

1997 Retic & Juno Bloom

By Alan McMurtrie

Reticulatas (Iridodictyums)

BIG NEWS: Arnis Seisums and Janis Ruksans were successful in collecting the very mysterious & elusive *I. winkleri*. Congratulations Arnis and Janis on your sensational find!!! I am heartily looking forward to reading about the expedition [Alpine Garden Society Bulletin, Sept. 98], as well as eventually seeing pictures of it in bloom, etc. Hopefully it will prove to be a good garden plant!

This year the first Reticulata opened on March 27th. It was from my first cross to bloom six years ago ("Armenian Caucasus Retic" x *bakeriana*). Prior to the 27th, most beds had 5 to 10 cm of snow covering them, and temperatures were only slightly above freezing. On the 27th the temperature soared to 16°C. With the sun's heat, it almost felt like a warm summer day. The 28th and 29th were drizzly, and both the 30th and 31 were cooler, with 5 cm of snow falling on the 30. April 1 was a bright sunny day with temperatures reaching 6°C. Quite a few more Retics were starting to show colour. I was able to collect pollen from 4 clones, however most anthers weren't opening due to the cool damp weather, so I didn't try to make any crosses.

Temperatures continued to seesaw with it soaring to 22°C on April 6, and then dropping to 5°C on the 7th (-10°C at 6 AM). The 7th was one of those days where, although the temperature was 4°C (ie. above freezing), very strong winds meant my hands got quite cold and lethargic. Overall I didn't mind the more seasonal temperatures since they gave me a chance to get caught up with my hybridizing. See Juno section for more weather info. (which may have affected this year's bulb increase).

This year's Retic bloom was very good and essentially as expected. The only disappointment was 87-BN-1 ('Gordon' x "Armenian Caucasus Retic"), which had a couple of bloom sized bulbs disappear without a trace. Many of the *sophenensis* x *danfordiae* (s x d) clones did well. 89-F-2 had 8 blooms, which was the highest, but there were 5 others with 7 blooms, 3 with 6, and 4 with 5. This is their 4th year of bloom, so with doubling you would expect 8 blooms per clone.

This was the first year of bloom for my 1992 hybrids. Unfortunately only 4 bloomed and 3 of those, were *sophenensis* x *danfordiae* hybrids. One however showed the most actual yellow influence of all ~36 s x d clones I have to-date, due to its blue being a light blue: 92-CI-1. However the yellow was not evenly spread out on the fall blade. It will be interesting to see whether this blotchiness happens again next year.

The 4th 1992 bloom was suppose to be from "Armenian Caucasus Retic" x *winogradowii*, however it didn't show any *winogradowii* influence. I expect some of its siblings will bloom next year. Right now I would have to say that a bee might have spoiled the cross. I tried putting *winogradowii* pollen on it, but the cross failed.

Next year I expect a lot more bloom on the 1992 hybrids, as well as reasonable bloom from the 1993 hybrids.

I have several 1992 *winogradowii* x *histrioides* hybrids that should bloom next year. I don't expect they'll be much different from the current three named varieties ('Katharine Hodgkin', 'Frank Elder', and 'Sheila Ann Germany'), but it will be interesting to see if that is indeed the case (the collected *histrioides* I used may yield slightly different results). I also have one *danfordiae* x *winogradowii* hybrid coming along, but is the cross true, or just *danfordiae*? The bulb is smallish like diploid *danfordiae* (7 mm), though there is only one bulblet (*danfordiae* typically has many more). It is the only clone to come from 41 seeds produced by 5 crosses. I have no idea whether more than one seed germinated, since I didn't record any germination data. I expect the bulb needs to be a bit bigger to bloom.

I've mentioned this before, but just in case you missed it I'll repeat that the last time I had *winogradowii* bloom was in 1992. The following spring all of the bulbs came up very weakly. Fortunately only a few were lost. The rest took 4 years to recover from the disease that got into them when they were divided that fall. At least one bulb was large enough to bloom last year, but it didn't. This year 3 bulbs bloomed, one of which was purchased last year just in case my others didn't bloom -- I wanted to be sure I got a bloom this spring (had I thought last year's large bulb wouldn't have bloomed I would have purchased the new bulb a year earlier -- hindsight is 20/20). Next year I'm expecting at least 6 blooms, and possibly up to 9.

Unfortunately from a hybridizing perspective I didn't get very far with *winogradowii*. None of its pods set seed, and only 4 crosses out of 38 worked with its pollen. These gave 14 seeds, however 11 were from a cross onto a collected *histrioides* (ie. staying within the 'Katharine Hodgkin' mold). Two of the remaining 3 were onto *danfordiae* pods. I don't

hold much hope for these single seed crosses, since typically crosses with 3 or less seeds don't have any germination (aside: the lovely 87-BB-1 ["Armenian Caucasus Retic" x {'J.S. Dijt' + 'Purple Gem'}] was from a cross with only 4 seeds). As a result, I now plant all "3 or less" seeds together, except in very special cases, such as this

Only one 'Sheila Anne Germany' bloomed (14 mm diameter bulb). I had expected two others would bloom (12 x 13 mm and 11 x 15 mm). Unfortunately it doesn't appear that I recorded any of its bulb sizes this year, but I do remember that it had increased reasonably well. I do quite like it.

A bulb that was supposed to be 'Frank Elder' turned out to be 'Katharine Hodgkin'. It was good to have that bloom though, since it was the only one. My other 'Katharine Hodgkin' bulbs are not doing as well as I would like. They seem to do well in spurts -- I am certain I had quite a number of blooms last year. Mine are planted out in the open. Janis Ruksans reported, it "is almost naturalized in my old shade garden where it grows in thousands in grass without any attention."

The highest bloom count for a single clone was 27, on 87-DD-1 ('Pauline' x *histrioides* 'Major'). Second highest was 87-CQ-3 ("Armenian Caucasus Retic" x {Willam van Eeden's blue seedling + 'J.S. Dijt'}) with 20. 87-DQ-1 ('Purple Gem' x *bakeriana* ANM2275) did reasonably well with 16 blooms, one of which was a double. This is their 6th year of bloom, so with doubling 32 blooms would have been expected.

MORE BIG NEWS: Kew cytologists have made a very important discovery that will hopefully be announced in the not too distant future. I don't want to steal their thunder, so for now I'll only say that they found the plant we've been calling *Iris histrioides* var. *sophenensis* to be a species unto itself. It would seem to make sense to now call it *Iris sophenensis*. Originally this plant had been called *I. reticulata* var. *sophenensis*, however that was back before the turn of the century when even *histrioides* was called *I. reticulata* var. *histrioides*. In Dykes' 'The Genus *Iris*', where *histrioides* is listed as a species, *sophenensis* is listed as *histrioides* var. *sophenensis*. One distinguishing feature that lead *sophenensis* to be grouped with *histrioides*, is the fact that in both cases their flowers appear before their leaves. Back at the turn of the century nothing was known about their chromosome counts.

It is interesting to read in Sir Michael Foster's 'Bulbous Irises' (1893), that *sophenensis* is described as, "the orange ridge on the blade is continued as a yellow uneven ridge along the whole length of the claw [ie. fall]. The colour, which has a particular metallic sheen, varies from a dark red-purple to a blue-purple, or to a lilac or lavender. The flower is not marked with veins except on the claw, and occasionally on the blade of the fall". I wouldn't quite describe my *sophenensis* that way. First, it's ridge colour is definitely yellow, not orange; and light yellow at that. Second, its colour is very similar to *histrioides*' blue (ie. no red-purple). And third, it is definitely veined; though at the fall edge the veins are touching one and another giving the effect of solid colour. Also mentioned is the fact the name "sophenensis" comes from Sophene, the ancient name of the district around Kharput. It is interesting that no mention is made of the numerous bulblets produced by *danfordiae* and *sophenensis*.

As Brian Mathew pointed out in a letter, it's quite likely all of the bulbs circulating amongst enthusiasts are from Paul Furse's 1960's expeditions. Brian has asked a Turkish botanist to go back into the wild and try to find *sophenensis* again. This is needed in order to establish whether it still exists in the wild, plus to see how variable it is (in part for writing its description). Hopefully the botanist will be successful!

Out of interest I should try selfing *sophenensis* to see what that tells us.

Kew cytologists made their discovery as a result of investigating why my "*sophenensis*" x *danfordiae* hybrids are fertile. Thank you Brian for getting the cytologists to take a look at them.

I am looking forward to seeing how much detailed information will be provided in their report.

This year I sent a number more bulbs to Brian in hopes that Kew cytologists will be able to study them as well. Of particular interest are: 88-AX-1 & 3, 89-A-1 and *reticulata* "Çat". Also of interest is Brian's own BM11026.

89-A-1 (*hyrcana* hort. x *danfordiae*) had 3 blooms this year. Because crosses onto it didn't work in the past (2 tries), I didn't bother to hybridize its flowers this year. However, its pollen was used successfully on 1 of 4 crosses, yielding 17 seeds. In 1995 I got 12 seeds with it as pollen parent. In both cases the crosses were onto *sophenensis* x *danfordiae* clones. It is quite surprising to get seeds using 89-A-1's pollen! (2n = 10 + 9) Now if only they'll germinate (none yet), and produce flowering bulbs. Certainly 89-A-1's parentage is correct.

Another of the Çat x *danfordiae* Retics bloomed: 88-AX-3¹. It was similarly small and “rosewood” in colour to 88-AX-1. Surprisingly in 1995, 88-AX-1’s pollen did set seed on 5 of 13 crosses, yielding 73 seeds. I tried using pollen from three s x d clones on it as pod parent, but it didn’t set seeds. This year’s 88-AX-3 produced 3 seeds using 3 pollen parents: *danfordiae*, 89-Q-3 (s x d), and *reticulata* “Talish” (which I included just in case the other two didn’t work). 3 of 7 crosses using 88-AX-3 pollen were successful, yielding 47 seeds. The fact that I’m getting seeds at all makes me wonder what’s happening genetically. I have certain suspicions about the Çat population, but nothing solid yet to bear them out one way or another. For the moment though, I am glad to be able to report that 3 of 21 *danfordiae* x 88-AX-1 seeds from 1995 have germinated

I have to laugh and shake my head at myself. In last year’s report I mentioned that essentially none of the 36 bulblets of Brian Mathew’s BM11026 came up last spring (ie. 1996). Well, in February I happened to be looking in detail at one of my garden maps showing a section where Retics had been replanted in the fall of 1995. There was a reasonable sized square marked “BM11026”. Then it hit me: yes, I had put the bulblets there. I guess I must be part squirrel, because I had completely forgotten I had planted them separately from the main bulbs. I’m sure many / most of them did come up, because I know everything had done well in that section of the garden.

