

# 1998 Retic & Juno Bloom

By Alan McMurtrie

## Reticulatas (Iridodictyums)

Oh the joy of Reticulata perfume in the Spring!

El Niño gave us the earliest Reticulata bloom I've ever seen: starting March 2! Normally bloom starts at the end of March in Toronto, Canada. The first species Crocus (named forms of *korolkowii*) actually opened 4 days prior (Feb. 26<sup>th</sup>), and of course some Galanthus were open even before that. Temperatures throughout February generally swung from just below freezing at night, to just above during the day. The mean temperature in February this year was +1°C, whereas it's normally -3.8°C (+0.5°C was the previous record high). Snow fall was recorded as being only 0.8 cm when 29 cm is normally received (5 cm was the previous low).

In mid December, only the soil surface was frozen. In many spots under the leaf and straw mulch the soil was soft. Temperatures did drop at one point to -13°C, however in early January El Niño gave spring-like 9°C daytime temperatures for over a week. Although a fair amount of snow fell prior to the end of January, by mid February it had melted.

It was two of Janis Ruksan's "Talish" at the front of the house<sup>1</sup> that opened on March 2<sup>nd</sup> (aka. *hyrcana* "Talish"<sup>2</sup>). Also, just starting to open in the backyard was one of my collected *danfordiae* (ANM2325). Two days later a couple of 1992 & 1993 hybrids opened at the front of the house. Over the next 2 weeks the Retics continued to open slowly, however the weather was such that their anthers were not opening (combination of dampness and coolness). On March 10<sup>th</sup> the temperature dropped to -10°C as predicted and there was some snow on the ground, as well as coming down. I covered the Galanthus with a light covering of straw -- something I meant to do the night before but didn't have time to. It was only on March 25, when the weather turned quite nice, that I was able to start doing a lot of hybridizing. It was so nice in fact that you would have sworn it was summer: I was out hybridizing in my shorts!

By April 1<sup>st</sup> the Retics were finishing! No joke! We had just had a warm spell for 5 days with temperatures of 25°C. Less than a week prior to the start of this we had been dumped on by 20 cm of snow. The day after I had been outside building a snowman with my sons. The warm weather began to build several days later (including on the 25th). Then on March 28<sup>th</sup> the majority of Retics all burst into bloom in symphony. Fortunately rain generally held off (we did get a little on the 28th, but it was near the end of the day). I spent 4 days almost solidly hybridizing. I got a lot of good crosses made, but I couldn't get everything done that I wanted to. In the end a fair number of *sophenensis* x *danfordiae* (s x d) blooms went without being hybridized. Most of these had been open prior to the warm spell and I just wasn't able to get to very many of them in the first couple of days of the warm spell. I had expected the weather to warm up slowly, which would have allowed me to get to them in the normal course of events.

I did try to keep assessing what the next highest priorities were and get to those. Sometimes it was a matter of not knowing what to put the pollen on in terms of making something that made sense. For example I had four Çat x *danfordiae* blooms. Although they are nice, and in one sense exciting (since they involve *danfordiae*), I tend to think that on some pod parents they wouldn't produce good results. Which in part is to say, I would be better off using some other pollen parent instead. Yes, sometimes one must ignore what seems to make sense, since perhaps something special may result from an odd ball cross.

Sometimes when I might think of making a specific cross I would find the pollen wasn't ready, so I had to try to keep some of those ones in mind to do later. In a few cases I even wrote up a tag and left it with the flower as a reminder, in order to make sure I did the cross. I did have computer printouts of the crosses I've made previously (one list by pod parent, and another by pollen parent). As well as telling me which crosses I had already tried (so I could try others), it gave me information about how successful they had been. For example a lot of 'Purple Gem' crosses didn't work last year, so I didn't make many this year.

Although the Retics came on so quickly, I must say it was really nice having the warm summer days to work with them. It was very enjoyable but hectic. Afterwards we started to get some cooler rainy weather, which made me appreciate how nice it had been.

Back in early April I was trying to see what record keeping I needed to do. In particular to mark down how many *sophenensis* x *danfordiae* blooms there were since this was information I wouldn't be able to piece together later: ie. because I hadn't crossed all of the flowers, I wouldn't simply be able to count each pod parent's crosses later in my data base, as I use to do in the past.

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<sup>1</sup> Southeast facing, which means it gets the morning sun.

<sup>2</sup> "Talish" is indeed early blooming like *hyrcana* hort., though *hyrcana* is now believed to just be a form of *Iris reticulata*.

There were 262 *sophenensis x danfordiae* blooms not counting those of bulbs given out for testing last fall. Of particular interest was the fact 21 89-Q-3 bloomed. In this case 4 bloom-sized bulbs had additionally been given out for testing (thus tentatively 25 in total). This was the highest bloom count of any s x d clone. I had originally been predicting 13 would bloom here. The 21 means eight of the 10 mm diameter bulbs would have bloomed -- some of the original bulblets! Next year (1999) however, I'm predicting only 14 blooms as you will read below.

Stepping back for a moment to March 9th, that morning I discovered 91-FC-4 had one flower open along with several others showing colour; also starting were 1987 *hyrcana* hybrids. In the afternoon temperatures reached a lovely 12°C. On careful inspection I found 36 1989 s x d hybrids in the process of opening. Surprisingly they were in one portion of the bed; others weren't quite as far along. It was particularly impressive to see all of the blooms coming up so close together: 100 sq. inches (10" x 10"). Last year there had been 126 s x d blooms compared to this year's 262. With bloom-sized bulbs being down in number, I'll be lucky next year to match this year's total.

Surprisingly 92-CI-1 didn't bloom this year. It's the s x d clone that showed the most yellow to-date. The other two 1992 s x d clones which bloomed for the first time last year had 2 flowers each, and a third, which hadn't bloom previously, also had 2. At the time I replanted the bulbs last year I found a 2<sup>nd</sup> "double nosed" bulb up against 92-CI-1. I wondered if / hoped they too were 92-CI-1. They are now designated 92-CI-3. Unfortunately I couldn't keep the smaller bulbs and bulblets of the two separate last fall, so that will be a tricky task in future. I am expecting one bloom of 92-CI-1 next year. The other 92-CIs will have 2 to 7 blooms. Yes, if 92-CX-1's three 10 mm bulbs bloom, next year there will be 7 flowers!

Reticulata increase was fairly good overall: the numbers of bulbs increased as expected, if not better in most cases. This was definitely true with 89-Q-3. It had 807 bulblets verses the 700 I had predicted. I was surprised and a touch disappointed that the number of bloom-sized bulbs were down. You might think this was due to overcrowding, and perhaps indeed it was. However it was pleasantly surprising to find last year's bulblets had increased quite well: they were perhaps half a size larger than last year's. This would have been in part due to the milder weather, though the whole growing season was generally earlier by 3 weeks (there were only a few things that occurred when they normally would have such as strawberry season). Last year's bulblets had been planted on top of the mature bulbs and the small bulbs, giving two or in some instances even three layers of bulbs. Yes, the bulbs were all were quite close together, but I imagine the mature bulbs would have a much more demanding root structures than those of the bulblets. Unfortunately I tended to plant similar sized bulbs together. This meant mature bulbs were together, increasing the competition for nutrients (nutrient starved), rather than having them spread out with smaller bulbs in-between as I have done this year.

Since I couldn't hybridize all the blooms, I was wondering if in these crowded situations the bulbs of unhybridized flowers were noticeably larger than those of ones that were hybridized. Unfortunately I don't believe I have enough data to say one way or the other. Next year I should flag a number of each and see what I find (but will I remember and have the time to do so? I spoke of needing to do this in last year's report, but I forgot all about it!).

In September I sent Berney Baugen 10 of the largest bulbs of 89-Q-3 in hopes that he will successfully force them for one of the English early Spring shows (many were not as large as I would have liked them to have been, but the majority should bloom). Now that 89-Q-3's numbers are becoming quite reasonable I need to develop interest in it and some of the other s x d clones.

I now have a number of people around the world testing my s x d hybrids: Australia, England, Holland, Japan, Missouri and Virginia in the U.S., plus Alberta and Manitoba in Canada, and soon New Zealand. Many of these were added this year.

Figure 1's predicted numbers have been updated, and they also take into account the bulbs given to Berney. I expect the totals will be slightly conservative. Based on this year's results I am taking the view that the second bulb of every original parent will be 2 years away from being bloom-size. Performance in the earlier years was clearly better than that. Bulblet numbers are calculated from the previous year's number of larger<sup>3</sup> and medium bulbs: I estimated 8 and 4 bulblets are produced respectively on average.

In the early years the actual number of bulblets can vary much more widely than predicted due to only a couple of bulbs producing all of the bulblets. As mentioned last year, parent bulbs can have anywhere from 5 to 17 bulblets (up to 25 for 91-FC-4). "1 year away" can have 1 to 9.

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<sup>3</sup> Bloom-sized and 1 year away (which will be bloom-sized at the end of the next growing season).

	<u>End 1994</u>	<u>End 1995</u>	<u>End 1996</u>	<u>End 1997</u>	<u>End 1998</u>	
					<u>Actual</u>	<u>Predicted</u>
Bloom-sized <sup>4</sup>	2	5	7	25 <sup>5</sup>	14 <sup>6</sup> est.	58
1 year away	?	1	16	37	81	95
2 years away	?	8	27	82	309	249
3 years away <sup>7</sup>	<u>8</u>	<u>36</u>	<u>67</u>	<u>249</u>	<u>807</u>	<u>700</u>
Total:	?	50	117	393	1211 act.	1102 est.
If Doubling	2	4	8	16		32
(updated)	<u>End 1999</u>	<u>End 2000</u>	<u>End 2001</u>	<u>End 2002</u>	<u>End 2003</u>	
Bloom-sized	85	394	1,205	3,206	9,996	
1 year away	309	811	2,001	6,790	18,849	
2 years away	811	2,001	6,790	18,849	56,014	
3 years away	<u>1916</u>	<u>6,396</u>	<u>17,644</u>	<u>52,808</u>	<u>155,364</u>	
Total:	3121 est.	9,602 est.	27,640 est.	81,653 est.	240,223 est.	
If Doubling	64	128	256	512	1024	

**Figure 1: 89-Q-3 (*sophenensis* x *danfordiae*) Bulb Count**

89-F-4 continues to have the highest total bulb count with 1349 (858 are bulblets). This is 10% higher than 89-Q-3; down from last year's totals, which were 25% higher. I had predicted 13 would bloom, including 3 of 4 given out for testing. There were actually 15 blooms here, so the total was likely 18. As well there were 3 bulbs in with 89-F-5 which also bloomed. I flagged and moved them plus their bulblets. No doubt there are more mixed in due to previous year's bulblets.

91-FC-4 continues to do fairly well. Last year's total was 178. This year's was 407. This is back in line with being 1 year behind 89-Q-3. I don't know why last year's had such an explosion (vs. this year's sort of settling back). 91-FC-4 can have as high as 25 bulblets: all of reasonable size.

One F2 s x d clone (89-Q-1 x 89-AC-4) from 1994 is doing particularly well. It had 2 nice sized leaves up, along with what appeared to be the leaf of a bulblet. I am looking forward to seeing it in bloom next year. I flagged all of the 1994 s x d hybrids and replant the ones that looked large enough to have bulblets re: moving the bulblets closer to the soil surface so that they can increase. It looks like only the one mentioned above is large enough to bloom.

11 *winogradowii* flowers bloomed! Now I'm getting somewhere. One was a double (2 flowers per bulb). I used *winogradowii*'s pollen quite extensively. For example, almost all *histrionides* were crossed with it. This made good use of the *histrionides* pod parents. Unfortunately it will be 5 years before I start to see the resulting progeny<sup>8</sup>. I had a number of 1993 *histrionides* hybrids which appeared to be pure *histrionides* (a bee must have gotten to them first, or some of it's own pollen got on to it's stigmatic lip). This happened with 4 crosses, which is quite surprising. Perhaps they opened while I was at work, and I didn't notice any white pollen on the lip when I made my crosses.

Based on bulb sizes I only expect 4 will bloom next year. It would seem that my attempts to set seed took their toll on the bulb sizes; in particular with all of the pods that produced "popcorn" (endogerm, but no endosperm). Yes indeed, they looked like small bits of popcorn. Only 3 of the pods set seed, yielding just 4 seeds. Certainly these crosses were not worthwhile, including ones using *histrionides* pollen. I would have been better off just intercrossing the *winogradowii* flowers.

<sup>4</sup> Bloom-sized are > 10 mm; 1 year away are > 7 mm; 2 years away are <= 7 mm; 3 years away are bulblets. Note: keep in mind that sizes may be different for other hybrids. Where appropriate, the actual number of blooms are shown, and the '1 year away' numbers were adjusted accordingly.

<sup>5</sup> 21 bloomed here in 1988, but 4 which were given out for testing should also have bloomed. I had predicted only 17 in total would bloom. This means that 8, which were about 10 mm in diameter, also bloomed.

