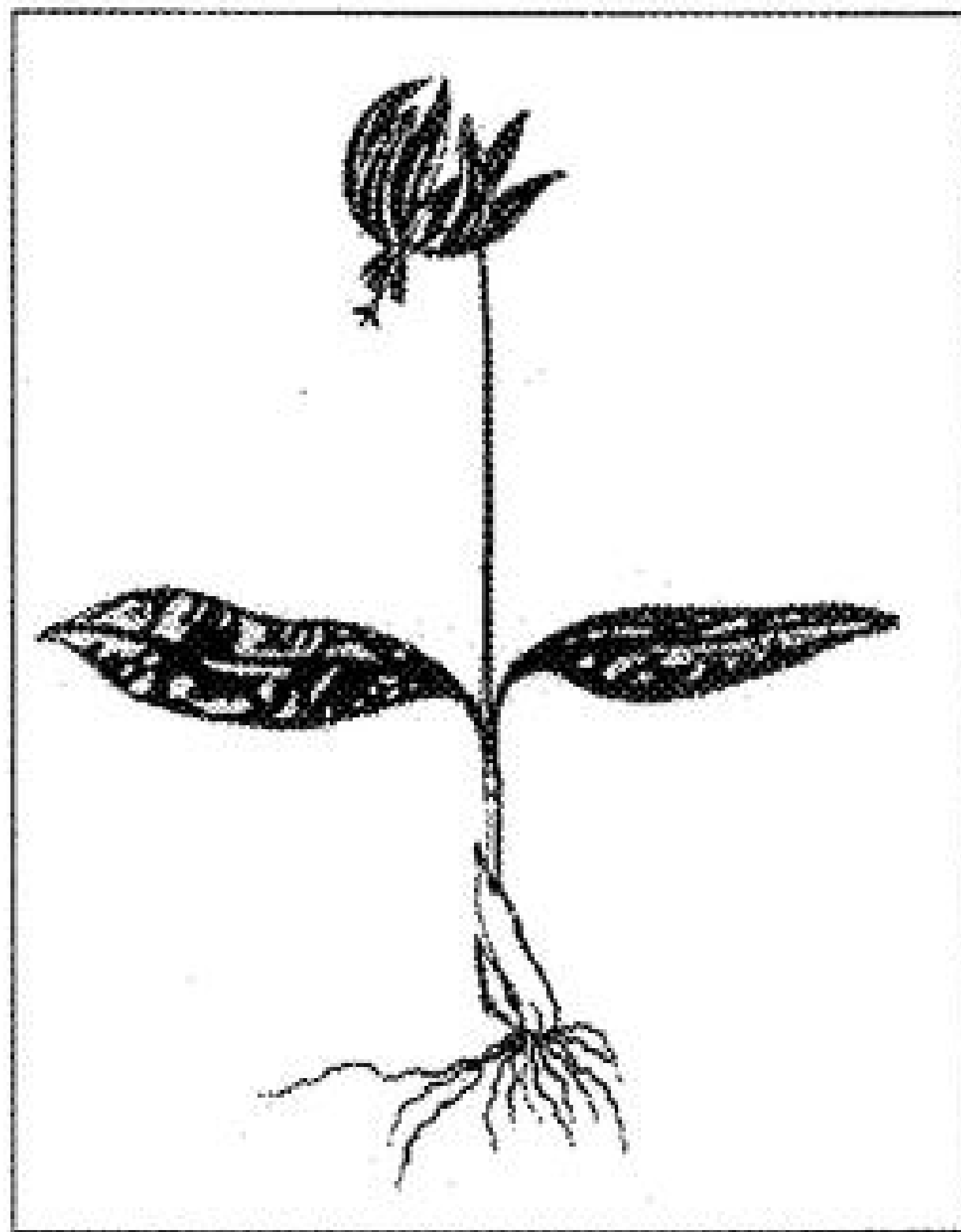


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The Bulb Newsletter Team: Brian & Margaret Mathew

90 Foley Rd, Claygate, Esher, Surrey KT10 0NB, U.K.

Drimiopsis

For many years I have known and cultivated a pleasing little species of *Drimiopsis*, *D. maculata*, which is a summer grower producing nicely dark-blotched leaves and dense spikes of small white flowers; the leaves are not the usual long narrow shape of most members of its family (Liliaceae/Hyacinthaceae) but broadly oval, narrowed at the base to an obvious stalk. In winter the pan can be put away under the glasshouse bench to dry off, away from frost. The bulbs are repotted in spring into a sandy potting soil (I am using this phrase now since someone told me that 'compost' in North America refers to the decomposing heap at the bottom of the garden and that 'potting medium' is more likely to be understood: U.S. friends please advise!). During summer the plant seems happy enough on a window sill, in a conservatory or even outdoors, although excess rain is not appreciated and root rotting occurred in one damp year. The bulbs are about 2-4 cm across, very fleshy-scaly and grow best when planted with the tips level with the surface.

Drimiopsis in East Africa

The above note was prompted by some work on *Drimiopsis* recently published in the *Nordic Journal of Botany* 14(1) by Brita Stedje. She provides an account of the four species recognised in East Africa and a key to their identification; these are *D. maculata*, *D. barteri*, *D. botryoides* and a little-known one provisionally dubbed '*Drimiopsis* sp. A' which inhabits northern Kenya in the Lake Turkana area. The genus as a whole comprises about 7 species, few of which are in cultivation; they are all from South Africa and Tropical Africa, south of the Sahara.

And a new Drimia

In the same publication as above, Brita Stedje has described a new species of *Drimia*, *D. exigua*, from Ethiopia. This genus is also a member of the Liliaceae/Hyacinthaceae and mainly African, probably about 15 species. It now includes *Urginea*, so the very common sea squill or Crusaders' spears is *Drimia maritima*. The new species, from 1900 m in the Guder river valley in the Shewa region, is a small slender plant, said to be

related to *D. indica*. As with most of the *Drimia/Urginea* species it appears to produce its flower spikes before the leaves appear. The type specimen was collected by the East African petaloid monocot expert Inger Nordal on October 26, 1982.

A Little Gloriosa

The mention of Lake Turkana reminds me of a very exciting visit I once made to this area; no *Drimiopsis* but I did encounter a few monocots which I would love to be able to try to grow now that I have the facilities and a little more expertise. The most interesting was *Gloriosa minor*, a 15-30 cm high species with very narrow grassy leaves without the usual tendrils at the tips: there is little else to climb on in the desert so no point in having tendrils! Gloriosas are said to be all variants of one species but I find it hard to believe that this one is a synonym of *G. superba*.