This year four BM11026s bloomed. Two were in the 1995 bulblet area. They would have been small bulbs when they were planted there. A squirrel attacked one of the other buds, which was very unusual. In the past I have seen damage to Crocus flowers and to flowers of my *Fritillaria michailovskyi* ANM2225. Needless to say, I covered the other nearby bud right away. Normally I cover the Retics only when they are just about to open²; in this case cooler weather meant it would have still been another day or two before the bud opened, which is why it hadn’t yet been covered.

Only one of the three BM11026 gave seeds, and it was a self (37 seeds). 5 of 10 pollen parent crosses yielded only hollow seeds (the other 5 didn’t work). BM11026 gives noticeably smaller diameter seeds than those of other Retics. Because of its atypical hybridizing results, one would wonder if it is different genetically from other Retics. I mentioned this to Brian in hopes he might persuade Kew do a preliminary chromosome analysis on it.

I asked Brian Mathew for a suggestion on how to refer to distinct populations of a species, such as Janis’ *hyrcana*, Ahmet Atilla’s *Iris reticulata*, etc. In these cases, the collected bulbs contain more than one clone, but all of the bulbs from the same site have certain common characteristics about them. He replied, “I am not sure that there is a clear answer, taxonomically or nomenclaturally speaking! I think it comes down to a matter of practicality and using double quotes as in “coll. Atilla” might be as good as any; you should avoid single quotes since that implies that you have selected a clone (ie. one individual from which vegetative propagules arise). A bit unorthodox, but helpful.”

Thus Janis’ Talish population would best be referred to as *Iris hyrcana* “coll. Talish”, or *Iris hyrcana* “Talish”, though having the word ‘coll.’ helps enforce the idea that the bulbs are from a collection. Even simpler would be to use just “Talish”. In this case though the implied species is *I. reticulata*, so if that isn’t the case, then either of the first two examples should be used to establish the species. Incidentally, Talish refers to the Talish mountains bordering Azerbaijan and Iran by the Caspian Sea; it has also been spelled Thalish, and my atlas uses the spelling Talysh (just to confuse things). For the moment I have tended to try to distinguish its different clones on the basis of colour intensity of blue (light blue, blue, and dark blue), and pollen colour (white, or orange). This knowledge may or may not come in handy when their progeny bloom.

When referring to collected bulbs under a collection number, there’s no need to use double quotes: eg. BM11026, or *danfordiae* ANM2325.

Along this same line, you will see that when I refer to a species as a whole I use just its species name. Otherwise I tend to use a reference name along with the species name (this is especially true for Junos). The reference name can be a specific clone name, or a population name, but often it’s just something to separate one group of plants in my garden from another. These names can seem somewhat strange at times, such as *magnifica* - Edmundas 94, which refers to bulbs I got from Edmundas Kondratas in 1994 versus other *magnifica* clones from him. In cases like this, I don’t necessarily know whether I have a single clone or a population, but the former is usually the case. As well, I may know the bulbs were collected, but I don’t know specifically where; especially if the person I got them from, in turn got them from someone else. Ideally it is best to use the collection location if it is known, rather than a person’s name, such as *vicaria* “Sangardak” which is from Janis Ruksans. I do have a *vicaria* ‘tall Ruksans’, for lack of anything better, since it was one

¹ Actually the cross was Çat ANM2175 x {Yuksekoa + *danfordiae* ANM2325}, however *danfordiae*’s characteristics are quite clear in both 88-AX-1 and 88-AX-3 thus I refer to them simply as being from Çat x *danfordiae*. 88-AX-2 has yet to bloom. The only reason 88-AX-2 was given a number was because it (and 88-AX-3) was moved in 1995, and because of its importance. I expect it will bloom next year.

² For hybridizing purposes I cover my Reticulatas in order to keep bees away, as well as to keep rain from damaging the flowers and pollen, and to keep fluffy ripe pollen from being blown by the wind before I have a chance to collect it.

of about 3 clones in group of *vicaria* bulbs that I got from Janis many years ago (it does have other identifying characteristics, but 'tall' was the one I started using at the time for reference).

I have tried to consistently apply all of this notation to my article, but I do take a bit of liberty and use "Armenian Caucasus Retic" rather than 'Iris *reticulata* "coll. Armenian Caucasus"'. And I do at times use the simpler "Talish", rather than 'I. *reticulata* "coll. Talish"'.

Where there are plants masquerading incorrectly under species names, I try to distinguish between the incorrect plant and the actual species by adding the word 'true' when referring to the actual species, as in *willmottiana* (true), and append 'hort.' when referring to the misnamed plant. I do this of course only when the misnamed plant was sold commercially. Adding 'hort.' is appropriate if the misnamed plants are unnamed hybrids. If they were a different pure species, then I would of course use the actual species name with incorrect name shown after in brackets. Of course any misnamed plants I obtain in exchanges with individuals are relabeled under their proper names.

On April 11th Wim de Goede and his wife Hanny visited our house. As you might guess from their last name, they are bulb growers from Holland. They were interested in seeing my Reticulata hybrids. I had thought that they might have been retired since they were traveling in spring for what appeared to be a vacation to the US west coast. As I found out when they arrived, they were looking for new bulbs for their company, and their trip out west was to look for Calochortus. They are having good success with them, and see a great future for Calochortus as year round cut flowers.

Their timing couldn't have been better. Some of the 1987 clones were past their best, but in other parts of the garden the Retics were only just opening. Wim was particularly interested in hybrids that are different from those available commercially. In late August I signed a test agreement with Wim, and then sent him 21 clones for evaluation (along with a number of other bulbs, including Junos). Trust is a key element in terms of the agreement's long term viability, since a lot of details are missing. The agreement allows Wim to test clones for two years and then decide whether any are of interest for further testing / introduction. If Wim decides he isn't interested in certain clones, then I am free to try to market those ones elsewhere. I don't expect he will be interested in everything I send him; though I am only sending him clones that I think have commercial potential. A further agreement will then need to be negotiated for the clones Wim wants to introduce.

Previously I thought I would need more bulbs of a given clone before any Dutch growers would be interested. My guess had been at least 25 in order to give a clone a good evaluation, but that's not the case. Wim took only 2 bulbs of each in order to minimize the manual work involved. For any clones he wants to introduce (which I expect there will be some), I can then forward the bulk of the stock I have on to him (I'll keep a few for hybridizing purposes).

I expect it will however still be quite a while before any actually hit the market. I'll just remind you that with doubling, it takes 5 years to go from one bloom-sized bulb to 32 (ie. at the end of the 5th year you have 32 bulbs that will bloom in the 6th year). And it's 5 more years to take those 32 up to 1000. Remember also, that doubling is turning out to be about the best rate of increase I'm getting here in Toronto, Canada. It could even be slightly higher if I hadn't suffered some set back over the past 2 years (see below). In the case of a near red-black that Wim expressed interest in (90-BH-1: 'J.S. Dijt' x *bakeriana*), which bloomed for the first time, I have only 2 bloom-sized bulbs, plus 3 small bulbs. I sent Wim one of each; thus he has essentially half of the stock. On the other extreme I have approximately 90 bulbs (all sizes) of several of my 1987 hybrids. Perhaps / hopefully the rate of increase will be higher in Holland.

Speaking of building up stock, it is interesting to realize that William van Eeden's named clones like Natascha' and 'George', must have been hybridized in the mid 1960s, if not a bit earlier, in order to be introduced in the early to mid seventies (they were registered in 1973). John Amand recently mentioned to me that 'George' is now the cheapest Reticulata, selling for 6 cents wholesale, compared to 1 guilder for 'Katharine Hodgkin'. I just took a look at some information about 'Katharine Hodgkin' and found out it was hybridized in 1955 (the year I was born), and first flowered in 1960. Nine years later, 1969, it won an Award of Merit. I don't know when it was first sold commercially.

At first when you think about these facts you begin to realize that if 'Katharine Hodgkin' was as good of a doer as 'George', then surely it would also now be selling in the millions for a similar 6 cents. This isn't the case, so does it mean 'Katharine Hodgkin' isn't as good and only its beauty keeps it in demand? No, it actually does reasonably well. What then? Further thought suggests the difference lies in the way the clones are marketed. If you had two clones of a 1000 bulbs each ready to be introduced, and you felt you could get 5 guilders for one, but only 2 guilders for the other, you might try to maximize your profits by selling 500 of the first, but only 300 of the second. The idea being to keep back some of the second in order to build up stock. Eventually though, supplies of the second get high enough that you don't have room to grow more, so you sell the excess for whatever priced you can get. Hence the price drops. Meanwhile, the 500 bulbs you replanted of the first clone produce another 1000 bulbs in their 2nd year, of which you sell 500 and replant the reset. You are only ever able to sell 500 and the demand far outstrips supply.

It is interesting to realize that if you had 1000 bulbs and you actually withheld them from market, you'd have 2000 the following year. Conceivably if you then sold half for the same 5 guilders, you'd have earned the same amount of money as in the previous case and you would now have a 1000 bulb stock to sell from. Taking it one step further, if you withheld the bulbs for 2 years you'd conceivably be even further "ahead of the game", since there would be 4000 bulbs, of which 2000 could be sold at 5 guilders and a stock of 2000 to work with. Over the 3 years this is 500 more sold than in the first scenario. Of course at some point the question becomes whether you could still get 5 guilders, given the number of bulbs you have for sale.

The reality is you need to build up the market for a given clone (build market awareness), and let the bulbs out at a reasonable rate, so that supply doesn't outstrip demand and force you to reduce prices unnecessarily.

One thing I'm finding is it takes a couple of years to properly evaluate a give clone: in particular, to see how well it increases (and get some sense of how susceptible it is to disease). In the first year you of course get a clear idea of how beautiful its flower is. Slight differences show up between clones in terms of numbers of bulbs and their size, but this becomes magnified significantly after several years. All of the bulbs that bloom start off on the same foot. That is, typically 5 years after being hybridized the ones that have made it that far produce their first bloom. It's in subsequent years that weather, bulb vigour, etc., play a role.

I am doing all of my Reticulata hybridizing for the love of the plants. It would be good though, to make as much money as reasonably possible with the few best clones, in order to help pay for all of the expenses. As you know, a lot of work, expense (particularly to get good breeding stock), and time goes into hybridizing -- roughly 15 year from start of hybridizing to having enough bulbs to sell (assuming of course you get something worthy of introduction). Ideally I don't want to sell off my hybrids with commercial potential cheaply and have someone else make large profits on them.

Perhaps one day I'll hybridize the equivalent of a 'Katharine Hodgkin'. Maybe it will be one of my F2 Iris x *mcmurtriei* clones.