<sup>6</sup> Includes 10 sent to Berney that are potentially large enough to bloom in 1999.

<sup>7</sup> In some clones, from time to time a few bulblets are quite small. By the next year they are only up to being considered large bulblets.

<sup>8</sup> Although there are already a number of nice introduced hybrids from *winogradowii* x *histrionides*, as you will read I am seeing some interesting new possibilities from my own crosses. Of course hybridizing two pure species produces a limited expression, but by using wild collected *histrionides*, my results have the possibility of some differences (vs. using hort. forms). It's just to bad all of these F1 hybrids are sterile.

To ensure I have a reasonable amount of pollen next year I purchased another 2 bulbs. I now have 38 bulbs of all sizes.

*Winogradowii*'s pollen was used much more successfully with 54 of 98 crosses yielding an "enormous" 646 seeds. Of this, 11 of 14 s x d pod parents produced 149 seeds. This was quite a change from all 11 tries last year being unsuccessful (which in part says don't get totally put off by something not working the first time). Now let's just hope they germinate. I got 120 seeds from 9 crosses onto the "Armenian Caucasus Retic". I really don't think the progeny will be all that interesting, but seeing what *histrioides* produced makes me hope something interesting will result. One key difference though is the "Armenian Caucasus Retic" lacks amount of white area and veining that lead to the lovely hybrids like 'Katharine Hodgkin'.

Eduard Hanslik has an Alba form of *winogradowii*! He hasn't revealed whom he got it from. He had promised to send a picture of it, but couldn't, saying, "the weather at flowering time was so catastrophic that I didn't take a picture." He commented, "it's not luminescent white, but whitish, for example like *Corydalis bracteata* 'Matina' (Alba)." I was successful at negotiating a trade of Trillium 'Snowbunting', a double form of *grandiflorum*, for a bulb of it. The bulb he sent was 10 x 15 mm which may be large enough to bloom. I'm keeping my fingers crossed though, since as I have written in the past, there have been times when I thought I had *winogradowii* bulbs large enough to bloom, but they didn't.

Six 1992 *histrioides* x *winogradowii* hybrids bloomed from 4 crosses. Three from two of the crosses were 'Frank Elder'-like. Two from one cross were more yellow than 'Katharine Hodgkin'. The last cross gave essentially a white with dark blue dots. Its fall wasn't as wide as the others (and thus my wife liked some of the others better), but it is still fairly wide. As soon as I saw it I said elegant! In fact I concluded that that's what it should be named: 'Elegant'. There were several other clones from this cross that didn't bloom. I wonder what they'll be like? Patience!

The only "disappointment" is that in 10 years time, when I may be able to retire from my day job, there will only be roughly 1000 blooms of 'Elegant'. I say this thinking that 4000 would be a nice number from which to start selling (ie. an additional 2 years). This long time to build up stock is the reality with any hybrids. It's certainly nice to look at the ones that have already been blooming for a few years and see how many bloom-sized bulbs I am currently up to. Again, it's a matter of patience. By starting now and working with them to promote increase, before you know it, so-to-speak, I'll be there.

'Elegant' now has 2 bloom-sized bulbs plus 3 bulblets. You may not think 3 bulblets are all that important, but if each blooming bulb were to produce 3 bulblets every year, and assuming they were replanted nearer the soil surface, then 1000 bulbs would be reached in just 6 years. And 5500 would be reached in 8 (along with 12,000 of all other sizes). Of course at this point I'm not counting on there always being 3 bulblets. Time will tell...

I am hopeful, but not too optimistic that Otto Fauser's 'Polly' will bloom next year: *I. reticulata* hort. x *winogradowii*. Otto sent me 3 bulbs of it back in 1991. The largest, which I simply recorded as being of medium size, is now 9 x 12 mm. An offset from it is 4 x 7 mm. The other two small 1991 bulbs were planted in separate locations in the garden. Neither survived. A picture I have from Otto shows 'Polly' being a medium grey-blue Retic with *I. reticulata* hort.'s form; not stunning, just something different.

The supposed *danfordiae* x *winogradowii* hybrid from 1992 is now 14 mm in diameter, along with 2 large bulblets. I am certainly looking forward to seeing it bloom next year. I hope the cross is true and doesn't just turn out to be pure *danfordiae*. I tried repeating this cross three times this year. Only one worked, giving 7 seeds. I also used 88-AX-2 pollen on it. Either way the results will be interesting. The big hurdle currently is, will any germinate?

I mentioned in last year's report that a bloom from "Armenian Caucasus Retic" x *winogradowii* didn't show any *winogradowii* influence, and that I was expecting more blooms from this cross in 1998. They too did not show any *winogradowii* influence, so yes indeed, it appears the cross was actually a self (the progeny were all reasonably similar).

89-A-2 (*hyrcana* hort. x *danfordiae*) and 89-A-3 bloomed for the first time. Both were extremely interesting. 89-A-2 was strongly yellow, though the yellow was less intense than that of *danfordiae* (the outside of the bud was cream). This was mixed with a small amount of *hyrcana*'s blue. Unfortunately, at least from my point-of-view, the colours were not even across the fall blades. My perception was that the blue was causing the blotching. 89-A-3's falls showed a distinct orange colour. It too had blue from *hyrcana* mixed in. Unfortunately the tip of its bud was eaten by a slug, which meant a good portion of the fall was missing, and thus I couldn't enjoy it in all its glory. What's of particular interest about these two is that it shows yellows other than just *danfordiae*'s bright yellow-orange are possible. As you can appreciate by the fact they are only just blooming, they must be slow increasers. As reported previously, 89-A-1 is a greyed blue due to a small amount of yellow mixing with *hyrcana*'s blue. In comparison, it increases reasonably well.

As expected none of these set seed, but surprisingly I got 47 seeds from 3 of 10 crosses using their pollen. A single seed was with 89-A-2 pollen; the others were of course with 89-A-1 pollen since the slug got 89-A-3's anthers. Of the other two crosses, one was a back cross to *danfordiae*, which gave 40 seeds, and the third was onto an s x d hybrid.

88-AX-2 (Çat x *danfordiae*) bloomed for the first time. It was similar to 88-AX-1 and 88-AX-3, both of which also bloomed. I had been surprised with 88-AX-2's large 12 x 15 mm bulb size, and I wondered if it might have been some other hybrid; though I was fairly certain I hadn't mixed it up. A second bulb 8 x 11 mm also bloomed. 88-AX-1's bloom was on a bulb only 9 mm in diameter. While these hybrids are not of interest commercially, the fact they are fertile is particularly interesting. This year I repeated this cross using what should be a larger flowered *danfordiae*. I'm not expecting anything different, other than hybrids that are hopefully a little more vigorous, with bigger flowers. The tiny 88-AX-1 is cute, but certainly larger flowers would be more showy.

Three of the 4 flowers produced 24 seeds. They were from intercrossing the clones. I expect this is the most interesting use of these since their expression will likely open up significantly in the second generation. Their pollen was used successfully on 18 of 26 crosses, giving 368 seeds. This breaks down as: 2 onto *hyrcana* for 26 seeds, 6 onto *danfordiae* for 157, 9 onto various s x d clones for 188, and a single "miscellaneous cross" (91-DV-3), yielding 5 seeds. As you can see, I felt crosses onto *danfordiae* progeny would be most valuable in the longer term, since these hybrids will **hopefully** be fertile. In the case of *hyrcana*, since my *hyrcana* x *danfordiae* crosses are turning out to be particularly interesting, I thought it would be interesting to see what crossing the 88-AX clones onto *hyrcana* would yield. The fact 88-AX clones are fertile makes me think the Çat Retic is  $2n = 18$ . If it is, then down the road some very interesting colours might come from *danfordiae*, *sophenensis*, & Çat combinations. It will take quite a while to get there though.

The three 88-AX hybrids increased nicely in number. 88-AX-2 continues to produce larger bulbs than the other two clones, with its largest this year being 11 x 17 mm. Next year it will again have 2 blooms. I am hopeful 88-AX-3 will also bloom, but know for sure 88-AX-1 won't. Total bulb counts are now 16, 16, and 22 respectively, with half being bulblets.

There hasn't been any news from Brian Mathew about Kew's studies of 88-AX-1/2/3, 89-A-1, reticulata Çat, or his BM11026.

*Kolpakowskiana* had 6 blooms in 3 spots in the garden. I also have it in two other locations. Generally I'm not happy with how well they are doing. Clearly by the fact they are blooming, they're not doing that poorly. Unfortunately a mouse ate the stems of two large bulbs, one of which had bloomed and set seed, as well as the stem of two bulblets. It was by chance that I noticed the seed pod missing. At the time I thought it might have been the work of a squirrel<sup>9</sup>. The next day I happened to discover everything was gone. The only thing that alerted me to the fact this was the work of a mouse, was some rustling in dried leaves. Checking under them I found evidence of the mouse (droppings). Within an hour he was no more. I then exposed about 1 mm of the stem / leaves that had been below the soil, in hopes of invoking some photosynthesis to rejuvenate the bulbs; not long after they did green-up. This might have happened anyway since the leaves were still growing.

Unfortunately those bulbs were affected by their ordeal: one of the bulblets disappeared while the other is smaller than it had been (it had been the larger of the two). Of the large bulbs, both are now 12 mm in diameter. This is the same size that the non-blooming one had been last year. Generally all of the others are equal or slightly smaller than they had been last year.

I am glad to report that the Armenian Caucasus Alba Retic bloomed this year. The large bulb in the spot where the Alba form first appeared did indeed turn out to be the Alba form. It is normally the last Reticulata to bloom (which makes it hard to use in hybridizing -- since I've already crossed virtually all other flowers). This year it bloomed from April 5<sup>th</sup> to 13<sup>th</sup>. All of the other "Armenian Caucasus Retics" were already open when the Alba form's bud was still at ground level.

I again selfed it and got 16 seeds. Incidentally none of 1994's 15 selfed seeds have germinated: **disappointing**. 6 of 13 crosses with it's pollen were successful giving 94 seeds. In the short term this won't yield much since the progeny will be coloured (I expect F1 hybrids will contain a dominant and a recessive gene for Coloured). It's only in the long run, once the progeny are intercrossed, that any Albas might result (potentially 25% of F2s will be homozygous recessive). The key thing I would be aiming for is to include some other characteristics in the hybrid Albas: in particular a better rate of increase. It is currently a very lovely large flowered clone; so that doesn't need improving.

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<sup>9</sup> On occasion I find Crocus flowers destroyed, petals everywhere. I'm not certain if it's the work of squirrels or birds; I suspect birds. I've never seen them do it. Presumably the flower's perfume attracts them and drives them into a mad frenzy. "She loves me. She loves me not. She loves me...". This has also happened to *Fritillaria michaelovskyi* which I collected in Turkey. As a result, for several years I've been covering *michaelovskyi* with netting so I can self the flowers and get their seed.

The main bulb is down from 11 x 12 mm last year to 9 x 11 now. Two bulblets from last year seem to have disappeared. Also missing is a second bulb in the 1987/88 hybrid area. In total I currently only have 5 bulbs. One of these, a 4 mm bulblet, was moved to fresh soil in a different spot in the garden. Last year two bulbs were sent to Wim de Goede; neither had been big enough to bloom. Wim didn't report how big they were this year.

I didn't try to count 87-BN-1's or 87-BB-1's bulbs, but I did replant them in the new location where they were moved last fall.

A reasonable of my hybrids bloomed for the first time: this year the number of 1992 blooms was a much more reasonable 44 (36 new, plus 2 each of 4 clones that bloomed last year). The number of 1993 blooms was 68. To my pleasant surprise I even had one 1994 bloom: 94-VX-1 (possibly a clone to watch; plus I quite liked it). I suspect it must have germinated the first year after being planted (almost all seeds germinate in their second year). Alternatively it could be more vigorous than other Retic's.

With 93-EH (parentage below) I had hoped to bring out *bakeriana* patterning with some variation. That didn't happen. Genetically, the expectation was ~25% would show *bakeriana* patterning. There were only three 93-EH clones, not a large sample, but it would appear more than one gene is involved. Their colours ranged from blue, to violet, to purple. A disappointing fault is the flowers grow too high (above the spathe), and then flop over.

93-EH		
87-DK-7	x	87-BG-1
<i>hyrcana</i> x <i>bakeriana</i>		'Cantab' x <i>bakeriana</i>

94-VX-1 is actually somewhat *bakeriana*-like: it has dark velvety violet fall blades. Unlike most *bakerianas*, the colour extends right around the fall blade. The white area around its orange-yellow ridge has some blotches, but the ridge colour dominates. Its standards and styles are a uniform purplish blue. As you can see below, it has a lot of *bakeriana* in its genes:

94-VX		
87-CF-2	x	87-BZ-4
'Gordon' x ?		'Purple Gem' x Turkish <i>bakeriana</i>
<i>bakeriana</i> x 'Cantab'		<i>bakeriana</i> x ?

