Editorial
Excursions and Expeditions

Excursions (organised by IBSA) and expeditions (organised by individuals or groups of individuals) can be divided into two categories – "search and rescue" authorised by the Dept of Nature Conservation, and "viewing and photographing". For some years now there have been two IBSA excursion each year: an annual three day one to Middelpos or Nieuwoudtville to look and photograph, and a one day "search and rescue" one within easy reach of Cape Town. At the same time there have been many privately arranged expeditions by small groups of members. This year IBSA has staged at least one and sometimes two excursions each month. A three day trip took place over a weekend, and we have also experimented with mid-week one day excursions. There have been no "search and rescue" trips this year as negotiations are in progress with the Dept of Nature Conservation and it is advisable to wait for the relevant permits.

Perhaps the most promising result of the IBSA excursions is that there is now a growing number of small group expeditions by a growing number of small groups! This has the excellent effect of widening the pool of knowledge of localities and botanical species in the SW Cape. There is an almost infinite number of areas worth visiting, far more than can be covered by IBSA excursions, but if the knowledge gained by expeditions is shared, possibly through Bulb Chat, it will encourage more exploration. We have long emphasised that the essence of IBSA is sharing, and the sharing of knowledge is as important as the sharing of seed and plants.

An unfortunate trend is the emphasis on exploring Namaqualand and the Roggeveld Plateau. Both are well worth exploring, but we should not ignore the great potential of the Southern and Eastern Cape, the Little Karoo and the Overberg. Nor should we concentrate only on the spring months, while ignoring the autumn which is the time of flowering for the Amaryllids and the hysteranthus Iridaceae. Excursions are sparked off by expeditions - by reports coming in about interesting places. The highly successful Tankwa Karoo excursion was staged on this basis. Regrettably few members went, but the number of rare and new species found was far beyond expectation. So the sharing of localities worth visiting is vitally important to the IBSA committee who is responsible for planning future excursions.

It is for the IBSA members to prod the committee into organising activities, not up to the committee to prod the members into activity. What applies to excursions and expeditions applies also to monthly meetings. It is for the members to express their preferences about venue, subjects for talks, timing, etc.

- Is the last Saturday of the month the best day?
- Is the afternoon the best time?
- Should we have only one venue where all our meetings are held?
- Should we have a formal talk each month?
- Which areas should we visit on excursions?

- Are external experts or IBSA members the best speakers?
- Should IBSA hold mini-shows?

These and many other matters should be guided by the member's opinions and not dictated by the Committee.

Why are you a member and as a member, are you getting what you want and expect? ❁

Letter to the Editor

Crinum campanulatum notes

Dear Editor,
In the IBSA Bulletin No.49 of August 2000 I discussed the germination habits of *Crinum campanulatum* and posed questions relating to the time it would take for plants to reach flowering size and whether they would flower without the stimulation of flooding, as is the case in nature where they only flower when the seasonal pans in which they occur, fill after rains. Observation of plants grown from seed sown four years ago in our nursery has thrown some light on these questions.

We plant *Crinum campanulatum* seed in open raised beds under 30% shade cloth in a light soil mixture consisting of approximately equal parts of composted pine bark, loam soil, compost and coarse sand, with the addition of bonemeal and 2:3:2 fertilizer. These are the same general conditions we use for all our seedling bulbs. Despite being close together (less than 10cm apart) the Crinum bulbs develop rapidly, start making suckers in their second year and remain evergreen. Even in the vleis where they occur naturally, the bulbs are very close together. No special irrigation is applied – we rely on normal summer rainfall (900mm per annum) supplemented by light watering during dry spells and occasionally in winter. Thrips and amaryllis caterpillar need to be controlled, which we do with regular spraying with a cocktail of Cypermethrin EC, Malasol and a sticker/spreader, Nu-Film P. Contrary to beliefs published elsewhere, *Crinum campanulatum* is extremely susceptible to the amaryllis worm. The wild populations are heavily infested, and the worms are particularly fond of the seeds. One other pest we encountered was woolly aphid amongst the roots at the base of the bulb which can only be controlled with a systemic aphicide, such as Metasystox.

Under these conditions we have now flowered plants after four years from seed. By this time the bulbs are up to 6cm in diameter and suckering profusely. It is significant that flowering has commenced, even under these cramped conditions, without the stimulation of seasonal flooding or immersion in water, as would be normal in the wild. It is clear that under garden conditions *Crinum campanulatum* can be grown with success in the same way as any other Crinum species. They have the added advantage of being an excellent water feature in garden ponds and fish pools.

Yours sincerely,
Cameron Mc Master, The Croft Nursery, Stutterheim.

Letter to the Editor

"William Herbert on *Crinum* Classification"

Dear Editor,
In Bulletin 49, pp. 9-10, Hannibal proposes a "revision" of the Genus *Crinum*. I contend this "revision" is merely an analogue of a classification system published by William Herbert in 1821. Furthermore, Hannibal's "revision" sets forth taxonomic terminology which is contrary to published definitions (by Baker) and to the International Code of Botanical Nomenclature (ICBN).

Summarizing Hannibal's revision:
Subgenus Stenaster Baker -- sequentially flowering, pedicellate actinomorphic flowers
Subgenus Crinum (ex Platyaster Baker) -- group flowering, sessile actinomorphic flowers
Subgenus Codonocrinum Baker -- sequentially flowering, pedicellate zygomorphic flowers
Subgenus Codonocrinum var. Ornata subgenus nov. -- group flowering, sessile zygomorphic flowers
A. Superspecies *C. jagus*
B. Superspecies *C. zeylanicum*

In contrast, below is a brief summary of Herbert's classification:
Sectio 1. Patentes -- wide spreading corollas
Subdivision 1. Nutantes -- buds nodding before expansion, sessile or subsessile flowers
Subdivision 2. Inclinate -- buds inclining before expansion, pedicellate flowers
Sectio 2. Semipatentes -- half expanded corollas
Subdivision 1. Ornatae -- buds nodding before expansion, sessile flowers
Subdivision 2. Longifoliae -- buds inclining before expansion, pedicellate flowers

Each classification scheme divides the two major categories of flowers, hypocrateriform and funnel-shaped, into two subcategories, sessile/subsessile flowers and pedicellate flowers. They are equivalent, regardless of the adjoining characters included. If Herbert's scheme is to be reintroduced in a slightly modified form, Herbert must be acknowledged and his terminology be given priority.

In addition, Hannibal's version contains misrepresentations and nomenclature errors:
1) Hannibal has embellished Baker's subgenera definitions, which are reprinted from Baker's (1881) "synopsis" in entirety:

> Subgenus I. Stenaster (type species, *C. asiaticum*). Flowers usually quite erect, with the linear segments of the limb spreading or reflexing, not more than 1/4 - 1/3 inch broad. Filaments suberect, diverging equally on all sides from the ascending style.
> Subgenus II. Platyaster (type species, *C. americanum*). Perianth tube straight or slightly curved, the lanceolate segments of the limb spreading or ascending when fully expanded. Filaments equilaterally divergent from the suberect style.
> Subgenus III. Codonocrinum (type species, *C. latifolium*). Perianth-tube almost more or less curved from youth to age, the limb horizontal or suberect, the oblong

segments standing forward so that they are permanently connivent or imbricated in the lower half. Filaments declinate, brought close together so that they are nearly parallel with one another and with declinate style.

Baker makes **no** provision in his subgenera definitions for whether or not flowers are sessile or pedicellate; the major distinguishing character between Subgenera Stenaster and Platyaster is segment shape/width. Baker's definitions as purported in Hannibal's "revision" are foreign to the original definitions, and when applied, they lead to quite dissimilar classifications. For example, Hannibal designates *C. firmifolium* Baker as belonging to Subgenus Platyaster, which directly contradicts Baker who classifies it as Subgenus Stenaster. Similarly, Hannibal classifies *C. subcernuum* Baker and *C. hildebrandtii* Vatke as Subgenus Stenaster, whereas Baker places both species into Subgenus Platyaster.

2) Hannibal's combination "Subgenus Codonocrinum var. Ornata subgenus nov." is not permissible according to ICBN rules (Articles 4.1 and 21.1). "Variety" is an infraspecies rank and cannot be used to stipulate a subgenus. More importantly, Baker (1881) designates *C. latifolium* L. as the type specimen for Subgenus Codonocrinum Baker; Hannibal cannot reposition *C. latifolium* (sessile flowered species falling within Hannibal's "Superspecies *C. zeylanicum*") into another subgenus while leaving subgenus Codonocrinum Baker supposedly intact (violates Articles 7.3 and 63.1).

3) "Superspecies" is not a defined taxonomic rank according to ICBN (Article 4.1). If the concepts implied in the entities "Superspecies *C. jagus*" and "Superspecies *C. zeylanicum*" are to be introduced, they must be properly defined, presented in legitimate taxonomic format, and meet the validating requirements of ICBN (Articles 32 through 45).

4) The combination of "crinum" and "ornata" in taxonomic nomenclature must be restricted to the context wherein it was first validly published. As I have pointed out (Lehmiller, 1997a), this initial combination occurred in Herbert's (1821) classification system presented above.

Herbert stands out as an exemplary botanist concerning the taxonomy of *Crinum* - it was he who first formulated an adequate definition of this genus in the referenced 1821 publication. He based his descriptions and classifications upon personal observations of living plants, and he was careful to set apart any opinions wherein he was relying upon drawings or herbarium specimens or observations alluded to others. He assigned many species to each of his subdivisions outlined above, but he anticipated that some species would likely fall outside his classification scheme: " .... I have subjoined other particulars which appear to coincide with the characters of each section, as far as I have seen, but which I scarcely expect to find invariable." Indeed there are species which fall outside Herbert's scheme regarding nodding versus inclining buds; from my personal observations of Southern Africa species, I can cite *C. subcernuum* Baker as a deviant from the pedicellate (Inclinate) section, and both *C. rautanenianum* Schinz and *C. carolo-schmidtii* Dinter from the sessile (Ornatae) section. With respect to Hannibal's group versus sequentially flowering hypothesis, I find most *Crinum* species to flower in sporadic, unpredictable modes, and I contend no objective evidence exists to warrant extrapolating the work of Muller-Doblies.

I wish to make one final comment. All Southern African literature has befuddled *C. carolo-schmidtii* Dinter subsequent to its discovery. Dinter (1914) described this bulb as a small, limestone vlei species with only 1-2 flowered umbels -- "only one in a thousand specimens 3-flowered" -- and the type specimen (Dinter 2337, 14 Jan. 1912, B) depicts an umbel with two sessile flowers. Verdoorn misrepresented this plant in **Flowering Plants of Africa** (1972) and in **Bothalia** (1973); she confused it with a Namibian *C.lugardiae*, as did Dyer (1948) with *C. occiduale*. Roessler (1974) recognized Verdoorn's error; he also remarked that *C. carolo-schmidtii* appeared very similar to *C. rautanenianum* Schinz herbaria (indeed it differs only by its smaller statue and by possessing rosulate leaves rather than distichous leaves), but then he confused *C. carolo-schmidtii* with a Namibian *C. paludosum*. I have discussed this on several occasions, and a summary is provided in **Herbertia** (Lehmiller, 1997b). One cannot accurately classify *Crinum* unless one has had the opportunity to examine living plants in the field; many herbarium specimens and published descriptions impart much to the imagination.

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Yours sincerely,

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Yellow *Romuleas*

Do not assume that the yellow *Romuleas* in one population are all the same species! Examine them closely – corm shape, leaves, bracts and bracteoles, as well as markings on the back of the petals. In Nieuwoudtville, *Romulea hirta* is interspersed with *R. discifera* (different leaves, corms and flowering times), plus *R. montana* and *R. monticola* (different corms and leaves). On the Kamiesberg *R. pearsonii* is mixed with *R. luteoflora* (different bracts, bracteoles and corms) and sometimes also *R. citrina* if the area is wet.

The Cape Floral Kingdom

Andries de Villiers

When we became interested in indigenous bulbs we each became aware that we were in the Cape Floristic Region which used to be the Cape Floral Kingdom. We may not know where it is but know we are in it. The great Marloth coined the phrase at the beginning of the 20th century and the area that he was describing encompassed the land between the sea and the mountains. When a man as eminent as Marloth says something, lesser men hasten to define, to explain, and to analyse. Very soon it became established as a strip of the littoral from Port Elizabeth to the mouth of the Olifants river, about 100 km wide. Outlines were drawn on maps and the Kingdom acquired boundaries. It became a place. But it is not a place, it is a concept. Unfortunately those lines on maps became entrenched. The concept was forced, and still is, within them. Which is a pity because the concept is good, but the maps are bad. In the process of defining, explaining, and analyzing, the concept was hitched onto the Fynbos and particularly, within the Fynbos, to Ericas, Proteas and Restios. In the hundreds of thousands of words that have been written about it, Marloth's awe and wonder at the beauty of the plants has been lost in the thunder of taxonomy, environmental sciences and conservation administration. The map appeared in Bond and Goldblatt 1984 and has appeared again in Goldblatt and Manning 2000. No doubt it will appear again and again and again. The present authors repeated the map but nowhere in the text do they justify it. Instead they write extensively about endemism and diversity; in other words about the concept which is simple: it is the land where the unique flowers of the Cape live and thrive.

Because the map has become set in concrete, many of the Kingdom's flowers have been excluded from it. We, in IBSA, are concerned with the bulbous genera. We know that the fynbos is only one of many habitats and that more of our species grow in the renosterbos than in the fynbos. We know that the presence of Ericas, Proteas and Restios is largely a matter of soil and water. The Kingdom has an infinity of soils and water conditions, all of them part of the intrinsic texture of the Kingdom. We know that plants of the Kingdom grow in the Roggeveld and in Namaqualand. But they are excluded for they are outside the line of the map, the line you cannot step over for it doesn't exist on the surface of the veld. It is said that there will always be a margin between Regions and that some plants will radiate into and across the margin becoming denizens of the next region or perhaps of no region. Genera do emigrate but there is a wealth of difference between purposeful, active and penetrative emigration and the outer fringe inhabitants of a land. Consider the genus *Romulea*. *Romulea rosea* is the eponym of Section Roseae. It grows throughout the Kingdom from end to end. At Port Elizabeth it translates into Subsection Autumnales which includes *R. campanuloides* which extends on to Kenya and perhaps to the Mediterranean. It does not matter whether radiation was from tropical Africa to the Cape or from the Cape to tropical Africa. It is a plain instance of emigration and emigrants are not citizens of the Kingdom. *R. monadelpha* is excluded with contempt while its brother *R. sabulosa* is admitted. It does not matter that they grow but a short distance apart and are so similar as to be almost indistinguishable. One has citizenship, the other is cast into outer darkness. The map has vanquished the concept.

So let us, in IBSA, restore the definition of the Cape Floral Kingdom. It is inland from the Cape coast, wherever the bulbs and corms peculiar to the Cape, morphologically, genetically and in life cycle have developed and flourished within a habitat and climate which is essentially of the Cape. That brings the Roggeveld (and Namaqualand) into the Kingdom. There is one spirit, peering out through Peter's Gate, who will be pleased: Marloth's *Gladiolus* will be back in his Kingdom.

When Marloth strode the veld around
And saw within it flowers abound
In beauty far beyond compare
He praised the Lord who placed them there
And said: "This glorious Kingdom of the Cape
Is surely where bright souls escape
From Heaven to delight us here.

Editor's note: *Two SW Cape botanists were asked to comment on the above article:*

Reply by John Manning, Compton Herbarium, Kirstenbosch

'Maj de Villiers' call to arms is stirring stuff but while the sentiment is noble I do question its essence. In attempting to establish boundaries for the Cape Region, later botanists have merely aimed at a more specific delimitation of what Marloth meant when he recognised such a place between the sea and the mountains. Of course no firm borders can ever be drawn about a sub-continental region like this but unless some limits are established to it no two people will ever end up discussing the same thing. I have no doubt that few modern botanists take the boundaries reproduced in Goldblatt & Manning to be anything more than approximate. Without them, however, how could anyone even begin to count the number of species within the region, let alone the proportion of species endemic to it? The de Villiers concept of defining the Cape Region as that place where bulbs typical of it grow is no help at all. By his own examples that would include the whole of Africa and much of the Mediterranean since that is where both *Romulea* and *Gladiolus* grow. He is quite correct, however, that several areas currently lying beyond the borders of the Cape more properly belong within it, and I think immediately of the fynbos that occurs on the top of the Kamiesberg and up the Namaqualand coast. These islands could well be included into the Region as an archipelago. The problem of renosterveld is more difficult as large tracts of it occur on the central plateau. While they support a few typically Cape bulbs (*Syringodea* is one) the number is not significant in the context of the rest of the vegetation. May I, therefore, suggest a more moderate solution, and one in keeping with current trends. Why not adopt a more informal concept, the Greater Cape Floral Region, which would include those marginal areas that harbour some Cape plants but which do not accord fully with the floristic composition that is taken to characterise the region in the strict sense. I don't know Marloth's personal inclinations towards aggrandisement but to me, as a fancier of Cape Bulbs, the Greater Cape has a certain prosperous attraction to it.