At the time Wim was here he wasn't interested in my F1 *sophenensis* x *danfordiae* hybrids, although he did see a number in bloom. This was understandable since they are mainly various shades of blue, and there are already a number of blues in commerce. On quick inspection they look *histrioides*-like (even their falls are on the wide side -- from *danfordiae*). The fact they are fertile and from *sophenensis* by *danfordiae* didn't interest Wim (I mentioned those points to him only in passing). The average consumer isn't concerned with parentage, but at the very least there is a specialty market for novelties like these. Certainly I believe a number are quite good doers, and that several of the F1s are worthy of introduction.

At my urging Wim did decide to give them a closer look, so 12 of the 21 clones I sent him were *sophenensis* x *danfordiae* hybrids. If they continue to do well, and Wim decides he still isn't interested in any, then for those clones, it will just be a matter of finding someone else interested in partnering with me.

I expect the colour expression of the s x d hybrids will open up greatly in the second generation and beyond (in F1 hybrids *sophenensis*' blues are clear dominant to *danfordiae*'s yellow); it's still 2 years before any will bloom. The current mixing of blue with *danfordiae*'s bright yellow is giving "muddy" mixtures in two of three clones I have with significant amounts of yellow. What's needed is light blue to be mixed with a slightly less intense yellow. What I've seen so far is that *sophenensis* produces, or at least is capable of producing, a range of blues. Hopefully *danfordiae* will be capable of producing several different carotenes (yellow / oranges). This is where *winoogradowii*'s pale yellow is more appropriate for mixing with blue as demonstrated by 'Katharine Hodgkin'.

91-FC-1 (*danfordiae* x *sophenensis*) falls have a bit more white area than other s x d clones, and there are a couple of what you might call dots, though nothing like *histrioides*' dots and blotches. 92-CI-1, which I mentioned earlier, shows the most yellow of any (without turning "muddy" as in 89-Q-7; though its slate-grey buds are nicely different). A point of note though, 92-CI-1's yellow was not quite even across the fall. It will be interesting to see if this continues in 1998.

My understanding is Wim primarily sells to the wholesale bulb market. What I also need is to find a grower who sells to North American markets. I have a couple of clones that are not the most striking, but which appear to be quite good doers. Many people here in North America find that the current named Retics do well for 2 or 3 years then only a few leaves come up after that. At the moment the longest I've left any of my hybrids in one spot once they've started to bloom is two years. I find they increase better if they are replanted every year or two; in particular so that bulblets and small bulbs are planted close to the soil surface. The average gardener wants to be able to plant a variety, then leave it alone for years and years, with it continuing to bloom every year.

I'm not sure exactly how reasonable this is. I'm finding that a couple of my Tulips that have been in the same spot for about 8 years are now doing quite poorly. Probably what I should do is dig them up and toss away the smaller bulbs,

thus giving the larger ones a bit more room. It's interesting that a clump of *Iris bucharica*, which has been left in one spot for many years reached an equilibrium point of just over half a dozen bulbs. It continues to bloom quite well.

I wouldn't say there is any difference in depth of wild *Reticulatas* which produce a lot of bulblets, and those that don't (about 7 cm deep [2.5 inches] -- from the bulb's base to the soil surface). There are some issues at stake (eg. why did some species evolve to produce more bulblets than others), but they may have more to do with environmental conditions. The species / clones that produce a lot of bulblets are: *danfordiae*; *sophenensis*; and *Retics* from south of Erzurum Turkey, including BM11026. *Histrioides* produces a lot of bulblets, but not as "badly" as the other varieties: ie. its bulblets are a bit larger, and very importantly the parent bulbs regenerate back up to bloom size each season. Hybrids like 'Katharine Hodgkin', 'Sheila Anne Germany', etc. produce bulblets, but they are larger in size, and less in number. I don't believe the Dutch bother with bulblets: they're tossed away. Any left in the soil are plowed deep into the ground so they can never see the light of day again. Increase is generally good enough that bulblets are not of much use. Yes, they can be used to increase stock, but this would be done only when numbers of bulbs are very low since they would have to be handled manually, and the costs of doing so are very high. Though, as with anything, if it made economic sense I'm sure machines could be invented to handle them.

A lot can be said for all of those cursed bulblets in terms of survivability. It's because of them that I still have my collected *Iris danfordiae*, Çat Retic (south of Erzurum), and *sophenensis*. However all of *histrioides*' bulblets didn't help it -- several forms have been wiped out.

William wrote, "I had *Iris sophenensis* also for a couple of years after the 1962 expedition of Paul Furse. I never used it in hybridizing as I found it far minor compared to *histrioides* 'Major' in brilliancy of colour, in sturdiness, and its making a myriad of little rice grain bulblets an evil by digging for commercial cultivation, so disposed of it in a couple of years."

Myself, I do like *sophenensis*, but I would certainly agree its "shattered" bulbs are quite a problem; both because the parent bulbs do not get back up to bloom-size, and because the bulblets are quite small. For my *sophenensis* x *danfordiae* hybrids the bulblets are a bit of a blessing in disguise. First, and most important, the main bulbs do not seem to suffer -- in most cases they are able to get themselves back up to bloom-size (likely due to hybrid vigour). And second, although there are a fair number of bulblets, they are of a reasonable size. At this point I am actually quite glad to have them, and don't find them to be a nuisance; but of course I'm wanting the increase they provide, and I'm putting the effort into taking advantage of it by replanting them closer to the soil surface every year. These *sophenensis* x *danfordiae* clones will "quickly" overtake my older hybrids in terms of numbers; especially now that the original bulblets are coming up to bloom size. Keep in mind though, that the number of bulblets in the first two years (1994 & 95) was low compared to numbers from the past two years (1996 & 97). As well, only a few of the clones were replanted at the end of the 1994 season. I hadn't stopped to realize they would be producing so many bulblets, and the potential of using them.

I did notice this year that on 1992 s x d clones, when the parent bulbs are only about 4 cm (1.5") deep, their bulblets are able to send leaf shoots up to the soil surface, and thus increase in size. Whereas they aren't able to do so at the ~8 cm (~3") depth that I tend to plant the s x d parent bulbs at.

When I replanted my 1989 *sophenensis* x *danfordiae* clones (the ones that first bloomed in 1994), I found that some now have over 250 bulblets. The highest was 335! More typically the number was about 150, although in reality it varied a reasonable amount. This is an increase of 3 times over last year's numbers. In 3 more years those bulblets will be bloom-sized bulbs (ie. bloom in the year 2000). Previous years' bulblets have all increased well. Of course the big question for the future is, where will I have the space for them? This year I dug each clone separately and then replanted it back into the same spot in layers (mature bulbs ~7 cm deep, bulblets ~2 cm deep and medium sized in between). There was enough space for this, but next year I will need to double that area by moving nearby bearded *Iris* elsewhere (I'll have to go through the whole garden when they're in bloom, and toss ones that I don't really want).

A quick look at the s x d bulb measurements shows that, although the bulbs increased reasonably well, the second bulb of ones that flowered, is generally not up to bloom size. This means that although there were a number of clones with essentially the expected 8 flowers this year, there won't necessarily be the expected 16 next year. However in some cases the original bulblets are now up to bloom size³, so overall the numbers should be ~16 for the better performing clones (a couple of the 36 clones are poor performers).

Looking back, in 1996 most mature bulbs also only yielded one bloom-sized bulb. A minority did give 2. It appears likely that about half of 1995's blooming bulbs produced 2 mature bulbs (remember some of the clones are not as good doers as others). That was the first year I replanted all of them. At the time I simply measured each of the bulbs and listed them in order of size. For the past two years on the other hand I have individually measured each blooming bulb's new bulbs (normally two, occasionally three). In 1995 I also counted the number of bulblets produced by each bulb. Last year I

³ Only a few of the clones were replanted in their first year of bloom.

didn't bother. It is interesting to note that two of this year's 3 blooming 1992 s x d hybrids produced two bloom-sized bulbs, and surprisingly one non blooming clone also produced two! Some of the factors affecting increase are: weather; crowding; and soil conditions (type, amount of moisture, and number of years growing the same type of bulbs).

I was wondering if there might be any correlation between bulb size and bulbs that didn't produce seeds. I did manage once again to cross all of my important hybrids, but on average only half of these were successful. You might think that bulbs which produced seeds, wouldn't have as much energy to put into bulb increase, and thus wouldn't produce as large bulbs as ones from plants that didn't produce seeds. In particular I was wondering whether this might affect the second bulb's ability to get up to bloom-size. Off hand, looking back at the data I have on hand I wouldn't say there was any correlation. Perhaps next year for a couple of clones I can actively look at this. I'll need to remember to flag which clones produced seed and which didn't.

89-F-4 has an incredible 497 bulbs in total: 4 years after first blooming. I expect 13 of these will bloom in 1998; 36 are one year away of being bloom-size; 113 are two years away; and 335 bulblets are three years away (ie. bloom in 2001). 89-Q-3 has 393 bulbs in total and is more typical of the better doers. I expect up to 17 blooms; 45 are one year away; 82 are two years away; and 249 have three years to go. Of the 17 bloom-sized bulbs, 2 were sent to Wim, 1 went to William, and 1 was sent to Brian Mathew. Interestingly, in three years time, assuming I have all of the remaining bulbs (ie. no others are sold or given out for testing, and I can find room for them), there will be approximately 460 bulbs of 89-Q-3 ready to bloom in the year 2001! And there will be close to 10,000 bulbs in total. Yes, projections like this are a bit like counting my chickens before the eggs hatch, but it does at least give me an idea of where I'm potentially headed; what a difference using the bulblets makes! Roughly 5% of the bulbs are bloom-sized.

	<u>End 1994</u>	<u>End 1995</u>	<u>End 1996</u>	<u>End 1997</u>	<u>End 1998</u>
Bloom-sized ⁴	2	5	7	17 ⁵	58
1 year away	?	1	16	45	95
2 years away	?	8	27	82	249
3 years away	8	36	67	249	700
Total:	?	50	117	393	1102 est.
 If Doubling	 2	 4	 8	 16	 32

	<u>End 1999</u>	<u>End 2000</u>	<u>End 2001</u>	<u>End 2002</u>	<u>End 2003</u>
Bloom-sized	153	460	1,310	3,860	11,460
1 year away	308	850	2,550	7,600	24,300
2 years away	700	2,100	6,300	18,900	56,700
3 years away	2100	6,300	18,900	56,700	170,000
Total:	3,260 est.	9,710 est.	29,060 est.	87,060 est.	262,460 est.
 If Doubling	 64	 128	 256	 512	 1024

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

Interestingly, blooming bulbs typically produce 8 bulblets, but they can have as many as 17⁶, or as low as 3 or 4. Maturing bulbs, and bulbs 1 year away have anywhere from 1 to 9 bulblets. In rare cases small bulbs have 2 or 3 bulblets. As shown by the chart below I soon won't have time to measure and count all of the s x d bulbs.