93-DZ-1 was a nice pale blue; from ['Pauline' x *hyrcana* - 1] x ['Cantab' x "Armenian Caucasus Retic" - 3]. I certainly hadn't expected this. It's of course more blue than 'Natascha'. It's nice. We could do with a nice powder blue clone. It's quite possible however, that the consumer might view it as wishy-washy, preferring instead stronger / brighter colours. That is, unless it was just the right shade of powder blue to appeal to them.

There were a couple of other particularly nice clones that bloomed. It will take two or three years though to see how well they increase. For example I particularly liked three of five 93-BA (87-BB-1 x "Talish") clones (87-BB-1 is one of the clones I feel should be introduced). The bud of 93-BA-1 showed a colour that was a combination of blue and purple anthocyanin. When the flower opened however it was blue like "Talish", but had 87-BB-1's larger more pointed fall blade: rather nice, but disappointing in a sense. It would have been interesting if the flower turned out to be the bud's colour; case of "just another blue". The other 93-BA clones ranged from blue to slightly violet. Time will tell both how they do and how well I continue to like them.

I was a bit surprised at the fact that I didn't see the F2 expressions opening up. Yes, it is true that one expects the progeny will be similar to their parents. And certainly if the parents are similar to one and another, you can't expect much difference in the progeny, but I thought there might be something striking. What was I expecting you ask? Well, a few first generation crosses were tricolour: standards, style arms, and fall blade all noticeably different. So I thought there might be more bicolours / tricolours. As just mentioned above for 93-BA-1, I was hoping for new colours. Also a wider range of colours within each cross. Plus hopefully more colours in each flower; just as some wild collected clones had: ie. various shades of blue and/or purple on the fall blade radiating out from the ridge rather than just pure colours<sup>10</sup>. Patterns with veining and spotting would be nice. I wonder for example if dark blue spots are possible on a light mauve, or a pale purple background.

<sup>10</sup> Smile: it's funny to think of how we're often looking for opposites. Normally a goal would be to create pure, even colours. Here I'm wanting to break away from that.

I wouldn't say that I saw much in the way of bad characteristics. But I don't really expect with first year blooms to see their faults. A couple of years are needed to see how well they increase, and whether any anomalies are really faults, or just temporary weather related effects: such as the crape paper effect one flower had when it first bloomed in 1992; or the faint yellow ridge some standards appeared to have. To-date all flowers with more than 3 falls were simply temporary faults. I do have one seedling *bucharica* that consistently has no style arms; its anthers are normal.

89-AU, and in particular 89-AU-1, is markedly better than the 87-AS and 90-G clones, which are from the same parentage ("Armenian Caucasus Retic" x *bakeriana*). Of course both parents were wild collected clones, so it's not surprising to see some variation in them, but all progeny are quite consistent in flower colour.

Certainly when the parents are quite different, such as *sophenensis* x *danfordiae*, you would definitely expect the F2 expression to open up. I hope to start seeing that on at least one plant next year; the other's bulbs don't appear to be large enough to bloom.

Bloom on 1987 and 1988 clones was generally down. There were a few strong clones that did have good bloom in spite of not being replanted for the past 3 years.

'Pauline' is doing poorly. I don't understand why. It only had 2 blooms. True it hadn't been replanted last year. But even in 1997 it had done poorly, and I believe I did replant it in the fall of 1996. It had done well in previous years with being replanted there. The particular bulbs had originally been obtained and planted where they are in fall 1992. Some 'J.S. Dijt' on the other hand are in a location right at the front of the house, and they have been doing well there for many years. I tend to replant them every year.

I had intended to do seedling counts this year for years 94, 95, 96 & 97, but didn't have time to. These days what is of particular interest is to see whether any of the special crosses germinated. I only managed to flag special 1994 crosses, in particular s x d clones so I could replant those and get any bulblets closer to the soil surface. Surprising there is only one s x d clone large enough to bloom next year.

BM11026 is a fickle clone: none of the bulbs in the 1995 bulblet area bloomed. I do quite like this clone. It is possible that it tends to need to be replanted in order to do well. Those 1995 bulblets are in the area where I have my 1987/88 Retics, so it could just be that they need fresh soil. Two of the bulbs in my main area for it bloomed. Both of these produced 8 seeds each. One was a self. It had a lot of hollow seeds. Interestingly only 2 of 8 crosses with its pollen worked, both of which were onto *hyrcana*, yielding 63 nice large seeds. I had never tried *hyrcana* as a pod parent before. Three of the ones that didn't work had hollow seeds. They had all been onto my F1 hybrids. Two of the other three were with "Talish" (it's interesting that they didn't work and *hyrcana* hort. did), and the last was with *sophenensis*.

It would seem that the name 'Hercules' is being reused for a different hybrid. I bought some 'Hercules' last year from Hoog & Dix and they've turned out to be very dark blue like *I. reticulata* hort. They have a moderately wide fall, with virtually non-existent pollen (anther surface is waxy; ie. no good), which suggests the pollen parent is likely *histrioides*. 'Hercules' should in actual fact be near "red-black", with a fault that it's flowers do not open properly due to its stem not growing above it's spathe. This new hybrid is quite nice, but it's disappointing to see the name 'Hercules' being reused from the point-of-view of the confusion it will cause. At least the confusion will be minimized by the fact this hybrid is sterile. I doubt that this new clone was registered with the Royal General Bulb Growers Association. I must inquire.

Hoog & Dix's Descriptive Catalogue has the same original description as printed in the 'International Checklist for Hyacinths and Miscellaneous Bulbs: "raised by Mr. A. van den Berg Gzn. from *I. histrioides* x *I. reticulata*, flowers velvet-purple, with an orange blotch [ridge]." As I wrote above, this new hybrid is definitely a very dark blue.

I crossed all of 'Hercules' flowers, but as expected none gave any seeds. Those crosses were not included in this year's hybridizing statistics since they would throw off the numbers. This way the numbers reflect this year's success rates with varieties considered to be fertile.

When I went to dig a couple of bulbs of 'Hercules' to send someone I was quite surprised, actually shocked, to find a lot of diseased bulbs. In most of the cases the two new bulb were completely replaced by a lesser amount of peat moss-like material. Out of 50 large bulbs I'm left with only 30. Since all of the original bulbs had doubled in number that means 35 (70%) were lost.

I expect that many people will be disappointed with the hybrid being sold as *I. reticulata* Alba. It's not really very close to white: very light blue. As near whites go, I prefer 'Natascha'. The *I. reticulata* Alba clone would have been better sold as a near white in mixtures rather than trying to sell it separately. It's actually quite unfortunate someone is trying to pass

this off as a pure white, especially when pure whites are known to exist<sup>11</sup> I wish I could get my Armenian Caucasus Alba Retic out into the market. It's a beautiful true white, and worlds better than this *I. reticulata* Alba. Unfortunately its just not a good increaser

Surprisingly none of the crosses onto *I. reticulata* Alba worked. It is planted near 'Hercules', however all of it's bulbs increased nicely.

'Alida' was nice, but as the saying goes, "just another blue": nice light blue. Unfortunately a good number of its bulbs were affected by disease. I found all of the bulbs, but a high percentage were pock marked with dark brown tissue on at least the top half of the bulb. I trimmed off what I could with an Exacto knife, and some were simply tossed out.

This year Hoog & Dix had Reticulatas 'Marguérita', 'Pixie', and *I. reticulata* "Kuh-e-Abr" for sale for the first time. Janis Ruksans also had 'Marguérita' I ordered some, but he didn't send any; I haven't heard what the problem was. I was particularly interested by *I. reticulata* from Kuh-e-Abr, but unfortunately Hoog & Dix weren't able to send any bulbs of it. I don't know whether they were sold out, or whether there was a "crop failure". My order confirmation only said it, and quite a number of other bulbs, were unavailable. Fortunately this year Hoog & Dix produced a supplement to their Descriptive Catalogue (which is separate from their price list), so I am able to pass on the following descriptions:

*I. reticulata* from Kuh-e-Abr: "collected in Iran, province Semnan, in eastern Elburz near Kuh-e-Abr, around 2500 m alt. 1977; flower a delightful colour, Maria-blue; the shade of blue was unknown by growers of *I. reticulata* cultivars; ridge honey mark yellow-orange; height 12-14 cm."  
This sounds exciting, but at the same time it may truly be "just another blue".

'Marguérita': "raised by Mr H. Kroon from a variegated sport of 'Clairette' [its leaves have a white stripe running along them]. Its standards are cornflower-blue (CC 96a/b), and its falls are dark victoria-violet (CC89a) with ivory white (CC 155a). Its fall ridge is honey mark lemon-yellow (CC 14b). Height 10-15 cm."

'Pixie': "a new selection from 'Harmony' ". This, plus the fact it has been granted Plant Breeders Rights<sup>12</sup>, is the only information given. In last year's report William said 'Pixie' is a purple 'Harmony'.

From late October on into November I replanted my 1987/88 Reticulata bed. As I dug it up one section at a time, I replaced its soil (to about an 20 cm [8"] depth). All of the bulbs fit back into 3/4 of the bed. This is not a good sign: it means overall the clones there did quite poorly. It will be extremely interesting to see how the bulbs do by the end of next season. The soil was some ordered in for the expansion at the front of the house (see below) and thus hasn't seen Irises before.

I am quite pleased to report that some of the bulbs I got back from William had 3 flowers per bulb! Incredible!! Now if only I could find the data I recorded about bulbs sizes so I can cross correlate it to the number of blooms.

I was surprised to notice that some *danfordiae* bulblets that I had planted in two different good spots in the garden have not done well; they died out in one spot and there are only about 4 in another. What makes this surprising is that in another location not too far away diploid *danfordiae*, along with its bulblets, is doing quite well.

Near the end of the growing season Reticulata leaf lengths were a fairly consistent 45 cm (18"). Of course bulblet leaves were somewhat shorter. William van Eeden's unintroducted 'Blue George' had 61 cm (24") leaves, and my 89-AU-1, which Wim is interested in for the European market, were 75 cm (30").

I added 300 square feet of new garden at the front of the house. I am hoping this will meet my seed planting needs for the next 3 years. The gardens are now 7 feet closer to the road, but there is still about a 20 foot buffer. I can't easily go any closer due to water shut off valves for my neighbour's and my house being 6 inches from the new garden edge. In addition, the main garden was expanded closer to the house. Now there's only a 2 and a half foot wide strip of grass

<sup>11</sup> In some instances it is valid to call near whites "Albas"; they are the nearest to white known.

<sup>12</sup> My understanding is that it costs about \$1500 to obtain Plant Breeders' Rights for a clone. This means growers can't sell the clone unless they have an agreement with the holder of the breeders' rights; presumably to pay a royalty [in practice it discourages other growers from growing the clones]. It allows the holder to control the market for that clone for 2 years [I have to find out more details]. This is only fair. It prevents another grower from "stealing" or undercutting the market by buying up large quantities of a new clone then selling it at or below the price of the person who introduced it. Even if the bulbs were sold at the same price, the person who introduced the clone, wouldn't be getting anything from those bulbs; and this would go on for years and years. With all of my hybridizing, I can now certainly appreciate all of the years of hard work and expense that goes into getting worthy clones introduced.

running beside the walkway to the front door. Previously it had been 6 to 10 feet or more. 10 cubic yards of nice sandy loam soil meant I was able to raise the beds to the same 8 inch height of the existing beds. Once the beds were built, a fair bit of work was required to move bulbs from the old edges to the new ones. In a number of cases it was good to replant the bulbs; something that hadn't been done in upwards of seven years.

I tried looking at Retics under black (ultraviolet) light in order to see what they might look like to insects, but nothing fluoresced. I thought that the ridge colour might show up brightly since people often speak as if this is like a landing light for insects. Probably no matter what we do we can't really see what insects do since our eyes just aren't receptive to the same wavelengths of light.

Speaking of ultraviolet light, I'll just remind you that it reacts with the flower's anthocyanins (blues, violets) out in the garden to cause them to lighten somewhat. It's something you don't tend to notice when you're looking at the flowers on a daily basis. Some clones are affected more than others. Hence, the colour of Retics forced indoors during winter are slightly different than they'd be out in the garden.