Cultivation notes

We get requests from subscribers from time to time asking for more cultivation notes, so as a regular feature we will now include as often as possible some notes about various genera and species. This is a good opportunity for growers to write in with their experiences, particularly involving the less well-known bulbs since information about those is often hard to come by in the existing literature. It will also serve to compare the way in which certain bulbs behave in various parts of the world. To start off this 'series', here are a few comments about three genera which have been reasonably successful with us.

Fortunatia (Liliaceae/Hyacinthaceae) A small genus from South America, incorporated into *Camassia* by some authorities. Two species are likely to be met with in cultivation, *F. biflora* and *F. arida*. These have true bulbs, producing long narrow basal leaves and starry white flowers in racemes, looking more like some of the taller Mediterranean *Ornithogalum* species than camassias. The most frequently seen, *F. biflora*, is a real enthusiast's plant, rather tall with small flowers, often in pairs at each axil, hence the name, but also sometimes having one or three, hence one of the synonyms, *F. triflora*! In this species the flowers are about 1-1.5 cm across in an inflorescence about 30-50 cm tall, but *F. aridum* has larger flowers on shorter stems so is a much more attractive plant. They inhabit dry rocky places in the Andes from Bolivia and Peru to Chile and Argentina. In cultivation they behave as winter growers, dormant in summer and flowering during the autumn-winter-early spring period. To date I have grown them in a frost-free glasshouse in long pots (they have vigorous

roots) of a well-drained sandy-loamy soil mix (about 50:50), watered from early autumn to late spring after seeding and then they dried off under the glasshouse bench for the summer months. In view of the fact that they are in leaf through winter I would not expect them to be very hardy but as yet I have not had enough bulbs to experiment with them. There is a third species which I would like to try but, as yet, have had no luck in tracking it down. It is *F. sessile* (originally described as *Allium sessile*) from Bolivia and Peru where it grows in short turf at 2700-4000 metres, flowering between October and February. This one has the flowers produced in a bunch at ground level, overtopped by narrow long-tapering leaves; the individual flowers are small, perhaps less than 1 cm across, white with purple stripes. For the size of the plant, the bulb is large, some 2-3 cm diameter with a long neck up to 15 cm long.

Bowiea (Liliaceae/Hyacinthaceae) Another enthusiasts' curiosity plant! There are probably three species from tropical and South Africa, the most frequently cultivated of which is *B. volubilis*. This has a huge spherical fleshy green bulb and long, twining stems bearing green fleshy flowers in summer, the whole plant reaching two metres in height if given support and ending up as a tangled mat of branching stems with no obvious leaves (there are tiny ones but they drop off quickly). *B. volubilis* is a summer grower and is suitable for pot cultivation in sandy soil in a slightly heated glasshouse or conservatory but in summer it can be placed outside as soon as the warmer weather has arrived (about 15 deg.C min. at night); some means of support for the climbing stems is required. This is a bulb which seems to flourish on neglect; with very little water required, even at the height of summer, the bulbs will expand to totally fill their pots and perform well without repotting or feeding for years on end. In winter the stems die away and the bulbs must be dried out until the following spring; a winter minimum temperature of about 5 deg.C is sufficient, providing the bulbs are dry

Urceolina (Amaryllidaceae) There are two species from Peru and Bolivia, *U. peruviana* and *U. urceolata*, and these are placed by some authorities in *Stenomesson*. They have broadly strap-shaped to elliptical basal leaves appearing after the flowers which are carried in an umbel on a fleshy leafless stem; they are pendent and urn-shaped, red or orange-red in *U. peruviana*, yellow in *U. urceolata*. I have not grown the latter but there is no reason to believe that it will behave any differently from the more familiar species. This is a spring/summer grower, flowering in spring/early summer, then producing leaves for the summer before dying down for the winter months when the bulbs should be dried off and kept at a minimum temperature of about 8 deg.C. In countries with mild winter areas they can

be grown outside in sunny well-drained beds but in cooler regions such as Britain they are best in pots in a heated glasshouse, but can be placed outside during summer. A freely-draining loam-based soil mix seems to suit them very well with an annual top dressing of new soil, thus leaving the bulbs undisturbed. Propagation is simple since the bulbs produce small offset bulblets which are easily detached by scraping away the soil down to the parent bulb. Seeds are seldom produced in my experience but it is possible that my bulbs are of one clone.

South American Amaryllids

The Amaryllidaceae in South America are confusing, to say the least, with many opinions as to what constitutes a genus. Just as one example, *Hippeastrum* can be viewed in a wide sense to include various other genera such as *Rhodophiala*, *Rhodolirion*, *Phycella*, *Famatina*, *Worsleya* and even *Habranthus*. There are many other problem areas before starting on the delimitation of the species. Any work which takes a close look at them is to be viewed with great interest, so the recent studies by Silvia Stranak in Berlin are very welcome. In *Lilloa* 38(1): 23-32 (1993) she has provided a key to the genera, together with the nomenclature of each genus, its synonymy and distribution. There are 26 genera recognised, as follows: *Chlidanthus* : Bolivia, Peru, Argentina. *Eucharis* : Venezuela, Colombia, Ecuador, Bolivia, Peru. *Eucrosia* : Peru, Ecuador. *Eustephia* : Peru, Argentina. *Eustephiosis* : Argentina. *Griffinia* : Brasil. *Habranthus* : Argentina, Bolivia, Uruguay, Brasil, Jamaica. *Haylockia* : Peru, Argentina, Uruguay. *Hieronymiella* : Argentina. *Hippeastrum* (as Amaryllis): Mexico to Argentina. *Hyline* : Brasil. *Pamianthe* : Peru, Ecuador. *Paramongaia* : Bolivia, Peru. *Phaedranassa* : Ecuador, Colombia. *Phycella* : Chile. *Placea* : Chile. *Pucara* : Chile. *Pyrolirion* : Peru, Bolivia, Chile. *Rauhia* : Peru. *Rhodophiala* : Chile, Argentina, Brasil. *Sprekelia* : Mexico. *Stenomesson* : Peru, Chile. *Traubia* : Chile. *Urceolina* : Ecuador, Peru, New Granada. *Worsleya* : Brasil. *Zephyranthes* : Mexico, Guatemala, Peru, Bolivia, Argentina, Brasil, Uruguay. There are many synonyms, most of which are seldom encountered, but a few are worth listing: *Argyropsis* = *Zephyranthes*. *Calliphurria* = *Eucharis*. *Castellanoa* = *Chlidanthus*. *Crocopsis* = *Stenomesson*. *Plagiolirion* = *Eucharis*. *Rhodolirion* = *Rhodophiala*. *Stricklandia* = *Phaedranassa*.