I just happened to notice that 91-FC-4 is increasing quite well. It's already jumped ahead of 89-Q-3 by a year. It has 7 bloom-sized bulbs, 5 one year away, 31 2 years away, and 135 bulblets, for a grand total of 178 bulbs. Others from 91-FC have between 50 and 126 bulbs in total.

My two best 1987 hybrids, 87-BB-1 and 87-BN-1, again increased poorly: sizes were down considerably from two years ago and prior. Last year I blamed their poor performance on the strange spring weather. It would seem that possibly they've been hit by disease (perhaps from being grown in the same soil for so long: 11 years, though in the first 5 years they were just getting up to bloom size). The 1991 hybrids⁷ are right nearby, and their bulbs were nice and large, just as those two best hybrids had been originally in the spot where they were. I don't know the full story though, since I didn't

⁴ Bloom-sized are ≥ 11 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 clones.

⁵ March 98: 25 are going to bloom (counting the 4 given out for testing)!

⁶ The 91-FC cross this year had up to 25, with several at 22.

⁷ They have only been there for 7 years.

have time to replant many other of the 1987 hybrids in that bed. As a result I moved four of the best clones to fresh soil in another bed. I had thought of moving half of 87-BB-1 and 87-BN-1 last year, but unfortunately I didn't have a spot cleared for them.

This year there were 19 flowers on 87-BB-1, and only 14 on 87-BN-1 (as mentioned near the beginning, a couple disappeared without a trace). I had been expecting 25 and 23 respectively. Bloom count will be down next year due to this year's poor increase, but I expect bulb sizes should begin to pick back up to "normal" at the end of 1998.

Overall, Reticulata increase wasn't as bad as I had been expecting earlier in the year after seeing that May was cool and wet, similar to last year. Would you believe it was so cool on June 14th that I had to switch to long pants and a sweater in order to keep working outside!! Normally early June is quite warm, and in some years the tall bearded Iris can "melt" in the heat.

The attached page shows my hybridizing statistics over the years. As you can see 1400 hand crosses were done this year. Unfortunately the Reticulata success rate was down by over 10%, however a respectably number of seeds were still produced.

Approximately 4800 Reticulata seeds were planted along with 3000 Juno seeds at the beginning of October. The seeds were planted in the spot where I had previously had my 1992 hybrids. They in turn were moved to part of the 1993 patch which was a bit sparse on one end (where I had Juno seeds), and of course the bulbs in that area were themselves compacted together. I was even able to secure a bit more room for this year's seeds by squeezing surrounding bearded Iris even closer together than they had been. Ideally I would have liked to have planted the seeds right at the beginning of September, but with sending plants out, plus getting the area cleared and ready for the seeds, any earlier would have been impossible; and that will likely continue to be the reality.

As in recent years, the seeds were "double planted": Reticulata rows 3.5 cm apart, with Juno seeds planted in-between. They were planted shallow just like I have been doing since 1994. Last year I mentioned how the 1994 seedlings heaved out of the ground. This year I checked the 1994 seedlings carefully and found only a couple heaving (in spite of being covered with straw). As last year, I spread some potting soil on top of them. A few 1995 seedlings were also growing out of the soil. Disappointingly 1995's germination was lower than "normal". Since it's right beside the 1994 area, the only explanation for the difference is weather. Yes, there should be a reasonable amount of additional germination of the 1995 seeds in 1998. Prior to looking at these figures I hadn't realized the 1994 germination was only 14%. It's interesting to note that in 1992 my records for 4 years showed net Reticulata germination to be 25% -- I'm not getting that currently, and have no idea why that is. 1996's low number is as expected -- essentially no germination in the first year after planting; in spite of the seeds being planted shallower than they had prior to 1994. The Juno first year germination was a nice hand full.

Of particular importance is the fact that some of the F2 s x d hybrids have germinated. Now all I have to do is keep my fingers crossed for another 2 years and hope that some interesting plants result with pleasing yellow & blue mixes.

Unfortunately none of the Armenian Caucasus Alba Retic x self germinated. The only consolation is I do have one "Yuksekov" x Armenian Caucasus Alba Retic coming along. This F1 cross may only give similar results to the three 91-DV hybrids I currently have ("Armenian Caucasus Retic" x "Yuksekov") -- one of which I particularly like.

<u>Year</u>	<u>Reticulata</u>	<u>Juno</u>
1993	554 out of ~3600 (15.4%)	77
1994	827 out of ~5700 (14.5%)	297
1995	287 out of 3300 (8.7%)	100
1996	9 out of ~6000 (<1%)	76

Figure 2: Germination As Counted In 1997

For Junos, I have only indicated the number of seedlings since I don't know exactly how many seeds were planted (at least half were given away). Of course what's really important is how many of the particularly interesting seedlings germinated. I don't propose to analyse the results any further. Suffice to say the germination rates were at best half those of the Reticulatas, however it does appear that the shallower planting starting in 1994 has helped.

I spent a reasonably amount of time replanting my Reticulata hybrids⁸, along with various other bulbs such as Colchicums, Junos, etc. I wasn't able to do all that I had wanted to this year. By the time I had a chance to get to my 1987 and 1988 Retics, their root growth was already reasonably far along. I decided, that, for the number of bulbs I needed to handle, and thus how much they would be disturbed (eg. how long they would need to be out of the ground), it would be best if I left them alone. Two weeks prior I had gone ahead and replanted my 1985 Retic hybrids. In that case though I was dealing with a smaller number of bulbs, plus with the way I was planting them, I was able to plant each clone almost as soon as it had been dug up. I should have also replanted some of my bearded and beardless Iris beds, but I didn't get anywhere on that. It seems like every year I'm getting a bit further, and further behind. I should be cutting back, but I'm not. Instead I still keep acquiring quite a lot of new bulbs. This year I placed a large order for the first time with Hoog & Dix; they were the only source for a couple of Tulip species that I had been wanting for some time. I also placed a number of smaller orders with a number of other bulb firms.

As you might guess the result was they took up more room in the garden than I had expected / hoped they would. I'm not sure where I'm going to plant next year's seeds. I am running out of room to reuse. I do like all of the other bulbs I have and don't want to get rid of any. What I need is to find customers to buy my surplus. The "catch 22" is that attempting to sell them would take up more of the time I have so little of. With many bulbs, 1 to 4, or as many as 8, are not a problem for a given spot in the garden. It's when the roughly doubling continues beyond that, that their numbers can be a problem. Smile: it's terrible having a problem with too many bulbs; normally it's the other way around (there are some beautiful things that increase so slowly that I can only dream of ever having a problem with too many).

I have had great difficulty setting seed on *histrio*. There was one pod that I know of this year, but it disappeared by the time I went to collect it. I have no idea what happened to it. I only tried a couple of crosses since ones made in previous years didn't work, or similarly I never found the pods (selfs and with *danfordiae* pollen). Yes, I did dig down since *histrio*'s pods form underground.

All of the progeny from my "Armenian Caucasus Retic" x *histrioides* are quite lovely and very similar in colour (as you generally expect from crossing two pure species). A few clones are a bit bigger than others. One would be worth introducing; there are currently two clones from different crosses that I have my eye on. Time will tell how well they increase, and which is the best. For the moment I will keep all of the clones from the crosses. As mentioned above, I have found that it takes a couple of years to fully evaluate a cross. It's just too bad these are sterile, and thus I can't go any further with them; but I knew that would be the case when I made the cross.

A 1993 seedling with a variegated leaf had its variegation reduce as the leaf matured. I'll have to try to remember to see how it does next year. Certainly it's not nearly as distinctly variegated as the variegated clone I had previously.

I was quite surprised when I start flipping through my spring 1997 'Rock Garden Quarterly' (North American Rock Garden Society), and who did I see... none other than William van Eeden! One of the pictures shows him with his Erythronium seedlings. A black & white picture shows him in his wooden clogs beside an old bulb planting or harvesting machine. Wim de Goede is also pictured in a black & white photo, though unfortunately his back is to us. He has an article in the issue about commercially growing hardy Californian natives.

The 'Blue George' bulbs William sent me last fall came up quite well. I must say I'm quite surprised at how thick its flower petals are. Given that 'George' is from *histrioides* x 'J.S. Dijt', and thus sterile, I had previously assumed 'Blue George' would also be sterile. This is why I never tried to hybridize it. William had sent me 2 bulbs of it in 1991, but they have since died out. At the time William mentioned 'Blue George' was "a mutated 'George'". Just to be sure I made some crosses onto it. They appeared to be setting seeds, but the pods withered after a couple of weeks, so it looks like 'Blue George' is indeed sterile as expected. I did also try to use its pollen on one cross, but it didn't work. Next year I should check its pollen under the microscope and see whether it looks good.

I wouldn't be surprised in the least if 'Blue George' is a tetraploid or hexaploid. Its flower parts are just so incredibly thick. I've never tried selfing it, but I should... just in case that works.

William wrote, "...it has also the same sensitiveness for illness as its mother." It was never introduced.

At the NARGS eastern study weekend held in Toronto at the end of January 1998 I was quite interested to learn from Brian Mathew that 'George' is a triploid with two sets of *histrioides* chromosomes. I never would have guessed this. As far as I can remember its petals aren't any thicker than those of any other Retic, so I dismissed it and other *histrioides* hybrids as being sterile due strictly to their $2n = 8 + 10$. 'George's wide fall blade is of course from *histrioides*.

⁸ I got about half of the 1989 hybrids replanted (primarily the s x d clones), plus all of the 1990, 1991, and 1992 hybrids. I hate to think about how much work there will be next year, but at the same time I'm looking forward to seeing how many bulbs I'll have.

It was interesting to read William's comments that, "Harmony' is the one most used for forcing in pots in Scandinavia."

Back in 1995 I sent William eleven of my hybrids, in part to hear what he thought of them, but also to see how they would do in Holland both in terms of increase and consistency of bloom. With some, particularly 1989 clones, it was a bit of a catch 22 at the time because, although I wanted to find out this information, I only had a small number of bloom-sized bulbs, and I wanted those for hybridizing. As a result, the 89 clones I sent William would have required a year's growth to get up to bloom size. Many of the 1987 hybrids however should have been large enough to bloom (I didn't record their exact sizes). Unfortunately William didn't have time to record blooms or report on bulb sizes. In the summer he wrote, "I am very sorry, I have to say I don't know your [seedling] numbers any more. I put them on plastic labels with a permanent marker and then buried them totally under the soil. That is because of an army of cats use our garden as a cat box, and especially in the spring it is their local town centre for scratching in the sand." William returned the bulbs this fall so that I could count and measure them, plus when they bloom I'll be able to identify which is which. Until then the bulb counts are meaningless. There were only 9 clones, however in one case the large and small bulb had to be tossed because a dark green powdery fungus inside the bulb coat consumed them. Thus, 3 didn't survive. Several had 10 bulbs, 4 of which were small, which potentially means they were increasing at a rate of 2.5 times (some of the bulbs were quite large).