It is always interesting to hear from time to time what the grower's side of the bulb trade is like. This summer William wrote, "Retic prices are still very low; even the demand. In winter and spring at every show with Retics, always 'George' gets the highest rewards and the first prizes. Concerning prices, 'George' is offered for 2.50 Guilders for 100 bulbs, which is about \$1.75 Canadian (~\$1.25 U.S.)." William attached a clipping from December 1997 giving market information for summer 1998 delivery. A well as 2.50 for 'George', 2.75 Guilders is shown for *I. reticulata* hort. Now if only we could pay that little... Hoog & Dix list these at 10 Guilders per 100 bulbs, 88 Guilders per 1000 (minimum order 500 Guilders), while Potterton & Martin charges £1.30 per 10 (about 45 Guilders per 100), which drops to £5 per 50 and a near £7 per 100 (about 24 Guilders per 100). Of course postage, packing and phytosanitary certificate add another 50% to 25% respectively. Note: the wholesale price for 'Natascha' is 3 times that of other Retics. This fall *danfordiae* and 'Harmony' were selling for \$6.30 Canadian for 20 bulbs including taxes in local nurseries (about 40 Guilders per 100). One nursery had *danfordiae* and *reticulata* hort. for \$1.60 per 10 (about 20 Guilders per 100). A local mail order bulb firm was charging a ridiculous \$11.45 for 25 bulbs including taxes (60 Guilders per 100; Yikes!). 50 and 100 quantity prices were only 10 & 20% less respectively. An additional 12% delivery charge can be avoided by picking the bulbs up in person. A few additional varieties were available at similar prices (no wonder more people aren't enjoying Reticulatas).

Hearing William speak of low prices makes you think of market economics: supply vs. demand. The only problem is that in this situation there are middlemen. In the past I would have said so what, they just add on their costs to come up with the price consumers are charged. Recently pig farmers have been complaining about record low prices. So low in fact that they are getting back only 60% of what it costs to raise pigs. Apparently this has been going on for several months (partly due to the collapse of Asian markets), yet the price charged in stores for pork products hasn't changed one bit. There goes the "law of supply and demand" right out the window. Perhaps that's also happening in the bulb market. Retail sales at 40 Guilders verses the 2.50 Guilders bulb growers get is definitely highway robbery. Clearly the middlemen are getting rich at the expense of everyone else.

William also commented, "this year I made many Crocus and Corydalis pollinations; no seeds at all. I know other growers had the same experience. Even the natural bee crosses didn't work." He went on to say all early spring flowering bulbs and corms were either without seeds, or only had a few small ones. William later wrote, "the Retics are all lifted, but bulb yield is disappointing this year with every one of the early flowering bulbs and corms, lesser and smaller bulbs."

Unfortunately I was late getting to replant my Retic hybrids. There were a number of reasons for this, but I won't go into them. Last year, in the last half of October I found root growth was just too great to allow replanting, so this year I was prudent and covered the beds with sheet plastic to keep them dry. This worked quite well. There had been a bit of root growth prior, but it wasn't too much.

I am to the point were a machine to separate the bulbs and bulblets from the soil would be quite helpful. As in the past, I found that in spite of thinking I got all of the s x d rice grain bulblets I would inevitably find a few in the soil. To minimize the mix-up this would cause, as I dug each clone I put it's bulbs and soil into separate plastic dish pans. This worked out well since it then allowed me to separate the bulbs from the soil indoors after dark. In many cases I additionally took the time to count the different sized bulbs. When the bulbs were replanted, I covered them with the soil from the dishpan. That way any bulblets I missed separating out would still be with that clone. Of course if they ended up being planted too deep they'd simply die out, but so be it. One has to be practical about the effort involved.

Speaking of bulblets dying out, it was clear with a few of the s x d clones, ones I didn't get to replant last year, that this was exactly what happened -- only bulblet hulls were left, along of course with this year's bulblets. Last year's bulblets weren't able to get a leaf up through the soil, and died trying to. The parent bulbs increased as expected.

It was certainly a treat to see how well all of the hybrids were doing, especially many of the s x d clones; to physically see and feel the increasing number of bulbs. The only catch is I'm having to triple the area available for them; verses

doubling. This wouldn't be a problem per se if I only had a couple of clones, or if this was their first couple of years (lower numbers per clone). I was finding that in spite of the tripling area I was having trouble planting last year's bulblets (now 4 to 6 mm small bulbs) into the new area. For example 12 x 18 inches gives 216 sq. inches. Allowing for the fact you need to plant a bit in from the edge means, with 390 small bulbs, their centres can only be .5 inches apart. Since the bulbs are physically 4 to 6 mm in diameter that leaves about .3 inches between them. If you remember the fact that last year I replanted the bulbs back into the same space they had been in, then I actually need to give them as much as 9 times the area in order to allow me next year be able to replant them back into the same space they are now in.

In this particular example I'm clearly in trouble. In other cases the bulbs may not be quite as tight: 250 in the 216 sq. inches, which means they're .6 inches apart. It's a matter allocating enough space as I replant, while keeping an eye on the total space available. In all cases I'm planting 3 layers deep: large bulbs at the bottom (bloom-size and 1 year away), then 4 to 6 mm bulbs followed by the bulblets. Of course one thing I can do next year is plant any excess elsewhere so I don't have to completely replant the whole 1989 area: I will certainly have enough others to replant. I can't do this with too many of the clones though because of space limitations -- there are still some areas in the garden that could be used more efficiently. These spots however generally haven't proven to be the best.

Even in the second case, next year there would typically be 500 small bulbs (this year's bulblets). I'm not sure if I would be able to plant in more than three layers. It might be possible with the bulblets and first year bulbs. It's also a matter of how well they would be able to do (but that's something I won't know for sure until I try it). Certainly I can expect to have trouble with large bulbs since this year's small bulbs would be moved to the lower level. Too bad I didn't think of all of this before starting to replant. I would have given certain ones more space: at least quadruple rather than just triple.

A guesstimate would be that I have 26,000 bulbs in 6 sq. m (64 sq. ft). Of course roughly 17,000 are bulblets.

Like last year, I found 89-F-1 lost many large bulbs including bulblets that had formed at the base of the large bulbs. The reticulated coats were all that were left. I mention this since it is a reality, and of course it's one of the factors that separates the good clones from poorer ones. When I was replanting I also noticed that some of my s x d clones did not regenerate their parent bulbs very well. I will need to take better notice of this next year. Because a fair number of the clone's parent bulbs increase well I hadn't realized there were some exhibiting the same characteristics as the paternal parents: *danfordiae* and *sophenensis*. Up until now I have been tracking performance based on rate of increase (total bulb count plus relative size -- it's no good having lots of bulbs if they can't bulk-up properly), as well as number of blooms.

I seem to be finding that Reticulatas should be replant after ~2 years. This isn't necessary in all cases, but it might go a fair way towards minimizing losses. For example I hate the fact I've lost all of the lovely *bakerianas* I had. My outlook in general has been two fold: first, species such as *bakeriana* come from the wild, so they should do well just planted out and left alone; second, I largely want only the hardiest to survive (of course it's no good if all of the bulbs get wiped out as happened with my Dutch Iris hybrids a number of years back).

I still suspect my previous problems with disease in one bed started with diploid *danfordiae* bulb overcrowding. Certainly this isn't the only answer as witnessed by the problems with 'Hercules' and 'Alida' this year: both of which were not over crowded. It would be interesting to see if *danfordiae* hort. (triploid) would do better if all of it's bulblets were tossed away (given that in my previous test it did poorly from the third year onward without replanting). 89-F-1 may just be a somewhat poorer clone than other *sophenensis* x *danfordiae* hybrids; particularly in terms of its ability to regenerate flowering-sized bulbs. I must try planting a bulb or two of each s x d hybrid in separate but similar spots (possibly also different situations), and see how they do: do they too have problems with disease when there's overcrowding? In the case of the diploid *danfordiae*, even though the bulbs weren't being replanted, and as I've stated previously, the bulblets would have had difficulty sending their leaves up to the soil surface<sup>13</sup>, a reasonable percentage did get up. Overall prior to disease hitting, the area looked like it had tufts of grass.

Ideally you'd expect the bulbs to reach a certain equilibrium number and consistency of bloom. Accepting that there are some that produce lots of bulblets (eg. *danfordiae*, *sophenensis*, and the Çat clone), it's surprising that these aren't just

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<sup>13</sup> Brian Mathew's suggestion of planting *danfordiae* bulbs deeper makes sense in terms of limiting the number of bulblets that are able to get leaves up and thus compete for nutrients, etc. However, the parent bulbs still need to have as a characteristic, the ability to regenerate themselves. It is important to realize that generally speaking, even if the clones you have don't do this, there may be ones in the wild that do. In the case of my *sophenensis* x *danfordiae* hybrids, some clones are better at this than others. Ideally the one(s) I choose to introduce will both be good regenerators, and resistant to disease (especially if they become overcrowded from not being planted too deeply). I have written that only the reticulated tunics of last year's bulblets are left if the bulbs were not replanted the previous year. This is when the bulbs are planted about 7 cm deep. At shallower depths, which is sometimes the case with undisturbed seedlings, the bulblets are shallow enough for many / most to get their leaves up. In all cases so far I've replanted them once they've bloomed for the first time.

simply “hardier”: in part meaning that they are able to stand up well to disease, and that overcrowding doesn’t just simply turn off the bulblet producing mechanism. One thing to remember: in the wild Retic bulbs don’t bloom every year. Typically there will be only a few blooms for many leaves. I suppose now that I remember this, it is indeed one characteristic that does need to be improved through hybridizing.

It’s funny to think that I’m wanting to shake up all of the genes, and create things that are new and different. At the same time, when we look at our children or our friend’s children, we see the parent’s characteristics in them. The same will be true with hybrid plants, though the more diverse the parents the more distinct the progeny will be, such as with *histrioides* x *winogradowii* crosses (unfortunately they are a dead end; but look what was accomplished in that one generation). The goal is to make diverse crosses in hopes of being able to pull out recessive traits in future generations that are genetically there, but weren’t able to be expressed.

Just as a reminder, when crossing two pure species it’s only in the second generation and beyond that you generally expect their progeny’s expression to open up. Assuming the species are distinctly different of course.

'Blue George' is now doing quite well. It produces a reasonable number of very large bulblets. This year William kindly gave me some bulbs of his lovely *bakeriana* clone, as well as his 'Michael'. I've had both in the past, but they died out after a couple of years. I plan to keep my eyes on these and actively propagate them.

I sent Wim 60 89-AU-1 of all sizes, which leaves me with 2 large bulbs plus about 20 very small bulbs. I also sent him a bulb of 'Elegant'. At the end of October Wim wrote, “I lost the two bulbs of 89-AU-1 [sent in 1997], I don’t know what happened, but they were completely calcified. Maybe I was a bit too late with digging, so next year I will dig them earlier. [I leave all of my Retics in the ground year round (except briefly of course when they are replanted). I’m sure a few are affected by disease, bugs, etc. that otherwise wouldn’t be, but the percentage is generally low<sup>14</sup>.]”

I think it’s important and interesting to hear of some of the practical realities of growing various varieties. At times disease will attack a given variety, and the fact it doesn’t do well doesn’t necessarily mean it is a poor variety. ‘Katharine Hodgkin’ for example was lost in the 1960s<sup>15</sup>, but fortunately a few bulbs had been sent to someone else, and look at the lovely hybrid we all have to enjoy.

Unfortunately after the last weekend in October when daylight savings goes into effect I’m left with only an hour of daylight between the time I get home from work and when it gets dark. Floodlights can help, but realistically there’s not a lot you can conveniently do (shadows make it hard to dig bulbs and be sure of getting them all).

I continued to replant until mid November. Killing frost hit on Nov 4<sup>th</sup>, with the thermometer showing -2°C at 6AM and not budging all day. The first snow fell that evening, but didn’t amount to anything. Vegetables were hit by the cold before this, especially in the backyard which is open to winds blowing down a 230KV transmission right-of-way.

At the end of October / early November the ground was quite dry. I noticed this because of wanting to push my seedling tags back into the ground; some had previously been heaved up half an inch or more. Earlier, after several wet rainy days, which provided a good soaking, I was easily able to push them down. At the time however there were many other higher priority items that needed doing, so I worked on those instead thinking that there would be plenty of opportunity for pushing the tags in later. What I ended up doing in mid November was watering the seedling areas. I imagine many of my neighbours were wondering why in the world I was watering the garden then.

For about 3 weeks at the end of November and into December we had unusually warm spring-like weather (up to 18 °C). It was a delight to have, though I wasn’t able to enjoy it as much as I would have liked to, due to numerous commitments. Weathermen had been saying this winter the weather pattern was going to be a La Niña, which would give a bitterly cold winter. Clearly that hasn’t happened, and I’m keeping my fingers crossed that it doesn’t. The suggestion earlier on was that the worst would hit in the new year.

If you stop and think about the warm spell for a moment, you begin to understand why Retics (and other bulbs) don’t do well in the southern United States, northern parts of New Zealand, etc. They have to be immune to strange weather patterns otherwise they would perish. This December there were reports of a few Forsythia bushes being tricked into flower 100 km north of Toronto. If Retics were to do this, they would surely perish in their native environment due to the severity of weather still to come. Certainly Retic flowers can easily survive freezing and snowfalls, like we often get in early spring. The problem would be due to the damage prolonged heavy snow would do to the leaves, thus affecting the

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<sup>14</sup> So-to-speak, I let mother nature take care of them. Of course I did loose many of my collected Turkish clones, as well as *danfordiae* in an area of one bed over the course of several years presumably to disease. I’ll repeat that I believe overcrowding was a part of the problem there.