Seed germination of South American Amaryllids

Quite a lot of these have flattish black seeds which I usually sow conventionally in a loam-based medium under a layer of grit. The timing depends upon whether they are winter or summer growers and, as a basic

principle seeds of the former are sown in autumn, the latter in spring. However, seeds ordered from lists do not necessarily arrive at the correct season for sowing so, in case viability is short, these are sown as soon as they arrive, with the intention of later on adjusting the growth pattern, if necessary, when the young bulbs are large enough to stand up to the treatment; a lot of the temperate bulbs will naturally choose the correct time for germination and the subsequent growing/dormant periods. Seeds of the more tropical subjects are always sown as soon as they are received since these species do not have the same built in cool-moist-winter/warm-dry-summer or cool-dry-winter/warm-moist-summer growth patterns as the temperate ones and in cultivation will grow at any time of year in response to watering. Some growers prefer to germinate these flat seeds by floating them in a dish of water, others on damp tissue paper. Recently I had enough seeds of a ? *Hieronymiella* (thank you, Patrick!) from Salta Prov., Argentina, to experiment with the three methods. The two batches which were floated and placed on damp tissue both germinated very soon after sowing on arrival last spring; interestingly those in soil under grit stayed dormant through summer and have behaved as winter growers, germinating in autumn-winter and producing healthy-looking seedlings. However, I am ashamed to say that I cannot report success with the progress of the other two batches. Tiny white root tips emerged from those floating in water but they rapidly rotted while only about 1 mm long, in spite of changing the water each day; possibly as a result of an air-borne infection or toxins in the water. Those on damp tissue looked fine until they dried out over two days while we were away, so the trial was a most unfair comparison! However, it suggests that for rapid germination the water treatment is worth a trial. Perhaps other BN subscribers would like to write in with their seed-sowing methods, not necessarily relating specifically to South American bulbs.

Erythronium albidum and *E. mesochoreum*

The taxonomic status of these two species is not clear; some authors regard them as separate species, others treat *mesochoreum* as a variety, or as a subspecies, of *E. albidum*. Since all appear to agree that there are two distinct entities involved it is perhaps not too important what level of the taxonomic hierarchy is attached to them; as far as I know, no-one has suggested that *mesochoreum* should be 'sunk without trace' into *E. albidum*. Dr Kenneth Robertson of the Illinois Natural History Survey is preparing the account of the *Erythronium* for the Flora of North America project (see BN1:7) and is convinced that they are separate species. He has written to us recently (in my sense of the term recent!) expressing the view that 'based on morphology (especially of living material), chromosome

number and ecology it seems clear that *E. mesochoreum* is a quite distinct species.' He had earlier investigated this species for his Master's thesis and published papers on the subject. With his letter he included another paper* which I had not seen, by Robert B. Kaul, relating to the two species in Nebraska and it is worth quoting one of the paragraphs since it brings together his own observations and those of Dr. Robertson: 'My colleagues and I have little trouble distinguishing these entities in the field in Nebraska and Kansas, but the plants lose some diagnostic characteristics when pressed and dried and so present problems of identification as herbarium specimens'. Kaul then gives a summary of the distinctions, as defined by Robertson in his earlier studies:

E. albidum : leaves abruptly attenuate [ie., tapered] at base, mottled, flat; perianth [segments] reflexed; mature fruits held erect; sterile plants forming stolons & offsets; chromosome number $2n=44$; habitat moist woods.

E. mesochoreum: leaves gradually attenuate [ie., gradually tapered] at base, not mottled, conduplicate [folded]; perianth [segments] spreading; mature fruits resting on the ground; sterile plants forming droppers & offsets; chromosome number $2n=22$; habitat prairies and dry woods.

Dr. Kaul continues: 'My observations in the field generally support these observations, with modifications. I have found an occasional barely-mottled leaf in living *E. mesochoreum*. In *E. albidum*, it is common that older, senescing leaves lose their mottling, and leaves in sunny exposures often show reduced or even no mottling. While the leaves of *E. mesochoreum* are usually conduplicate at flowering time, they usually open with age, becoming flat and losing their glaucousness and appearing more lustrous.' He says that the position of the perianth, reflexed or spreading, is not always reliable and that the mature fruits of *E. albidum* can be either erect or prostrate (those of *E. mesochoreum* always prostrate). The habitats in Nebraska are described as distinct, *E. albidum* occurring in upland deciduous (oak) forests, where it sometimes carpets the ground, whereas *E. mesochoreum* mainly inhabits prairies, often hidden among tall dry grasses. There is some suggestion that prairie fires are important in maintaining populations of *E. mesochoreum*. There are also interesting comments, mostly based on previous work by others, that *E. mesochoreum* (in Kansas populations) is pollinated by a solitary bee which appears to depend for its survival on the *Erythronium*. The female bees dig burrows with chambers which they pack with pollen from *E. mesochoreum*, then lay a single egg on each pollen mass before dying. The method of vegetative propagation has been observed to be rather different in the two

* *Transactions of the Nebraska Academy of Sciences* 17: 71-79 (1989)

species: *E. albidum* increases vigorously by means of runners - bare horizontal shoots arising from the base of the bulbs, producing new bulbs at their tips and resulting in huge patches. *E. mesochoreum* does not produce runner but forms offsets, young bulbs adjacent to the parent; this does not form large thick colonies but exists rather as scattered individuals or small groups. All this is very revealing and I will now look at my plants of these two species, which are superficially very alike, with renewed interest.

Hot Cyclamen

In BN 5:15 I wrote a short note about a silver-leaved *C. graecum* which we collected some 20 years ago and which is now 'around' as 'Glyfada', after the nearby town; I mentioned the idea of taking a seedling of it back to Glyfada but our old friend Wessel Marais has sent a cutting from *Newsweek International*, suggesting that this would perhaps be a painful experience, both for us and the Cyclamen. To quote: 'On week nights, young and beautiful Athenians jump into their four-wheel-drive jeeps and head out for Glyfada, a coastal neighbourhood vibrant with clubs and bars', and that 'modern demi-gods in the form of models, shipping magnates, moguls and movie stars gyrate amongst mere mortals.' This mere mortal was so busy looking at cyclamen leaf patterns he appears to have overlooked something----!