	<u>Doubling</u>	<u>2.5 Times Increase</u>	<u>Tripling</u>
originally	1	1	1
end of first season	2	2 bloom-size + 2 smaller	3
end of second season	4	6 bloom-size + 4 smaller	9
end of third season (est.)	8	16 bloom-size + 12 smaller	27
end of the fourth season (est.)	16	44 bloom-size + 32 smaller	81
end of the fifth season (est.)	32	120 bloom-sized + 88 smaller	243

Figure 3: Rates of Bulb Increase

Notice that differences in the rates of increase only show up to any real degree after the first few years (end of the third season). Also remember that there may be a few other smaller bulbs being produced that take more than a year to get up to bloom size. Notice also, that the 2.5 times increase is giving that number of bloom-sized bulbs; the actual number of bulbs is slightly higher.

I sent William six more hybrids this year. Five were bloom-sized. Most were different from the ones I sent Wim. One was 89-A-1 (*hyrcana* hort. x *danfordiae*) which William may find interesting, but isn't stunning enough to be introduced, though I'm sure some people would like it.

In his letter William also wrote, "I don't advise you to register any of them. I will try to explain why. Indeed all the flowers are beautiful, in fact there are no ugly flowers, but unfortunately the trade is not interested in more varieties. They say we have Retic varieties enough. When we put a new variety in, we must take another out. Only an exceptional new exciting one will do, so bigger, or brilliant spectacular coloured ones will have a chance."

I do understand how William can think of my hybrids as not being that different from those already in commerce. The difficult thing as you can well understand, is it actually takes a couple of generations to really shake the genes up; and each generation takes 5 years. All of the cultivars that are available are either pure species, or only one generation away from them. I specifically tried to obtain a number of wild collected clones of *I. reticulata* in order to inject "new blood" into my hybrids, and get away from what is already available. However, crossing two pure species gives very similar progeny. It isn't until the second generation that the expression opens up considerably, assuming the parents don't have similar expressions ie. using two blue species, you can't expect much beyond blue progeny no matter how many generations out you go.

I would love it if I could come up with some real mouth watering winners right away, ie. like 'Katharine Hodgkin' was (*histrioides* 'Major' x *winogradowii*). That though was real luck, just as my *sophenensis* x *danfordiae* crosses have turned out to be, though the first generation results are not nearly as striking -- the potential is there however for future generations, but it will be a matter of getting the yellow and blue to show up in just the right amounts; and even better if there was just the right amount of veining and dotting. I have made quite a number of successful exciting crosses in my over 10 years of working with *danfordiae*, but it's only the *sophenensis* x *danfordiae* crosses that have amounted to anything significant so far (I do of course still have more crosses between the two still to bloom). Essentially only 6 years worth of those crosses have bloomed so far. Many of the other seeds involving *danfordiae* haven't germinated. One *danfordiae* x *histrioides* that bloomed this year turned out to be just *danfordiae* -- disappointing.

One surprising fact: I don't believe any of the lovely large "Armenian Caucasus Retic" x *danfordiae* seeds have ever germinated; and that speaks of ~590 seeds from 35 crosses over the past 10 years. I did again make one more cross this year which yielded 36 seeds, but given the results to-date I don't hold much hope for them.

In a sense hybridizing is one failure after another: exciting crosses that don't work; seeds that don't germinate; flowers that aren't as excitingly different as I would have liked them to be; cultivars that don't do as well as I would like. **However**, I am fairly happy with where I am currently. I do have several clones which I believe are fairly good, and of course I believe the future holds lots of promise. I am a tad disappointed that 87-BB-1 and 87-BN-1 haven't done as well over the last 2 years as they did previously, but they had showed very good performance, and I am confident that it will return. What I need to do now is market the good clones I have, and get something in return for all of my hard work: money and recognition (would be nice). Marketing is something I simply do not have time for. I am actually at the point where I really need to cut back, not get into more things; especially with spending much of my time working for the soon-to-be-split-up Ontario Hydro. I definitely need to find other people who can market my clones. Worst case what I can do is sell them through Potterton & Martin and Janis Ruksans. "Worst case" solely refers to the fact the volume of bulbs would be low, thus I would make very little money from it, plus there wouldn't be as many people enjoying my hybrids as I would like. However, it would build up my reputation and hopefully get people interested in buying my hybrids. If the deal with Wim works reasonably well, all the better. Or failing that, if I can find someone else to market them, great (time will tell how well the relationship works out with Wim. I certainly hope it does, but I'm not assuming that it will be exactly the deal that I would ideally like it to be: specifically I imagine Wim will pick only a couple of cultivars and reject the rest, so then I will need to find additional partners).

In a broad sense Reticulatas are largely blues, purples and wine-reds. If all someone wants is just a blue, any blue, then the clones already in commerce will do quite nicely. If though, the person is selective, then there is a chance some of my hybrids will be what they want. It's interesting that very few Reticulata varieties reach the Canadian market. I can buy William's 'Natascha' from a local bulb retailer, but that's it in terms of his hybrids. *Danfordiae*, *I. reticulata* hort., 'Cantab', 'Harmony', and 'J.S. Dijt' are also available. I don't believe this firm has ever had 'George' or 'Gordon' for sale, not to mention 'Edward', 'Ida', and 'Michael'. 'Natascha' retails 9 bulbs for \$12.95 plus taxes and shipping. The others are \$9.50 to \$10.50 for 25 bulbs. This certainly does not reflect the low wholesale prices in Holland over the past 2 years. It also doesn't tend to encourage gardeners to just try them for the heck of it. 12 bulbs for half the price would give a reasonable number for what seems like a lower price, and the customer might be more able to afford two different varieties, even though the total price is the same (taxes add another 15%, and postage and delivery is about 12%). The building supply chain called Home Depot with its huge hardware / garden centre stores had 'Purple Gem' available inexpensively this year and last: 12 for \$3.00

In a broad sense my hybrids are going to be somewhat similar to those already in commerce just by default, since the parents are also those colours. Part of my aim is to produce clones that do better in the average gardener's garden. Clearly the fact people find they have only a few leaves coming up after 3 to 4 years says this is needed. They certainly aren't going to buy more Reticulatas if the ones they already have do somewhat poorly after the first or second year of bloom. The other part of my aim is to produce new, exciting, and different colours and patterns. In bearded Iris this was somewhat of a slow process, but it is how yellows were modified to give beautiful vibrant orange, and soft pure pink. In less than 100 years bearded Iris went from limited range of yellow and red-purple dash-hound ears, to a rainbow of colours on large showy, ruffled flowers. Not nearly as much improvement is needed with Reticulatas since they are already quite beautiful. But certainly new colours and patterns are needed. I like many of the Retics in commerce, but at the same time I'm longing for something new. Ameenons would be nice for example (white standards and coloured falls); page 60 of Martin Rix & Roger Philip's 2nd edition 'Bulbs' shows just such a Retic from the wild.

Ideally price will drive demand. William is right in a sense, when a new variety is introduced one must be removed. 1) Essentially what this says though, is the market is fixed. That's not really true. It may seem that way; especially for the wholesale market. What needs to be done is promote new, different varieties and cause demand to increase. This promotion needs to be done at the retail level. It won't happen by itself, and it won't happen by just selling into the wholesale market. Even if the market was fixed, one could try to sell hybrids as "New - Improved", or "New for 1998", and in effect take away business from other growers / varieties. Price and, supply and demand, will decide who wins. 2) New **improved** varieties should drive out old poorer performers (assuming they are indeed improved). It's sad if the market doesn't allow this to happen. Of course, a poor performer in one set of conditions may be a good doer in other conditions. With existing cultivars it is a case of is 'Pauline' better than 'Purple Gem', or vice versa? We only need one, but if they both prove to be commercially viable then that's fine. Certainly there's no need for retailers to carry both, but there's nothing wrong if one retailer carries one, and another carries the other.

A new variety just for the sake of being new won't go very far due to price: its price obviously has to be somewhat high since it can't be supplied as cheaply as an existing variety. I believe my 87-BB-1, 87-BN-1, and 87-DQ-1 though are different and should be introduced. The *sophenensis* x *danfordiae* hybrids are very *histrioides*-like. I can see the idea of those being much more questionable since *histrioides* is already available in large quantities. If however they prove to be extremely good doers then they should be introduced (ie. better doers in the average garden). At the very least they have a novelty appeal because of their parentage and hair-like standards, so they should be introduced via perhaps Potterton & Martin (no, I haven't yet talked to Bob Potterton about this; the numbers I have currently make this a bit premature, plus of course I need to see what develops with Wim).

I certainly have no intent of trying to replace 'Springtime' or 'Clairette'. I have some similar looking clones from 'Cantab' x *bakeriana*, but they are nothing special; in fact their falls twist a bit. I have made crosses with them as well as with *hyrcana*-like seedlings (*hyrcana* x *bakeriana*), only to see what the F2 progeny are like. In both cases I'm looking to see what comes through from the *bakeriana* side. *Bakeriana* is a wonderful species, but it just hasn't done well here. *Histrioides* is another species I've had trouble with, though it would possibly do better if I replanted it (and other Retics), every 2 years or so (I've only ever had time to do this with my hybrids).

Many of my hybrids have the "Armenian Caucasus Retic" as one parent since its proved to be a good parent. I've deliberately tried to cross these reddish clones with blues. Otherwise of course most of my hybrids will come out looking just like it; particularly because of they are so close to the species level. I'm now using Janis Ruksan's blue "Talish" a lot, but the "Armenian Caucasus Retic" parentage dominates by far.

William suggested that I could make presentations at garden clubs, alpine societies, etc. in order to promote and sell my hybrids. I would need to have bulbs available for sale right there though, otherwise the audience would likely just buy the commercial Retics and not my hybrids. Plus having the bulbs right there would mean people would not have an excuse not to buy them (often people say they will do something, and they may indeed have good intentions of doing it, but it turns out, for whatever reason, that they don't). The main problem with lectures is it requires time, and I actually need to cut back -- I still have about 14 years to go before I can retire from Ontario Hydro with a pension. I've got too many high priority things I can't get to as it is.

William also suggested that I should contact a botanical magazine about my hybrids and see if they are interested in doing a write up. This is an excellent idea, and one I will definitely have to follow up on. At the moment though I need to build up stock of my hybrids to the point where I have a reasonable number to sell (its no good generating interest when you don't have enough product to sell). Of course the catch 22 is I don't have much space for building up stock. For the moment, I can still increase the number of bulbs of particularly good clones within a seedling area and reduce that of the others.