<sup>15</sup> Darn, some day I’ll find that reference and put it here.

bulb's ability to regenerate, and to the potential that sudden large temperature drops would cause the exposed leaves and flower to turn to mush, which in turn could cause the bulbs to rot<sup>16</sup>. This latter case being due to the cell sap's freezing point being raised when the plants are in growth. When bulbs and buds are hidden under leaves, or a blanket of snow, they are frozen solid and not subject to starting into growth as a result of a week of warm weather. As well, early blooming would severely lessen the plant's chance of successful seed production, which is the whole reason plants flower in the first place.

Thinking back to areas that only get a minimal amount of freezing, if this in itself were able to trigger the Retics into bloom, then they would have done just that in the warm spell we had. I was actually glad to see they weren't being fooled. A few other factors / conditions must come into play as well.

Normally our Novembers are dull so we don't tend to get the warming radiant heat from the sun that we would in other months.

Here's an interesting one: while writing these paragraphs it hit me that *histrion* ssp *histrion*'s leaves start to come up in late fall and thus tend to go through winter exposed above ground. I would sometimes observe in spring that part or all of their leaves were straw colour, and thus dead. But with the warmer weather they would start back into growth, exposing new green tissue. I haven't carefully checked all of my *histrion* bulbs. I have a feeling there are problems with some patches. I did replant *histrion* ssp *histrion* in one bed and they seemed to be doing reasonably well. I know leaves hadn't been showing this fall in two other locations. I will have to keep my eye on them and see if anything shows up.

It always disappoints me to hear that Retics are somewhat difficult in these areas. I would like them to do well everywhere.

**Iridodictyum kopetdagensis**: now here's a dilemma -- we now have an *Iridodictyum kopetdagensis* and a *Juno kopetdagensis*. What do we call this new Retic in the Iris world? Clearly the Juno's name prevails. There are several possibilities, but I would prefer to give Dr. Kurbanov the honour of naming it. I will ask Dr. Rodionenko to pass this suggestion on Dr. Kurbanov, before someone else publishes a name. I have one in particular in mind, but personally, I want to see that this is indeed a new species before suggesting the name. I am skeptical. Over the years I have seen many variations in wild collected *Reticulatas*. Dr. Rodionenko kindly sent me 4 bulbs of *Iridodictyum kopetdagensis*. They were two bulbs that bloomed and divided which Dr. Kurbanov had sent George last year. I am quite looking forward to seeing them in bloom next year.

As you will read in the attached description, *Iridodictyum kopetdagensis* is said to "differ from [*reticulatum*] by a number of characters: narrow leaves without four clearly seen borders; shorter fruits [seed pod] -- its length only twice (not more) longer than width, whereas in *I. reticulatum* fruit length two-four times longer than width. Moreover, leaves of the new species in a period of flowering are of smaller sizes [shorter] than that in *I. reticulatum*, but in postfloral period they grow up faster to 40-48 cm (but not 7-12 cm)." Its leaf tips are said to not be pointed. The description lists its colour as: dark violet.

Back in 1995 Janis wrote, "...two forms of *I. reticulata* - from Tbilisi (Tortilla lake) and from Kopet-Dag (east of Caspian sea, near border with Iran. Both are almost identical in colour, but Tbilisi plants are more than twice as large as the Kopet-Dag sample." This year Janis commented, "I'm still doubtful about its species range -- I've been growing it for years and for me it looks like only a minor form of *I. reticulata*."

My guess is *Iridodictyum kopetdagensis* and Janis' Retic aren't the same, since I have Janis' Tbilisi Retic, and it's red-purple in colour. A photo Janis sent in 1995 shows a plant that is somewhat 'J.S. Dijt'-like. *I. kopetdagensis* on the other hand is dark violet. Colour of course is not a good species separator, but it can be used in a crude way.

Brian Mathew astutely mentioned "I guess [*kopetdagensis*] must be the same as that collected by Paul Furse in the 1960's from the other (Iranian) side of the border, in eastern Iran. Unfortunately no living bulbs survive; only [herbarium] specimens."

In the 1964 British Iris Society Yearbook, page 103, Paul Furse wrote:

**PF.5179.** Near Bojnurd, in Transcaspia, on bare slopes and among limestone rocks, facing north; in flower very soon after the snow had melted.

This was an interesting find, a deep violet-coloured form of *I. reticulata* looking just like the typical commercial form of it; the original locality for this Iris has never been known, and it will be interesting to see when this flowers in England if it is identical with the old-fashioned garden form.

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<sup>16</sup> I have yet to see this happen to Retics, only *Galanthus* and on rare occasions to *Junos*.

Janis' 1999 catalog will list a mystery Reticulata under the name *kolpakowskiana* aff. *Ihnachsai*: “we were very surprised during our last expedition when we found a Reticulata Iris at 2800 m. This in no way can be considered foothills, which is thought of as the homeland for *I. kolpakowskiana*. You might think this plant must be identical to *Iris winkleri* reported from Itegesai, which is not far from *Ihnachsai*, but it has a reticulate tunic (*Iris winkleri*'s is longitudinally ribbed). Further investigations will show whether it is only a highland form of his *kolpakowskiana*, or a new third Central Asian Reticulata Iris species. Collected in *Ihnachsai*, Pskem mnt. range, Uzbekistan (ARJA-9865).” [text edited for clarity]

In a letter to Ron Goudswarrd (New Zealand) I wrote: “Your 1993 minimum for July of 1°C would explain why your ‘active period’ before flowering is so short: you don’t get it cold enough. Because temperatures here drop well below freezing for ~December to March the Retics get put on hold (the ground is frozen rock solid). Some years they get buds up higher than others before being put on hold [certain varieties more so than others]. When the weather warms up enough, as it did this year, then the flowers are all set to start blooming (March 2nd). They have been a bit lethargic though: temperatures haven’t been warm enough for much to happen -- however those first flowers are sure lasting a long time!! Perhaps with exposure to the elements they wouldn’t be lasting as long as they are under dish pans and cans (which I’m using for hybridizing purposes).”

In late June Ron wrote, “Every day another Retic seems to be showing. No flowers open yet though. I see that ‘Joyce’ and ‘Jeannine’ were up yesterday. ‘Harmony’ was the first shoot to appear above ground closely followed by *reticulata* hort. and then ‘Clairette’ a couple of days ago. Two of your seedlings have 3 inch [7 cm] leaves up already too, which means that they must have emerged even before ‘Harmony’. Your seedlings were early last year too (from seed received June 1995, from NZIS seed pool).”

“I have come to the conclusion that in previous years, bloom season seems to have started after 3-4 weeks of relatively warm weather (minimum / maximum temperature doesn’t seem to have a bearing). Once the bloom season has started, any drop in temperature simply extends the bloom season. I think you already knew that, but what causes the season to start early? Warmer temperatures at the end of February so that water is freely available instead of being locked in snow and ice? In theory I would expect our season this year to be late because autumn rains were so late. We aren’t doing so bad for rain now though. It would make sense that plants that come from relatively dry areas would be very in tune with seasonal rainfall. Our Retics flower from late winter to early spring; yours flower mid to late spring.”

“Overall we have had a long dry summer period, with drought over much of eastern N.Z., which means we should have few losses in the ground. We had our local Iris group meeting on June 21<sup>st</sup>, and although other members report Retics starting to appear above the soil, no one else had flowers open yet.”

In August Ron E-mailed, “Do Retics grow roots while bone dry in their rest period? One of our local members forgot to bring her pot of ‘Harmony’ out of storage and it sat bone dry from mid summer until mid winter (June). In June she brought the pot outside (no sign of any growth), and a month later on July 27<sup>th</sup> (ie. Three weeks earlier than usual!), the pot was smothered in flowers, and is still flowering now – August 18<sup>th</sup>). NB: My ‘Harmony’, in a pot, was showing at the soil surface near mid June.”

In mid October I replied “The answer is essentially ‘No’. I actually have some of my Retic hybrids out in the garden covered with sheet plastic at the moment. I put the plastic there several weeks ago specifically to prevent root growth so that I would still be able to replant those areas (it becomes impossible, as I found out last year, if there is a lot of root growth). I’m getting some leakage at the edge. I just started replanting those areas this past weekend. The bulbs in the leakage areas are growing roots, but there is no growth in the bone dry areas. Bulbs in general will form root nubs when they are ready to start shooting even if they are bone dry, but of course they are using up some of their internal energy storage for this. The amount of growth is quite minimal.”

It's quite possible that the ‘Harmony’ bulbs were perfectly ‘ripe’, and shot into growth the moment they felt moisture. Whereas other bulbs that had been constantly feeling moisture, were growing at a slow but steady pace.

Ron's August letter continued, “Gwenda, the editor for our society, wrote that her first Retics were ‘Katharine Hodgekin’ on July 23<sup>rd</sup> and 31<sup>st</sup>, and *histioides* ‘Major’ on July 31<sup>st</sup>. I have written to you before that although *histioides* and ‘Katharine Hodgekin’ flower early for us, their leaves often do not start growing until other Retics have finished blooming.

In my garden ‘Royal Blue’ were first to open as usual (‘Katharine Hodgekin’ and *histioides* didn’t flower), but the surprise was that the group of ‘Harmony’ in the ground flowered without leaves and with such a rich lustre that they put all the other Retics to shame. The ‘Katharine Hodgekin’ in my garden are just starting to grow their leaves now and most of our *histioides* have yet to start growing leaves. Some of the Reticulatas already have leaves over 20 cm [8"] long.

I currently have two flowers of ‘Jeannine’ open on the kitchen windowsill and this really is the best way to enjoy them because they are too small to leave at ground level. They have such a lovely scent too. How about breeding that scent into some of the bigger flowers?”

This thought certainly hadn't escaped me. Over the years I hadn't been very successful working with 'Jeannine' (for one thing, it happens to be pollen sterile). Two years ago I started to renew my efforts, but it was only this year that 3 of 12 crosses worked, yielding 46 seeds. This is a first step. Time will tell whether any of these turn into blooming plants.

In mid October Ron E-mailed, "Have you ever tested the affects of potash on Retics? I recently visited a new garden that was growing unbelievable bearded Iris with no extra fertilizer. An analysis of the soil had shown it to be naturally rich in calcium and phosphorus and almost deficient in potash. I could only conclude that Iris do not need potash. I believe I have read that potash actually inhibits the uptake of calcium. Even more surprising, there is no humus in the soil, it bakes like concrete in summer, and the pH is 7. Even so the tall bearded iris grow so dense and so strong that in this garden they are planted along the outer fence as a windbreak! I have suggested the owner try growing *Reticulatas*.

I promptly started adding more calcium to our soil. I suspect that rose fertilizer (which is particularly high in potash) may have caused some of my Retics to dry off early previously."

In mid January 1999 I was delighted with being able to buy forced bulbs of 'George' from a local nursery. They were \$2.49 plus 15% tax for a pot of 4, and happened to be on sale for just \$1 per pot. Too bad there weren't other varieties as well. They were only identified as "Iris". A slight disappointment is some of the flowers didn't unfold fully. It was as if they stopped growing. The falls remained curled widthwise.

## Junos

Janis had Juno *capanoides* for sale: "only" \$50 U.S. per bulb; yikes! To make things even "worse" (more expensive), the Canadian exchange rate dropped due to the Asian, then Russian, crises (\$1 U.S. now costs \$1.57 Canadian; at the beginning of the year it had been \$1.46)! Of course what can you do when this is the first time *capanoides*' available anywhere. Congratulations go out to Janis for making it available. Janis also had *maracandica* (\$30), and *orchioides* 'Chimgan' (\$30) which should be different from what I consider to be the normal true form (not the wholly yellow trade form of *bucharica* going by the name *orchioides*, and which I refer to as *orchioides* hort.). As well Janis listed a *rosenbachiana* 'Varzob', but I believe it is actually *nicolai*. His 'Harangon' form is true.

The distinction between *rosenbachiana* and *nicolai* has become a blur for me. Previously the one key distinction between these two was *rosenbachiana*'s white pollen, and *nicolai*'s bright yellow. This seemed to hold true even though I've seen several forms of *rosenbachiana* that tended to be paler than the typical. Up until this year all of the *nicolais* I've seen have been the same clone. Perhaps this just means that all of the Czech bulb collectors I've gotten bulbs from, over the course of many years, collected from the same vicinity. Thanks to generous donations and trades by various Juno enthusiasts last year I've now seen quite a wide range of plants that confuse the heck out of me. I now begin to wonder how indeed to also separate out *baldschuanica*, which is pale yellow with a few dark markings on it's fall blade (I've had it here, but lost it). Are these all just colour forms of a single species? I wonder if genetic analysis would be able to sort them out. My suspicion, without any grounding, is that they are all slightly different genetically, including several of the *nicolais*.