Reply by Peter Linder formerly of the Bolus Herbarium, UCT, now working at the University of Zurich

What is the Cape Floristic Region?
The Cape Floral Region is of course the same as the Cape Floral Kingdom. This odd double terminology is the result of a hierarchical biogeographical classification that divides the world up into six Floral Kingdoms, and most of the Kingdoms into Regions and Provinces. The Cape Floral Kingdom has but one Region, and so the two are synonymous. Much like genera with only one species, so that the species and the genus become synonymous. The realisation that the flora of southern Africa can be divided into two major types - a temperate southern flora, and the tropical northern flora, is quite old, and predates Marloth's work. However, Marloth did first coin the phrase "Cape Flora", and also made a major contribution in the delimitation of this flora. It is immensely helpful to geographically delimit this flora, so that we can assign a "home" to it, we can list its species, genera and families, and indeed so that we can define a "Cape Floristic element" as a genus or family that has most of its members in this defined area. However, drawing lines on maps in the most sensible and useful manner is not easy. The transition between the Cape Flora and the tropical African flora is based on the region where the most rapid change in the flora is found - not only in species composition, but also in the generic composition. There have been numerous studies on the transition. Most of these have been based on mapping the distributions of individual species, and time after time the species distribution boundaries have been found to follow the same line. Several other studies have used a large portion of the total flora, and investigated the distribution groups, and these have also found the same boundaries. So, far from repeating an old myth, the boundaries of the Cape Flora are based on a large volume of work, empirically based. Of course, some plant groups do not follow this boundary - among these are many of the bulbs. But this has also been known for some time. And it has to be appreciated that it is simply not possible to map the Cape Flora in such a way that everybody will be happy with the borders. The Cape Flora is not entirely restricted to the Cape Floristic Region, and the presence of outliers is well documented. The first detailed investigation of these outliers was, to my knowledge, by Weimarck. The outliers are not only restricted to Namaqualand (especially the Kamiesberg) and the Roggeveld Escarpment, but also eastwards along the Great Escarpment to the Drakensberg, north to Blouberg in the Northern Province. Even further north there is a large outlier on the Chimanimani mountains in Eastern Zimbabwe. Beyond that, members of the Cape Flora become rather rare, but can still be found. If we were to include all these areas in the Cape Flora Kingdom, we would be doing the Tropical Flora a grave injustice, since many of its members would then be included in another Kingdom, even though their elements are in the majority.

But Mr de Villiers need not despair - all members of *Romulea* could be regarded as members of the Cape Flora, although some species might be outliers that lie beyond the borders of the Cape Floristic Region. The same applies to members of Erica, Restionaceae, Proteaceae, Stoebe, and many other genera or even families that occur predominantly in the Cape Floristic Region, but have species beyond the borders.

Gethyllis longistyla, an enigmatic species from the Eastern Great Karoo

Charles Craib

The Genus *Gethyllis* contains several species that are only known from a few specimens. These plants tend to be found a few times and then sink into obscurity. One such species is *Gethyllis longistyla* a species from the elevated mountainous and hilly areas of the summer and autumn rainfall Eastern Great Karoo.

The observations, which follow, were made in the foothills of the Sneeuberg and the Agter-Sneeuberg in the Murraysburg district where the plants were found on dolerite hills or ridges. Suzette Vlok formerly of the Witwatersrand National Botanic Garden made the record in the western foothills of the Agter Sneeuberg and despite a thorough search, only one bulb was located amongst dolomite pebbles on a large rocky hill. Further bulbs have not been found in this area. The eastern foothills of the Sneeuberg were thoroughly searched whilst I was researching the ecology of *Pelargonium aestivale* for my book "Geophytic Pelargoniums : Field and Cultivation Studies of the Section Hoarea". About 12 *Gethyllis longistyla* were seen in flower at the beginning of December 1999 - the large pale lavender flowers are very conspicuous and are strongly scented. They were growing individually near the summits of a series of rocky ridges. A few bulbs were growing out in the open amongst dolomite pebbles, but the majority was amongst or under tufts of short grass between dolomite boulders suggesting that this is the preferred habitat. The leaf growth had withered completely when the plants were in flower. Further observations in late February indicated that the bulbs had produced fruit. Two fruit, fully ripe, contained about 30-40 seeds.

The area was searched again in early May 2000. After about four hours, one bulb was found growing on a low ridge that had not been inspected before, but as the bulbs amongst grass tufts had not been accurately marked previously, none of them could be relocated. It is apparent that this species is autumn and winter growing responding to the rains which are normally heaviest between late February and April. This winter growing habit characterises *Lachenalia karooica* and *Pelargonium aestivale* which grow in the same habitat as the *Gethyllis*.
A wider area was searched in early December 2000 as I hoped to obtain some data on the numerical strength of the species in this region of the Sneeuberg. No bulbs were seen in flower - in fact no more bulbs were located at all. The area where the plants had flowered in 1999 was searched again a few weeks later with the same negative results.

It is evident that the species is very scarce and thinly distributed in its habitat, and it is likely that very few bulbs will ever be seen unless they are in flower owing to the fact that short grass tufts often conceal their leaves. The limited amount of data available suggests that pollination rates are high in the years that plants flower, but it would appear that flowering is very sporadic for reasons which are not yet understood. The recruitment of new plants to the population is also a rather tenuous process. The fruit ripen in February and early March but the seeds only have a chance of germinating if they are liberated when the autumn rains fall. If these fail, which they often do, seeds will simply shrivel during their brief period of viability. A

significant factor, which complicates matters further, is that plants which fruit in dense grass cover produce seeds that fall into the grass and rarely reach the ground, or if they do, there is insufficient light in which to germinate and develop. It is probable that these plants only produce seeds that germinate after the veld has burned, about once every four to six years.

Cultivation of the species out of its natural habitat is specialised. A plant grown in a pot in morning-only sun has survived quite well in Graaff-Reinett when left to its own devices. Seeds sown in Johannesburg within 48 hours of collection, all germinated producing only one leaf in the first season but two in the second. These seedlings have behaved in exactly the same manner as mature bulbs in habitat, i.e. growing in the autumn and winter months and entering dormancy in spring. They have been kept dry, sheltered from summer rain, until the cooler weather sets in during late February, and they produced leaves immediately when exposed to rainfall at this time.

It is very much hoped that *Gethyllis* enthusiasts will contribute further records of plants in habitat, thus expanding our knowledge of this unusual species. People with the inclination for exhaustive searches and also with time on their hands could look in the foothills of the Sneeuberg, Agter-Sneeuberg and the Kamdebooberg near Aberdeen. It is necessary to bear in mind that bulbs do not seem to favour mountains or flats which experience excessive winter temperature inversion. The habitat seems to be, in this area at least, large hills and ridges with short grass cover amongst dolerite pebbles and boulders. ❁

Nerine sarniensis: fact or fiction

Andries de Villiers

We have all heard the romantic story of the ship fighting for its life in the raging tempest of the English Channel; of the fragile case of bulbs that was swept onto the shore from the wreckage; of the beautiful flowers that sprung up on the shoreline. This story was first published by Robert Morrison, professor of Botany at Oxford, more than 20 years after the "event". Research has utterly failed to find an appropriate wreck or even a suitable coastline. What it has discovered is an equally romantic story of a very different kind: a love story and a secret marriage.

Our hero is Charles Hatton, son of Lord Hatton, Governor of Guernsey in the government of Charles II. Our heroine is Mary, daughter of John Lambert, one of Cromwell's Major-Generals. In the best operatic tradition, the supporting cast comprises the two fathers, Mary's mother and the Oxford professor. Of these secondary characters, the most colourful is John Lambert, the son of a Yorkshire magistrate. He was a prominent and successful commander of the revolutionary forces who in 1647 was appointed the Major-General of the five northern counties, and is reported to have used his power "with great wisdom, moderation and justice". He was 28 years old. He tried to dissuade Cromwell from executing the King, but nevertheless in 1650 was appointed second-in-command of the army. He supported Cromwell's appointment as Lord Protector but opposed his attempt to be declared King, and in consequence, Cromwell stripped him of all his offices. At the Restoration in 1660, he was

imprisoned in the Tower of London, escaped and was recaptured at Daventry whence he was again imprisoned, this time in Castle Cornet on Guernsey. In 1662 Mrs Lambert and her three children were allowed to move to Guernsey to be with her husband. His later story need not concern us because now the motif of our story appears. Lambert was a keen gardener and probably had bought bulbs of *Nerine sarniensis* (thought then to be of Japanese origin) earlier in Paris. His wife brought the bulbs with her to Guernsey. There Charles Hatton, who had studied Botany under Morrison, was much struck by the plants and grew them in the castle garden. He was also much struck by Mary, who he married secretly, to the great embarrassment of Governor Hatton who claimed that he only discovered it a year later and had then "turned his son out of doors and never since had given him a penny".

Young Charles, who was a man of parts, began to carve himself a future in politics and court circles. He needed to dissociate himself from his father-in-law, an action which appealed to the "Merrie Monarch". John Lambert was moved to St Nicholas Island in Plymouth Sound which detached him from the Hatton menage, and the story of the shipwrecked bulbs further distanced Charles from John Lambert who was well known to have had them in London. Such a charming cover-up has all the characteristics of the puckish humour of King Charles II. Anyhow, Morrison, Charles Hatton's old professor, went public with the story and we, three and a half centuries later, have received it and, on the whole, accepted it. Love conquers all!

Postscript: The indefatigable Samuel Pepys visited John Lambert on St Nicholas Island in 1683 shortly before the latter's death, but even he was not suspicious of the hidden story. John Lambert was saying nothing.

Gladiolus juncifolius

Rod Saunders

On visiting the Chimanimani Mountains in Eastern Zimbabwe, one is immediately reminded of the Cape Mountains. The rock formations are very similar to parts of the Cedarberg and the soils are typical of the Cape – white, sandy and chronically poor in nutrients. The vegetation, too, is similar in appearance and many familiar plant families are represented, for instance Restionaceae – 3 species, Ericaceae – 10 species, Proteaceae – 7 species including 1 *Leucospermum*. For people accustomed to walking in the Cape Mountains, the similarities are bizarre.

Whilst walking in the southern part of the range, near the saddle, in July, we noticed a small *Gladiolus* flowering in profusion, always growing in restio colonies on shallow sandy soil. We had seen this plant on a previous occasion and had identified it as *Gladiolus juncifolius*, but had not seen it flowering in such profusion before. The species is known only from this region and appears to be a rare endemic to Eastern Zimbabwe and adjacent Mozambique. At the time of flowering, plants were in full growth, the leaves were green and actively growing. One must remember that normally at this time of year (mid-winter) the ground is hard and dry, and has been so for several months. This year however, it was pouring with rain and the plants were flowering through 5cm of water lying on the sand! We commented at the time that the plants were behaving much as one of our typical Cape *Gladiolus* species such as *G. gracilis* which was in flower when we left Cape Town. The plants have 4 or 5 narrow leaves with thickened margins and mid-rib. Each flower spike had 2 to 4 flowers which were pale pink with yellow markings on the two lower tepals.

At the end of September we had the opportunity of visiting the site again, and we immediately sought out the plants to see what they were doing. We found plants still in flower, perhaps due to the heavy rain in July, and after much searching, we found some in seed, some with green capsules, some gone and completely dormant, and the balance of the plants in the process of going dormant. The seed capsules were very small and each capsule only contained a small number of tiny seeds. Seed was collected and it will be interesting to note how the plants behave in cultivation. When exactly do the bulbs resume growth after going dormant in August or September? Is it almost immediately to coincide with the start of the wet season in October, or do the plants commence growing in mid-summer and continue into the winter?

Medicinal properties of *Boophone disticha* ("Gifbol") are many and varied. Bulb decoctions are given by mouth or as enemas, and are used to treat headaches, chest and bladder pains, hysterical adolescent females, as outer dressings for various wounds and in the treatment of skin diseases. Bulb infusions can cause hallucinations and have caused poisoning following medicinal administration. The scent of fresh flowers and the inhalation of pollen can cause headaches, sore eyes and drowsiness. Obviously the line between kill and cure is a narrow one!

White Mischief

John Manning

There is no doubt that the Cape flora comes into its own in the sheer diversity of its bulbs. Out of a total flora of around 9 000 species almost 1 200 are what are commonly conceived of as bulbs. This is a staggering proportion by any measure, and four to five times higher than is typical of other areas of mediterranean climate. The true glory of Cape bulbs is not, however, so much a factor of the richness of the species but rather of the diversity of their flowers. Where else can one encounter such a bewildering array of flower types within any one genus? The current spate of rationalisation that is taking place at the generic level among Cape bulbs is actually a telling legacy of the effect that this bewildering diversity had on earlier botanists. Who can blame them for thinking that *Gladiolus quadrangulis*, with its bowl-shaped lilac flowers, was a species of *Geissorhiza*, or of failing to discern the connection between the small greenish flowers of that curiosity now known as *Freesia viridis* and the gloriously fragrant chalices of more typical freesias? No, I for one never cease to be amazed at the seemingly endless variety that is evident within many of the genera.

Of course, this great floral diversity is directly linked to the unusual array of pollinators that have been drummed into service by the bulbs of the Cape. Nowhere else in the world are there comparable developments of several of the pollination systems that are so important to Cape bulbs. Among the more unusual of these rely on various furry monkeybeetles, long-proboscid flies and the swift Table Mountain splendour butterfly. Each of these groups of pollinators has had a marked influence on the flowers that are adapted to pollination by them, and we enjoy this influence in their diversity (the connection between pollinators and flower form was previously explored in the IBSA Bulletin 48: 5–13). Among Cape bulbs both the families Amaryllidaceae and Iridaceae have adopted a range of pollination strategies that are not evident, or are only poorly expressed, elsewhere across their range. There is, however, one glaring exception.

There is only one species of *Crinum* that can truly be thought of as being adapted to a winter-rainfall climate and this is *C. variabile.* This past autumn I was fortunate enough to be visiting a fine stand of the species near Nieuwoudtville just as dusk began to fall. Although the flowers are scented throughout the day the fragrance intensifies in strength and sweetness in the evening, when the blossoms pour out waves of a heady, lily-like perfume. This effusion is accompanied by a final unfurling of the petals. Others in the gloaming around us were also moved by these attractions. For a brief twenty minutes after dark the air was abuzz with the ghostly forms of hawkmoths as they probed the flowers for nectar. The adaptations for hawkmoth pollination shown by the flowers of *C. variabile* are obvious, comprising the pale-coloured perianth, long nectar-filled floral tube and heavy scent. What was less clear to us was why only a single species of hawkmoth, *Hyles lineata*, appeared to visit the flowers. It is usual for any hawkmoths in the vicinity to be drawn towards such flowers, although not all will be equally effective at pollinating a particular flower. Despite several nights' observation, however, we did not see moths of any other species visiting the flowers.

This observation led to the realisation that in fact there are actually very few flowers of any type in the Cape flora that are adapted to pollination by hawkmoths, despite the evident proliferation of other pollination systems in the region. A shortlist for the flora produced only two species apart from *C. variabile* (which actually barely enters the Cape region proper). These are *Cyrtanthus leucanthus* and the orchid, *Bonatea speciosa*. Both of these species occur only along the coast and thus the great majority of the Cape is destitute of flowers that are adapted to pollination by hawkmoths. This is not to say that it lacks flowers adapted to pollination by other types of moths. Indeed there are numerous examples of bulbs that are pollinated by various smaller moth species, particularly noctuids. Among these are several species of *Gladiolus*, and the amaryllid genera *Amaryllis* and *Cybistetes*. But of hawkmoth flowers there are precious few. The situation is rather different elsewhere in the country, where flowers adapted to hawkmoth pollination fairly abound, particularly among the amaryllids. While a trifling 2% of Cape amaryllids have hawkmoth flowers, a staggering 18% of the summer-rainfall species in the family are adapted to pollination by these moths. This extraordinary imbalance is obviously not a function of the plants and must therefore be related to the insects.

An examination of the recorded larval foodplants of the various hawkmoths important in pollination in southern Africa reveals that the caterpillars rely predominantly on members of the plant families Loganiaceae, Rubiaceae and Vitaceae. All of these families are essentially components of subtropical savannah, grassland and forest and are not characteristic of the Cape flora. The exceptions are *Hyles lineata*, which is also recorded to feed on the succulent genera *Aloe* and *Bulbine* (Asphodelaceae), both of which are important components of the winter-rainfall succulent karoo vegetation, and *Hippotion eson*, which feeds on *Zantedeschia* (Araceae), which is scattered through large parts of the region in damp places. It appears, therefore, that the near-absence of plant species adapted to pollination by hawkmoths in the Cape Region is due to the fact that the vegetation types that characterise the region, in particular fynbos and renosterveld, support few of the appropriate larval foodplants. This conclusion brings home the interdependence of our plants and their pollinators and furnishes just one example of how a seemingly peripheral insect is actually the central determinant in guiding the evolution of flower form.