A Little-known Bearded Iris

Although it is 10 years since *Iris falcata* was described as a new species it is seldom mentioned in literature and is possibly not in cultivation. *Iris falcata* was published by D. Babalonas and K. Papanicolaou in *Willdenowia* 14: 71-74 (1984). It is a member of section Iris, the bearded or pogon irises, and is related to *I. reichenbachii* and *I. suaveolens* (*I. mellita*); it occurs in north-central and north-east Greece on ophiolitic and serpentine rocks at 300-1100 m. It is a stocky plant with broad, strongly sickle-shaped (falcate) leaves, which are broader towards the tips, and short flower stems bearing 2-3 pale yellow flowers, rather typical of the small bearded irises of this group. The authors provide a table to compare the three species which shows that *I. falcata* has features which combine and in some cases overlap with those of the other two. Thus, in *I. falcata*, the leaves are generally broader but overlap slightly with those of *I. reichenbachii*; the flower stem is 4-7.5 cm long in *I. falcata*, 6-30 cm in *I. reichenbachii* and 1-6 cm in *I. suaveolens*; it differs from both in having the lower spathe valve (outer bract) longer than the stem; in *I. falcata* the perianth tube is half as long as the falls, in *I. reichenbachii* it is 'much shorter' than the falls and in *I. suaveolens* it is equal in length to the falls; the veins in the perianth

segments are said to be wavy in *I. falcata* but straight in the other two, and the seeds roughly globose in *I. falcata* and *I. suaveolens* but pear-shaped in *I. reichenbachii*. So, even if this is a distinct species, in garden value there is little to choose between it and *I. reichenbachii*. The falcate leaves are always rather appealing but this is a variable character in most species and I have seen western Turkish plants of *I. suaveolens* with quite well curved foliage. The occurrence on a different soil type may mean that it behaves differently from the other two in cultivation, since they [?always] inhabit limestone formations.

And a Rare Iris in Jordan

Dr Alf Evans, who used to be in charge of the Alpine Department at Edinburgh Botanic Garden (author of *The Peat Garden*, lecturer etc., etc.), showed me a photograph last year of a fascinating little *Iris* which I have seen only a few times before, usually flattened on a herbarium sheet. He has sent an account of the sighting of this:

'During the last week in January, while on holiday with friends in Jordan, we came across a small *Iris* and I was unable to give it a name. It has since been identified from a transparency by Brian Mathew [must be right-BM!] as *Iris edomensis*, a Juno. I had been unable to find any references in the limited botanical literature I had to irises growing at Little Petra in Jordan. In fact, had we been a week earlier we might not have seen it at all for we found only two flowering specimens altogether, suggesting that it is probably rare there. I now understand that it is recorded as being rare anywhere. On the other hand, it may have been that we were seeing only the first flowers to emerge. After all, no tell-tale mass of leaves heralded the fact that the blooming of this species was about to take place [as with several of the dwarf Junos, the leaves develop after the flowers -BM]. The flowers we saw were not very conspicuous, being carried on short stems [perianth tubes] approximately 2-3 inches high. The flower colour is dull, being a streaked purplish-red on a white background. The irises we saw were growing quite close to a well-trodden tourist path on the way to the classical site of Little Petra but were not close together. They grew in stony, sandy soil through which large rocks protruded. The area was level and open, fringed with plant-free perpendicular cliffs, but there was evidence from green patches that a certain amount of moisture must be present in winter. Snow fell while we were there, and it was not too warm, and it was obvious that frosts occurred at night. The whole area was fairly barren and would certainly dry out completely in spring and summer.'

These semi-desert Junos are among the trickiest in cultivation. They come

into growth very early in winter when light intensity is low, become etiolated very readily and tend to damp off at the slightest hint of condensation on the leaves. The best chance of success lies in starting with seeds, growing the resulting plants as cool as possible and providing continuous fan ventilation; extra lighting would certainly also help.

Flora of Tropical East Africa

A recently published part of the above Flora, which covers Kenya, Uganda and Tanzania, deals with the Aloaceae. Although the large genus *Aloe* is perhaps of rather more interest to succulent enthusiasts than to 'bulbies', this is a perfectly good petaloid monocot and a few of the species do have swollen bulb-like bases to the plants. Aloaceae is one of the 'splits' of Liliaceae and has the basic set of characteristics which used to define that family, that is: six stamens and superior ovary. The twenty or so families which have been formed out of the 'old' Liliaceae are much less easy to define in such simple terms and it is necessary to take all sorts of other factors into account, not all of them observable without the aid of special techniques. However, I am sure that it does make more sense; it is now a case of learning to which family a particular genus belongs rather than being able to work it out! FTEA Aloaceae is edited at the Royal Botanic Gardens, Kew by Dr Roger Polhill on behalf of the East African Governments and this part of it was prepared by Susan Carter of the Kew staff. Even within East Africa, 83 species are recognised and there are many more in other parts of Tropical Africa, Southern Africa and Madagascar. Several species from dry areas behave like bulbs, dying down in the dry season to a bulb-like base below ground and reappearing with the rains or after fire, for example *A. bullockii* and *A. bulbicaulis*. Bulbous or not, this is a fascinating and most attractive group of plants, especially in their wild habitats. Anyone interested in acquiring FTEA Aloaceae can obtain it from the RBG Kew, Richmond, Surrey, TW93AB. £14.20 + £1.50 handling charge, plus postage at cost.

New Muscari, Bellevalia and Allium from Turkey

Three new species have recently been described, *Muscari anatolicum*, *Bellevalia anatolica* and *Allium turcicum*. The *Muscari*, described by Jill Cowley and Neriman Ozhatay, is recorded in Antalya, Adana, Icel, Sivas and Konya vilayets (provinces) and resembles the widespread *M. neglectum* in having blackish-blue flowers; these are, however, barely constricted at the mouth and the relatively large white lobes are flared outwards and somewhat recurved at the tips; the flowers have a greyish-green appearance in the bud stage, and the sterile flowers forming a 'top-knot' at

the tip of the inflorescence are pale blue. The colouration, with the very conspicuous white rim, is also reminiscent of *M. discolor* but this has short leaves which are wider towards the apex; those of *M. anatolicum* are more like those of *M. neglectum* in being long and narrowly linear.

Bellevalia anatolica, described by myself and Neriman Ozhatay, is one of a group of species which will never set the horticultural world alight! It has long loose inflorescences of tubular flowers which are purple in bud, changing to a dull putty colour to brown as they open and mature; the leaves are broadly strap-shaped, conspicuously hairy on the margins. In its overall appearance it is like *B. gracilis* and *B. longistyla* but differs from both in having yellow anthers (violet in the other two), and more flowers in the raceme (33-52) as opposed to 12-30, although this latter feature may not have great significance. The purple bud colour is a character shared with *B. longistyla* but not with *B. gracilis* (buds white). The length of the flowers is 6-8 mm in *B. anatolica*, longer than in *B. gracilis* (5-6 mm) and shorter than *B. longistyla* (10-12 mm), so it is defined on a set of characteristics rather than on any unique feature. It has been collected once by myself, in Elazig vilayet.