Either in 1998 or 1999 (more likely) I should send some bulbs to people who show Reticulatas at Royal Horticulture Society shows. It's just a matter of having enough bulbs to spare (at least half a dozen), as well as getting the person to sign an agreement not to distribute them to anyone, not to use them in hybridizing, etc. Cost to me would be at least \$20 each: for the phyto and postage.

The "trick" is to bring my hybrids to the attention of people who are most likely to be interested in buying them. There will be various people interested at various price levels depending on how distinct the clones are.

Given the magnitude of my hybridizing and the success I've been having, I will likely have quite a few good clones to introduce over time (certainly I have a number of good ones already). As a result, I would ideally like to find someone to partner up with on an ongoing basis. The question becomes one of: "will I be able to find someone who can sell the cultivars into all markets"? I believe there are a number of markets for my hybrids. It's partly just a matter of developing those markets. The two main ones are: 1) the "large scale market" which in particular could do with new clones that are different from the ones currently available, and 2) the specialty market for things that are unusual, but that aren't able to make it in the first market. At the very least my F1 *sophenensis* x *danfordiae* hybrids would fit into the specialty market, though I believe they have large scale potential, and it's actually the two or three clones with a fair amount of yellow influence (eg. the grey or "muddy" clones), that could be sold in the specialty market (ie. they are different, but not really beautiful).

I also believe several other markets could also be developed. One is like the market for new bearded Iris hybrids (or daffodil varieties), where many new cultivars are made available every year by a reasonable number of hybridizers. The trend is toward continued improvement in colours and patterns, hardiness, petal thickness, etc. and other characteristics such as lacing, which doesn't apply to Reticulatas. There is a group of people who are always looking for something new, especially if they find that the plants do well for them. These clones have a much shorter life span in commerce: perhaps only ten years. By that time other similar but better clones along the same line have become available. Another market is in hardier, more robust varieties that do well in certain areas of world. I say this thinking of two clones I have, which to me are not spectacularly attractive, but that seem to be quite good growers. These two would likely be good for the people who complain that they have tried Reticulatas, but found that after 3 or 4 years all they have are a few leaves coming up, but no flowers. Ideally I would like to see those clones introduced into the North American market (presuming they continue to do well). Ideally they should be tested widely to assure that they do bloom well in those more difficult situations. So far I have only grown them in one spot in my garden.

The success of these markets is dependent on how good the distribution channels are, or can be developed. We need to drum up business, and create interest for new Retics. Certainly some of my bulbs could be sold into the Canadian market using a slogan like "New Canadian Hybrids", or "Robust New Reticulatas Bred In Canada".

I wasn't surprised when Wim didn't express interest in the *sophenensis* x *danfordiae* hybrids because I had previously heard from William van Eeden that he felt there were already enough blue Reticulatas in commerce. He mentioned this over 10 years ago in connection with a seedling of his that I quite liked and happened to buy in a batch of mixed seedlings through the English subsidiary of Walter Blom. Personally I still quite like that clone of William's, and I do think there is a market for it (though it isn't as good a doer as one would like it to be). I certainly don't see it as a case of too many blues. From my point-of-view the difficulty is in getting new varieties out to the right retailers. If the public could see William's hybrid, I think they would buy it (its fall blade is a lovely dark blue from *bakeriana*). The problem is they aren't able to; thus they don't know what they are missing.

I should also mention that I believe the specialty market would be interested in collected clones, such as BM11026 and the "Armenian Caucasus Retic". Janis Ruksan's "Talish" and "Tbilisi" clones are also good ones. They probably need a wider distribution though. Janis has a certain clientele that don't mind the extra expense, documentation, etc. associated with ordering from overseas companies, but there is probably a group of enthusiasts in England for example, that might buy those clones if they were available locally, such as from Potterton & Martin.

This is my current outlook. I certainly realize I don't know the bulb market well, but the main thing is I see lots of potential for my hybrids. I felt it was worth mentioning all of the above so you have an understanding of where I see my hybrids going. It would roughly appear that every year I have 2 or 3 cultivars worthy of introduction; sometimes more, sometimes less. We need to market the good clones as soon as they become available relatively speaking (ie. recognizing it takes a reasonable number of years to build up stock), and get whatever money we can from them. Ideally with all of the seedlings I have coming along there will continue to be newer, better, and more exciting cultivars flowering by the time we release our first variety. That though shouldn't stop us from releasing each of the good varieties as they become available.

In the fall I received a letter from Jan van den Berg expressing his interest in evaluating my hybrids (he speaks of representing a group of Reticulata growers). Previously in the summer I had sent him information about my hybridizing work, along with pictures of some of the clones. I am going to follow up with Jan since I don't know how well the deal with Wim will work out. I certainly do believe I have some Retic hybrids worthy of introduction, but it will be interesting to see which ones, and how many, Wim is willing to introduce (as well as how successful he'll be with his efforts -- but it will be a long time before we know that). For the moment I am going to proceed on the basis that Wim probably won't be wanting the F1 *sophenensis* x *danfordiae* clones; especially with having the other hybrids that he will likely be more interested in. Thus I should try to see if other parties might be interested in them. Now that the number of bulbs is increasing to a reasonable number I intend to send some to Florence in 1998 for the Iris competition (I need to find out specifics about this). As well, in either 1988 or 1999 (likely the latter re building up stock) I hope to see if someone exhibiting Retics at RHS shows would be interested in giving a shot to showing a couple of mine.

I now have a contact in Australia by the name of Shane Willis who many be able to help market my hybrids there. Again it's a matter of what deals I strike with everyone, and what markets they cover, that will effect where I go with Shane, along of course with how well the hybrids do there. In case you aren't aware, Australia has the harshest plant import requirements that I know of. All plants have to be quarantined, plus the costs associated with this are prohibitively high for individual gardeners, making importation of plants virtually out of the question. It also means that bulb prices are significantly higher than outside the country, plus selection is very limited!

Ron Goudswaard of Wellington, New Zealand [bottom of North Island] wrote, "the first Retic to open was 'Gordon' on July 22." Generally Ron's bloom lasts until the end of August. In 1995 he had two *histrioides* open slightly earlier: July 6th and 17th. I'm not sure yet whether this is typical or not. I don't believe Ron has mentioned *histrioides* since then, so it may not yet have bloomed again. It would be interesting to see when some of the earliest varieties here, such as *hyrcana* hort., "Talish", and diploid *danfordiae* would bloom for him. It could turn out that bloom for him runs for close to 2 months. He does have the commercial triploid *danfordiae* in several spots in his garden, but they simply remain bulblets.

It's at the end of October that the Retic leaves die down for Ron.

Ron reported that for 1993 the lowest temperature in July (their winter) was 1°C, while the highest was 20°C. I have asked him to make detailed records of highs and lows for next year, in order to get a clearer idea of what temperatures are like coming up to, and during bloom time. As well it would be interesting to know how much rain the bulbs get since he doesn't have the snow melt that they would get in the wild. Perhaps from this information we will be able to see what triggers the bloom, especially when it's potentially stretched out to almost 2 months, without any freezing temperatures to put the Retics on hold.

Ron said, "Because Reticulatas are relatively expensive and take careful care, anybody who has got any covets them and doesn't want to share them. Even those people that are relatively successful with them never seem to have more than they want." Some of Ron's Retics are grown in pots, but he has many in various spots around the garden. "As soon as I

build up numbers in a pot I start transferring the bulbs into a garden setting. When I have a garden setting where the bulbs do survive I stop the pot culture.” Ron finds that often, but not always, Retics bloom only ever other year.

In New Zealand most Retics retail for about \$3.00 each. However *winogradowii* is only \$10, while 'Katharine Hodgkin' is 3 for \$2.50; they go for at least twice that in England. I suspect the biggest difficulty is to find specific varieties you might want. Unlike Australia, it is possible to import bulbs, however import permits cost \$65 per country.

Ron mentioned a Reticulata named 'Baby Blue', which I had never heard of before. Philip van Eeden of Van Eeden Tulips in Invercargill (bottom of South Island) was able to clear up the mystery: “the wholesalers in New Zealand made up the name because they didn't like the name 'Harmony'.” I shake my head. Thank goodness this practice of renaming is not wide spread. Can you imagine the confusion it would cause! Surely the name 'Baby Blue' isn't going to generate that many more sales than the name 'Harmony'.

In early July Ron wrote, “Dunedin [South Island] is a good month behind our bloom season. I am not sure about their Reticulatas, but their Evansias were still in full flower at the end of November and their tall bearded ones were only just starting to open at the end of November last year.

Robin members in Auckland [North Island] report they don't try growing Reticulatas -- it's too warm. Auckland is also decidedly wet in summer, and so is Dunedin for that matter. I didn't see any Reticulatas in Dunedin last year.” Ron however adds, “Bill D yke at Daffodil Acre in Tauranga [150 km southeast of Auckland] must have a lot of Reticulatas. One year he supplied our local group with Reticulatas and although the clones are all wellknown varieties, most of them were not ones that he advertises in his catalog.

Unfortunately he is not much of a writer, but two of our Wellington members have seen his operation and report he grows all of his Reticulatas in barrels, some half a metre deep, in very free draining soil mixes.”

“Our Wellington climate is variable, not so much year by year, but by micro climate. We bought our house because it is in a warm sheltered location. It can be a cold windy day where I work and yet when I come home for lunch I can find my wife outside in the garden enjoying lunch in the sun. The first time it happened I thought the weather had improved. Until I went back to work and discovered it was still a cold damp blustery day. And where I work is probably less than 4 km from home.

We are a bit like E.A. Bowles when he wrote about his garden ie. we can often look out and see it raining on the hills all around us, but our little valley is bone dry.

In the colder parts of Wellington there are usually 2 or 3 frosts a year when they record a ground temperature of -9°C. Our garden probably doesn't get below 0°C.”

Earlier in the year Ron wrote, “I think our real problem is keeping them dry and fungus free for the warm extended summer period.” “I have been planting mine in areas that are not irrigated in summer and tend to get / remain dry. Those that vanished this season were in pots and I was probably too late moving them under the eaves of the house. I think I was afraid they might get too dry / desiccated.” “This summer has been notable for periodic rain.”

In late 1996 Ron observed, “it was no surprise to discover that the longest leaves were on those Retics growing in part shade under the edge of deciduous trees. But I was surprised to discover that those growing in moist retentive (but still free draining) soils in almost full sun were not far behind. The shortest leaves were on Retics in full sun and heavy [compacted] soils which light rain had little or no penetration.” However as Ron found out, long leaves do not necessarily translate into large bulbs: the bulbs in moist retentive soils were noticeably larger than those in shade. “The worst growth was on those in compacted soil.”

“When Retics are grown in a soil mix with excellent drainage they are prone to drying out, even more so when grown in pots. And I know here in Wellington we usually get at least one spell of fine sunny weather in spring with no rain for three weeks.