I believe two red *rosenbachianas* with pale yellow pollen from Janis a number of years ago were hybrids between *rosenbachiana* and *nicolai*. At the time I intercrossed the various clones, but nothing has resulted either from these or my previous crosses. I couldn't say whether any of the seeds even germinated.

In March Janis Ruksans reported, "We made careful cytological studies this winter and found very interesting things. *Iris winkleri* has a different chromosome number than *kolpakowskiana*. Also, in *Iris orchioides* there are included 2 species, but still more research is needed to determine which population can be accepted as true *orchioides*, and which one needs a new name (possibly even names). Cytology confirmed that in Kugurt we collected two Junos, and that in Zaamin we didn't collect *parvula* but another species; most likely species nova, because it has a different chromosome number and its genotype is very different."

Janis updated this in Jan 1999 saying, "*Iris orchioides* from Chimgan is really a new species, description of which is prepared and now waiting only for DRN sequence research which will be finished in March (by Arnis Seisums working at Kew), which will show relationships between some Juno sp. Now we are almost 100% certain that Chimgan *orchioides* is *species nova*, but closely related to *orchioides* and *capnoides*. Plants from Chimgan have a different root system too - they are much longer and thicker than true *orchioides*, collected at Ihnachsai, Kurama, etc."

April 13: *aucheri* hort. and the dwarf form (aka. *nusairiensis* hort.) started blooming along with 'Sindpers', and *bucharica*. *Magnifica*, *maracandica* and *willmottiana* (true) started shortly after. This was 2 to 3 weeks earlier than normal.

The lovely *aucheri* Kew 78.3630 unfortunately didn't bloom; 2<sup>nd</sup> year in a row it hasn't. *Aucheri* is indeed a fickle creature. However, *Iris nusairiensis* (true) from Kew bloomed again: a single flower. I have now moved it to the new extension, where I am hoping it will increase faster.

A seedling *bucharica* from the Taskent Botanical Garden bloomed. It looked like the Duschanbe form, but what was most interesting is the fact its markings were black (very nice contrast), as opposed to the normal dark greenish grey. Its style arms are lemony yellow, as opposed to Duschanbe's light yellow. A second clone also bloomed. Its markings were more typical. Its pollen was surprisingly sparse and many of the grains were mis-shapen, suggesting it's an interspecies hybrid, but that didn't physically appear to be the case. The first clone's pollen was normal and was used successfully in 25% of the crosses tried.

Several of my Juno hybrids bloomed for the first time:

92-CY: *albomarginata* x (*graeberiana* & *maracandica*) - 2 clones: one with 2 flowers, the other with only one, started blooming on April 19th. They were *albomarginata*-like plants with *graeberiana*'s colouring. I either intercrossed them, or used pollen from older *albomarginata* x *graeberiana* hybrids.

92-BD: *magnifica* Alba x *warleyensis*: BIG disappointment -- they turned out to be *magnifica* Alba x self. I was quite surprised by this because I was certain their bulbs were slightly different from those of pure *magnifica*. Obviously I was looking at a characteristic of *magnifica* Alba bulbs, but didn't realize it.

93-JE-1: partly veined *vicaria* x *linifolia* - single bloom opening April ~25. Creamy white, small flowered like *linifolia*, without any of *linifolia*'s yellow fall blade or other markings. Appears that it may be a poor increaser (like most *vicarias*). That doesn't matter since it's not of commercial interest.

93-IX-1: *orchioides* x *orchioides* hort. - single bloom; typical *orchioides* x *bucharica* hybrid.

94-UO-1: *magnifica* x *bucharica* PF8223 - 4 blooms on a single stalk. Very similar to *magnifica* Alba, with a bit more over all light yellow. My guess is this is just a *magnifica* Alba self, particularly since there doesn't seem to be any *bucharica* influence coming through. If I remember correctly it both had good pollen and set seeds. I didn't bother planting any -- just gave them away.

94-ST-1: *magnifica* x *willmottiana* (true) - 3 blooms on a single stalk, April 22. Rats, it turned out to be pure *magnifica*. I am sure that I'll eventually see flowers from true crosses, since I've had over 50 successful in the past 7 years.

*Magnifica* x *bucharica* in a bed at the front of the house died for an unknown reason. It had been a nice clone. I believe there had been at least 2 separate stalks last year. Had I dug them up and cut off their side shoots and then disease gotten in? I really don't know. I'm just very, very surprised.

*Bucharica* formas are doing well with the exception of one which happens to be at the front of the house. Its leaves broke through the soil surface, then they turned brown and the plant stopped growing. In some ways I'm glad I divided this plant last year (a nice healthy bulb is now right nearby). Did my dividing cause the problems I witnessed this year? Keep in mind that something like 99% of the divided plants are doing fine. Without question, the value of dividing Junos (active propagation) far outweighs any problems it might cause. I just hope the disease doesn't "jump" the short distance and invade the good bulb. I didn't want to disturb them at the time for fear I might in some way harm the good one.

I was a bit disappointed to find I only have virtually one bulb of each *bucharica* forma. Clearly the side shoots I cut off last year all died. Equally clearly they are not good increasers.

A new *bucharica* forma raised from seed bloomed for the first time. It's similar, but slightly different from the other clones I have. Of particular note is the fact it appears to be robust. Unfortunately when I dug it, I ripped its two bulbs off their basal plate. Boy was I disappointed when that happened! I immediately put the bulbs in a plastic bag. By late November they had formed root nubs. When I planted them I found several of the basal plate shoots were doing well. I had divided up the basal plate using an Exacto knife at the time I tore the bulbs off. I could end up with more than 4 bulbs by the end of next year if I'm lucky, but what a risky way of doing so. Plus now I won't have any bloom in 1999.

It is very unfortunate that *warleyensis* is not as robust as *bucharica* or *vicaria*. In all its forms it is truly very beautiful! I don't quite know what to do to get them to do better. What is it that they are missing?

This year two bulbs of *warleyensis* from Dr Josef Mikulastik bloomed: 8 years after being collected in growth in the wild. My other clones don't seem to be doing all that well -- not very robust. I didn't try dividing them last fall, so that didn't cause any problems. On the other hand that may be what's affected some of my *maracandicas*. I did have 2 blooms on one group, but several others nearby are not doing well -- weak leaves in my opinion. Yet, when I divided them last fall they had seemed to be doing well: I found clumps of a reasonable number of smallish bulbs. I didn't record any data about the bulbs, but I suspect quite a few perished. I wish I hadn't separated them. Of course I was only trying to help them do better.

Two bulbs of *warleyensis* from Hoog & Dix last year turned out to be *bucharica* x *warleyensis* hybrids. This is one of those things when you're disappointed and yet happy at the same time -- you didn't get what you were hoping and looking forward to, yet at the same time you got something new and interestingly different. It turns out Hoog & Dix are now selling these as "hybrid from 'WARLSIND,'" which in itself is incorrect, since 'WARLSIND' is a sterile hybrid. Hoog & Dix's descriptive catalogue says, "we have mistakenly offered this plant in 1996 and 1997 as *I. warleyensis*, but we are very sorry, it seems not to be; it was found in our stock of Iris 'WARLSIND' and appears to be another hybrid, with *warleyensis* and *bucharica* as most likely parents" [alternatively it's a sport]. It has nice brown striping on its orange-yellow fall blades, which makes me think of tiger stripes. 'WARLSIND' in contrast has a fully brown fall blade. Both have white with greyed violet infusion on the lower half of their falls plus style arms

*Warleyensis* is still listed with the same source coding, but Hoog & Dix's descriptive catalog states, "a stock recently received from Czech gardens." I ordered two bulbs of it, but they were unavailable.

Arnis Siesums went collecting again with Janis Ruksans in central Asia. He E-mailed, "now having seen *albomarginata* in nature I feel it is the same as the cultivated [plants]. Simply in the prologue measurements of extremely dwarf specimen are given, it is more winged as well. It is a real beauty, and quite variable as well (from almost white to violet-blue). It is related to, but distinct from, *zenaide*." Arnis also went to Iran where he collected Iris *hymenospatha* subsp. *leptoneura*, *pseudocaucasica* from Zagros mountains, and a Reticulata Iris which he commented, "I did not see it in flower, but herbarium specimens from that place are almost black and white coloured."

In April Arnis wrote, "in Aksu-Dzhabagli true *I. willmottiana* grows, although always called *I. coerulea* by Vvedensky. I have seen some herbarium specimens from there. Another Juno there is *orchioides* auctt. I have never visited Aksu-Dzhabagli, but quite close is the quite rich 'orchioides' [Kara-Archa] collected by me." "It is quite clear to me that the so-called *orchioides* contains at least 2 species."

I didn't do as much Juno hybridizing as I had in the past. I'm not as interested in the "common" crosses, such as *magnifica* x *bucharica*, since I already have a number of plants from them. They are nice, but you only need so many. I did still do some, but most were distributed to other people.

It is interesting to realize that the natural propagation of Junos is somewhat slow. Some are clump forming and thus increase at a reasonable rate on their own: eg. *aucheri*, *bucharica*, and *magnifica*. Others like *vicaria* need some help. A number of the side shoots I cut off my Junos last year did not come up: *albomarginata* and several *willmottianas* for example, but when I replanted many of the Junos this year I found quite a number of small bulbs which were without a doubt last year's side shoots that I had cut off. I again put in a reasonable effort and went around cutting off as many as I could. This year though I did it earlier: early August. By late fall I observed tremendous results: many were showing new growth. I must try for a similar timing next year.

I was surprised and disappointed at how poorly *parvula* did, especially when it had seemed to be doing fairly well last year when I replanted it. The same was true for *maracandica*. I wish I had kept a record of the numbers of bulbs and their sizes in each case for factual comparison. I hope they recover.

I shake my head. Again this year I managed to rip a tremendous number of Juno bulbs off their basal plates. More than 2 dozen from over 12 clones. Yikes, that hurts! This was a small portion of the total number dug, and was in spite of trying to be reasonably careful (occasionally being too gung-ho -- it won't rip off, I'm being careful, right?). Probably the soil was too dry, and thus wasn't able to go around the bulbs when I was digging them.

Handling the basal plates was not a problem since the very centres of the bulbs were left. Each was simply cut off along with a few roots. You might think of just throwing away the bulbs since their centres were missing, but I knew from experience with Junos I collected at Leylek station, Turkey back in 1986, that I could get them to root. However, as a result of some difficulty with the technique in previous years, I made sure I quickly got the bulbs into plastic sandwich bags. Note: they were nicely dry, so there wasn't going to be a problem of too much moisture. This, and a longer period for root development, made a lot of difference. Only just a few didn't show signs of root nub development by the time I had to plant them in late November.

When you stop and think about it, the whole thing amazes me. These are simply scales. If you examine a ripped off bulb it seems like you could easily take it apart. I don't think the scales could individually accomplish the same thing. I expect they would simply dry out. Perhaps this is something I should experiment with in 1999. I don't know how they do it. When they're ready to plant you find root nubs have developed around only the outer scale, not on all scales. It's as if all the scales were working as a collective; remember: they are touching each other, but no longer attached together.

Patrick Healey in Belmont Manitoba Canada (~near the U.S. border) wrote, "*aucheri* had 2 fans, but no blooms. *Vicaria* bloomed modestly, but *magnifica* and *willmottiana* hort. have developed into first class garden plants. *Magnifica* was in bloom May 3 to 15, with 4 bloom stalks 15 to 18 inches tall, with 3 to 7 blooms per stalk. *Willmottiana* hort. bloomed from

May 3 to 11, with 5 bloom stalks about 12 inches tall, each with 5 to 7 flowers. *Vicaria* had 3 bloom stalks, 6 to 8 inches tall, with 1 to 3 blooms, from May 5 to 12th."

**Late Breaking News** (Jan 1999): Eugenijus (Augis) Dambrauskas in Lithuania has a number of lovely, what I believe are, *albomarginata x magnifica* hybrids. He has named, but not registered, two of these. As far as I know they have not yet been introduced. I have been distributing a third hybrid from him under the name "*willmottiana* - Edmundas 94". As you can probably surmise, I first got it from Edmundas Kondratas (Augis' friend) in 1994 as "*willmottiana*". The only thing Augis can say about these three is, he raised them from seeds from an unknown European Botanic garden.

'Evening Shade' is pale blue with an orange blotch on it's fall blade, while 'Morning Sky' is bright blue with a yellow blotch. 'Morning Sky' appears from a picture Augis sent, to be a slightly brighter blue than "*willmottiana* - Edmundas 94". "*Willmottiana* -Edmundas 94" however has a noticeably orange blotch. This blotch does fade to near yellow as the flower ages. It will be interesting to compare all three clones someday, especially the latter two since the colour in the picture could be off slightly. I can only guess that Augis likes 'Morning Sky' better than "*willmottiana* - Edmundas 94" since he named it.