Allium turcicum, also described by Neriman Ozhatay and Jill Cowley, is a member of section Codonoprasum, bulbous species with wiry stems bearing slender stem leaves and loose umbels with small bell-shaped flowers on long thin stalks, the inner flowers tending to be erect and the outer ones arched over to the pendent position; the two spathe valves are long and slender, often much longer than the individual flower stalks. *A. flavum* is a typical example and the new species is closely related to it. The characteristic features of *A. turcicum* are: the leaves and their sheaths are finely toothed on the margins, the pinkish-green perianth segments are unequal, the inner three noticeably longer than the outer three and dark purple at the apex, and the long-protruding stamens have purple filaments with yellow anthers. The flowers are only 3-4 mm long, so this is not a showy plant, although in close-up the flowers are strikingly coloured. The only collection known at present was made by Norman Stevens (of Cambridge Bulbs) in eastern Turkey, in Batman vilayet (yes, there is a province called Batman!), which was formerly known as Siirt.

Paris, Daiswa and Kinugasa

A recent request for information about *Paris* (the genus, we are not becoming a travel agency!) from Johan Mens (he is interested in acquiring/exchanging species, address: Pottershofstraat 20, B-2610 Wilrijk, Belgium) reminded me that in the last few years I have had several

enquiries about *Daiswa*, so it might be interesting to outline the work which led to the splitting of *Paris*. *Paris* is the oldest name for this group of plants which Linnaeus based on Herb Paris, the widespread European/Asiatic *P. quadrifolia*. In its wide sense the genus consists of about 20 species distributed from western Europe eastwards through Asia to the Himalaya, China and Japan. In 1983, whilst working on a monograph of *Paris*, the world-renowned Armenian botanist Armen Takhtajan came to the conclusion that the group should be regarded as comprising not one genus but three, leaving *Paris* in its strict sense as a small genus, widely distributed from Europe to Japan; the somewhat larger genus *Daiswa* is spread through the Himalaya, Burma, Thailand, Laos, Vietnam, China, Hainan and Taiwan; *Kinugasa* from Japan has, as far as I can ascertain, only one species, the loveliest of them all, *K. japonica* (*Paris japonica*). In an account of the genus *Daiswa* (in *Brittonia* 35: 255-270, 1983), Takhtajan provides a comparative table to the three genera. *Paris* has a slender long-running rhizome, a berry-like fruit which is black and does not split open ('indehiscent'), and seeds which have no fleshy outer coat; in *Daiswa* the rhizome is much thicker and far less spreading and the fruit is a fleshy capsule which splits open revealing seeds with fleshy scarlet coats; *Kinugasa* has a short thick rhizome more like that of a Trillium (they all belong to the Liliaceae/Trilliaceae); the fruit is, like *Paris*, an indehiscent berry, dark purple, containing seeds which are also more like those of *Paris*, without a fleshy brightly coloured coat. I might add that the one species of *Kinugasa* has large white flowers and it is not an easy plant to cultivate (said with sadness since I have lost it on two occasions for no obvious reason). Takhtajan also makes the observation that *Paris* berries are poisonous whereas those of *Kinugasa* are edible. He also describes differences in the shape of the ovary and styles between the three genera. The splitting of *Paris* is not followed by everyone and we find that, for example, in the latest part of the Flora of Bhutan (see this BN, page 20) *Paris* is retained as the generic name for the widespread Himalayan *P. polyphylla*, a species regarded as a *Daiswa* by Takhtajan. Unfortunately taxonomy is very subjective and it really is just a matter of opinion as to which characters are important enough to constitute generic differences. If we do accept the splits, the species are distributed among the three genera as follows: *Paris* has about 4 species: *P. quadrifolia*, *P. incompleta*, *P. verticillata* (*P. hexaphylla*) and *P. bashanensis*, but there may be more. Many others have been described in *Paris* in recent years from China but at present I am not able to report whether these really belong to *Paris* in its restricted sense, or (if *Paris* is split) to *Daiswa*. I will look up the various references and report in a future BN.

Kinugasa from Japan has the one species, *K. japonica*.

Daiswa, as defined by Takhtajan in 1983, had 15 species; these are: 1. *D. yunnanensis* (*P. polyphylla* var. *yunnanensis*, *P. atrata*): E. India, N. Burma, SE Tibet, SW China. 2. *D. dunniana* (*P. dunniana*): China, Yunnan. 3a. *D. hainanensis* (*P. hainanensis*) subsp. *hainanensis*: Hainan Is. 3b. *D. hainanensis* subsp. *vietnamensis*: N. Vietnam. 4. *D. birmanica*: Burma. 5a. *D. chinensis* subsp. *chinensis* (*P. chinensis*, *P. mercieri*, *P. christii*, *P. franchetiana*, *P. petiolata*, *P. gigas*, *P. cavaleriei*, *P. pinfaensis*, *P. formosana*): widespread in China, Taiwan, N. Burma, N. Thailand, N. Laos, Vietnam. 5b. *D. chinensis* subsp. *brachysepala* (*P. brachysepala*): China, Hupeh Province. 6. *D. cronquistii*: China, Kwangsi Province. 7. *D. fargesii* (*P. fargesii*, *P. polyphylla* var. *fargesii*, *P. hookeri*): SW China, Vietnam. 8. *D. polyphylla* (*P. polyphylla*, *P. debeauxii*, *P. biondii*, *P. mairei*, *P. marchandii*): Widespread in Himalaya from Pakistan to NE India, S & SE Tibet, China, Taiwan, N. Burma, N. Thailand. 9. *D. thibetica* (*P. thibetica*, *P. polyphylla* var. *thibetica*): Tibet, SW. China. 10. *D. lancifolia* (*P. lancifolia*, *P. hamifer*, *P. polyphylla* var. *stenophylla*, *P. polyphylla* var. *brachystemon*): Tibet, SW China, Taiwan. 11. *D. violacea* (*P. violacea*, *P. marmorata*, *P. polyphylla* subsp. *marmorata*, *P. luquanensis*): Nepal, Bhutan, E Tibet, SW China. 12. *D. bockiana* (*P. bockiana*, *P. vaniotii*, *P. arisanensis*): E Tibet, SW China, N Burma, Taiwan. 13. *D. pubescens* (*P. polyphylla* var. *pubescens*): China, Yunnan Prov. 14. *D. forrestii*: China, Yunnan Prov., N Burma. 15. *D. delavayi* (*P. delavayi*, *P. henryi*): SW China, Vietnam.

