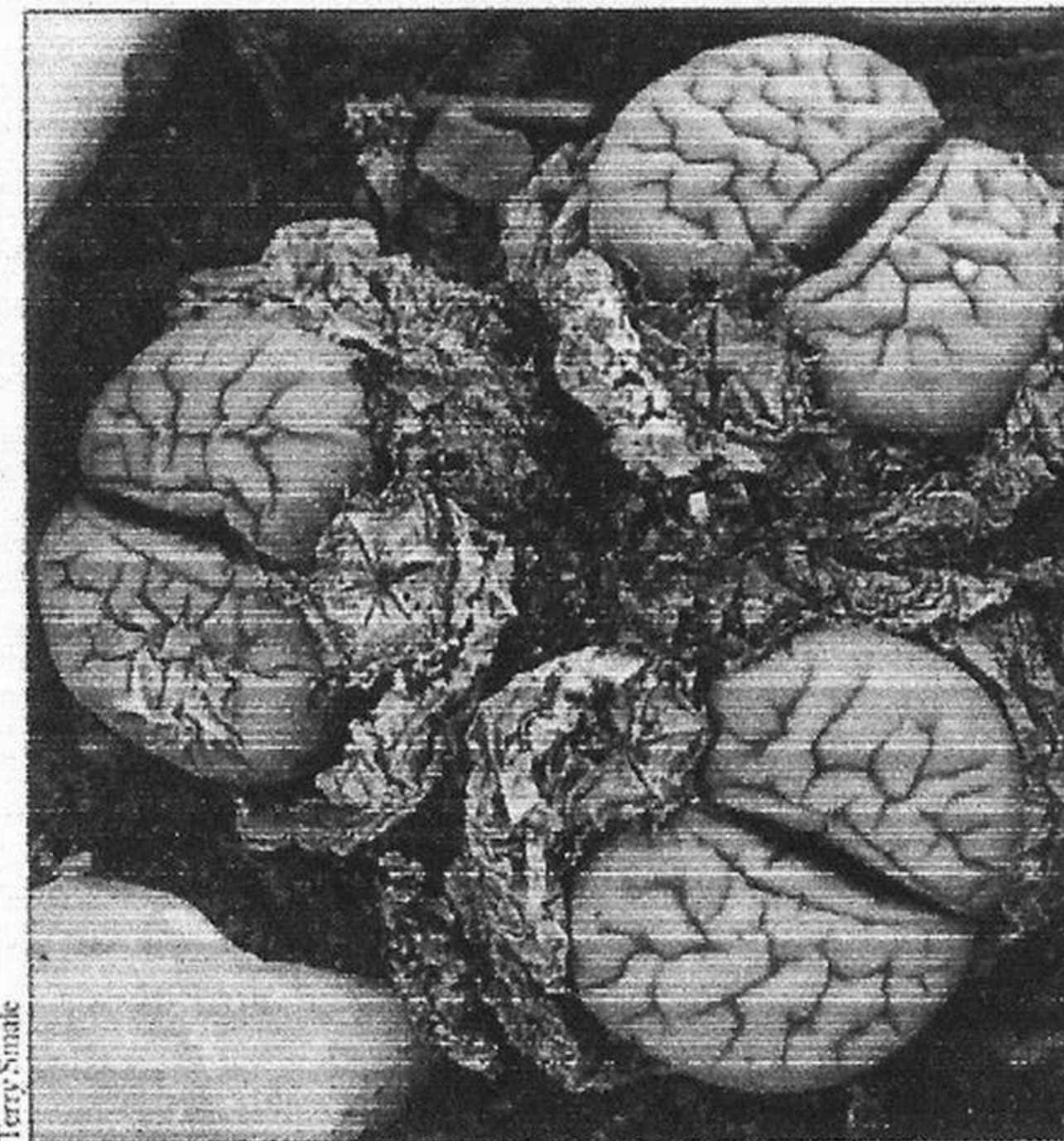
A new pair of leaves forcing their way through the central fissure of *L. karasmontana*

Lithops marmorata var. *elisae* showing the remains of old, shrivelled leaf pairs

The star-like seed capsules of *L. colorum* open in the rain



GPL Vaughan Fleming



Terry Smale



Terry Smale

body on fresh soil, place in a well shaded environment and water after a few days. Root growth, if it is going to happen, will occur within a couple of months.

If you have never tried growing Lithops before and would like to venture into that part of the hobby then I would suggest the following species as being excellent ones to try first:

- L. aucampiae and varieties
- L. bromfieldii and varieties
- L. hallii and varieties
- L. hookeri and varieties
- L. karasmontana and varieties
- L. lesliei and varieties
- L. olivacea and variety
- L. pseudotruncatella and varieties
- L. salicola
- L. schwantesii and varieties

CONCLUSION

As stated earlier, Lithops are easy to grow. However, as with so many cacti and succulents, there are always exceptions to the rule. *L. comptonii* and *L. viridis* are much more difficult to grow well and keep healthy for long periods of time. Both may well experience winter rainfall in habitat but so do some other species which grow easily in cultivation. Grow your plants well, enjoy their variety, have plenty of success then, perhaps, try this awkward pair.

EXCELLENT READING MATTER FOR LITHOPS

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|--------------------------------|---------------------|-----------------------------|
| Lithops | by G. C. Nel | first published around 1946 |
| Lithops, Flowering Stones | by Desmond T. Cole | first published 1988 |
| Lithops, Treasures of the Veld | by Steven A. Hammer | first published 1999 |

Bibliography

The Garden, Journal of the Royal Horticultural Society, Volume 125 part 7, July 2000

Lithops, Flowering Stones by Desmond. T. Cole

Cactus & Co Volume 8 part 4 (2004)

and plenty of personal experience.