Spring Bulbs in our Region

Cameron and Rhoda McMaster

Spring arrives very late in the Eastern Cape, long after the wonderful displays in August and September in the Western Cape and Namaqualand. Our winters are usually very dry with sunny days and frosty nights. We hope for a little rain in August, a little more in September and proper seasonal summer rains from October onwards. If rains come on schedule our spring bulbs will start to flower in October, although there are a few exceptionally early species. This year we had above average rainfall at The Croft in July of 24mm, August (58mm) and September (62mm) were normal and our flowering season is now in full swing.

While the displays are nowhere as spectacular as those of the Western Cape in spring, the many and varied species that we have are well worth a visit to our region any time from October onwards. For those intrepid Bulb enthusiasts who may wish to visit the Eastern Cape, here is a record of what we have seen so far this spring (up to 18 October).

Not counting *Haemanthus albiflos* which flowers in winter, the earliest bulb to flower was *Hesperantha longituba* which we encountered on a rocky hillside in Cathcart in the first week of August. The dainty little white *Hesperantha candida* flowers prolifically on the high mountain slopes in August and September, long before the grass has turned green. Our special little *Massonia jasminiflora* is also in full flower in rocky crevasses on the summits of Mt Kubusie and Dohne peak in August. *Veltheimia bracteata* plants are in full flower in August/ September in coastal bush and shady places further inland.

The evergreen yellow form of *Cyrtanthus mackenii* flowers on the edges of pools in sheltered streams near the coast where *Drimiopsis maculata* and *D. maxima* can also be seen. A little later *Cyrtanthus brachysyphus* may be found in flower in streams further inland. Still further inland at altitudes around 1000m and higher, the deciduous *Cyrtanthus sp. (mackenii* type*)* also flowers in August in open grassland where it prefers wetter patches. Large populations in damp spots near Stutterheim can make massed displays, and its distribution extends right up into the North Eastern Cape and Transkei. The status of this species needs to be revised, since it is very different in growth habit, appearance and habitat to the coastal *C. mackenii*, and recent DNA studies have confirmed that it is not the same species.

Spring fires in the grassland stimulate many of the *Cyrtanthus* to flower. By early October this year we had observed the following species in flower: *C. contractus* (widespread*), C. tuckii* (on the higher mountain slopes), *C. helictus* (in dry sandy veld near Cathcart), *C. flavus* (in marshes near Bathurst), *C. suaveolens* (only on mountain tops where it is endemic to the Amatola Mts.) and *C. breviflorus* (spectacular massed displays in marshes at the Tor Doon heritage site near Hogsback). There was even an early *C. obliquus* on 8 October, but such early flowering is unusual inland, although they do flower in September nearer the coast

Boophone disticha flowers from late September, but is becoming increasingly scarce due to habitat destruction and collecting. *Ammocharis coranica* is still very common, but very rarely flowers unless stimulated to do so by fire, when spectacular displays can be seen. September

is the month for *Scadoxus puniceus* to flower in the specialised protected habitats it prefers in the forests and rock outcrops. *Crinum campanulatum* had already flowered and was in seed in vleis near the Fish River mouth in early October.

In September and October one also sees many Iridaceae beginning to flower. Diligent searchers will be rewarded by sights of the small *Moraeas*, *M. stricta* and *M. ungiculata*. More spectacular are the large yellow *Moraeas* - *M. muddii* is rare on the mountains, *M. huttonii* flowers prolifically on the banks of the mountain streams in September and this year we also came across a few *M. spathulata*, which is very sparsely distributed here.

By October *Freesia laxa* already dots the cool shady forest floors near us. They are confined entirely to the Afro-montane forest, and being adapted to this habitat, they make excellent subjects for shady gardens.

Two *Dierama* species flower in early spring – tall *D. pendulum* in the drier bushveld areas and the prolific *D. igneum* which is very common in grassland. Many *Watsonia* populations are also now flowering – some massed displays hectares in extent, as we observed on the farm Moonstone early this month. The common *Watsonia* in our region is variable in colour, mostly shades of orange – which can be attributed to *W. pillansii*, but some populations are of mixed colours from red through all the shades of pink to white. Here the ID becomes more obscure and these are then referred to as "pillansii hybrids," probably with *W. knysnana*. By early October the pretty straw-coloured *Tritonia lineata* is dotted all over the veld, probably the most widespread and common of all our spring bulbs. The dainty pale blue to white *Gladiolus wilsonii* also makes its appearance in October and we have already seen the first buds of the interesting and seldom observed *G. pubigerus*. *G. longicollis* commences flowering by the middle of the month.

Most of the *Ledebouria* species flower in spring and early summer. One of the earliest, *L. cooperi,* is difficult to overlook in the montane grassland because of the unusual striped leaves. Many of the *Albuca* species that flower early, useful for water-wise gardening, are not very eye-catching. A notable exception is the beautiful yellow and green *Albuca aurea*, flowering at present in the Cathcart district.

When one adds to this list a number of species of *Hypoxis, Tulbaghia, Drimia* and *Ornithogalum* which are in flower by October, it is clear that a spring visit to our part of the Eastern Cape is very worthwhile. Of course, as the summer progresses the flower displays as well as the range of species, become increasingly impressive. By mid-summer the mountain grassland is a blaze of colour and the challenge is to find the up to thirty species of interesting ground orchids which also occur here and flower at different times throughout the summer. ❁

An unconfirmed report tells us that the USA Government is considering irradiating all mail into the USA to protect against the spread of anthrax. We wonder what this will do to seeds sent via the post. Perhaps we can expect a flood of variegated or otherwise modified plants – it may be interesting!

A new *Ornithogalum* species from dolomite rock sheets in the North West Province

Charles Craib

Bulbous flora associated with rock sheets is rare in the summer rainfall areas of South Africa, but abundant in the winter rainfall regions both as to number of genera represented and species within them. One reason for this is probably that this rocky habitat is a hostile one - the temperatures on rock sheets, in shallow soil over exposed rock and deeper soil pockets are very high in mid-summer from November to February, and water retention on the rocks is low. Bulbous flora that grow in these situations need to restrict their growing and flowering times to months when temperatures are milder. The new *Ornithogalum* described here has evolved some very interesting growth habits, and is perfectly adapted to its exposed, arid and sun drenched habitat. The habitat occupied by the plants consists of cracks in sheets of exposed dolomite filled with soil, shallow soil over sheets of exposed rock and patches of dolomite grit in depressions on bare rock.

The new species resembles *Ornithogalum unifolium* in general appearance with a single prostrate leaf pressed against the soil. The leaf is, however, covered with short white or ivory coloured bristles that impart a silvery or shiny appearance when the leaves are in direct sunlight. The leaf is cryptic and blends in very well with the rough and shiny black and grey dolomite pebbles and rocks which surround it.
The leaf is produced between early February and mid-April in response to good rain and cooling of the harsh habitat. The peak of the growing period is mid-March to early May, and bud development is initiated in mid winter (from about the end of the first week in June). At this stage the leaves are often covered in fine dust which renders them more cryptic than during the autumn rains. The first frosts in this area start in May and these often become severe late in May and June.

The species is currently only known from an area of about 10 square kilometres in the Zeerust district of the North West Province. The specific habitat occupied by the species covers an area of about 20 square kilometres and the plants may also be found elsewhere in this region.

The taxonomy of this plant is currently being studied at the National Botanical Institute in Pretoria, and at present, its affinities are obscure.

Reference:

Obermeyer A.A. *Ornithogalum*: a revision of the Southern African species. Bothalia Volume 12 No. 3: 323-376.

A trip to the Drakensberg in summer

Rachel Saunders

In January this year Rod and I accompanied a group of plant-mad Americans to the Drakensberg looking for flowers. We were lucky – the summer was a good one with plenty of rain, masses of flowers and warm to hot weather. Even luckier was the fact that when it rained, it was always while we were driving or at night, so we had two weeks of perfect flower hunting weather.

The trip started at Tiffendal Ski Lodge, close to the small town of Rhodes in the Eastern Cape. This is an extremely harsh area with short intense summers of great beauty slotted in between hard cold winters, usually with snow. Even in summer the temperatures plummet with sunset, and we all snuggled under thick duvets in bed each night. The Ski Lodge is situated at about 2 700meters above sea level, and is right below the peak of Ben Macdhui, the highest mountain in the Eastern Cape (3001m). We arrived late in the evening in the middle of a spectacular thunderstorm, so we had no idea of the spectacle spread before us. The next morning we were up at crack of dawn, to find that the entire hillside, from the top of Ben Macdhui to the plains stretching out below, was covered in flowers, and it was obvious that our trip had started off well!

We spent the whole of that first day on the slopes above the Lodge, only coming down late in the afternoon when we were chased off the hills by a thunder storm. The most eye-catching sight was probably the sheets of *Kniphofia caulescens* below the Lodge in all the damp boggy areas. There were simply thousands of flower spikes and the sight was wonderful. The sunbirds were going frantic, desperately flying from flower to flower! We were a bit too late for *Kniphofia northiae* which was already in green seed, but the plants had obviously also flowered well and the huge rosettes of broad leaves were spectacular, even with no flowers. On all sides of the *Kniphofias* were many other plant species including *Nemesia denticulata* with beautiful pink flowers, dark blue *Lobelia preslii*, various *Geranium* species in full flower, *Euryops* and *Felicias* and *Senecios* and *Eumorphias* (all daisies). For bulb lovers there were tiny plants of a beautifully spotted *Eucomis* species, *Gladiolus longicollis* in full flower, *Kniphofia triangularis* all up the slope and *Cyrtanthus breviflorus* in green seed. On the wet ledges of the rocky cliffs were big clumps of a *Cyrtanthus* species – unfortunately it is an early flowering species and we were a couple of weeks too late to see it flower. The entire area was very wet, but in the drainage lines it was completely waterlogged, and here we found thousands of *Wurmbea elatior* with their strange beautifully marked white and brown flowers.
As we made our way up the mountain, the flora became more wind swept and stunted. Anything that grows there grows flat and very close to the ground to take advantage of the warmth radiating off the soil surface. No bulbous species were found on top apart from *Kniphofia ritualis*, but there were many species of *Helichrysum* forming beautiful tight cushions of leaves and flowers, *Crassulas, Drosanthemums* and *Euphorbia clavaroides*.

Our second day at Tiffendal was spent on the slopes and along the water courses below the Lodge where the flora was completely different. Here we found *Rhodohypoxis baurii* along the riverbanks, *Gladiolus saundersii* on the drier slopes, sheets of *Romulea macowanii* with its bright yellow flowers just starting to open growing amongst the gravel on waterlogged flats,

plus many different species of orchid. Each step taken amongst the grass resulted in another flower, and the Americans felt as though they were in paradise! We walked as far as a beautiful waterfall in one of the valleys, and by then the clouds were building up and looking ominous, so we made our way back to the Lodge.

From Tiffendal we drove through the Transkei to Underberg and then to the base of Sani Pass, in rain almost all the way. In the grassland near Barkly East we passed fields of *Kniphofia linearifolia* and *Brunsvigia grandiflora* and *B. radulosa* in full flower. The Americans, who had never seen *Brunsvigia* seed heads were puzzled to see so many plants all along the fence lines. Once we had explained how the seeds are dispersed, they realised why!

Another perfect day was spent on Sani Pass. We drove straight to the top, and spent several hours on the Sani Flats and pottering along the high cliffs on top. The Flats were completely saturated with water and the area was carpeted with flowers. Bulbous/cormous plants included *Hesperantha, Massonia, Romulea, Wurmbea* and *Rhodohypoxis* species. After a quick lunch on top most of us opted to walk down, so our vehicles and drivers spent the rest of the afternoon travelling slowly up and down the pass, picking up stragglers! On the way down plants seen included dark blue *Agapanthus campanulatus*, *Eucomis bicolor*, *Kniphofia linearifolia*, *Watsonia densiflora, Haemanthus* leaves high on the cliffs, many orchids, plus *Geraniums, Euryops, Sutherlandia montana* in full bloom, *Protea roupelliae* and *P. subvestita, Glumicalyx, Diascias, Wahlenbergias, Zaluzianskyas* – you name 'em, we saw 'em! By the end of the afternoon Rod and I were exhausted from all the running up and down the pass, trying to identify plants for enthusiastic Americans!

We woke up the next morning to damp thick mist so, very happy that we had gone up Sani Pass the previous day in superb weather, we went for a long walk through the grassland to a site with Bushman paintings. Here we found *Ledebourias, Scilla dracomontana, Watsonias* and many grassland orchids. Everyone enjoyed the walk -–the paintings were in excellent condition, and walking in mist has almost magical properties with views coming and going, rocks and trees appearing as though from nowhere and the sound of the streams filtering up from unseen gullies. We were hungry that night and enjoyed our dinner!

Then on to Cathedral Peak, arriving on a hot afternoon just in time for a swim in the magnificent hotel swimming pool. The next two days were spent walking up towards the contour path, and in the cool forest of Rainbow Gorge. Rainbow Gorge was probably the more interesting for bulbous plants, and we saw many species including *Talbotia elegans*, a strange little plant with white flowers clinging to the rocks above the river, *Xerophyta viscosa, Eucomis bicolor* on the rocks and *en masse* in the gullies, *Agapanthus campanulatus* and huge *Chlorophytum krookianum* with their 1.5m high flower spikes. Non-bulbous species included hillsides of *Encephalartos ghellinckii, Dioscorea sylvatica, Melianthus villosus*, many beautiful grasses and lots of daisies!

The final destination of the trip was Mont-aux-Sources where we spent two nights. We had a half day walk in the hills around the hotel where we found sheets of *Galtonia candicans* in full bloom and many orchids in the forest. Our last day was spent walking up the Gorge, through Protea veld to start with, and then in the river valley. The most exciting species to be seen were the most spectacular *Gladiolus microcarpus* with large pink flowers, high on the cliffs where

we struggled to photograph them, together with *Galtonia regalis*, a smallish species with creamy coloured flowers. After several swims in the Tugela River, we made our way back to the cars and back to the hotel, tired and saturated with plants.

Both Rod and I felt that the trip was extremely worthwhile floristically and for once the weather co-operated all the way. There are good hotels and other accommodation at all the places we visited, walking is superb, and the flowers spectacular. Those of us who live in the SW Cape tend to neglect the summer rainfall areas, and when one sees the wealth of the flora, it seems silly to do so! ❁

Where did it all start?

Andries de Villiers

The Synoptic Review of *Romulea* (discussed elsewhere in this Bulletin) suggests perhaps a new insight into the origin of some of the cormous genera of the winter rainfall region. Such genera as *Androcymbium, Gladiolus, Ornithogalum* and *Romulea* are all largely African, have all radiated extensively in the South African winter rainfall region and have a small secondary centre of diversity in the Mediterranean. This leads one to speculate on the relationship of the species in these two centres and of the species in tropical Africa.

In her *Romulea* Revision (1972), Miriam de Vos considered that "all species of the northern hemisphere…….are seemingly closely allied to subsection Ciliatae and can be placed in a distinct subsection Romulea of Section Romulea" (p 42). She goes on to state that "subsection Romulea is probably not more primitive than subsection Ciliatae" (p 43). The identification of the northern species with subsection Ciliatae is confirmed (on p 48). In her listing of species she starts with *R. schlechteri* in Section Romulea (no. 1), subsection Ciliatae (no. 1.1). The inference is that the Ciliatae type is basic in the genus and that the genus presumably originated in the Cape and migrated northward to the Mediterranean leaving living traces of the journey in species such as *R. camerooniana* along the eastern highlands of the continent.

In the Synoptic Review of Manning and Goldblatt (2001) there is a very detailed analysis of the infraspecific characters which results in an entirely different subdivision of subgenus Romulea into four sections. The first is Section Romulea in three separate Series: Autumnales, Pratenses and Romulea. Autumnales includes one SA species and the three species of tropical Africa. Pratenses includes two SA species and Romulea covers all the Eurasian species, ie. those of the Mediterranean. The second Section is in five Series: Ciliatae, Minutiflorae, Aquaticae, Stellanthe and Tortuosae, all of which are South African. The Sections and Series are tabulated on pp 62-63 of the Review and the corms illustrated on p 65. The inference from this arrangement is that the genus originated in what was then temperate Africa, and that radiation following changes in the continental environment was bi-directional southward and northward.

Much the same scenario appears to apply to *Androcymbium, Gladiolus* and *Ornithogalum*. ❁

A is for April and absolutely amazing Amaryllids!

Alan Horstmann

In South Africa April is always a very busy time for an IBSA member. This is the month when pots that were stored for the hot summer months are taken out, examined, and put into their places. It is also the time to repot those plants that have become potbound or that are in need of fresh soil. April is also the time that I start to sow my newly acquired seeds for the year.

Sunday April the 1st: It is another hot dry day in the Western Cape and we are desperately in need of rain. Jim Holmes gave a talk at the monthly IBSA meeting on the last Saturday of March on general potting including seed sowing. I feel inspired by his talk and I am watering some of my pots with chlorpirifos to prevent mealy bugs.