The species of the three genera are superficially alike in having a whorl of leaves on the stem but in some the leaves are stalkless while in others there is an obvious slender stalk with a broad expanded leaf blade. The flowers are usually green, sometimes yellow-green and rarely white, and consist of several large sepals surrounding the usually very slender to thread-like petals and cluster of stamens; the petals may be green, dark purple or bright yellow. *Paris quadrifolia* is an attractive little woodlander, although not impressive, whereas some of the daiswas are quite showy in a green sort of way, and some have very attractive foliage. The best-known *Daiswa* is *D. polyphylla*; this has been known in cultivation for quite a long time and is a good garden plant, even becoming a little invasive when well suited, although personally I have never been in that happy position; Chris Brickell had a very flourishing patch in his former garden at Wisley. It is an extremely variable plant from only 30 cm to over a metre in height and has large green flowers varying from about 5 cm to nearly 20 cm across; the 'bulk' of the flower is made up of the lance-shaped sepals. Many of them are not in cultivation but a few have been filtering in from China in recent

years. The pick of them for me is *D. violacea*, with striking creamy-veined leaves stained dark purple on the underside. Prof. W.T. Stearn, when describing his *Paris marmorata*, which is now considered to be a synonym of *D. violacea*, likened the leaf markings to those of *Arum italicum*. Hopefully this, and some of the others, will become more readily available in the future, although several of them seem to be variations on the *D. polyphylla* theme.

The Calochortus Society

Long overdue is a mention of The Calochortus Society and its newsletter called, appropriately, *Mariposa*, which first appeared in July 1989. The annual subscription is \$4.00 in the USA, \$6.00 outside, and this entitles the member to 4 issues per year, and a free seed distribution in October. The Newsletter contains almost anything of *Calochortus* interest from cultivation (a high priority in the Society) to conservation, history, letters, identification keys, descriptions of species etc. The Society can be contacted via the Editor, H.P. McDonald, P.O. Box 1128, Berkeley, California 94701.

The South American snowdrop?

Not really, but *Trichlora* does have flowers with three white outer petals much larger than the inner ones. Eric Walton of Ruakura Research Centre, New Zealand contacted me recently describing a snowdrop-like bulb from Chile and I think that there is only one candidate for the description he supplied: *Trichlora peruviana*, or maybe a related species. *Trichlora* is about 15-30 cm in height with long narrow basal leaves and umbels of up to 10 flowers, each 2-3 cm across and consisting of three large white outer segments which taper to a long point at their apices; the very small inner segments appear to be purple- or are they staminodes (sterile petaloid stamens)?; it is difficult to see in the few squashed specimens I have seen. Comments on one of the specimens are worth repeating: 'Peru, coast region where vegetation only flourishes from June to September, the rainy season, the rest of the year the hills are dry and bare.' Other specimens suggest an altitude range of 500-3300 metres. *Trichlora* is one of those odd genera from South America, including *Gilliesia*, *Miersia* and *Gethyum*, which belonged to Liliaceae until it was split up into many other families; they do not appear to fall readily into any of the 'new' families, although Alliaceae seems the best bet at present; maybe a separate family is required. Eric says that the bulb is a winter grower which would fit in with the other members of the group I have grown: the fascinating little green orchid-like *Gilliesia graminifolia* and the dark purple 3-petalled *Gethyum atropurpureum*.

Double Rhodohypoxis

Don Lee of Harpenden has written in describing a variation on the *Rhodohypoxis* theme which I have not come across before, in spite of having grown a great many over the years. He writes: 'This year [1994] I have noticed a considerable number of flowers with petaloid stamens - at the extreme all the stamens in a flower have been converted to petals about half the size of the regular ones. This produced a quite attractive hose-in-hose effect. This aberration was not confined to one variety but with 'Stella' (if that is a valid name for the plants I have) between 10 and 20 per cent of the flowers showed some petaloidy.'

A study of Iris lacustris

This charming small North American crested Iris, the Dwarf Lake Iris, from the Great Lakes region is now listed as a threatened plant by both the Michigan and Federal Governments; the threat is from development on the north shores of Lake Huron and Lake Michigan. J.E.van Kley and D.E.Wujek have studied the species in the wild and published their findings in a paper* which 'describes *Iris lacustris* habitats and identifies the effects of selected environmental factors on *Iris* populations.' The populations which were sampled were mostly along lake shores on well-drained sandy or gravelly beach ridges in semi-shaded clearings in and near evergreen forest (*Abies*, *Picea*, *Thuja*, *Pinus*), growing in calcareous sand/gravel with a partly decomposed layer of conifer litter; it sometimes grew in deeper loess-type soils over limestone; accompanying plants noted were *Arctostaphylos*, *Vaccinium*, *Linnaea*, *Trillium grandiflorum* and bracken (the last two in the deeper soils). Their conclusions were that in order for the *Iris* to survive the forest clearings along the lake sides needed maintaining, whether by the action of waves, scouring by ice, fluctuating water levels and storms; if this forest margin/clearing type of habitat is destroyed by development the *Iris* will not survive. Another interesting point which the authors make is that sexual reproduction is poorly developed, the plant increasing largely by vegetative means to form large patches; to produce seeds a pollinator [presumably insect] is required but this has not yet been observed and identified. This is a detailed study, noting factors such as soil type and light intensity in relation to shoot growth, flowering and fruiting, showing, if I have understood it properly, that from the ideal middle-of-the-road degree of shade, growth and flower production fall off quite rapidly as light intensity increases. Its larger relative *I. cristata* grows very

* The full paper is: 'Habitat and ecology of *Iris lacustris*', published in the *Michigan Botanist* 32(3): 209-222(1993).

well here in Surrey in a slightly acidic 'peat bed' (mostly rotting wood and leafmould from deciduous broad leaved trees) but *I. lacustris* is not so successful, so I will now try a mixture of conifer mould and calcareous sand to see if growth improves; the best plant we have is, in fact, near to a large Cupressus. Studies such as this, giving intimate habitat details of plants in the wild are, I find, not only interesting but very valuable when trying to decide on cultivation methods.

Stamps

Will you accept dahlias? Christian Geoffroy has sent us from France a very showy (2.80 Fr.) stamp depicting mixed cactus dahlias, which he describes as 'a horror'. Well, they are tuberous, and some of the species and smaller singles are really very nice, so this stamp will go into 'the collection' (currently a heap!). The 29 cent bulb stamps from the USA seem to be endless - how many more are there? We now have hyacinths, gladiolus, daffodils, Solomon's seal, irises, tulips, turk's cap lily (? *L. pardalinum*) and the rosebud orchid, which I do not recognise. A nice white fringed orchid (? a *Platanthera*) water irises (? *I. ensata*) are shown on a stamp from Japan (80), Germany has issued a very nice *Lilium martagon* (50 + 25) and there is a bright orange *Lilium bulbiferum* subsp. *croceum* (160) from the Netherlands. I haven't yet acquired the various bulb stamps produced in Uzbekistan (*Colchicum kesselringii*, *Crocus alatavicus*, *Tulipa greigii*, *T. kaufmanniana*) and Azerbaijan (*Tulipa eichleri*, *T. florenskyi*, *Iris elegantissima*, *I. acutiloba*, *I. reticulata*, *Puschkinia scilloides* and *Muscari*"elecostomum" -something lost in translation, I think). Moldavia has issued a flower set including *Tulipa australis*, *Convallaria majalis*, *Galanthus nivalis*, *G. plicatus*, Ukraine has *Cypripedium calceolus* and *Erythronium dens-canis* and, for all those *Cyclamen* groupies, Russia has a *Cyclamen persicum* stamp. We seem to be witnessing the Post-USSR 'War of the Bulb Stamps'!