Reticulatas produce only 1 leaf and that one leaf has to generate all the food required to produce a new bulb for the next season. It is essential that the leaf grows unchecked and remains green for the maximum length of time if the bulb is to have any chance of becoming large enough to flower the following year. The conclusion I have come to and the practice I have begun to follow, is to liquid feed the Reticulatas every ten days or so, both those in pots and those in the ground. It seems to be working.”

In the past I have expressed surprise at finding Retics that appeared to be growing under snow cover when the ground should in fact be frozen solid (at least this is largely true of the period from January to March). Our coldest temperature in the early morning hours can be -25°C, though this past winter we didn't get it quite that cold. Our fall rain starts in late

September. Sometime around then the Retics start their root growth (I don't know exactly when since I've never recorded any data; I did find that by the of October root growth is quite heavy). We can get snow as early as the latter half of October, but it never lasts more than a day or two. Snow is generally expected in December, but lately it hasn't stayed permanently on the ground until after Christmas. Normally Retic Flower buds are still below the soil surface, but last year quite a number had broken the surface before Christmas. I was expecting that at the first sign of warm weather they would explode into bloom (even if it were just a brief warm spell). Fortunately they didn't.

I believe Ron's Retic "problems" lie largely on the bulb regeneration side. During our summer the bulbs are very dormant (mid June to about mid September). Yes, the cold winter temperatures likely help keep fungus at bay, but I don't believe when the young tissue is in growth that it is as susceptible to fungus. The problem for NZ is likely that the ground remains moister during summer than the bulbs are use to in their native habitat.

I still believe one secret to good bloom is keeping the bulbs in growth as long as possible. Another is good, reasonably well drained soil (ie. not allowed to stay too wet), which is kept reasonably loose (replanting every year or two should be good enough; assuming one doesn't walk on it). A feeding of fertilizer is likely helpful, but I haven't experimented with frequency and amount, or timing (in my case, its: when I think of it). As well, replanting is a necessary evil if you are wanting to get good increase. At a point in time, the bulbs will become too crowded for them to do well, even if you're giving them optimum conditions. Crop rotation should be practiced. It is something the Dutch do, but it's a luxury I can't afford: too much additional work, plus I don't have the space that would be necessary. Planting depth can be a factor, but this is really only important for small bulbs and bulblets.

Invariably you will find differences between Retic clones in exactly which conditions each optimally prefers. In a sense you could say this is personality differences ("sorry guys, around here you all get treated the same"). Certainly I find quite a performance difference between my best hybrids, average ones, and poor doers (ie. minimal increase but nice flowers). A true measure of success comes after 5 or more years of growing a variety. I say this from experience. You can have some clones seem to be doing well, for 2 or 3 years, only to have them wiped out.

My lovely white Armenian Retic appears to be a poor increaser. It bloomed in 1994 and 1995, but has not done so for the past 2 years: the bulbs weren't big enough. Of course it was in with bulbs I purchased in either 1989 or 1990, so it took 4+ years to bloom the first time. After it bloomed in 1994 I moved 2 bulbs to the present location (in with the 1987 hybrids), and left one in the original spot. Obviously one of the two had been large enough to bloom, and it simply may be a case of not liking the present location. In fact, if you think about it for a moment, you realize that the bulbs in the 2nd location have never increased up to bloom size. They are now 8x10, 5x6, 7.5 and 5 mm in size, none of which are big enough to bloom. I sent Wim the largest and smallest for evaluation. I may also have 11x12, 4 x 6 mm and a bulblet in the original location (there is a chance these may actually be the normal form, but I should know next year since the larger bulb should bloom). Unfortunately none of the 15 seeds from selfing the clone in 1994 have germinated. The goal had been to try to produce a more vigorous white. A self in 1995 didn't work. I'll try again when next it blooms.

In 1991 Otto Fauser in Australia kindly sent me some bulblets of his 'Polly' (*I. reticulata* hort. x *winogradowii*), named after Rear admiral Furse's wife Polly. I have a single bulb of it growing at the front of my house very near my *winogradowii* bulbs. Unfortunately it is still only 10 mm in diameter. I wonder if it will ever increase enough to bloom? It is growing very close to *winogradowii*. I don't want to chance moving it for fear of loosing it. If and when it splits I'll move one of the bulbs.

Just to give you a little insight into the realities of being a commercial bulb grower, I'll pass on the following comments from William van Eeden: "1997 bulb yield seems to be an overall failure: low increase, and shortness of big bulbs for Alliums, Crocus, Reticulata Iris, Tulips, and many other bulbs. I bought 35,000 Allium 'Purple Sensation' measured as 12 cm as every year. This week I got 3,000. That was all. I can get only 32,000 smaller ones. The growing season was not favourable for bulb growth: strong winter without snow; spring very dry with mostly north wind instead of the usual southwest wind."

I'll just remind readers that other areas of Holland may have had better results.

William's experience with Allium 'Purple Sensation' is extremely disappointing I'm sure. It's one thing to get only low profits, but another entirely to suffer a loss. One shakes their head at realizing they would have been better off not to have planted the crop at all.

It is unfortunate that garden propagated collected Reticulatas are not more available commercially than they are. There were only two sources for them this year: from Janis Ruksans, and Monocot Nursery (Mike Salmon). Janis Ruksans had diploid *danfordiae* and *I. hyrcana* "Talish" available. Monocot Nursery also had a wild *hyrcana* available, which unfortunately was sold out before I could get any. As many of you are aware, *I. hyrcana* is actually a form of *I. reticulata*. The fact that *hyrcana* is a blue Retic is not enough of a distinguishing feature to make it a separate species. As you've just read, a number of wild blue Retic clones have taken the name *I. hyrcana*. Myself, I only use the name "I.

hyrcana” for the Dutch horticultural form that has been available for many years. That aside, Janis’ form is quite nice and it contains at least 3 distinct clones: a blue with orange pollen; a light blue with orange pollen; and a blue with white pollen. There may be a light blue with white pollen, or I may have gotten it mixed up with the light blue that actually has orange pollen. The blue with white pollen appears to be the more robust clone.

I was surprised and saddened at the loss of two particularly lovely *kolpakowskianas* for no apparent reason (no trace of them). I had considered them to be my two best clones (one had purple standards and styles, while the other had light blue ones). A smaller *kolpakowskiana* bulb right in front did fine. Surprisingly none of the *kolpakowskiana* bulblets seem to have come up. I had forgotten about them at bloom time so I didn’t think to look for them. It was only at the end of the year when I was counting and measuring various bulbs that I looked back at last year’s results and was reminded about *kolpakowskiana*’s bulblets. Next year I will try to remember to check up on this year’s bulblets.

At the time my other *kolpakowskianas* came up (in other spots in the garden), I felt they were doing poorly -- for example their leaves seemed narrower than they should have been (than they were last year), and only two bloomed. I had expected them to do much better based on last year’s bulb sizes: I actually would have guessed there would be at least 7 flowers (9 counting the two that disappeared). This year bulb sizes were down a bit, except for two that were planted on a mound where the bearded Iris *toachia* survives (I find it very susceptible to rot, but it does well there). The 30 cm high mound of earth is sitting off to one side on our patio, and is edged with some old clay bricks. I now have two smaller *kolpakowskianas* there as well.

Two Retic hybrids have recently been introduced into the trade. *I. reticulata* Alba is actually one of William van Eeden’s seedlings from similar breeding to ‘Natascha’. Using the name *I. reticulata* Alba, which suggests it is a pure species, is misleading. The other hybrid is ‘Alida’, which William was able to tell me is a light blue mutated ‘Harmony’. It was registered by Henk Kroon. William also mentioned that there is a purple ‘Harmony’ that has been named ‘Pixie’ and should be making its way into the trade within a year or two. As well, a clone named ‘Margarita’, which has variegated foliage, is being increased for introduction, but I don’t know when that will be.

Michio Cozuka of Nagoya Japan purchased some Reticulatas and Junos from me in 1995. In November he reported, “at the end of December 1996 new leaves started coming out of the ground and grew to a height of 10 to 15 cm. The buds appeared soon after the leaves came out and grew up well at the middle of January 1997. The first flower was of 87-BX-2, which opened on the 5th of February. Next was ‘Katharine Hodgkin’. One after another the Retics opened, with one cultivar generally keeping its flowers for two weeks. I had a good time this spring enjoying the Retic flowering until the middle of March.

The leaves grew up well after flowering, up to 30 cm or more high, and died at the end of April to beginning of May.

The Retics had too much flowering I suppose, as they had smaller bulblets this year. So I changed and fertilized more than half of the soil, and I planted the bulblets this morning [Nov 21] as a rain-fall is forecasted tomorrow along with a fall in temperature to 17°C, and a few days later down to 14°C in daytime.”

Junos

The weather in May was 5°C cooler than normal. This didn’t affected the Junos, since they all bloomed when they normally would have, with the main bloom starting May 2nd. In the first 15 days of May we received all of the rain we would in a typical May. This weather was similar to last year’s, which generally yielded poor Reticulata increase. On one hand you might think the cooler temperatures would be of benefit, since they extend the normal growing season and give the bulbs more time to bulk up. One thing to keep in mind, even if the increase was more typical, because the bulbs from last year are smaller than they otherwise would be, the increase in terms of numbers of bulbs will not be as high as it typically would. I was able to confirm this at the time simply by looking at the number of leaves coming from each bulb and seeing a lower number. Because of last year’s poor increase I applied fertilizer twice during this year’s growing season in hopes that it will help. June’s weather continued to be a bit cool: so cool in fact that on June 14 I had to switch to long pants and a sweater in order to keep working outside: unheard of!!

Aucheri hort. bloomed quite well, but the lovely Kew clone 78.3630 didn’t. Goodness only knows why. Overall I would say *aucheri* bloom was down a bit. As to whether this was due to last summer not being as hot as usual, or the bulbs becoming too crowded, I’m not sure. Certainly the latter is not true in the case of the Kew *aucheri*.

The interesting *bucharica* formas are continuing to do well (pale creamy yellow with characteristics similar to *bucharica*). The two clones that bloomed last year did so again. As well, a third clone that I have had for 5 years bloomed for the first time. It is clearly a different clone from the other two. They are all quite nice, and enjoyably different from the “common” *bucharica*.

Willmottiana (true) continues to do well, however a few bulbs did not bloom this year. The only disappointment was a squirrel got a lovely darker blue clone that I had obtained in a batch of collected bulbs from Janis Ruksans in 1993. Why did the squirrel get that clone and not another one instead?!### This happened early in the year, well before the other squirrel problems started (see Pests below). A few more *willmottiana* seedlings bloomed. The seed had been sent under the name *kuschakewiczii*. They showed some variation in the pattern of blue and white on their falls, as well as intensity of blue (no really dark blues though).