The *Brunsvigias* have started to flower. In the garden there are two huge red *Brunsvigia orientalis* inflorescences within half a meter of each other. A short distance away in the same raised sand bed is a *B. comptonii* in flower. I also have three pots with flowering plants of *B. bosmaniae* in them. The biggest pot has the biggest and darkest pink flowers. The petals are striped and the pedicels are 16cm long with the highest flower 50cm from the ground. In the next pot, which is 20cm in diameter is a very light pink fragrant form, smelling like nasturtiums. The inflorescence is relatively compact and similar in size to those plants seen on the Vanrhynsdorp flats. The third *B. bosmaniae* has a much smaller inflorescence of diameter about 18cm and the petals seem to form a tube and are not as flared as the other two forms. At first I thought that this might be *B. appendiculata*, but after discussion with the botanists, it appears that there is a lot of uncertainty about this species and it may be a local variant of *B. bosmaniae*.
A *B. minor* is also flowering in a 25cm pot. These plants are relatively easy to maintain in a smallish pot and will flower every year once established. They also set seed readily and this particular pot has both a mature plant plus some seedlings growing in it. Even the leaves of *B. minor* are interesting – they are dark green with a dark red/maroon serrated margin. If botanists were looking for features when naming plants, then this species would obviously have been called *Brunsvigia "marginata*"! Instead it was probably named *B. minor* because of its small size.

During the afternoon of Friday the 6th April, it finally began to rain and it continued to rain all weekend. The clouds were dark grey to nearly black and they hung low in the sky. To some people this is a depressing sight, but to a plant lover this is the start of good things to come!
By Wednesday April the 11th, some of the pots with *Haemanthus* species in them have suddenly come to life. The most spectacular pot has four *H. crispus* inflorescences, already 5 to 7cm above ground level. These bright red flowers with their yellow paintbrush-like anthers are really extremely beautiful. In previous years I have seen them flower with the tips of their two crinkle-cut leaves showing above the ground. This year no leaves are visible during flowering. I wonder if the flower stems were stimulated by the rain too quickly for the leaves to start sprouting?

Another very interesting *Haemanthus* has also started to flower, for only the second time in 7 years - the very light coloured inflorescence of *H. lanceifolius* has broken through the surface

of the soil. I have seen this extremely rare species from the Vanrhynsdorp district flowering en masse once in my life despite regular visits to the site. The reason for this is probably that sheep graze the area and the leaves and flower spikes are eaten each year. The protection of this population could be a worthwhile IBSA conservation project – a fence paid for by IBSA could perhaps be erected round the population to protect the plants from grazing.

Up to now I have not even mentioned a word about our common but still beautiful *Haemanthus coccineus*. There is little that beats the thrilling sight of a clump of *H. coccineus* flowers in the veld – the bright red flowers with gold specks of pollen on a 20cm peduncle marked like a snake skin, with reddish brown markings on a cream background.

And now to talk about the small Amaryllids that have been flowering all month. The first one to flower was *Strumaria gemmata*. This little gem from the southern Cape has pale lemon coloured flowers with crisped tepals. These plants flower profusely for about 10 days each, but when one has several plants per pot, you will have constant flowers for more than a month. They set lots of seed and after several years one has a pot full of plants at all stages of maturity. *Hessea brevifolia* and *H. stellaris* began flowering towards the middle of the month. These plants with their pink stellate flowers are closely related and when in flower the only difference is the length of the perigone tube. From the species name it is obvious that the tube is shorter in *H. brevifolia* (brev = short), and the tube length in *H stellaris* always exceeds the length to which the filament tube is exserted beyond the throat.

Obviously everyone has his/her own opinion, but I think that the most beautiful *Strumaria* has to be *S. salteri*. During the last week of April the dark wine-red scapes of these magnificent plants start to appear above the ground. A few days later the flowers have all opened. The tepals are a light rose-pink with a darker pink median line on the reverse, they are slightly recurved and they have an iridescent shimmer similar to *Nerine sarniensis*. To see these intensely beautiful plants flowering in a pot is a fantastic experience, but this pales when one sees them in flower in the wild on the Nardouwsberg near Clanwilliam.
The final member of the Amaryllidaceae family to flower during April is the fascinating *Strumaria* with drooping or nodding flowers – *S. truncata*. The flowers are normally white, but some populations are pink, they are borne on a tall peduncle (15-20cm long) and they usually hang downwards (in a few specimens the flowers face upwards). By the time these flowers appear, the 2 to 6 leaves have usually also appeared as well as the dark red cataphyll (the trunk).

These Amaryllids require a fair amount of attention all year, but seeing their impressive flowers during April makes it all worthwhile. They have obviously cast a spell on me and I am hopelessly hooked for life! I hope that his article will also inspire you to start caring for and nurturing an Amaryllid!

In the Gladiolus book, Peter Goldblatt and John Manning state that *Gladiolus acuminatus* "is poorly recorded, with just a few collections from the wild, and we assume it is rare. We have not seen it in the wild, although we have searched for it at sites where it has been reported in the past". This year there were 30 cut stems of this plant displayed at the Caledon Wildflower Show! What a waste, but at least we now know that the plant is still to be found in the area.

Too many *Lachenalias*?

Rachel Saunders

Are there too many *Lachenalia* species? This question has been asked before, and after many observations in the veld, we have to ask it again. Take the two species *Lachenalia kliprandensis* and *L. carnosa* as examples. This year Namaqualand had good winter rain. We visited the Kamiesberg and in the rocks near Nourivier, we found a large colony of *L. carnosa* in full flower. We spent close to an hour photographing and admiring them amongst the bright orange *Dimorphotheca sinuata* and white *Heliophila*, in cracks in the granite and in beautiful clumps in the wet rocky depressions. The next day, chased out of the Kamiesberg by rain, we fled inland and south, and landed up at lunchtime at Kliprand, the home of *L. kliprandensis*. The area was damp and had obviously had some rain, so we went to the site where we had found the species flowering in the past. Well, instead of the 20 or 30 plants we had found previously, we now saw hundreds all over the hillside as well as in the deep red sand. But what species was this? It looked almost exactly the same as the *L. carnosa* from the previous day. Two prostrate leaves densely covered with green and brown pustules, a dense inflorescence of campanulate white flowers with magenta tips. We rushed back to the car to get The *Lachenalia* Handbook and sat down amongst the plants to compare the descriptions. For the life of us we could not find any means of distinguishing the two species!

	L. carnosa	*L. kliprandensis*
Leaf	Two bright green ovate to broadly ovate, lanceolate leaves with depressed longitudinal veins on the upper surface. Usually unmarked, but can have green or brown pustules above.	Two ovate prostrate leaves which have depressed longitudinal veins and numerous dark brown or green pustules on the upper surface.
Flower shape	Numerous sessile urceolate-oblong flowers.	Many-flowered inflorescence of urceolate-oblong flowers.
Flower colour	Outer perianth segments are dull white and have green or maroon gibbosities. Protruding inner segments are white with broad mauve/magenta tips.	Outer perianth segments are white with brownish-green gibbosities and pale magenta tips. Protruding inner segments are white with broad magenta tips.

The first time we saw *L. kliprandensis* the plants were tiny, only about 3 to 10cm tall, and they appeared squat and stubby. But this year they were between 10 and 25cm high and were lusty and rivalled their better watered relatives further north. So are these plants *L. kliprandensis* or are they merely a smaller form of *L. carnosa*?

Perhaps we have to accept that *Lachenalia* is a very adaptable genus which fills many niches and the wide variation seen within a species is a result of evolution or adaptation to a different habitat. The annual rainfall for the Kliprand area is probably half that of the Kamiesberg, so

maybe in a normal year the *Lachenalias* in this area are much smaller. But a different species? I am not so sure!

Editor's note: *I asked Graham Duncan for comments on this observation, and his reply is printed below.*

"Superficially, *Lachenalia carnosa* and *L. kliprandensis* do look similar but they are two very distinct species. Minor differences between the two species are leaf and peduncle orientation. Major differences concern flower shape, length of the inner and outer tepals, length of the lower inner tepal, as well as the position and length of the stamens, and most importantly, the length of the style.

Leaves: Both species have two large to very large ovate leaves (depending on rainfall) but their orientation in the wild differs: those of *L. carnosa* are spreading (not prostrate) or suberect, whereas those of *L. kliprandensis* are always prostrate (i.e. appressed to the ground). However, under cultivation the leaves of *L. kliprandensis* become spreading and are seldom prostrate unless grown in absolute full sun.

Peduncle: The peduncle of *L. carnosa* is relatively long and clearly visible whereas that of *L. kliprandensis* is almost always completely subterranean in the wild (occasionally a very short portion may be visible above ground).

Flower shape: The flowers of *L. carnosa* are narrower and distinctly urceolate (urn-shaped) whereas those of *L. kliprandensis* are relatively large and oblong-campanulate, i.e. the latter has a much more open flower (I incorrectly referred to the flowers of *L. kliprandensis* as being urceolate-oblong in The Lachenalia Handbook).

Length of inner and outer tepals: The two upper inner tepals of *L. carnosa* are only slightly longer than the outer tepals (outer tepals 8 mm long, upper inner tepals 10 mm long), but in *L. kliprandensis* the outer tepals are very much shorter than the inner tepals (outer tepals 5 mm long, inner tepals 12 mm long).

Lower inner tepal: The lower inner tepal of *L. carnosa* is distinctly longer than the two upper inner tepals, whereas the inner tepals of *L. kliprandensis* are all the same length.

Stamens: Both species have declinate stamens (more obvious in *L. kliprandensis* than in *L. carnosa*). However those of *L. carnosa* are well included within the perianth and are much shorter (6 to 7 mm long) whereas those of *L. kliprandensis* easily reach the tips of the inner tepals and may also be very slightly exserted, and are 10-11 mm long.

Style: The style of *L. carnosa* is extremely short (only 2-3 mm long) whereas *L. kliprandensis* has a very long style (13-14 mm long). Consequently, as the ovary enlarges following fertilisation, the style of *L. kliprandensis* protrudes conspicuously beyond the perianth (up to 8 mm beyond), whereas the style of *L. carnosa* remains completely hidden within the perianth despite the enlarged ovary."

So it appears that we need to study these two species more closely next time we see them in flower. The *Lachenalia carnosa* plants that we saw did have prostrate leaves, but on examining our photographs again, I see that the leaves of *L. kliprandensis* are pressed more closely to the ground and that the peduncle is much shorter. From the pictures I cannot really see the differences in the flower structure, so we will have to wait for next spring!

Early *Cyrtanthus* in the Eastern Cape

Jaco Adendorff

For the *Cyrtanthus* enthusiast, the Eastern Cape is unparalleled for its diversity of species and the close proximity in which they occur. My first visit to the area during the latter half of November 2000 convinced me that early October would be ideal to find most of the spring-flowering species in bloom, particularly those stimulated by grass fires. I therefore set off on 6 October 2001 for a weeklong tour of the area, my hosts being Cameron and Rhoda McMaster of The Croft.

The species or variety hitherto referred to alternately as *C. ochroleucus* (Stutterheim form) or *C. mackenii var. cooperi* (inland form) grows in great abundance along the road from Elliott to Ugie, towards Maclear and south of Ugie through the Transkei and west towards Stutterheim. In Ugie the flowers are up to 7 cm long, and most have completely recurved lobes. Towards Stutterheim they are shorter and paler, with lobes slightly recurved. Over the whole range they are strongly scented, with a perfume reminiscent of radishes. This feature, along with the orange-pink colour of the flower tube, distinguishes it from *C. mackenii var. cooperi*, which occurs near the coast in shaded streambanks and has bright yellow flowers.

C. contractus was beginning its flowering season, surviving on top of steep road cuttings and in areas where the many free roaming goats and cattle do not yet reach. Just south of Cathcart, one grassy slope was dotted with little white flowers bobbing in the breeze, almost as if confetti had been strewn over a few hectares. These belonged to *C. helictus*, in a colony of several thousand plants flowering at the same time. Around the Dohne Peak area most of the grasslands have been destroyed by forestry, but in the remaining patches we found several *C. tuckii var. viridilobus*. An altitude of 1200 m seems to be the lower limit of its distribution. It shares its grassland habitat with *C. ochroleucus/mackenii*, occurring here surrounded by lovely displays of *Dierama igneum*, *Moraea muddii* and *Tritonia lineata*.

C. obliquus grows in vast numbers on the inaccessible slopes overlooking the Kei River, the bulbs perched precariously on rock ledges and in cracks between boulders. Normally flowering towards the end of November, a solitary bloom completely out of sync with its peers brightened the rocky terrain. We could find no other flowers though, despite covering a large area.

C. brachyscyphus can be found near Macleantown, where it grows along streams in dappled shape and permanently moist soil. I found the stream banks ablaze with patches of bright red. It is spectacular to see these flowers in such masses, and one can hardly imagine such a display by one of the smallest-flowered members of the genus.

Around Gaikaskop and Hogsback a severe fire had stripped much of the grass cover and killed all but a few of the pine trees where it had swept through the plantations. We were dazzled by millions of *C. breviflorus* flowering synchronously in bogs and wet slopes, but little else was to be seen apart from the odd *C. tuckii*.

We had obtained very reliable directions from Tony Dold in Grahamstown to what seems to be the only known population of *C. flavus*. This species was described by R. A Dyer in 1939. Since then, it has not been recorded often, and no other populations are currently known. We found the site where they grow seemingly well preserved, although at first, no signs of *Cyrtanthus* were to be seen in the thick grass cover. After considerable searching, I found a plant with three little yellow flowers, looking rather tatty. Sure enough this was *C. flavus*, but we never expected it to be so small! The flowers are barely 17mm long, soft yellow in colour, and similar in shape to *C. brachyscyphus*. A further hour-and-a-half of searching produced three more plants only betrayed by their characteristic star-shaped dehisced capsules. Just as we were about to call it a day, Rhoda seemed to tune her radar to the right frequency and found a further five plants where I had searched probably three times already. To our delight we found a further two plants with perfect flowers, and some seeds still hanging by threads from their dehisced capsules. These were hastily collected, and we hope they will enable us to bring the species into cultivation. Although the colony lies within a private game reserve and is safe in the medium term, it can only be beneficial to preserve the species ex situ given the very small area they occupy. From a horticultural viewpoint the species has little but curiosity value, although it may prove to be an interesting addition to hybridisation programs. Scientifically it is poorly known, and we hope that our collection of herbarium specimens as well as seed for DNA analysis will add to the knowledge and ultimately, preservation of the species.

The new Cape Catalogue

'CAPE PLANTS' was published on Friday 13 October 2000 as No 9 in the Strelitzia series so now we must talk of "Goldblatt & Manning" instead of "Bond & Goldblatt". An extensive review was published in June 2001 in Veld and Flora Vol 87 (2), so another review is not required. However we feel that some explanations are necessary.

Containing 740 pages it starts with a 35 page description of The Cape Floristic Region and its flora, and included herein are 12 pages of photographs. Then follows the body of the book. At the start of each chapter there is a key to the families and at the start of each family, a key to the genera. At the start of each genus there is not a key to the species and the species are not listed alphabetically in a single sequence; rather they are broken up into groups under headings and some sub-headings which give the main characteristics which would appear in a key. A typical example is: the key to Monocotyledons (page 692) takes you to the families; at Iridaceae (page 110) a key takes you to the genera; at *Ixia* (page 133) there are several groups under the letters A, B, etc. Under C you will find a short description of characteristics common to a small group of *Ixias* and thus by following the keys you are led to your target. At the end of the main body of the book there is a section of taxonomic notes. Do NOT be tempted to skip this because if you do you will get lost. It explains how and why names have been changed. For example we all know of the monospecific *Daubenya* which grows in the Roggeveld and is not to be found in this book because the authors adhere to the convention that the Roggeveld is

outside the Cape Region. But there are 3 species of *Daubenya* in this book, species we have hitherto known as *Massonia zeyheri, Androsiphon capensis* and *Amphisiphon stylosus* but are now in the genus *Daubenya*. If you do not like this (personally we do like it) you must argue with Alison van der Merwe whom we congratulate on breaking into this select company of taxonomists. Some 'sinkings' are self-evident like *Satyridium* into the genus *Satyrium* and some have not happened though we might have expected them. Thus *Apodolirion* remains aloof from *Gethyllis*. No less than 5 genera disappear into *Drimia*: *Urginea, Tenicroa, Rhadamanthus, Schizobasis* and *Litanthus*.

We think that the *Gethyllis* fanciers are going to be surprised how few species are recognised. This leads us to the unfortunate feature that many of the names published by the Muller Doblies have been disallowed, resulting in confusion amongst those IBSA members who hastened to incorporate Muller Doblies species. The facts are:

1. The Muller Doblies have given names without lodging evidence
2. They borrowed Herbarium sheets up to 20 years ago and are refusing to return them so that, in the absence of their own specimens and the holotypes and isotypes of the original sheets their 'new' species cannot be verified
3. Field studies have shown that some of their 'new' species are only local forms of known species without significant characteristic differences.
4. Where it has been possible to identify a new Muller Doblies species and to confirm that it qualifies for species status it has, of course, been accepted

It is a great pity that their behaviour is shaming the respected name of German botany which has done so much for South African botany over the past two centuries.