Clearly *albomarginata* is one of the parents. I expect *magnifica* is the other, partly because I have one *magnifica* clone with a very orange blotch. A number of other factors supported the "*magnifica* theory": widely winged haft; no other colour mixing in with *albomarginata*'s; reasonable flower count. I suspect the parentage is actually *albomarginata x magnifica* since I've had only one of 14 reverse crosses work. As it turns out though, I have only tried the *albomarginata x magnifica* cross twice, and in each case *bucharica* pollen was also used (and I now know *bucharica* pollen will work on *albomarginata*). Both crosses did of course give seed. For-what-it's-worth I should try this cross two or more times in 1999 without any other pollinators (it's been a case of not having enough flowers and wanting to use them for other crosses).

## Pests

In early March I saw a black squirrel eating some Crocus 'Blue Pearl' which had some bulbs right at the soil surface. I bought a small animal trap, but didn't have to use it, since there weren't any further problems. In early July however another squirrel dug up and ate a few bulbs I had recently replanted, including some of the lovely and rare *Tulipa primulina* (fortunately he didn't get all of them!). I sent a grey squirrel packing 50 km away. Since I didn't see the squirrel digging the bulbs, I could only hope that this was the culprit. There haven't been any problems since.

As mentioned above, a slug chewed my lovely 89-A-3 (orange) bud. It had been under a tin can, which I was using to keep rain off, plus prevent any pollen from blowing away, as well as keep pollinators off. It had been a lovely warm evening, and I had been proactive and put down some slug bait within the previous 2 days since a sibling had recently had parts eaten off. The culprit is no more, but the damage had already been done. After that, I surrounded the whole flower with slug bait! By the way, those two flowers were the only ones damaged by slugs.

As reported above, a mouse (now deceased) made a meal of some of my *kolpakowskiana*'s leaves and a pod. Fortunately the bulbs recovered due to their leaves continued growth, though they are down a bit in size. Another 5 mice made their way to mouse heaven in the fall. Four of those had taken up residency in our compost bin.

I've always chased cats away from our property because I didn't want them doing their business in the garden or in my son's sand box. Now I'll have to change my tune. I need a cat around occasionally to keep the mice away.

A problem with moss in the garden has escalated in recent years. It goes hand-in-hand with fact that I'm not getting to replant many of my beds, as well as the fact that, as it's gotten worse I didn't do much about it (too many higher priority items). Breaking up the soil surface by hoeing or cultivating for example can greatly reduce the moss. I am fairly certain that the main reason the problem developed in the first place is because I am using one of my neighbour's silver maple leaves as a mulch in the winter. The neighbour has moss in her lawn which in recent years has gotten quite bad. In fact it has now spread directly into my front lawn and infested the one side quite badly. When I got leaves from her last fall I noticed a lot of small pieces of moss in with the leaves, particularly when the piles were small. Obviously as she raked her lawn bits of moss were broken off and mixed in with the leaves. I actually threw out a fair amount of the leaves from her. This year there was virtually no moss in with the leaves. I had been expecting I would have to tell her I wouldn't be wanting her leaves -- it would be less costly in the long run to buy a couple of extra bales of straw (assuming of course the straw is clean; which I discovered at many nurseries isn't the case).

Well this year I attacked it in earnest! I spent over \$100 trying to get rid of the moss. Most of that went to killing the moss on the lawn. I expect more moss killer will be needed next year since there are signs that some may have survived. I had been a little leery of spraying it directly on the garden, but in the end I did just that. It is effectively a 7-0-0 fertilizer. The high nitrogen didn't adversely affect any of the Iris. Some black spots were produced on Tulip leaves, as well as a few other plants, but none on Iris (they were in active growth at the time).

I actually used two kinds: one you sprinkle on (very effective, but I may be using more than recommended), and a liquid form in a container that you simply attach your garden hose to and water the affected areas (an application the previous spring didn't seem to do anything). Presumably it was mixing too much water and coming out too weak. It was this that I put into a sprayer with a quantity of water and sprayed directly on the garden. I plan to repeat the spraying next spring since there are still spots with moss.

When I was replanting my 1987/88 Retic area I found a fair number of white grubs. I will have to see about applying a killer next year. I just don't like the fact that the killer must be fairly strong since its label warns: "Make no more than 2 treatments per year".

### Potpourri

The September 1998 Alpine Garden Society Bulletin, Vol. 66 No. 3. is devoted to bulbs. It is a 'must have' publication (I bought a second copy). Of particular interest is Tony Hall's article 'The Cultivation of Juno Irises' which is accompanied by pictures of numerous rare Junos. I was particularly fascinated by *I. subdecolorata*. I am certain that I at one time had this species, but I simply regarded it as a form of *kuschakewiczii*! It, like *kuschakewiczii*, survived for several years, was seeming to be doing reasonably well, then died out.

I do have *kuschakewiczii* again and will actively propagate it. Once I have a couple of bulbs of it I will move some to a different location as insurance.

Janis Ruksan's article 'The Hunt For Iris *Winkleri*' is a must read. He and Arnis Seisums had an arduous adventure on their historic trip. It's just too bad that *winkleri* isn't the cherry red colour that turn-of-the-century literature suggested it was. An accompanying colour picture shows it to be a lot like *kolpakowskiana*. It is though, definitely a distinct species. The article also includes pictures of *orchioides* and *zenaide* which they came across. I am fairly certain this *zenaide* is actually *albomarginata*. Janis has since written to say that this plant's chromosomes are distinctly different from those of *albomarginata*. In Jan 1999 he wrote, "we came to the conclusion that most of the samples of so named *albomarginata* grown by western gardeners are *zenaide*. and true *albomarginata* is extremely rare in gardens. We are certain that we have both species. Both are collected in locus clasicus, and what is most important, chromosome research confirmed that both are different and separate species. Although superficially they look something similar - *albomarginata* is smaller plant; there are other differences too."

Janis' 1999 catalog will list Iris *winkleri* for \$80 U.S. Congratulations Janis and Arnis for making this rarity available. Numerous Junos species are also listed for the first time!

A slightly shorter account appears in the British Iris Society's 1998 Year Book under the title 'Something Old... Something New...'. Quite surprisingly [actually shockingly] no pictures accompany the article.

In mid year I started looking into getting more Hall metal labels. Many years ago I bought 5000 at about \$30 U.S. per 1000 including delivery. I'm now wishing I had bought twice that number. At the time, as you might well imagine, I figured 5000 was plenty - I had estimated I was using at most 700 per year. This summer I could see that if I was "lucky", I would just have enough for this year. It turns out that Hall labels are now being produced under the Best Plant Tag name. The shocker is they now cost \$156 U.S. per 1000! This includes delivery in the U.S. The price for 5000 is \$600 plus \$37.54 delivery. A smaller version of the tag is \$110 per 1000 (\$380 per 5000), but I often find I need all of the writing space available: 7 cm for the large vs. 4.5 cm for the small, with overall lengths of just over 13 cm and 10.5 cm respectively.

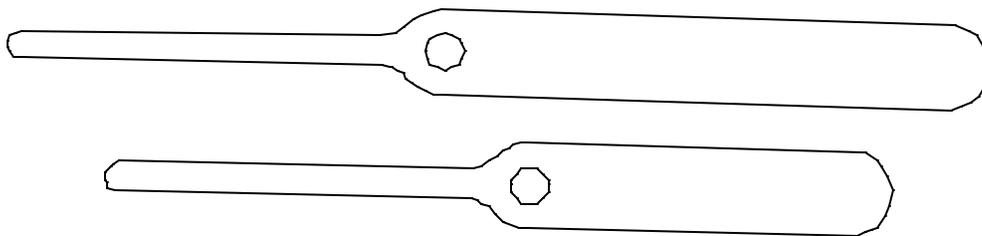


Figure 1 "Best Plant Tag"

With the Canadian dollar at an all time low, the tags are even more expensive; and we mustn't forget the 7% GST (Goods and Services Tax) that will be added by Canadian Customs. The Best Plant Tag web page mentions that tags can be wiped clean with household cleaners. From experience I know that some of the pencil lead gets effectively etched into the aluminum over time. In the past I had tried unsuccessfully to clean the tags and at one point I had even tried to sand them. That took too long and ruined the tag's writing surface.

As a result of the web page suggestion I thought of trying the reasonably harsh CLR (Calcium, Lime, and Rust Remover). I was quite pleased to find this worked fairly well. Often a ghost is left of the previously written text. Now, as I finish off this report I have recovered about 1200 tags. They had been buried in the ground to separate my numbered Reticulata clones. I recovered them this past fall when I replanted a number of the seedling areas. In their place I used strips of sheet aluminum (I used up almost a 30 cm x 10 m sheet; note: the Retics now take up even more area than before). These, plus 400 unused tags I found when I was cleaning up, should mean I won't need any more for 2 years. I still have two other Retic seedling areas to replant next year, so hopefully I can stretch that to 3 years (maybe wishful thinking).

As well as using Hall tags to mark crosses, they are used to flag individual clones (quite a few of those), and of course all other plants. For flagging individual hybrids I had been reusing old tags by turning them upside down and marking the cross several times on the side facing the clone; the old name was simply crossed out. The reason for marking on several times is because when the tags are pushed in the ground the soil rubs against the tag acting like an eraser. You want to be sure that the pencil you use leaves a good strong letters. Until the areas are replanted the individual clones are not marked on any of my maps<sup>17</sup>, so I want to do my best not to lose track of which is which.

The Hall version of the tags had a curve along their length, which gave them added strength. According to John Zey of Best Plant Tag, "the curve was taken out due to making the cost prohibitive, as it lead to stamping problems." Instead slightly thicker metal is used. "The gauge, I have been told by users from the 70s is now the same as they originally got from England" (now 25/1000 of an inch vs. 20 under the Hall name).

The tags are made of anodized Aluminum, which unfortunately corrodes if it comes in direct contact with granular fertilizer. The corrosion's particularly noticeable with potted plants that get fed every other watering with liquid fertilizer. I can't say how long the process takes, but the tags get extremely corroded; you can forget about being able to decipher what was on them.

I do like the tags, but they are without question too expensive. I did get a sample of Paw Paw Everlast "J - Small Plant Labels" which are made of pure zinc: 1/2" x 4". They cost \$59.45 per 1000, with discounts applying only to orders of 10,000 or more. They are definitely made of a thinner material (10/1000 of an inch), which can quite easily be bent, so the soil would need to be loosened before pushing them in the ground. "B - Plant or Shrub Labels" are much longer (1/2" x 7"), but only a touch more expensive: \$60.65 per 1000. Insurance and foreign shipping are extra.



Figure 2 Paw Paw Everlast: "J - Small Plant Labels"

Their straight forward shape makes you think you could easily cut your own. You'd just need to find a source for zinc sheet. The problem with the aluminum sheet I was cutting into strips is that it's got a shiny surface, so it's virtually impossible to write on.

Incidentally, I bend over roughly the top quarter inch of a label so that it can't get pushed all the way into the ground. This also gives a quick clue to where each planting is.

When I think of all of the changes happening at my day job over the course of a year, the 5 years it takes to go from a seed to blooming bulb seems like an impossibly long time. Perhaps genetic engineering will one day be applied to Retic & Junos to speed up the process plus produce new patterns and colours that are only hit and miss right now. Of course its first a matter of learning what genetic switches exist.

This fall I became an assistant leader with 2<sup>nd</sup> Willowdale Cubs (Scouts Canada). Both of my sons are now cubs (wolf cubs). This is taking up a lot more time than I expected it would. I thought I was busy before. Now things are impossible! One casualty is my plan for having this article finished by the end of November.

It's late January 1999, and I suspect our record 100 cm of snow in the first 13 days of the new year will mean a later than normal bloom as a result of how long it will take to melt. Currently though we are having above freezing temperatures (as high as 9°C Jan. 23). Fortunately precipitation over the past couple of days has been in the form of rain rather than snow,

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<sup>17</sup> Whenever I replant an area, I map it on paper showing the relative position of each plant. That way if any tag ever gets lost I can refer back to the map and properly identify the plants. Once you have more than a thousand different things, it becomes difficult to keep track of them all; especially so, if you then go and move them around.

though this isn't so nice for winter sports. Who knows, if the mild weather keeps up for a while, a lot of the extra snow could melt, and we'll end up with a typical bloom.

I have suggested in the past that you can extend your bloom season a bit by planting bulbs in shaded areas. Taking this one step further, you could even cover the area with extra snow and then put a good layer of straw on top for insulation. It would be interesting to try this sometime just to see how much additional delay it would give. Be sure to do this in a shaded area, since I doubt it would be all that effective in a sunny spot.

This report keeps getting stretched out... it's now February 22<sup>nd</sup> 1999, and I noticed one *Galanthus* in "bloom" today: the first bloom of 1999. It's too cold for the flower to actually open ( $-11^{\circ}\text{C}$  in the morning, rising to  $-2^{\circ}\text{C}$  by late afternoon), but the flower is just above the straw and out of its sheath. Two others are just "noses" sticking through the straw. The clump of *Galanthus transcaucasicus* is about 35 cm (14") out from the house, and 20 cm (8") from the nearest pile of snow. It gets both warmth from the morning sun, and some heat coming through the uninsulated concrete block basement walls. In the morning I could work my fingers into the soil by the bulbs; it's frozen about 5 cm (2") from the snow.