The IBS

The International Bulb Society, which publishes *Herbertia*, has a new address: P.O. Box 92136, Pasadena, California 91109-2136, USA. The latest *Herbertia* will be reviewed in the next BN, there is so much of interest this time. Subscriptions to IBS are \$30 in the US, plus \$10 for postage outside the US (cheques on US bank, international money order or US dollars).

Notes for the diary

At the end of February this year I will be visiting Vancouver, Seattle and

Portland areas, so this would be a good opportunity to meet up with any local BN subscribers, if they have nothing better to do! I will be giving talks as follows: 23 Feb. Alpine Club of B.C., Vancouver (tuberous *Corydalis*); 24-26 Feb. NARGS Winter Study Weekend, Doubletree Inn, Seattle (Bulbs and Daphnes); 28 Feb. Northwest Hort. Soc., Center for Urban Horticulture, Univ. of Washington, Seattle (Bulbs); 2 March, the Portland Chapter of the NARGS (Bulbous Plants of Turkey).

The same weekend as the above Study Weekend (24-26 Feb.) there is the Northwest Flower Show at the Washington Convention Center in Seattle.

The excellent Early Bulb Display [see BN6:1], organised by the Scottish Rock Garden Club, will take place on Saturday 18th February at the Braeport Centre, Dunblane, Perthshire. This event is non-competitive, thus encouraging growers to bring along whatever they have of interest, even if not in huge spectacular clumps; a very good idea, since it means that we get to see some of those rarer bulbs which increase very slowly or not at all. Later in the year there is the Late Bulb Display in Aberdeen on 7th October 1995. I look forward to going to this event - well, except for the two talks I am giving, although the nerves are improving!

From the Postbag

Peter Watkins from Bouremouth, Dorset, wrote (over a year ago -sorry, Peter!) about sternbergias. It is quite clear that the taxonomy of these superb autumn bulbs is still unresolved. Peter writes: 'I have bought in stock from various sources. From Michael Salmon I have what he calls *S. sicula* var. *sicula* MS981 Altimura-Cori, Italy, which is typical *sicula*, with the dark green leaves and paler glaucous stripe and the channelled cross-section. I also have Michael's *S. sicula* var. *graeca* MS796, Kotsifou Gorge, Crete, and this plant has flat bright glossy green leaves, most of which are 4 mm wide but I notice that a couple are 7 mm wide. The flowers have blunt perianth segments and are at the larger end of the range for *S. greuteriana*, which I think the plant must be.' [I imagine that Michael collected this before *S. sicula* was 'split' into *S. sicula* and *S. greuteriana*, and certainly long before *Sternbergia* was placed on CITES Appendix III-BM]. [See ref. in BN 2:11-13] Peter continues: 'I also have a bulb from Paul Christian of his *S. greuteriana* from Karpathos. This plant has a smaller flower with much narrower petals, giving it a starry appearance. This year the flower appeared before the leaves, which are just beginning to show. With the three species *lutea*, *sicula* and *greuteriana* all present on Crete, have they developed genetic separation? Or might hybrids occur? If not, what about the excellent garden plant we call *S. lutea angustifolia*?'

The short answer is, as is quite normal in things taxonomic, that no-one knows all the answers. Each of these three species is very variable in leaf size, petal size and shape, length of stem etc.; in gardens we already have quite a lot of variants of each one, and many more could be introduced by searching through wild populations. As far as I know, no-one has investigated the genus from the point of view of experimental hybridization. Quite a lot of chromosome counts have been done but even where numbers are the same it does not necessarily mean that the plants will hybridise since there are various reasons for incompatibility. Chris Brickell and I once saw mixed populations on Crete (BN2:11) so the physical possibilities for hybridization are there. To progress any further, detailed genetic studies are required, coupled with a series of crossing experiments involving both wild-collected bulbs and any long-cultivated clones such as *S. lutea* var. *angustifolia* (probably best treated as a cultivar and referred to as *S. lutea* 'Angustifolia'. A nice Ph.D. project, perhaps? The degree of leaf development can be controlled by watering in the autumn; last summer I had a large pot of *S. lutea* (a variant with enormous flowers, collected by Primrose Warburg in the Peloponnese) which was hot and dry in the glasshouse; in early autumn, without any water, it suddenly pushed up a fine show of flowers with no leaves visible at all, although previously, when growing in the open garden, it has been quite leafy at flowering time.

Alan King from Crick, Northamptonshire has some observations on mouse trouble, possibly valuable to those who try to grow collections of crocus. *Crocus* species appear to be the caviar of the mouse world so Alan suggests placing pots of romuleas among the crocuses: 'some years ago I found that the corms of *Romulea* (Mediterranean) were devoured before anything else and were rapidly fatal. No mouse got more than about six inches from a pot before dying.' He goes on to say that unfortunately all of the romuleas were killed in one of the cold winters but that now a family of five cats act as an effective control. We have no mice and lots of cats; none of them are ours, they just come in to use the sandy bulb frame, but physical damage to the bulbs occurs in the form of our dog chasing the cats; why do we persist against all odds, I wonder?

However, our old friend Wayne Roderick has many more problems than mice and cats (even allowing for a little exaggeration). Wayne writes from his home in Orinda, California to say that 'I had an eight feet fence put up to keep the *!#?! deer out, but still have racoons and once in a while a skunk. Now if I could only get rid of the squirrels and blue jays life would be heaven'.

Don Lee of Harpenden, Herts. is growing several of the colour variants of

Anomatheca laxa (*Lapeirousia laxa*, *L. cruenta*) [see BN 8:6] and has written to ask if the plant which is being distributed in some seed lists, which has white flowers with a red centre, as *Lapeirousia anceps* is, in fact, a form of *A. laxa*. Without actually seeing a plant it is impossible to say, since *L. anceps* can also have white flowers with red markings on the lower three petals; *L. anceps* should have flattened, narrowly winged flower stems ('anceps' means 2-edged), the wings somewhat wavy or finely serrated, whereas *A. laxa* has slender rounded stems, quite smooth; the leaves of *L. anceps* are often also wavy-margined. The corms should be very different in appearance, those of *Lapeirousia* bell-shaped with a flat base and covered with a hard shell-like tunic, those of *Anomatheca* soft and fibrous-papery, rather more elongated and egg-shaped. As far as behaviour in cultivation goes, *L. anceps* is a strictly winter-growing SW Cape plant, dormant in summer whereas most *A. laxa* forms are summer growers, although the blue variant subsp. *azurea* can be a winter grower, as mentioned in BN8.