This book is therefore more than just a catalogue of species names. It is a serious verification of the Cape flora and its re-ordering according to the latest research (DNA and other). More than 40 botanists, specialists in different families or genera, have contributed to the book and it is an important publication.

On a recent trip to Namaqualand, we spent several hours exploring the granite domes so characteristic of the area. The vegetation on these domes is an extremely interesting mixture of arid fynbos in the hollows and plants clinging to the rock and growing in crevices. Many of the plants are succulent in nature due to the extreme conditions that they have to face during the long hot summer. However there are also several geophytes including *Babiana dregei* and *B. curviscapa, Bulbinella latifolia, Gladiolus equitans* and *Lachenalia carnosa*. On this occasion we found two *Hesperantha* species that we did not recognise – a pretty pink flowered species growing in damp soil and a tiny white flowered species. We collected a specimen of each for identification and John Manning, as usual, assisted! The pink one is *Hesperantha latifolia*, an endemic of the Kamiesberg range which grows in seasonal pools or damp sand or moss overlying rock sheets. The white one was more exciting – it had white flowers with dark reverses to the petals, and very thin leaves. It was identified as *H. minima*, and according to the Revision of *Hesperantha* by Peter Goldblatt, it is only known from the type collection made by Drege in 1839! Apparently the Compton Herbarium has no specimens – we will obviously have to return and find it again next season.

Excursions

Three day IBSA excursions are planned by the committee some time in advance. This is necessitated by the fact that hotel bookings cannot be made at the last minute, particularly if it is a good flower season. The result is that some excursions are superb, but others are not, simply because we cannot foretell the weather. Below are two accounts of excursions to similar areas, in two very different years. It is difficult to believe that the accounts are of the same localities!

Middelpos 2000

Alan Horstmann

Henry Pauw, Rachel Saunders and I left Cape Town in the rain on the 31st August 2000, and this should have warned us what to expect in Middelpos. It had been a very dry winter and now the rains were coming down on the last official day of winter!!

Our first stop was at the Gifberg turnoff from the N7, just south of Vanrhynsdorp. There we saw *Lachenalia violacea, Lapeirousia jacquinii* as well as *Lapeirousia pyramidalis* in flower. I have never before seen these two *Lapeirousia* species flowering together and despite their proximity, there were no signs of hybridisation of the two species. At this site we also saw *Gethyllis oliverorum* as well as more than one *Ornithogalum* species in leaf. There was also a plant with green and white pendulous flowers which we could not definitely place into either *Ornithogalum* or *Albuca*. As usual there were hundreds of *Brunsvigia bosmaniae* in leaf and many old seed heads stuck against the fence. We also saw the dried remains of *Moraea falcifolia*, much to the delight of our American member, Bob Werra, who must have the biggest collection of *Moraea* plants in the whole of IBSA!

Our next stop was the Nieuwoudtville Reserve. There we saw a few scattered plants including *Lapeirousia oreogena, Moraea tripetala, Ixia rapunculoides*, more *Lachenalia violacea*, but there were no real signs of *Bulbinella latifolia var doloritica* or *Hesperantha vaginata*.
The Blommepad was extremely dry and disappointing. It was overcast and the *Romuleas* had closed up for the night. On examining them closely I found *Romulea sabulosa* and *R. hirta*, but there were far fewer in flower than normal. I also saw another yellow *Romulea*, not open, but probably either *R. montana* or *R. monticola*. In addition there were *Ixia rapunculoides* as well as *Babiana vanzyliae* and a white flowered *Bulbinella* – either *B. cauda-felis* or *eburniflora*. *Crossyne flava* was in leaf and there were a few *Sparaxis elegans* not yet in flower.

The following day was a sunny one, and we went along the Rooiwal road to an area where *Romulea komsbergensis* grows. They were just starting to open as the day was getting warmer. At this site we also saw *Lapeirousia plicata* as well as the white Hypoxidaceae that IBSA had found in 1992. We then went to the farm Nuweplaasrivier, close to Botuin but slightly towards Middelpos. There we found masses of *Polyxena* in leaf – possibly *Polyxena ensifolia*, plus *Androcymbium pulchrum*, a small unidentified *Ixia* species, *Lachenalia violacea* as well as

possibly *Neobakeria angustifolia* as we know it from Fransplaas. We will have to wait and see what it is on another occasion. Our next stop was the old favourite – Botuin. It had the usual selection of bulbous plants - *Romulea monadelpha* in a ploughed field, also *R. komsbergensis* and a few *R. tortuosa* plants, *Lapeirousia plicata*, a yellow *Spiloxene, Ixia marginifolia*, an unidentified *Lachenalia, Moraea ciliata* (big blue form) and *Babiana verginea* in leaf. From there we drove to Fransplaas which was a big disappointment. We found a few small *Daubenya aurea var coccinea* in leaf and Henry finally found a few (no more than 6 to 8) flowering plants. There were no mass displays this year. I looked for but did not find *Romulea unifolia. Romulea subfistulosa* were seen in leaf, but not a single flowering plant was found.

The next day was the official start of our Middelpos excursion. We went to IBSA's yellow *Daubenya* reserve on the farm of Holhoed Nel first. Here we found a total of three plants in flower with other plants showing signs that they had already flowered. However we were too early for seed. The plants were in good condition as were the other plants in the fenced area, and the leaves were not eaten off - it was obvious that the sheep had been kept out of the area. A problem for future consideration might be that the other plants – mainly dicots – in the fenced in area might do so well as to overgrow the *Daubenyas*. We spent about an hour there and found many other geophytes, very few in flower (the problem of the day), but we saw *Ixia marginifolia, Lachenalia violacea* and *L. congesta*. The plants that attracted the most attention were *Bulbine torta* with its tightly curled leaves and 'hairy' anthers, and *Oxalis palmifrons*. On this farm one member found *Gethyllis roggeveldensis*, an extremely rare *Gethyllis* with the leaves in a rosette on the ground. A few very interesting non-bulbous plants were also seen, including the little blue flowered Karooviolet.

We then decided to take the group to the top of the Gannaga pass. On the way there we passed bushes of white daisies (*Dimorphotheca cuneata*) as well as bright orange *Gazanias* near Agterkop. On the Gannaga pass we found *Gladiolus uysiae* and *G. scullyii* in flower and a few *Haemanthus coccineus* plants with heavily banded leaves were also seen. By now the weather had started to deteriorate - there was an icy wind blowing from the Tanqua Karoo which was bringing heavy clouds and rain and we were all pleased to get back into our cars!

The next destination was Syferwater, a farm IBSA as a group had not been on before. Unfortunately, due to the bad weather, and the fact that animals had been grazing there, we found very little of interest. We saw a *Moraea* which fits into the group with 3 petals, but it was not *M. tripetala*, a *Gladiolus uysiae* in bud, as well as *Lapeirousia plicata* and one lonely *Gethyllis*.

It was only mid-afternoon when we left Syferwater so en route back to the hotel we went to Botuin. We stopped at the ploughed lands to look at *Romulea monadelpha*, but then it started to rain and we had to turn back to the safety and warmth of the Middelpos hotel. This then was the end of a very disappointing day on the farms in the area.

As usual everybody raved about the food at the hotel. After dinner on Friday, Dr. Bob Werra gave us a talk on the way he grows *Moraeas* in California. He showed photos of his *Moraeas* as well as of *Calochortus*, the American plant that looks as though it could be related to

Moraeas. On the Saturday evening Cameron McMaster gave us a talk on the bulbs of the Eastern Cape and the problems that these bulbs, bulb-collectors as well as bulb growers are encountering there. Huge areas that used to be protected are now open to grazing and degradation, and some of the *Nerine* and *Cyrtanthus* populations are going to be permanently wiped out.

On Sunday we drove straight home, through a snowstorm in Sutherland and drizzle elsewhere!

To summarise; IBSA's Middelpos excursion for 2000 has come and gone. The camaraderie at the hotel was as good as usual, but unfortunately the flowers were very poor. Going there either earlier or later in the season would not have changed anything. The flowers had adapted to the extremely dry winter, with some flowering early and others not flowerering at all.

Middelpos and Nieuwoudtville 2001

Mary Sue Ittner

After years of wanting to visit South Africa, my husband and I scheduled a trip for August 2001. As we retrieved weather reports from the Internet, we could see that luck was with us as it was raining right up to Namaqualand. We had hoped to attend an IBSA meeting and we were excited to learn that a trip had been planned for Nieuwoudtville while we were in the Cape. One slight drawback was that the group was leaving Cape Town for Middelpos on the same day as our arrival at Cape Town airport after 32 hours in transit from our home in Northern California!

After a quick shower and with Rod Saunders driving our rental car we were off! We never did catch up with the group until we reached Middelpos that evening, but Rod and Rachel knew places to stop along the way so it didn't really matter. Some stretches along the road were covered with a yellow form of *Androcymbium burchellii* and there was a haze of bright yellow *Romulea tortuosa*. We stopped for an especially good patch of *Kniphofia sarmentosa* and admired blue and white *Lapeirousia montana* along the road. The highlight of the day however was seeing a number of *Daubenya aurea* in the fading light, their bright red petals shining in the dusk.

I cannot begin to find adjectives to describe the next day: awesome, spectacular, wondrous, magical are not adequate! In spite of extremely high expectations based on photographs we had seen as well as the good rains, the sights exceeded anything we could have imagined, starting with a whole field of *Bulbinella latifolia var doleritica*. Tucked around it were starry *Spiloxene serrata* and *Romulea monadelpha* just opening for the day, and thousands of *Hesperantha vaginata*, tightly closed. I lingered for pictures of *Lapeirousia oreogena* and *Babianas* growing in the rocks, and for *Geissorhiza heterostyla* and the first *Lachenalias* seen in the Nieuwoudtville Reserve. During the day we were to see *L. unifolia, L. elegans* and *L. violacea* all in bloom. There were so many planned stops that we had to move on long before we were ready! Lunch was spent admiring *Boophone* and *Brunsvigia* leaves and trying to

picture what it would be like in the fall when they were all in flower. Our visual feast continued into the afternoon with large areas of *Hesperantha pauciflora* in bloom, patches of *Moraea ciliata* and *M. tripetala, Ixia rapunculoides, Babiana vanzyliae* and more *Romulaes* than one could count. I found that it is one thing to grow bulbs in pots and quite another to see them growing in combination with annuals and other bulbs. We found carpets of *Romulea sabulosa* growing in the sand, and every time you thought that you had taken "the" picture, another possibility was waiting. This flower was bigger, the display broader, or the combination even more appealing. I especially liked it growing with *Romulea hirta*, or with *Hesperantha pauciflora* and *H. cucullata* as the pink buds opened to white flowers later in the day. Another special stop was to see masses of *Bulbinella nutans* surrounded by patches of water.

During the day my husband told me that this day would be worth the whole trip even if we saw nothing more! And it was made even better by being surrounded by a group of friendly helpful people who shared our gratitude for this rare chance to see nature at its very best. ❁

Onixotis stricta

For many years I have been watching my five *Onixotis stricta* (= *O. triquetra*) plants, bought at a Kirstenbosch plant sale in the early nineties. They did well at first, and then slowly dwindled away to nothing before my eyes. In November last year, feeling rather silly about having had an empty pot in the pond for so long, I pulled it out of the mud (no easy job!), emptied out the soil, and to my surprise found scores of healthy bulbs sitting in the bottom. I repotted as many as I could, but left some lying around under the bench and forgot about them. When I rediscovered them a few weeks later, to my even greater surprise, they had all made green shoots and were coming into active growth. I repotted them but the heat was too great and quite rightly they called it a day and went dormant. They have since come up again in the normal way this autumn. I found it interesting not only that *Onixotis* obviously needs a dry period before it will resume active growth, but also that the bulbs are able to survive at least two years of total immersion without rotting; in fact they seem to have used the time profitably to increase themselves!

Barbara Knox-Shaw

Gloriosa sessiliflora, a new species

In the Kew Bulletin, Volume 53 part 2, Nordal and Bingham describe a new species of *Gloriosa* found in Zambia. In general the plant looks very similar to several of the forms of *Gloriosa superba*, but the flowers differ. The plants are about 80cm in height with whorled leaves up the stem. The flowers are yellowish orange near the base and reddish further along the tepals. The interesting thing is that the flowers are like a *Littonia* flower in shape – they have no pedicel, are erect and funnel shaped and the tepals converge. This species seems to bridge the gap in flower shape between *Gloriosa* and *Littonia*.

Roots and water absorption

Alan Horstmann

At one of the previous IBSA monthly meetings, there was a discussion on the absorption or non-absorption of water by the thick persistent roots of Amaryllids that were damaged after lifting the bulbs from the ground. The following is a very superficial look at the structure and function of roots as found in Monocotyledons.

The principal functions of roots are anchorage and absorption. They conduct water and mineral salts absorbed from the soil to the stems and leaves, and also carry foods manufactured in the leaves down to all the main and branch roots. All roots, even slender ones whose primary function is absorption, may have a small amount of food stored temporarily in them.
The primary root develops from the radicle in the embryo. It generally penetrates the soil and then either forms a tap root system or it develops an extensive series of lateral roots to form a fibrous root system. More frequently however, the fibrous root system is formed by adventitious roots arising from nodes of the stem (the basal plate).
The root tip is divided into four zones of specialization:

- root cap which protects the meristematic region
- meristematic region
- a region of elongation
- a region of differentiation characterised externally by root hairs

The root is surrounded by an epidermis which is usually one cell thick. The epidermis is devoid of stomata and either lacks a cuticle or has a thin cuticle that does not affect water absorption significantly. Above the root apex some of the epidermal cells develop into root hairs by the extension of their cell walls into the surrounding soil. When grown in moist air, each root hair has the form of a slender tube, but in soil it may be greatly contorted due to contact with soil particles. The root hair and the epidermal cell from which it grows constitutes a single cell. The lifespan of a root hair is very short, from a few days to at most a few weeks, and new hairs are constantly forming at the anterior end of the root hair zone (end closest to the root tip) while those at the posterior end (furthest from the root tip) are dying.

The peripheral cells of the root cap and the epidermal cells of the root produce and secret large amounts of a slimy substance, mucigel. This is a hydrated polysaccharide containing sugars, organic acids, vitamins, enzymes and amino acids. The functions of mucigel are:

- protection - it protects the roots from desiccation and it contains compounds that diffuse into the soil and inhibit the growth of other roots
- lubrication – it lubricates the roots as they force their way between soil particles
- water absorption – soil particles cling to the mucigel thereby increasing the contact of the root with the soil, plus the continuity between roots and soil water is maintained.
- nutrient absorption – the mucigel contains a) carboxyl groups which influence ion uptake, and b) organic acids which make certain ions more available to the plants.

Inside the epidermis is the cortex, made up of three layers, viz. the hypodermis, the storage parenchyma and the endodermis. The hypodermis protects the roots. The storage parenchyma

cells store reserves for future use. And the endodermis is lined with a strip of suberin (the casparian strip) which diverts water and dissolved minerals into the cytoplasm of the endodermal cells.
Inside the cortex is the tissue known as the stele. This consists of the pericycle, the vascular tissue (xylem and phloem) and a parenchymatous pith in monocots. The pericycle produces the branch roots. Xylem and phloem form in alternating strands inside the pericycle. As the subject of this article is the absorption of water by roots, these internal layers of the root will not be discussed further.

The most abundant compound in an active cell is water which plays a varied role in the life of a plant. It serves as

- a raw material in the synthesis of organic compounds
- the solvent in which vital reactions take place
- the medium through which solutes move from cell to cell
- the source of turgor in plant cells

Although most water and nutrients are absorbed by root hairs in the region of differentiation (zone of maturation), the single layered epidermal cells without hairs also absorb. The hairs however markedly extend the absorbing surface of the root. Water is absorbed in large quantities in excess of the plant's requirements, and water and salts are absorbed independently of one another. Obviously the absorbing surfaces of the cells must allow ready passage of water and dissolved salts. Water must pass through the epidermal cell wall, the plasma membrane and the tonoplast, the membrane around the central cell vacuole. This central vacuole stores water, salts and certain organic substances and it maintains the required turgidity of the cell and the tissue. The cell wall is easily permeable to water and is also minutely perforated, while the other two membranes are selectively permeable. Water undergoes little or no ionization and enters the cells by diffusion and other physical processes. Surrounding each soil particle is a thin film of water, capillary water, loosely held to it by capillary forces. Capillary water, together with the nutrient salts dissolved in it, is absorbed by the root hairs and is regarded as the plant's principal source of water. To be absorbed, water must first dissociate from the soil particles by diffusion, imbibition, suction pressure and osmosis. Root hairs have some sugars and salts in solution in their sap making this sap stronger than the surrounding water, so osmosis occurs across the cell membrane bringing water into the cells. The plasma membrane is selectively permeable, thus allowing water to flow into the cell while stopping the sugars and salts of the sap from flowing out. From the root hairs, cell to cell osmosis occurs until the cortical cells of the root become saturated with water.
Imbibition is the physical process whereby certain materials, particularly in dry conditions, soak up water. Both the cell wall and the protoplasm can take up water by this process. Surface attraction between the cells and the water results in the uptake of water by the cells causing an increase in cell volume. A considerable imbibition force may be developed within the plant.