In the early afternoon the thermometer was reading  $-6^{\circ}\text{C}$ , but the radiant heat from the sun was melting snow on the concrete patio. Without a doubt bright sunny days are much more invigorating than dull dreary ones. The only catch is I'm eager to go out and start working in the garden, rather than sit indoors working on this report.

## 1999 Iris List -- Janis Ruksans

Note: shipping, phyto and bank charges are extra

	<u>US Dollars</u>
<b>271. <i>Iris aucheri</i>'</b>	<b>6.00</b>
Robust sp. with large, somewhat variable pale blue flowers in leaf axils, height up to 40 cm. From S.E. Turkey	
<b>272. <i>Iris bucharica</i> 'BICOLORED'</b>	<b>2.00</b>
Very well growing species. This stock of unknown origin has bicoloured creamy white flowers with yellow blade and is an excellent increaser. Height 50 cm.	
<b>273. <i>Iris bucharica</i> 'DUSCHANBE'</b>	<b>6.00</b>
Very vigorous tall growing form with pure yellow flowers from Tadjikistan. Coll. by our friend A.Kruminsch in 1978 near Duschanbe. Contrary to stated by A.Hoog, it never reverts to bicolor form and are much more beautiful than other.	
<b>275. <i>Iris caucasica</i></b>	<b>15.00</b>
Late flowering sp. Flowers greenish yellow with a yellow ridge on falls. Height 15 - 20 cm. Collected near lake Sevan, Armenia. Very limited stock!	
<b>276. <i>Iris cycloglossa</i></b>	<b>12.00</b>
Up to 50 cm tall, late flowering species with very large bright blue and white flowers of somewhat unusual shape. Easy growing in well drained sunny spot. Very tolerant. From NW Afganistan, SW of Herat (W-7727).	
<b>277. <i>Iris graeberiana</i> 'WHITE FALL'</b>	<b>3.00</b>
Flowers clear methyl blue with white, dark tipped falls. Very vigorous. Possibly mix of two almost inseparable clones, which differ in that one is fertile, the other is sterile. We now try to separate them.	
<b>278. <i>Iris graeberiana</i> 'YELLOW FALL'</b>	<b>3.00</b>
Rare form of this wonderful <i>Juno</i> Iris differing from usually grown in light yellow, dark tipped falls. Easy growing very tolerant plant.	
<b>279. <i>Iris magnifica</i> 'AGALIK'</b>	<b>3.00</b>
Tallest of <i>Juno</i> irises with very light blue flowers. The easiest in the garden. Excellent form from Agalik valley, Seravschan mnt. range, Uzbekistan.	
<b>280. <i>Iris magnifica</i> 'ALBA'</b>	<b>5.00</b>
Very beautiful and vigorous white form carefully multiplied from a single plant discovered among blue forms in the same Agalik valley near Samarkand, Seravschan mnt. range, Uzbekistan in 1977.	
<b>281. <i>Iris maracandica</i></b>	<b>30.00</b>
Height 10-15, rarely 20 cm, flowers 2 to 4 pure yellow with a widely winged LAST haft on a short stout stem. This stock is collected near Dshizak, Nuratau mnt. range, Uzbekistan (ARJA-9602) and is very nice and vigorous. Very limited stock!	
<b>282. <i>Iris orchioides</i> 'CHIMGAN'</b>	<b>30.00</b>
<i>Iris orchioides</i> is extremely variable species and probably should be divided in some subspecies, but much more studies in the wild are needed to make the final decision. So we still offer them all under the name <i>I. orchioides</i> . This is one of the tallest forms - up to 35 cm high with 3-6 pale greenish yellow flowers with a widely winged haft of the falls. Additional roots long and thick. Collected near mnt. Chimgan, Tschatkal m. range, Uzbekistan (R-8251 and ARJA-9622).	

- 283. *Iris orchioides* 'KURAMIN'** **25.00**  
 This stock is similar to the following stock from Urungachsai, but has a bit stouter habitus. Flowers large, creamy with yellow crest. Collected in Kuramin mnt. range, Uzbekistan (SAVV-9522). Very limited stock!
- 283. *Iris orchioides* 'URUNGACHSAI'** **25.00**  
 This stock represents the other extreme of variation of this species being very dwarf, only 12-15 cm tall with 1-3 large creamy white or creamy, yellow crested flowers. One of the showiest Juno irises, certainly worthy of the FCC award. Keeps its dwarf habitus in culture, too. Collected on a steep grassy slope in the valley Urungachsai, Ugam m. range, Uzbekistan (SAVV-9553 and ARJA-9749).
- 283. *Iris orchioides* 'YELLOW'** **20.00**  
 Quite rare form of this beautiful species of unknown origin, received from Alma-Ata Botanical garden with pure yellow flowers. Height up to 30 cm.
- 283. *Iris parvula*** **35.00**  
 It is true species collected in *locus classicus* with quite small, but very nice greenish yellow to yellow flowers on very proportional 15-20 cm long stem. Under that name are grown a lot of different Juno, but it is first time when are offered undoubtedly true *I. parvula*, which certainly are much more beautiful than plants from other stocks. From Sina, Chulbair mnt. range, SW Ghisar (ARJA-9803).
- 283. *Iris persica*** **25.00**  
 Very beautiful dwarf growing sp. (height only 10 cm) with somewhat dull purple crested in yellow flowers of unique shade. Can be quite variable. Our stock is collected in Turkey, E of Aksarzy in 1997 by our Czech friend.
- 284. *Iris rosenbachiana* 'HARANGON'** **25.00**  
 One of the earliest *Juno* Irises, flowering together with earliest Crocuses immediately after melting of snow. Flowers are very large, white with violet tint, falls purplish violet, anthers white. Excellently growing stock coll. in Harangon, Ghissar mnt. range, Tadjikistan, which by flower colour approximate to so named *I. nicolai*.
- 285. *Iris rosenbachiana* 'SINA'** **20.00**  
 Another stock offered by us which is collected just in the type locality (*locus classicus*) from which it is described. We still didn't see it in flowers, but as each stock of this wonderful and very variable species is different from others, we decided to offer it, because it at least undoubtedly is true *Iris rosenbachiana*. (By our opinion names *I. nicolai*, *baldshuanica* and possibly *I. popovii*, too, are only synonyms of widespread and variable *I. rosenbachiana*.) From Sina, Chulbair mnt. range, SW Ghisar (ARJA-9801).
- 285. *Iris rosenbachiana* 'TOVIL-DARA'** **50.00**  
 Flowers bright purple. Undoubtedly the most devious colour form of this variable sp. which mostly correspond with colour traditionally regarded as typical for *I. rosenbachiana*. Found only near village Tovil-Dara, N Darwas, Tadjikistan from which *I. baldshuanica* is described. Never before offered. Very limited stock.
- 285. *Iris rosenbachiana* 'VARZOB'** **30.00**  
 Another very different form of this charming species, which we collected in a grassy meadow at 1800 m in Chinoro, Varzob gorge, near Dushanbe, Tadjikistan (RK-8146 and RM-8276). Flowers are very large, creamy white even yellowish with velvety purple black fall, anthers yellow. By flower colour it approximate to so named *I. baldshuanica*.

- 285. *Iris tadschikorum*** **30.00**  
 One of the smallest Juno in our collection, height only 10-15 cm with up to 3 very pale lilac or even something translucent white flowers. Close to *I. parvula* but well separable by size, flower colour and foliage. Collected near Zaamin, Seravschan mnt. range (ARJA-9761).
- 285. *Iris tubergeniana*** **30.00**  
 It is the second time when this beautiful sp. is introduced in culture. The first was in beginning of century when it was described. Flowers shining yellow up to 3 on short (10-20 cm) stem. Needs very good drainage as in nature it grows in stone splits. Our stock is collected in Baschkhizilsai, Chatkal mnt. range, Uzbekistan (ARJA-9661).
- 286. *Iris vicaria* ‘HOD JI-OBI-GARM’** **3.00**  
 A nice *Juno* iris excellently growing in the garden with light blue flowers, height 40 cm. Collected near Hodji-obi-Garm, Varsob valley, Tadjikistan, (RM-8258).
- 287. *Iris vicaria* #419** **3.00**  
 This stock was grown from the seeds collected wild “somewhere in Tadjikistan”. It was not easy to determine its species name, because it looked somewhat intermediate between *I. vicaria* and *I. magnifica*. Possibly of a hybrid origin, but fertile.
- 285. *Iris warleyense* ‘KUGI-TANG’** **40.00**  
 This undoubtedly is one of the most beautiful Juno. Flowers are sky blue with deep violet blade and yellow orange crest. This is typical dwarf growing form (up to 20 cm high) from Kugi-Tang mnt. Very small stock.
- 285. *Iris warleyense* ‘TAHTA-KARACHA’** **30.00**  
 This certainly are one of the best forms of this marvellous species with up to 5 flowers on 40 cm high stem. Flowers sky blue with deep purple violet, rimmed white, blade and yellow orange crest. Plant of incredible beauty. Need warm rest. From Tahta-Karacha mnt. pass, Seravschan mnt. range (ARJA-9850).
- 288. *Iris* x ‘Warlsind’** **5.00**  
 Very vigorous Juno Iris considered to be a hybrid between *I. warleyensis* and *I. aucheri* (*sindjarensis*), but it is quite doubtful. Actually it more looks as a hybrid between *I. warleyensis* and *I. bucharica*. Standards deep blue, falls yellow, edged blue.
- 289. *Iris zenaidae*** **60.00**  
 Flowers large, deep cobalt blue, widely winged with white, striped blue blade, crest white with distinct blue rim. One of the rarest and most beautiful species introduced in culture by us for the first time. Seem to be good grower. Collected in its *locus classicus* - Kugart valley, Fergana mnt. range, Kirghizstan (ARJA-97 14-9716).
- RETICULATA IRISES**
- 285. *Iris* x ‘FRANK ELDER’** **3.00**  
 Flowers blue with subtle infusion of yellow-green, spotted blue on the falls; crest yellow. Hybrid between *I. histrioides* 'Major' and *I. winogradowii*.
- 290. *Iris histrioides* ‘ANGEL’S EYE’ (syn. ‘Angel’s Tears’)** **4.00**  
 Standards french-blue, falls gentian blue, blotch bluish veined on whitish ground with a small yellow vein. **Rarity!**

**291. *Iris hyrcana* 'TALISH' 4.00**

The earliest flowering of all bulbs in my collection, flowers often emerge through snow, at least a fortnight before the Dutch form. Very easy in the garden (the easiest of all Reticulata irises), excellent increaser. Flowers variable purplish blue or blue (RSZ-8706).

**292. *Iris* x 'KATHERINE HODGKIN' 1 bulb 1.50**

Flowers primrose yellow with bluish tint, very large. Prefer light shade, peaty soil which never dries out completely, but it grows in full sunshine, too, although then it is not so vigorous. **10 bulbs 13.00**  
**100 bulbs 110.00**

**293. *Iris kolpakowskiana* 'ALMA-ATA' 15.00**

One of the rarest Reticulata Irises with large light and dark purple and blue flowers and Crocus-like leaves. Blotch on the fall bright yellow. Very beautiful, well growing and increasing here in open, south faced field. From foothills near Alma-Ata, Kazakhstan.

**294. *Iris kolpakowskiana* aff 'IHNACHSAI' 50.00**

We was very surprised when during our last expedition found Reticulata Iris in height of 2800 m which in no case can be named foothills, which are nominated as homeland for *I. kolpakowskiana*. It seem that this plant must be identical with "*Iris winkleri* ?" from Itelgesai not far from Ihnachsai but it has reticulate tunic (*Iris winkleri* - longitudinally ribbed). Future investigations will show - is it only highland form of his *kolpakowskiana* or new, the third Reticulata Iris species in Central Asia. Collected in Lhnachsai, Pskem mnt. range, Uzbekistan (ARJA-9865).

**296. *Iris reticulata* 'MARGUERITA' 2.00**

Very unusual variety with sky blue and dark purple flowers and white edged foliage. Sport of 'Clairette'.

**285. *Iris winkleri* 80.00**

It is the first time when this wonderful, legendary gem from alpine meadows is offered. It is result of dramatic expedition of our team to Fergana mnt. range, Khirghizstan (see AGS Bulletin, vol. 66, No.3, pp. 366-377) in 1997. Superficially quite similar to *I. kolpakowskiana* but with longitudinally ribbed tunics. Undoubtedly far better grower (ARJA-9712).

**297. *Iris winogradowii* 10.00**

True gem of this section with very large, soft primrose yellow flowers early in the season. Prefer light shade, peaty soil with good drainage, but which never dries out completely because rooting starts early.  
**Extremely rare!**

Complete catalog listing numerous hardy bulbs is available on request.

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