More 8-petalled Crocuses. Alan King has observed 8 petals in a form of *C. biflorus* ssp. *melantherus* which I had (unknowingly) collected in Greece some years ago (now deceased, unfortunately) and in 1992 he found an 8-petalled *C. sieberi* ssp. *sieberi* in Crete. He also mentions that the white-flowered *C. tommasinianus* 'Eric Smith' is said to have 8 petals, although the original corms he had from Eric did not. I find this a variable feature, but usually a few flowers in the clump have 8.

Plant Records

In response to the item in BN6:12, 'Plant records: what should we record?', Antoine Hoog has written giving some details of the system he and Jan Dix have adopted for their nursery*: 'First upon receipt, a plant receives an accession number in chronological order per year, and a list in Word Perfect holds all the supplied information related to the stock under that number. Secondly, in spring I update a DataBase list of all stocks, marking numbers of plants emerging. This is the basis for sales in the following year. This holds a lot of information, just fitting on the screen of a PC and therefore probably useful for other gardeners. A great advantage of this programme is the almost endless possibility to modify it and extend the sorting capabilities. Thirdly I like to experiment with different soil mixtures etc., so I keep a DataBase list of planting/lifting weights with relevant dates for selected stocks.' Antoine also supplied a sample print-out showing the various fields (items) recorded; these fields can be varied according to

* Hoog & Dix Export, Heemsteedse Dreef 175, 2101 KD Heemstede, Holland.

whatever the user wishes to record of course, but this one includes: Accession number (eg 1994-104), Bed number, Position number, Name, whether that name has been Verified, what type of plant (eg. bulbous), Collector's name and number, Country of origin, Place, Altitude, Date of collection, Number of pots/rows, Number of plants/bulbs. If a plant dies, rather than delete the whole record there is a field to show that the plant has died and the reason for its demise; this is a good idea, since the information may be valuable even if there is no plant to go with it.

Adverts

John Wagner wishes to contact and correspond with enthusiasts who share his interest in South American bulbs. John can be reached at: 32 Excelsior Avenue, Castle Hill, New South Wales 2354, Australia.

Catalogues

Winter is a good time for seed catalogue browsing and I am currently enjoying Ron Ratko's Northwest Native Seed list which has a great range of western North American bulbs, alpines, herbs, shrubs etc. In particular I noticed *Allium hoffmanii* from California, described as having 2-3" heads of pinkish-purple flowers with exserted stamens giving a feathered appearance to the inflorescence which is a 'tumbleweed', and *A. parvum*, almost stemless with sickle-shaped leaves and compact umbels of white flowers with purple mid-ribs; lots of *Calochortus*, *Erythronium* (including the new-ish *E. elegans*), *Fritillaria*, Pacific Coast Iris, *Lilium*, *Trillium* and *Muilla transmontana* which I have not grown: a *Brodiaea* relative with umbels of white, lilac-tinged bell-shaped flowers. Northwest Native Seed, 915 Davis Pl. S, Seattle, WA 98144, USA.

Moving only slightly geographically, we come to Sally and Tim Walker's Southwestern Native Seeds which lists a great range of interesting subjects by State and habitat so that we have, for example, 'Arizona-New Mexico mountain shrubs', 'desert wildflowers', etc. Their catalogue is arranged very concisely to give tabular details of family, flower colour, qualities/characteristics, size, altitude and origin of seed. My eye always lights upon the Mexican bulbs: *Tigridia dugesii*, *T. durangense*, *T. chrysantha*, *Polyanthes nelsonii*, *Calochortus purpureus*, *C. exilis*, *C. venustus*, forms of *Bessera elegans* and the new *B. tuitensis* and *Nemastylis tenuis pringlei*, but there are hundreds of other items, many of which are unobtainable elsewhere. South-western Native Seeds, Box 50503, Tucson, AZ 85703, USA.

John Morley now has an extensive seed list of all types of plant but with a good number of bulbous subjects. Alliums always get prior treatment for alphabetical reasons but there are some very good garden plants here so it is not entirely unjustified; *A. stracheyi* is a good late-flowering easy one with pale lemon flowers; *Crocus banaticus* is one of the best of all the autumnal species and one seldom sees seeds on offer, or the lovely *C. vallicola*, so this is a good opportunity to grow stocks without having to buy single very expensive corms. There are lots of *Fritillaria* species including *F. stananthera* and *F. roylei*, *Leucojum valentinum*, *Paris quadrifolia*, *Trillium grandiflorum* (pink) and *Codonopsis forrestii* (well, it has fleshy roots) John Morley, North Green Only, Stoven, Beccles, Suffolk, NR34 8DG

Bookends

Flora of Bhutan. The latest part to appear of this valuable Flora, which is prepared and published by the Royal Botanic Gardens, Edinburgh, is Vol.3, Part 1, dealing with the monocotyledons but excluding the grasses and orchids which will form Parts 2 and 3 respectively. The Flora recognises the family splits of Liliaceae, so we find Trilliaceae, Colchicaceae, Uvulariaceae, Alliaceae, Convallariaceae and so on, as well as the 'true' Liliaceae comprising (in this area) *Lilium*, *Cardiocrinum*, *Notholirion*, *Fritillaria*, *Lloydia* and *Gagea*. Other familiar genera treated include *Iris*, *Maianthemum*, *Polygonatum*, *Ophiopogon*, *Hypoxis*, *Dianella*, *Allium*, *Clintonia*, *Disporum*, *Streptopus*, *Tricyrtis*, *Arisaema* (and many other aroids), *Trillium*, *Paris* and lots more. Non-native plants which are cultivated or naturalised are also covered and these include the widespread Mexican *Zephyranthes carinata*, South American *Hippeastrum puniceum*, *Phormium tenax* from New Zealand, South African *Gladiolus undulatus* and many other 'exotics'. Most of the accounts have been prepared by Henry Noltie but there are also contributions from S.J.Rae, D.G.Long, W.T.Stearn and R.M.Smith. Vol. 3, Part 1 (as well as other published parts of the Flora) is available from the Flora of Bhutan Project, Royal Botanic Garden Edinburgh, Inverleith Row, Edinburgh EH3 5LR, Scotland, UK at a cost of £18 plus £2 postage.

Final note for *Crocus* enthusiasts: Two new species and a new variety have just been described; they are *C. paschei* (after Erich Pasche), *C. kerndorffiorum* (named after Helmut and Robert Kerndorff) and *C. biflorus* subsp. *albocoronatus*, all from Turkey. They have been in cultivation for a while but the names have only just been validly published (in the botanical sense), in *Herbertia* 49:67-86 (1994). More in due course.