Water enters the root via two pathways:

- An apoplastic route consisting of spaces between the cells and the cell wall. In reality this is movement of water across non-living structures. Cells in the cortex then absorb this water and nutrients thus forming a vast collecting system.
- A symplastic route involving movement of water across the plasma membrane and into the cytoplasm of the cells. The water and nutrients then enter the tissue inside the cortex, the stele, consisting of tissues including the vascular tissues.

Thus the water absorbed by the root hairs by osmosis or imbibition gradually accumulates in the tissue of the cortex, resulting in the cortex cells becoming fully turgid. Their cell walls, composed of cellulose, exert pressure on the fluid contents forcing out a quantity of the fluid towards the xylem vessels. Water in the plant moves upward from the roots to the stems and finally to the leaves where it escapes by transpiration. The tissue conducting the water upwards is the xylem, and the cells carry both water and mineral salts. Phloem tissue in contrast, carries nutrients such as sugars and carbon compounds from the shoots to the roots. These nutrients are either used immediately for growth or are stored in cortical cells for future use.

If we now look at the situation which arises when Amaryllids are lifted from the ground and roots are damaged. If only the terminal 1 or 2cm are damaged, the wounded cells die and dry up while the cells of the underlying uninjured layers become impregnated with protective substances. The outer layers of the cortex become lignified and form a water resistant layer called the exodermis.
If the stems of Dicotyledons are damaged, the wood vessels develop tracheal plugs or balloon-like growths which plug the inside of the vessels. Latex, if present, coagulates, and some elements just dry up. In this way the loss of water is prevented from the exposed surfaces.
It is unknown if a similar reaction takes place in the thick persistent roots of the Amaryllidaceae. It has been observed that the roots of these plants tend to give rise to lateral roots under normal circumstances, and this also occurs in roots where the root tips have been damaged. Within a few days the root meristem gives rise to new root tips. Although this process is under the control of the root meristem, the cells of the pericycle must also play a role as all lateral roots originate from the pericycle. The pericycle of Amaryllids is only one cell layer thick and it lies near the centre of the root.

As you can see, we are still uncertain about exactly what happens when roots of Amaryllids are damaged. We have observed that new lateral roots are formed and also that all the roots do not shrivel up and die within a few days of the damage occurring. The roots stay alive and they can still absorb water. Water absorption is further enhanced by the formation of the new lateral roots on the damaged roots.

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Conservation through Cultivation

Andries de Villiers

All living organisms, which depend entirely or principally on sexual reproduction, have the same or very similar social imperatives. The essence of sexual reproduction is the spread of characteristics within a species: the broad gene pool. To ensure this, the habitat, in addition to more obvious factors, must provide space and opportunity for pregnation immigration. That is to say, genetic variability must be able to emigrate from one clump/head/pride etc. to another and to accept the corresponding immigration. In zoology the individuals are mobile and spread their genes themselves. In botany the pollen is mobile in that the pollen carriers are mobile such as insects, rodents, wind etc. To the naturalists all nature is one. The naturalist is prepared to contrast and compare animals with plants, to draw lessons from one and apply them to the other. For those of us who are particularly interested in geophyte monocots (bulbs/corms), one of our concerns is the restriction of species into small conservation habitats which increasingly isolate colonies of any particular species.

One of the most interesting and informative monographs on an animal species is Judy Rudnai's "The social life of the lion" (MTP 1973). It is appropriate to this question because it deals with the lion population of the Nairobi National Park (NNP) (115 km^2) which is constrained on three sides by human development but open on the fourth to the Kitengela Conservation Unit (KCU) (568 km^2). Emigration and immigration can thus be monitored across a single boundary. Because of its nature the NNP allows an abnormally high survival rate of cubs but a restriction on the number and size of prides. It thus necessitates considerable emigration, particularly of male juveniles, and encourages persistent immigration of mature males seeking to take over prides of females. There are no transient males and no males have an opportunity to dominate beyond their optimum physical age. A distinct peak occurs about every two years when mature males which had emigrated (been expelled) to the KCU at about two years old were now mature and strong enough at about four years old to challenge the resident pride lions. If we apply the same sexual phasing to many of our plants we have a somewhat similar situation. In our pots we know from experience that seed from mature specimens, four or five years from seed, tends to give better germination results than either young (third year) plants or old, rather woody ones. If we carry the analogy further the influx of pollen from mature plants of one clump gives the best chance of strong germination and outcrossed genetic material. In our case the vital factor is the pollinator which affords the mobility needed for emigration and immigration of pollen.

Small colonies, isolated by development, are at risk of recessive inbreeding. Agricultural development, with its modern dependence on insecticides, is not any less dangerous in this regard than urban development. If the Department of Nature Conservation could ensure that conservation areas were large, even if fewer in number, the emigration/immigration factor would be protected. However, we know to our cost that human population imperatives erode even the most strenuous attempts by the Department which is always, in the long term, subject to political and economic demands.

An expanding human population needs more water, more food, more housing, more factories, more roads and these inevitably encroach on floral reserves. Even where they can be combined with ecotouristic considerations the plants which can survive are generally dicot annuals. We may always have vygies but bulbs will be squeezed out.

The ethic of IBSA, conservation through cultivation, is more important today than it has even been. But it also needs a more careful and long-sighted practice than it usually receives. The breeding of indigenous 'bloodlines' is as important to us as it is to any hybridist seeking to establish a viable commercial 'intellectual property'. As it becomes more and more difficult to acquire 'mother-stock' it is vital that we exchange specimens from different gene pools, mature corms, cormels or even pollen. The member who boasts of a rare specimen that only he or she can show is not an active member of IBSA. The member who can point to the presence in every member's pot line of a well established species is truly a conservationist through cultivation.

Some observations on the seed germination of *Albuca clanwilliamigloria*

Rod Saunders

When observing *Albuca clanwilliamigloria* in the wild, it is always found growing in the middle of dense clumps of restio, usually *Wildeknowia incurvata*. This has been noted by a number of people and the opinion has been expressed that there may be a symbiotic relationship between the two plants. It has been suggested that if one is to cultivate the plant successfully, one should sow the *Albuca* seeds together with a restio species. Our first attempts at growing this plant were not successful, so the next time we sowed the seeds into an existent clump of restio, and this worked well. The seeds germinated and the plants are now in their second year of growth. However, in April 2001 we had some nice fresh seed, so we decided to sow it in drills in a frame without the association of restio plants. To our surprise, germination was rapid and we now have thousands of little plants growing vigorously in lines, with no restio plant in sight!

Presumably the reason that plants are always found in restio clumps in the wild is because of predation by porcupines, antelope, cows, etc. Any plants in "easy to reach" localities are eaten first, and only those in the middle of restios survive. I also conclude that *Albuca* seeds need to be sown fresh and they do not keep well, hence our first lack of success.

At the end of December last year, a report came from the USA that the local, state, and federal agriculture departments were swarming over a bulb grower's collection of *Homeria* plants. They initially quarantined them as noxious weeds, but the state then removed the quarantine. However, *Homeria* is now listed as a noxious weed. The bulb grower can no longer ship these plants out of state, and all importation of *Homeria* into the US, seed and corm, is now prohibited. This came about following an Australian regulation. The Government is worried about *Homeria* seed getting into grain shipments and then spreading into pastures that would affect grazing animals.

Experiences with growing South African bulbs

Peter Knippels

Before I start with describing my experiences with growing bulbous plants, I'd like to introduce myself. My name is Peter Knippels, I was born in 1966 and I live in Gouda, a city with about 70 000 inhabitants in the central part of The Netherlands. I have been interested in bulbs for a long period - I think it started more than 20 years ago with the planting of my first bulbs in my parent's garden, and later I studied Horticulture at the Agricultural University in Wageningen specialising in bulbous plants. My interest in South African bulbous plants started about ten years ago. I'm particularly interested in winter growing genera and in various families (Amaryllidaceae and the families belonging to the former Liliaceae) and genera (*Eucomis, Haemanthus, Scadoxus, Tulbaghia, Strumaria, Whiteheadia, Bulbine, Bulbinella, Crinum, Gloriosa, Zantedeschia, Ledebouria, Ornithogalum* and *Albuca*).

I am not a professional bulb grower - I grow the plants as a hobby. I also like to experiment with sowing methods and other types of propagation: leaf cuttings, scaling and partitioning. I have done experiments with *Haemanthus albiflos* and *H. coccineus, Crinum powellii, Albuca shawii, Lachenalia mathewsii* and *Eucomis bicolor*. I am interested to see how plants react to their habitat and how I can create a habitat which resembles that in nature. Furthermore I take pictures of all my flowering plants, I write articles about bulbous plants for Dutch magazines and I have my own non-commercial web site about bulbs (www.xs4all.nl/~chrisbos).

My first South African plants were mature bulbs bought from Dutch wholesalers. These were imported bulbs and I think they were taken from the wild - on the labels was not only the name, but also the locality. I started with *Gladiolus, Lachenalia* and *Ornithogalum* species. The plants didn't live very long and most died after one or two years. They didn't flower and the bulbs shrank until they passed away! My conclusion from this was neither new nor surprising - plants taken out of their natural habitat will seldom survive in cultivation when put into less suitable circumstances. Later I bought seeds or young plants from mostly South African companies.
The first problem is the difference in season. When it is summer in The Netherlands, it is winter in South Africa. When seeds of winter-growing plants are offered, it is autumn-winter in The Netherlands. By the time the ordered bulbs have arrived, it is spring (April-June). I can do two things: wait six months until the right season, or sow the seeds right away in the wrong season. Mostly I sow the seeds directly after they have arrived. Most genera and species germinate within a month and the young plants keep growing until the end of our winter growing period, March-April. The plants sown this way have in general bigger bulbs than the ones sown at the beginning of the winter growing period (November).

The next problem is the weather during the growing period of the winter-growing genera and species. The growing period of these bulbs in The Netherlands is between November and April. November is the second half of our autumn with temperatures between 0 and 12^{o}C, with occasional frost at night and some rain. The temperature drops in December and January,

sometimes for a longish period below zero. For the last few years our winters have been wet with temperatures between -5 and 5°C. The weather at the start of spring varies: the spring of 2001 was cold and wet, the one of 1998 was warm and dry. The point is that we cannot grow winter growing bulbs outside, we have to grow them indoors, preferably in a slightly heated greenhouse where we can control the temperature. Two important points are the light and the air humidity. In autumn and at the beginning of spring the humidity can be 100% for a long period, and this can lead to problems, particularly in autumn. When you have watered the plants for the first time and they start to grow, the soil remains wet for a long period. If this is combined with high humidity, it can lead to rotting of the bulbs. The other point is the light, or rather the light intensity and the period of daylight. The plants have to be grown with the maximum of daylight. This is a problem for me as I don't have a greenhouse, so I grow the plants near a window in the attic of my house. A couple of years ago I bought a 400W 'high pressure sodium growing lamp' and I hang it above the plants. The lamp is on 8 hours a day, regardless of the weather outside, and under this, the plants grow prosperously and they flower well. Last winter more plants flowered than in earlier winters – amongst others I had *Lachenalia mathewsii, L. orchioides, L. pustulata, Strumaria punctata, Whiteheadia bifolia, Massonia pustulata, Bulbine aloides* and several *Albuca* species, all grown from seed.

The summer growing species are less demanding. In summer the temperatures during the day are 18 to 25°C, with occasional rain. Some species can be grown outdoors, for example, most *Eucomis* species. However, I grow most of my summer growing bulbs in a greenhouse at my work. These are not all South African species, and they include *Gloriosa superba, Eucomis bicolor, E. zambesiaca, E. autumnalis ssp. clavata* and *autumnalis, Scadoxus puniceus, S. multiflorus ssp. katherinae* and *ssp. multiflorus, Cyrtanthus spiralis, C. sanguineus* and *C. mackenii, Galtonia princeps* and *G. candicans, Drimiopsis maculata, Caliphruria korsakoffii, Littonia modesta* and various *Ledebouria, Habranthus, Zephyranthes, Albuca, Crinum, Tulbaghia* and *Ornithogalum* species. Most of them flower readily each year.

I grow all my bulbs in containers. I keep the containers with the winter growers dry from April until November and the plants are stored in a warm and shady place on top of a closet in my bedroom. The summer growers are taken out of their containers in November/December and are stored dry at a temperature of 5 to 15°C. They are replanted in April.

After a couple of years of growing bulbs, I tried to learn more from the experiences of other people and from their recommendations. Several books gave some information, but most only in general terms. When I discussed this with some other amateur bulb growers, they suggested to me "Why don't you write your experiences down so others can read them and learn from them". The idea was to write an article, but after I had written 15 pages and wasn't half way yet, I decided to try to write a book! After 4 years of writing each day, I finally finished the manuscript. I wrote it in English and in Dutch and the books were published by Balkema Publisher in 1999.

Editor's note: *Peter Knippels' book was reviewed in IBSA Bulletin no. 49, August 2000.*

Growing summer rainfall species in Cape Town

Andries de Villiers

It has always been a reproach to us of IBSA who live in the Western Cape that we have so little success in growing and flowering many of the Iridaceae of the summer rainfall region. Nor is there any obvious reason why this should be the case. It may be because there are so many species in our own region which can be grown successfully that we have neglected to experiment in order to find a way of growing summer rainfall plants. Any such experiment must start by a comparison of the circumstances in the two regions, and an elimination of factors which would appear not to influence our failures. In fact, to establish clearly the differences between them.

There are very many more species of bulbous plants in the winter rainfall region (WRR). The reason for this lies in the fact that our region has, over millions of years, been more altered and disturbed by continental movements and ice ages, resulting in an enormous number of comparatively small areas of disparate soils. This encourages the evolution of locally endemic species but not, of course, the quantitative number of specimens grown. There are probably as many bulbous specimens growing in the summer rainfall region (SRR), but in fewer genera and fewer species. With such a wealth of variety available to our members, it is perhaps natural that we should have concentrated on our local species, the more so because they are generally amenable to a single standard horticultural technique. In the SRR there are fewer disparate soils and though some of these have given rise to local endemics, as for instance those which tolerate poisonous soil with an excess of magnesium, the number of such is smaller than in the WRR. If, therefore the nature of soils is not, of itself, the reason for our failure, we must consider other factors.

It might be thought that differentiation of pollinators might have led to changes in the morphology of SRR species, affecting our ability to grow these species. But we do not depend horticulturally on natural pollinators and, in any case, using the genus *Gladiolus* as an example, both regions rely on birds, moths, butterflies, long-tongued flies and bees (of various kinds). One WRR species depends on beetles and in the SRR there is one species whose pollinator is not yet identified, but these two instances do not invalidate the general concordance.

Rainfall is, of course, the most obvious divergent characteristic. This is not a matter of volume which, in horticulture, is controllable, but rather of timing. Rainfall and temperature tend to be factors which are inter-related. Although temperatures tend to be more extreme, both hot and cold, in the SRR, the ambient temperatures over the year are not so different as to account fully for our problem. It is true that we do not grow our bulbs in glasshouses with controlled temperature, but it seems unlikely that this alone would explain matters. Summer and winter are at the same time of year in both regions. If we eliminate those possible factors we fall back on the obvious difference inherent in the names of the regions, viz. the timing of the rain or in horticultural terms, of the application of water.

Staying with *Gladiolus* as our example genus, we find both significant differences and significant correlations in flowering time. Since flowering is the ultimate phase of growth, it is

a good factor to use in comparisons and for this purpose the month of flowering in terms of species is compared. Naturally there will always be minor variations in flowering time of any plant. Rain may be earlier or later from year to year and so too is flowering, but we can ignore such minor adjustments. For example, *G. tristis* normally flowers from September to November, but specimens can be found in flower in August or December. For our purposes we take September, October and November as the flowering months. The following is the number of *Gladiolus* species flowering in each month:

SUMth:

SUMt

	SRR	WRR
Summer flowering (October to April)	124	107
Winter flowering (May to September)	2	124
(*G. vernus* flowers for 2 months in winter).		

If our failure to flower SRR species in the Cape was due to temperature differences, we would not have almost parity between summer and winter in the WRR species, ie 107 flowering in summer and 124 flowering in winter. By discarding temperatures as the determining factor, we are left with the rainfall timing (not quantity) as the factor we seek. We should now correlate the 124 species of SRR flowering in summer with the individual month:

O	N	D	J	F	M	A
15	14	14	19	25	25	12

We know, from our observations in Cape Town, that different species react faster or slower to the onset of rain. *G. priorii* (Kraaifoontein) sprouts and flowers within just a few weeks of the first rains, whereas *G. alatus* (Potsdam) does not flower until 4 months later. Horticulturally therefore, we do not need to space out our watering of SRR specimens. Their own inherent speed to development will do the spacing of flowering for us.

We can now suggest the way in which SRR species (at least *Gladiolus*, but probably of all Irid genera) should be grown in Cape Town:

1. All species which are endemic in the WRR should be grown as usual even if the material comes from the SRR side of the weather boundary.
2. SRR corms should be held in cold dry storage from the onset of dormancy until the beginning of October when they should begin to be watered. Thereafter their soil should be kept moist but not permanently damp. It is a safe practice not to increase water before the first sprout appears in the pot.
3. If a sprout appears at any time, in or out of season, it needs to be treated as if it was in its proper growth sequence. Do not attempt to modify what is happening.
4. Rod Saunders reported (June 2001 monthly meeting) that SRR species dislike being disturbed, so the cold dry storage should apply to the whole pot. This may create space problems, so most members will need to risk bare corms in brown paper bags on polystyrene trays. A garage is NOT dry in our winter. The air is damp. “Cold, dry” means a cupboard sealed against the damp air, but as cold as possible.
5. As soon in October as the weather becomes warm and dry, put out the pots and start to water sparingly until the first shoots appear. Avoid draughts but ensure plenty of air.

It is suggested that the same applies to seed, i.e. cold dry, dark storage until October and then sow and treat as normal.
These suggestions are put forward on the basis of statistical analysis. They deserve to be proved or disproved by active horticultural experiment.

Editor’s note: *It would also be very interesting to hear from people who live in the summer rainfall areas and who grow winter rainfall geophytes.*

The Highs and Lows (or ups and downs) of growing *Ferraria uncinata*

Mary Sue Ittner

I'm not sure when I first tried to grow *Ferrarias*. It was long after I had tried other South African bulbs and before I started recording when I sowed seed, when it germinated, and when I had my first blooms. I do know that the first seed had International Bulb Society (IBS) numbers starting with 91 so I suspect that I sowed seed in the fall of 1992.

I had two packets: one labelled *Ferraria uncinata* and the other *F. uncinata uncinata*. My memory is that both came up without much difficulty that first year, but as I continued to grow them on, the seedlings labelled *F. uncinata* were more vigorous. Neither bloomed after several years of growth and most of the *F. uncinata uncinata* corms more often than not spent the entire year underground. I gave them larger pots and planted them deep, but still was unsuccessful. Meanwhile *F. uncinata* was increasing greatly in numbers each year.

About this time on the IBS Internet Bulb Forum George Krasle told about his experiences growing *Ferraria* in Seattle, Washington. George had unknowingly treated them as summer growing bulbs and was having great success. His theory was that because he had cold wet dreary winters that *Ferrarias* were much happier in his climate growing in summer when it was warmer and sunnier.

I decided to try something different. I did what I often do when I can't get a bulb to grow in a container - I planted some out in one of my raised bulb beds. These beds are rarely fertilized or watered, getting just what nature delivers, which is some rain starting late fall, more rain in winter, less rain in spring, and no rain at all in summer. The rest I decided to hold out and plant in spring and see if I could turn them into summer growers. That spring I saw my first *Ferraria uncinata* bloom in the raised bed while those corms planted in a container did not come up that spring or summer, but came up the following fall after skipping the season. *F. uncinata uncinata* corms did not come up at all, and I finally threw the few small corms I had away.

The following fall when the container corms still had not bloomed, I planted them in another raised bed that gets only partial sun. As plants broke dormancy I was alarmed to see in the first bed that not only were there many strong healthy plants growing where I had planted them, but they had migrated to other parts of the bed as well. I had understood that corms formed on corms, but was it possible that like *Crocosmia,* new corms were produced on runners?

Late December we woke one morning to snow, a rare event. The weather forecast was for several days of freezing weather starting that night. Having lost a large number of my South African bulbs in 1990 in record cold I knew I needed to take action. So every day for four days I covered my beds late afternoon with frost cloth, blankets, or mattress pads. Late morning each day when the temperatures were warmer I would remove the protectors, let them dry, and then replace them after the beds had had some air and sunshine. When the weather finally improved, all of my plants had survived except for the *Ferrarias* which had turned to mush.

I must confess to certain ambivalence. I was finally getting the plants to bloom and I really liked them. BUT I was worried about their potential to grow too well and overwhelm my beds. The next year the *Ferrarias* were back, perhaps reduced by the cold, but not killed. Plants in both beds bloomed for a long time and brought me great pleasure. The next fall when they came up in large numbers I wished I had dug them out! The large flowering stalks were so heavy they flopped over the sides of the beds so at least they didn't screen out smaller plants. I probably should have staked them if I could have figured out how. As they continued to bloom with those wonderfully weird flowers for almost three months filling that section of the garden with a delightful vanilla-like fragrance, I found myself being won over. So at the end of the season I dug them out of only one of the beds. I shared most of the huge corms with friends, but saved a couple to try in my harshest conditions, planting them directly in the ground in unimproved soil that is dry in summer.

Fall is here now and the *Ferrarias* are up. I obviously didn't find them all in the one bed, but they are in manageable numbers. They are the dominant plant throughout the other small bed however. At least one has come up in the hard very dry ground where I have not watered.

What puzzles me is that on our first trip to South Africa in August-September of this year we rarely saw *Ferrarias* in large numbers in the wild. More often we would see only a couple of plants and only a bloom or two at a time. Near Darling we saw some in greater numbers and one patch we found of *F. uncinata* had a number of plants and more blooms. The flowers in that spot were not identical so I would suspect they were not offsets from the same plant. Perhaps in South Africa there are predators that keep the numbers in check.

Others on the IBS forum have reported that *Ferrarias* do not always come up or are shy bloomers. Lauw de Jager in France says that they will skip a season if they do not receive moisture early enough. Rains in California generally come later than in other Mediterranean climates so it will be interesting to see how the ones I planted in the ground fare. Perhaps some of the years I grew them in containers I needed to water sooner. On the other hand, maybe the conditions in the raised beds where they have room to roam are more to their liking. I will be cautiously experimenting with other species in this genus.

Moraea barkerae, named in honour of W.F. Barker, a past curator of the Compton Herbarium, is probably one of the loveliest species in the genus. It has slender stems to about 30cm with the palest pinky salmon flowers with nectar guides outlined in purple. It is found in the higher parts of the Cedarberg and Kouebokkeveld Mountains and has been collected from isolated localities in these areas. The reason that it is seldom seen is firstly that the localities are not easily accessible, and secondly it is a late flowering species, normally flowering from late September to mid-November. We saw it in mid-October in two areas in the Cedarberg, interestingly, neither of which had burned the previous summer. It was scattered amongst rocks and clumps of restios, and was not frequent. Perhaps after a fire more specimens would be seen in flower. It is a most unusual and beautiful colour for a Moraea flower and it is a pity that it is s rarely seen.

Growing Bulbs in raised beds

Rachel Saunders, Jana Ulmer, Mary Sue Ittner and Lauw de Jager

In May this year the International Bulb Society had a discussion on their Bulb Forum on growing bulbs in raised beds in the ground, rather than in pots. The discussion was started by Jana Ulmer, and was taken further by Mary Sue Ittner and Lauw de Jager, all IBSA members.

Jana reached a point where she could no longer look after her large bulb collection which was grown in pots. If her interest in bulbs was to continue, something had to change – not only were the bulbs "dwindling", but she no longer enjoyed moving pots depending on the weather, the time of year, etc. She therefore decided to make beds in the garden and to move her collection into the ground. The beds were about 1.25 x 4 meters in size, and the ground was excavated to 0.75 meters deep. The hole was lined with wire mesh to keep the gophers (similar to moles) out, and refilled with a mix of native soil, a "raised bed mix" (similar to potting mix but heavier) and some organic soil amendments such as bone meal. The beds were made of treated timber, and on top of the timber she made a grid with nails and strung string between the nails to make planting "boxes". The boxes varied in size depending on what she wanted to plant in them – larger for Amaryllids (30 x 30cm) and smaller for Irids (20 x 20cm). When she planted the bulbs she tried to arrange them so that each square bordered on a different genus so that if she wanted to dig up one species, the bulbs/corms would be easier to tell apart. She planted the bulbs in autumn, and shortly after winter set in, the birds discovered her smorgas-bord and began uprooting the plants, so she had to cover the beds with aviary wire attached to frames. On very cold nights (Jana lives in California) she threw blankets over the tops of the frames to protect the growing bulbs.
The results in the first spring were wonderful – she had better growth from all species, and more flowers than she'd ever had in the pots. Many of the South African bulbs grown from seeds bloomed for the first time and the Californian species (eg. *Calochortus*) responded just as well. She speculated that this was possibly due to the increased root run, better soil temperature and moisture levels, or a better soil mix. The real question is, however, what will happen next winter and spring, and the one after that? Already Jana is seeing that certain species have "wanderlust" and are encroaching on their neighbour's territory, and some of the late flowering species are struggling as she planted them amongst early flowering species which require less water later in the season. She also found that she still needs to keep a good eye on seed development in the beds to prevent unwanted seeds from falling into other areas.

Mary Sue's raised beds, made 9 or 10 years ago, are lined with hardware cloth, and although she started off with octagonal beds, she has now also gone to rectangular ones which she finds easier to plant in. She made a few mistakes which she discovered too late:

1) if you plant many species of the same genus close together in the same bed, you will never be able to separate them again! She has *Moraea aristata, M. gigandra, M. bellendenii* and some others all planted close to each other, and although they all bloom every year, she cannot lift the thousands of little corms as she cannot tell them apart!
2) don't plant "thugs" in the beds as they will take over – *Lachenalia bulbifera* and some of the *Babiana* species are in this category.
3) be careful to plant taller things at the back and shorter species in front, otherwise you will never see the short ones in bloom.

In addition, Lauw warns:
1) keep at least 30cm between each planting
2) systematically gather all the seeds each season
3) do all transplanting, dividing, rouging etc immediately after collecting the seeds and before dormancy has set in as the plants are easier to find
4) protect your bulbs well against predators such as moles

Both Mary Sue and Lauw mentioned mulch. Mary Sue used gravel when she first started, and now she finds that not only are her beds very rocky, but she has difficulty digging plants out as the gravel gets in the way. She is now mulching with bark, and Lauw uses bark, straw, wood chips or compost. The mulch helps in temperature control, prevents erosion of the beds, and inhibits weed growth. Both of them also mentioned growing ground covers during summer, and then letting the bulbs come through in autumn and winter. Mary Sue is experimenting with a native Californian vetch (a legume) which grows on the bare ground, then dies back as the bulbs start to come through. After the bulbs have bloomed and started to die back, the vetch starts growing again and blooms (yellow or pink) over the dying bulb foliage. She now wonders whether the vetch will eventually become a problem, and I wonder if the nitrogen in the soil will become too high. Lauw feels that perhaps a ground cover should be an annual that one can destroy, perhaps by burning, in early autumn.

Both Mary Sue and Lauw found that genera such as *Gladiolus*, most *Moraeas, Babiana, Hesperantha, Tritonia* and *Watsonia* were particularly happy in the soil, whereas *Geissorhizas* did better in pots. Amaryllids seem to thrive in the ground, and this is useful as their pots tend to be the biggest and heaviest to move around.

All three of these people live in Mediterranean climates where there is no need to keep the rain off in summer and no need to protect against freezing cold winters. People in summer rainfall areas could experiment with summer growing and winter dormant species in beds, and it would be interesting to hear some of their results.

One point that no one mentioned is how they keep the beds clean of diseases and pests. We are also growing many of our bulbs in the ground, and we are finding that we have to lift the bulbs periodically and sterilise the beds in some way. This becomes particularly important if one is growing a large number of similar species, for example, we have a bed full of *Zantedeschias*, and another full of *Ixias*. This year the *Zantedeschias* are showing signs of fungal rot, and we will have to lift them all this summer and treat them as well as the beds. The *Ixia* species seem very susceptible to rust and this is gradually spreading to the *Gladiolus* species as well, so we obviously need to start some control measures. This probably does not differ much from disease control in pots, but it is simpler to re-pot one container of bulbs than to empty an entire bed and replant it. Another factor in growing the plants in the ground is whether they require sun or shade. In California the summers are probably cooler than our summers in Cape Town, and we are finding that if we grow the bulbs under 40% shade, they respond better than in full sun. The plants do not become lanky under this shade level, and their moisture requirements are less than in sun.
In conclusion, many of the winter growing South African geophytes do well in the ground, and for people with large bulb collections, perhaps this is the way to go.

Down Memory Lane

Andries de Villiers

Carol Turnley-Jones submitted a short piece to Bulb Chat on the road loop from the N7 to Algeria and thence by the back road to Clanwilliam. As we all know, 2000 was not a good year for winter rain, but in mid August she did see quite a lot of Irids along the loop. For me it revived memories.

I visited Algeria some half dozen years ago and, before that, twenty odd years ago. I have promised myself another visit, but age and incapacity make it very unlikely. At Algeria one can turn left along the road to Clanwilliam but if one turns right as I did in a 1600cc car twenty years ago, the road takes one through the Cederberg Pass and ultimately to a T-junction with the road from Gydo to Wuppertal. My memory is of a desolation of sedge and restio, of oily looking streams and pools and gigantic haphazard boulders: a depressing, almost frightening landscape, but one which, at an appropriate time of year (when?) might carry a wealth of unusual plants. Not until one reached Kalkoenfontein was one back into cultivated land. Perhaps by now the farms have spread up into the Valley of Desolation. The second visit, in mid February, was to show Lyn Holmgren *Gladiolus buckerveldii*. By then an attractive picnic area had been developed, to the right (east) of which a path, steep as a stairway, wound up to the waterfall where *G. buckerveldii* clings to the vertical cliff edges with its perennial roots. These roots, stoloniferous like those of *G. sempervirens*, lock into a thin layer of humus-laden moss, their long stems sweeping down in the spray of the waterfall. At the bottom of each stem there are capsules of ripe and ripening seed beyond which there are flowers in bloom and unopened buds, all on the same stem.
Sunbirds flitter above the pool at the base of the cascade clutching the stems to rob the nectar from the blossoms. Most seed capsules are pierced by the claws of the birds as they bend down to reach the open flowers. In cultivation these plants should be kept damp throughout the year. The whole scene is one of active but peaceful beauty. ❁

A short visit to Zimbabwe in late September this year resulted in the following list of bulbous/ cormous species seen in flower:
Gladiolus melleri growing in seasonally wet sites, and flowering well in recently burned areas.
A beautiful dark pink form of "*G. crassifolius"* growing high in the Chimanimani Mountains. This early flowering plant is probably a new species, but at present is *G. crassifolius*.
Some late flowering pink *G. juncifolius* were found on sandy flats in the Chimanimani Mts. This unusual species flowers in mid-winter and bears its seeds in spring.
A *Moraea* species, possibly either *M. elliotii or stricta* flowering profusely in burned areas.
A *Dierama* species flowering on the edge of a stream in the Chimanimani Mts.
Several *Ledebouria* species were found on all the granite domes in the area south of Harare. Most were pushing up flower buds or were just in flower.
Boophone disticha in flower along the roads in burned areas.
Several species of *Ornithogalum* and *Albuca* flowering without leaves.
We were surprised to find so much in flower so early in the season. Perhaps it was due to some good rain in late July and in August in many areas.

Some unusual species of tuberous plants

Rachel Saunders

A very strange genus in the family Tecophilaeaceae is *Walleria*. There are three species in the family, namely *W. mackenzii* and *W. nutans* which occur in the drier areas of tropical and sub-tropical Africa south of the equator, and *W. gracilis* which is found in the south western Cape.

W. nutans is illustrated in Flowering Plants of Africa (1961) 34; plate 1321. The accompanying text is of interest as it includes the history not only of the species, but also of the genus. The genus was created in 1864 by Sir John Kirk to accommodate the two undescribed species *W. mackenzii* and *W. nutans* collected in Nyasaland. He put the genus into the family Liliaceae, but he also realised the affinity with *Cyanella* as he commented on the similar floral structures. In Phillips Genera 1951, the genus was placed in the family Amaryllidaceae. Dr J Hutchinson, in 1957, stated that he thought the genus should be transferred to Tecophilaeaceae, but he was concerned that it introduced a genus with a superior ovary amongst those with a partly inferior ovary.

Walleria nutans has a tuberous rootstock and a stem armed with straight or curved prickles. The leaves are long and straight, and may also be prickly. The single flowers are borne in the leaf axils, and are pinky-mauvish in colour – they are cup-shaped, about 1-2cm long and hang downwards with the petals reflexed. The most interesting thing about this plant is that the tuber is edible and was an important source of food for the black and Bushmen people's living in the area. Tubers were either eaten raw or they were roasted and stamped into a porridge.

Walleria gracilis, illustrated and described in Flowering Plants of Africa (2001) 57: 44-47, was first collected in 1686 on an expedition led by Simon van der Stel to the copper mines in Namaqualand. The expedition halted on the Olifants River in mid-summer, and a small piece of stem plus attached fruit was collected. This "eco-scrap" was inadequate for accurate description, and the Dutch botanist Jan Commelin thought that the plant was a species of Euphorbia (based on the shape of the seed capsule and a report of a "milky" sap). It was next collected by the Irishman William Marsden in 1779, and again in 1896 by Rudolph Schlechter. All the collections appear to have been from a similar site – close to the town of Klawer, with two other localities known (Pakhuis Mountains, and near Kuboes in the Richtersveld).
The species grows in sandy soil and the weak stem is often found supported by small shrubs. The leaves are narrow, very prickly and are almost like tendrils. The nodding flowers, produced in June and July, are pure white with a purple blotch at the base and are rose-scented. Capsules are about 2cm long and hang downwards. The seeds are most unusual with a tuft of sausage shaped papillae at the end.

We found *Walleria gracilis* in seed for the first time this spring near Klawer, and it had us baffled! The seed capsules are large, and they hang from prickly stems which are twined over the surrounding vegetation. Prickly geophytes are rather unusual and we had never seen such an unusual growth habit. Next year we shall try to find specimens in flower. ❁

From the Archives

Seed germination

In IBSA Bulletin number 32 of 1982, Johan Loubser wrote an article on the germination time of seed of bulbous plants.

"Because it frequently happens that beginners give up when seed does not germinate within a month of so, the germination times of all the seed sown in the autumn of 1982 was recorded and are given here:

10 to 20 days	*Ornithogalum dubium, Cyanella alba, Moraea insolens*
20 to 30 days	*Gladiolus carmineus, Tritonia squalida, Homeria comptonii, Hesperantha inflexa, Gladiolus tristis*
30 to 40 days	*Tritonia securigera, Cyanella lutea, Gladiolus longicollis, G. triphyllus, Lapeirousia corymbosa fastigiata, Gynandriris sizithinchium*
40 to 50 days	*Gladiolus sempervirens, G. odoratus, G. citrinus, Romulea hirsutus cuprea, Geissorhiza inflexa erosa*
50 to 60 days	*Romulea eximia, R. atrandra atrandra, Gladiolus aureus, G. maculatus meridionalis, Hesperantha radiata, Scilla autumnalis, Moraea villosa, Hexaglottis longifolia*
60 to 80 days	*Geissorhiza sp, Gladiolus undulatus, Hesperantha pauciflora, Cyphia volubilis, Gynandriris hesperantha*

Nearly all the seed was sown just after the middle of March. To see what effect the time of sowing has, the seed of *Gladiolus aureus* was divided in two and sowed a month apart. A complete record of was kept and the following is a summary of the results:

	Sown on March 17	**Sown on April 17**
First germination after	59 days	49 days
Last germination after	112 days	101 days
Average time for germination	75 days	74 days
Percentage germination	88	68

The conclusion is that there is not a significant difference in germination time. Even the pronounced difference in the percentage germinated may be due to factors other than the time of sowing. Three species were sown as late as the beginning of July and germination was not a problem. The disadvantage with this is that the later the seed is sown, the shorter the season and the smaller the young bulb is by the time the plant is due to go into rest."

In August 2000, Johan added the following information: "I sowed all my seed ahead of time this year (2000) and stored it dry. On the 1st April I took them from storage and watered them. This made it easy for me to record the time it took to germinate. The periods of time for the *Moraea* species to germinate were recorded as follows:

M. cedarmontana	20 days	*M. lurida*	48 days
M. loubseri	46 days	*M. calcicola*	50 days

M. saxicola 20 days

A very large percentage of the above seed germinated.
In the dozen or so publications on bulbous plants, only Eliovson indicates the period of germination of *Gloriosa* seed – she states that it germinates over a period of 2 to 3 months. I have found that it is still germinating after 5 months. There is still a huge deficiency in all publications on the cultivation of bulbous plants, and particularly on the germination of seeds."

The Acclimatisation Problem

In the IBSA Bulletin no. 24 of 1974, G. Delpierre wrote an extremely interesting article on acclimatising bulbs taken from one hemisphere to the other:

"The acclimatisation of bulbous plants received from the Northern Hemisphere presents a most intriguing and vexing problem. I have received in the last few years quite a few geophytes native to Eurasia and North Africa, and now feel bold enough to put pen to paper and share my experience on the subject with other IBSA members. On the negative side, the acclimatisation process is both time and effort consuming, and often the flowering performance of acclimatised plants is not very good. Raising the plants from seed is by far the best method of overcoming these problems. Unhappily there are a great many desirable plants whose seed is very difficult if not impossible to obtain, or whose seed germinates poorly.

The fundamental difficulty resides in the fact that geophytes have a growth cycle absolutely determined by the seasonal cycle. For example the growth of a winter-growing plant is normally triggered by an increase in the moisture content of the soil, accompanied by a lowering of the ambient temperature. Dormancy, on the other hand, is induced by a decrease in the soil moisture together with an increase in the average ambient temperature. The wrong combination of these factors is usually detrimental to the plant. Thus for a winter-growing geophyte, high soil humidity with high temperatures favours rotting of the rootstock. The implications of moving a geophyte from one hemisphere to the other are far reaching. A corm grown in Europe and sent to South Africa in August, ie. in the middle of its dormancy period, arrives here at a time when it should be in full growth. In other words, its growth pattern is about six months out of phase. The fundamental problem is how to bring the corm into the right phase for our conditions.

There are two schools of thought as to the best method of achieving success. In the first instance, one can adopt the simple expedient of artificially lengthening the dormancy period for six months. The bulb should then start to sprout in March and it should grow in phase during autumn and winter. Unfortunately this seemingly simple approach is fraught with snags. Bulbous plants appear to possess some intrinsic timing mechanism which makes them start their growth in spite of adverse conditions – try to keep a corm of *Gladiolus carmineus* out of the soil until June and you will see what I mean! Alternately the corm might simply dry out during its extended dormancy, and rot upon planting. I confess to having had nothing but failures in all my attempts at acclimatisation by this method.

In the second place, the corm may be forced into growth as soon as it is received, and kept in growth as long as possible into the summer. This is then followed by a shortened dormancy period, say from January to May, and hopefully the corm will restart at once and will end the growth season at the end of spring, in phase. While this technique sounds more complicated than the first, and does indeed require some fancy gardening footwork, I have found it to work reasonably well. I will touch on some of the problems.

Firstly, several species require a fairly extensive period of cold humid weather before they will sprout, so one cannot always get them to start their growth immediately one receives them. They will often rot away before the summer, so these species may have a better chance of being acclimatised by the "extended dormancy" method, but unfortunately one discovers these things when it is too late. It is recommended therefore to treat the corms/bulbs with a fungicide, to pack them in moist sphagnum moss and to store them for about three weeks in the vegetable drawer of the refrigerator.

Secondly it is very difficult to keep the plants in growth for an extended period of time as the conditions prevailing at the start of summer are those which normally induce dormancy in winter-growing geophytes. The trick is to keep the plants in as cool and shady a spot as possible. Usually by the beginning of January the leaves will turn yellow and the plant will become dormant. All water must be withheld at this stage and the plant should be kept in a cool dry spot. Sometimes a bulb refuses to go dormant – do not force it into dormancy, but rather allow it to grow right through the summer and into the winter, thus skipping a resting period.

Thirdly, the amount of watering is crucial. Too much water during the acclimatisation process often leads to rotting, while too little induces premature dormancy. I acclimatise all plants in small clay pots in coarse sandy soil and I water sparingly every other day. Plants, which are struggling with adverse conditions, appear to be very susceptible to attack by pests, notably aphids and red spider. I spray once a week with a malathion-based insecticide and once a fortnight with a systemic.

An examination of the corm or bulb, once dormancy has set in, must be carried out. If all has gone well, cormous Iridaceae will have formed a new corm and perhaps one or two offsets. In exceptional cases the plants do well enough to flower by Christmas – remove the flower spike as it may exhaust the bulb."

In December 2000, the Bulb Forum of the International Bulb Society discussed this same topic, and came to very similar conclusions as above. Some useful additions to the above article include:

A lot seems to depend on what you are acclimatising – bulbs, corms or tubers. Bulbs can be considered as "perennials" and they may be able to tolerate interruptions in their growth cycle, but they do appreciate a period of time to establish roots in the new soil. A corm can be considered an "annual", and once in growth, it must produce a new corm as well as leaves and

roots. Once it has produced roots and begun to sprout, denying it further development will probably lead to its death.

Experience has shown that potting the plants up when receiving them and providing no extra care results in losses. Many of the plants we grow are influenced by temperature, so hot weather may cease the growth of some winter growers before roots are formed or new corms produced. If you continue to water, the bulb or corm will simply rot. Also, storing dry may not work as the bulbs may sprout and will then have to be planted, even if weather conditions are totally unsuitable. Those people living in climates that do not have extremes in temperatures may have an advantage in this regard.

Another important point is choosing when one wants to receive the material. Normally bulbs/corms are shipped when dormant (or as dormant as they go). However, the shipper can induce premature dormancy by drying the plants off a bit earlier than normal. The plants can then be shipped to the other hemisphere early in the season, given a short dormancy period, and can then often be induced to grow again. *Sandersonia aurantiaca* tubers, for example, need a period of dormancy at a temperature below 6°C. If they are put into cold storage in mid-summer in the southern hemisphere (January), instead of late summer, they can be given 3 months of cold before being shipped to the Northern Hemisphere. Then when they arrive in March or April, they can be planted immediately at the beginning of summer and their correct growth cycle. For winter growing plants, try to obtain the material as early in dormancy as possible so that when transported to the other hemisphere, they arrive early in the cool growing season and may be able to break dormancy and grow for almost an entire season.

It may take 18 to 24 months before the plant is back on schedule. During this period, watch the plants carefully and let them decide what they want to do. If growth commences, start watering, no matter what time of year it is. When growth stops, stop watering. The first growth will often be six months out of synchrony, but in many cases the next growth cycle may be correct. The most important factor is not to rot the bulbs, so don't water them if they are not growing.

Most people reported good acclimatisation success with Amaryllids such as Crinum and Nerine species, particularly if they are planted immediately, given some time to produce new roots, and then watered when they begin to sprout. On the whole Iridaceae appear to be more difficult, and here an extended dormancy period may work better than immediate planting. For winter-growing species, keep the corms warm and dry and plant them in autumn as normal. Even small corms of Moraea tripetala coped well with the extended dormant period and came up well when planted in autumn.

From all the above information it seems that different geophytes require different conditions and it is not possible to generalise. If possible each batch of plants should be divided up and treated in different ways to reduce losses.

Book Review

A Synoptic Review of *Romulea*

By J. Manning and P. Goldblatt

Published in Adansonia (2001) 23 (1) 59 – 108

This Review covers *Romulea* in sub-Saharan Africa, the Arabian Peninsula and Socotra. It includes five species not previously published (*R. albiflora*, R. discifera, R. lilacina, R. maculata, R. rupestris*) and sinks three species recognised in 1972 by Miriam de Vos (*R. papyracea* never seen since discovery in 1897 and now sunk into *R. schlechteri*; *R. vanzyliae* which is probably a hybrid; and *R. campanuloides* of which the South African specimens previously *R. campanuloides var. gigantea* are sunk into *R. autumnalis*, and the tropical African specimens into *R. camerooniana*). Of the 76 species described, only 3 are non-South African (*R. camerooniana, R. congoensis* and *R. fischeri*) and no South African species is recognised as extending into tropical Africa, but one tropical African species does extend southwards into South Africa (*R. camerooniana*).

This critique of the Review is solely for IBSA and therefore looks at the Review from a different perspective than that of its authors who are professional botanists working within their discipline. Our criterion must be its usefulness to us. Obviously the descriptions of the five new species and the elimination of three others are useful although there are line drawings of only three of the five. Apart from that consideration, the usefulness of the Review depends on the extent to which it is user-friendly to amateurs who are not scientific botanists. It re-orders the species at sub-generic level, recognising two sub-genera (Romulea and Spatalanthus), Sections within the sub-genera and Series within the Sections, all of which is botanically significant but to us is measured by ease of reference.

Before we pursue this, you must correct three typographical errors:

On p 69 " 5'…….Section 6 Rosea" should read "5'…..Section 6 Spatalanthus"
On p 96 "Romulea subg Romulea" should read "Romulea subg Spatalanthus"
On p 98 "Romulea subg Romulea" should read "Romulea subg Spatalanthus"

The key to the Sections at the top of p 69 is based on corm structure, tunics and fibrils, just as was the case in de Vos 1972, and this is the first and principal identifying characteristic, one, incidentally, which, by Nature Conservation regulations, you are supposed never to see! The corm structures are drawn on p 65 and are really excellent. There are six Sections and you MUST start with the Sections because each Section has a separate key. If you look for a species in the wrong Section you will never find it because there will be nothing to lead you to it. So, despite Nature Conservation regulations, start with the corm – there is no short cut.

Although the Sections are divided into Series, the keys of the Sections do not distinguish Series, but we must not generally ignore them. Although the first and essential step is the Section based on a corm I am not supposed to see, I found the keys user-friendly. They contain enough but not too much information.

But we do not use a book only to identify a specimen. We frequently want to read up or compare some detail about a species of which we know the name. Now we really hit a problem. There is no alphabetical index to the species. There is a two page table (pp 62-63) which lists all the species (by Sections and Series) giving the species number but not, of course, the page number and not, of course, in alphabetical order. Since there is no alphabetical index, there is no means of tracing discontinued names either. For example we came across the name *R. longituba*. To get its current name we had to use de Vos 1972 and not the Review. The lack of an index is no reflection on the authors. By botanical convention Synoptic Reviews do not have them. Synoptic Reviews are intermediate summaries between Monographs which normally appear very many years apart. Is a Synoptic Review useful to IBSA? Yes, because it is up to date, it does contain enough information to identify a specimen, and it is more accessible that a long out-of-print monograph. For the more particular member it is not a substitute for de Vos 1972 which remains an essential item in his or her library.

The Review is clearly and cleanly printed on 54 loose glossy pages stapled into laminated outer covers. It is 17.5 x 24.5 cm and 5mm thick and is thus suitable to take into the veld. There is one page of 8 fine coloured photos chosen for no apparent botanical or horticultural purpose, but very striking. I could have wished that the five new species had been featured instead of the well known species shown. Each species entry consists of an abbreviated, but quite adequate, description and a most useful and informative discussion. The Review is highly recommended.

* *R. albiflora* is not really new to us. It is what we have called the white form of *R. syringodeoflora*.

A. T. de Villiers

The first item in Bulb Chat number 1 was about a new *Romulea* species found in the Nieuwoudtville area. It was a yellow *Romulea* flowering amongst a number of other yellow species, and it was only discovered when a corm was dug up for a confirmation of identity. The corm is most extraordinary – it is completely flat underneath, or disc shaped, and so far it is the only species with a corm of this shape. This new species now has a name, viz. *R. discifera*. It grows north of Nieuwoudtville in soil that is mixed quartzitic sand and clay, and grows in mixed colonies with *R. hirta*, another yellow flowered species. *R. discifera* flowers early in the season, normally in July and early August, and is thus in green seed when the main bulk of geophytes flower in the area. The flower is cup-shaped and bright yellow with a darker yellow cup and each outer tepal has a dark blotch in the throat. The flower is similar to that of several other species, but the corm is certainly not.

The IBSA Annual General Meeting 2001

The AGM was held on Saturday the 24th February 2001 at the Edgemead Primary School hall. About 53 members attended the meeting.

The minutes of the previous meeting were approved and matters arising discussed. The financial report was discussed and the bank statement showed that IBSA had R5943 in the account at the end of December 2000.

Gordon Summerfield gave his last Chairman's report:

- IBSA had a very successful year in 2000 if one considers the interest demonstrated by members. The attendance at monthly meetings was good and the number of plants exhibited increased markedly.
- Unfortunately only two "rescue operations" were carried out – one in Worcester and one in Somerset West. Rescue operations were hampered by the lack of a new permit from Cape Nature Conservation.
- Dr. John Manning of the Compton Herbarium and Ernst van Jaarsveld, curator of the glasshouse at Kirstenbosch, were both thanked for their support during the year.
- Thanks were given to all IBSA members for their support of the Chairman over the years.
- The committee was also thanked for all assistance given, for the wonderful spirit of committee meetings, and for working towards the interests of members at all times.
- Finally the new Chairman, vice-chairman and committee members were wished a successful and enjoyable term of office.

Election of office-bearers: The following members were elected:
Chairman: Andries de Villiers
Vice-chairman: Alan Horstmann
Secretary and treasurer: Paul von Stein
Additional members: Jim Holmes, Rachel Saunders, Rod Saunders, Burger van Eeden

Finally, the bulb and seed sale. This year seeds of over 200 different species were offered, and bulbs and corms of about 60 different species. The seeds and corms were arranged on a series of tables in a large room and within minutes of the sale beginning, there was chaos! All the bulbs and corms were sold very quickly and the seeds followed fast. The total amount raised from the sale of these items was R1582.50. Book sales totalled R220. The range of seeds, bulbs and corms was excellent and it was encouraging to see the range of genera and species being grown.