I received a copy of Hoog & Dix Import's 'Descriptive Catalogue Of Bulbs And Plants', and was quite surprised to read under Iris "*willmottiana* Alba":

"Received from Dr. G.I. Rodionenko who said it had been collected near Duschanbe in 1968."

I thought the commercial clone went back further in time than that -- the American Iris Society 1939 Check List indicates that it was registered (or listed in a catalog) in 1936. It was mentioned in BIS 1950 yearbooks (1957), so I had always thought the clone in commerce was the original 1936 one. The mystery deepened when Jan Dix E-mailed: "We do not know what has happened to the original stock of Iris *willmottiana* Alba raised by Van Tubergen. The present stock was received from Mr. Maurice Boussard in 1968 and originates from Dr. Rodionenko." Maurice in turn replied, "I got my bulbs from the late Frank Kalich of Albuquerque New Mexico in 1965/66. He told me then that the bulbs originated from Dr. Rodionenko so I just reported that to the late Michaël Hoog. It's not very striking, but it is easy. It was even offered once in this country [France] as *kopetdagensis*, which is definitely quite a different species."

Potterton & Martin (P&M) lists *willmottiana* Alba as having "a very beautiful orange blotch." Not so! It actually only has a yellow crest with no blotch at all! If I remember correctly the yellow fades as the flowers age, so I tend to think of *willmottiana* Alba as being essentially white with green fall markings. You might think P&M is selling something else such as *vicaria*, but they were using that same description back in 1983 when I bought my first bulb of it from them (a few years later I got the same plant from two other sources for comparison).

Janis Ruksan's "*graeberiana* Yellow Fall" is very similar to the "Kara Kum Desert" Juno, but ever so slightly different. I have a feeling they are *albomarginata* x *bucharica* hybrids. They are similar to one of my two *graeberiana* x *bucharica* hybrids, but the blue colour is more intense (like *albomarginata*'s blue), hence the suspicion that *albomarginata* was pod parent.

I have gotten *albomarginata* x *bucharica* seeds, and reverse, when *bucharica* - Duschanbe was used (33 seeds in the latter case from 3 of 10 tries; 17 from one cross in the former case -- other crosses involving *bucharica* have been with multiple pollen parents). Reverse crosses with other *bucharicas* as pod parent, have been unsuccessful.

My 1992 Juno hybrids are in a different spot from the 1992 Retics, however none bloomed -- I'm keeping my fingers crossed for 1998. It's very hard to judge whether the bulbs are now big enough to bloom. In particular there are a number of *magnifica* x *warleyensis* hybrids that I'm quite looking forward to seeing.

Important Conclusion: I definitely seem to be getting better results from planting my Juno seed shallower than I had been; though the seedling numbers are still not as high as I would really like them to be! I say this thinking of particularly interesting crosses. It must be remembered that because of the genetic diversity of Junos, it is possible that even if good seeds are produced, the seedlings may be fatal. For example, I don't understand why none of my *aucheri* x *stenophylla* seeds have germinated: not one out of >1500 seeds from 70 successful crosses over the course of 5 years -- they were beautiful solid seeds. I had simply planted them in the ground and left mother nature to take care of them.

Arnis Seisums wrote that he has been successful with making a number of particularly interesting interspecies crosses. I don't know which have germinated, but Arnis has mentioned that none have yet formed bloom-sized plants. The more exotic of which include:

<i>caucasica</i> x <i>microglossa</i>	
<i>caucasica</i> x <i>orchioides</i>	(occasionally gives a couple of seeds)
<i>orchioides</i> x <i>willmottiana</i>	(I've consistently gotten a low number of good seeds)
<i>willmottiana</i> x <i>bucharica</i>	(my crosses were 50% successful)
<i>willmottiana</i> x <i>kuschakewiczii</i>	(I've had only 3 of 8 tries work)
<i>willmottiana</i> x <i>orchioides</i>	(only 1 of 5 worked for me and none of the seeds germinated)
<i>vicaria</i> x <i>orchioides</i>	(my crosses were only 25% successful)
<i>vicaria</i> x <i>microglossa</i>	
<i>vicaria</i> x <i>willmottiana</i>	(only 2 of 20 worked for me; did a bee interfere in those cases?)

Arnis also commented, "since I have had problems to grow low-land species, such as *fosteriana*, *kuschakewiczii*, *persica*, *pseudocaucasica*, *kopetdagensis*, *maracandica*, etc. in the open, I grow them much more successfully in clay

pots which I keep frozen at 0°C to -10°C from December up to the end of February, then in an unheated glasshouse, well ventilated during the above 0°C days. I feel that all Junos must be lifted up and kept dry from the end of June till the beginning of November.”

In an August letter Arnis mentioned, the “species from Aktash valley seems to be *orchioides* - an extremely variable species. It is not the most deviating form [variable species]. I have some collections which show flowers like Mojmir’s “*orchioides*”. It seems to fall in the range of variation of *orchioides*. At any case, representatives of different populations of *orchioides*, each being quite uniform, differ quite well, but much more studies are necessary to solve whether they show a geographic coherence to mountain ranges.”

Re: Juno classification -- yes the hybrids do pass on their seed characteristic, but of course not all Juno species will intercross with each other, and F1 hybrids tend to be sterile due to the diverse genetics involved. *Graeberiana* x *bucharica* seeds are nubbed, just like *graeberiana* for example, though much, much smaller in size (two different sections being intercrossed: Tylosperma with Juno). Note: the reverse cross doesn’t work at all. As you would expect, *albomarginata* x *graeberiana* are nubbed like both parents (both are Tylosperma), and the resulting seeds are of normal size, etc. The same goes for intercrossing species within the Physocaulon section: *nicolai* x *rosenbachiana* and reverse give seeds with a white ridge along their length. With inter-section crosses the tendency is for the pod parent to pass on its seed characteristic. I just can’t say whether this happens all the time; especially so since a reasonable number of species are not in cultivation.

There have been a number of disappointments in the garden this year. Junos in the “hut” are continuing to do quite poorly and losses have been high. I have not planted any new Junos in the hut for a number of years. One fault with the hut is its 3 foot high sides are metal, thus the plants inside don’t get as much light as they would in the open garden.

Two good-size bulbs of *nusariensis* in another spot did not have any leaves come up. The bulbs seemed to be good (nice and firm: I dug down to them and gently squeezed them, trying not to disturb their roots), but there was definitely something wrong. One did eventually make a feeble attempt to put up weak leaves in the summer, but by fall both bulbs had disappeared. All of the surrounding Junos were fine except for bulbs of *nicolai* nearby which didn’t come up. They had bloomed there for several years. Very disappointing! I have no idea why this happened. Going back to *nusariensis* for a moment, four other bulbs I have in a garden at the front of the house were up as per normal. They are perhaps a bit too close to a spruce tree. It may be taking some of their moisture since it’s been a couple of years since they last bloomed (although some *vicarias* are just as close and they have been blooming every year). I should try moving them further out into the open. They do get at least half a day of sunshine. After the loss of the other two I hate to chance moving these ones.

I didn’t have any *warleyensis* bloom this year. The bulbs are in several areas of the garden where they have been doing fairly well. Hopefully it was just due to last year’s overall poorer increase (I don’t have any data on their bulb sizes from one year to the next for comparison). Certainly, as I’ve seen in the past, *warleyensis* is not as robust as *bucharica*, *magnifica*, and *vicaria*. The other bulbs of the *warleyensis* clone in hut, which had been affected by disease last year, did not coming up. I may have lost a couple more Juno *orchioides* as well. The *zaprjagajewii* bulbs I raised from seed didn’t do as well as they should have (they’re still in the same spot where they grew from seed). In May I found one bulb rotted, and I seem to down by a couple of bulbs. I also have two other bulbs of *zaprjagajewii* in two other spots. They were also raised from seed in those spots and are doing reasonably, but haven’t yet bloomed.

One *magnifica* Alba started off growing well, then seemed to stop, with others beside continuing normally. The leaves of the stunted plant had brown tips. I dug down to examine the bulbs and they seemed fine. It was perhaps 10 cm tall. The plant went through the season like that. Its bulbs seemed to regenerate to reasonable size. So whatever hit it appears to be temporary.

There is a lot of good news though: *Willmottiana* (true) is continuing to do well, though a few of the bulbs won’t be blooming this year. *Albomarginata* continues to do well; though not increasing that well. The *bucharica* formas that had bloomed for the first time last year bloomed again. *Pseudocaucasica* bloomed for the first time. The bulbs appear to be doing reasonably well. Clones I collected in Turkey over 10 years ago never bloomed and eventually died out. Maurice Boussard did get some bloom on the ones I sent him, but they eventually died out too. Obviously there was something those clones needed which we weren’t giving them

I quite like Janis Ruksans’ *vicaria* 'Sangardak'. He listed it for the first time last year with limited availability. Unfortunately it wasn’t in this year’s catalog (he listed 2 other clones). It has up to 7 flowers. Most of my *vicarias* have only 3 flowers. He described it as, “bright blue form of this usually much paler species with very large flowers.” This is a touch misleading since you would get the impression that it is along the lines of *albomarginata*’s lovely blue. In fact its falls are still white, but they do have bright blue in them (particularly around the edge), and its standards and style arms are mixed white and bright blue. Its fall blotch is somewhat olive in colour.

In July Penny Aguirre E-mailed, "I have bad news to report. First of all, it gets down to -30 degrees [Fahrenheit] for a few nights a year typically. This last year -20 was probably the lowest, and we had great snow cover. Unfortunately, I learned a hard lesson this year. In early April I uncovered all my plants and pots (removed the 8" of marsh hay) after having a week of near 70 degree weather. The following week we got 4 nights of 10 degrees. All my pots were lost. *Magnifica* put up foliage but did not bloom. All the others did not show at all. I was quite disappointed!"

I dug down to check a couple yesterday and could not find the bulbs. Perhaps the new growth was ready to emerge and then rotted."

I replied: "Most Junos should have no problem surviving the -20 to -30 degree temperatures where you are. The thing that killed yours was the fact they were in pots coupled with the freeze-thaw cycles. Had the Junos been in the ground the bulbs would have survived (including having the pots buried in the ground). Yes, it would be possible for new growth to rot and then subsequently travel into the bulb (ie. after a number of days). In the past I have had some rot in the leaves of Junos which were up quite a bit (one position is quite sunny, so stalks there are up much sooner than anywhere else). Cleaning the rot off and applying some Gypsum (or other powder) to dry it out, stops it.

Having the bulbs in the ground and leaving a bit of hay on them initially would have been a good compromise. I usually take off a portion of my leaf / straw covering initially, and once it clearly seems the plants are coming up, I take the rest off. If there is growth starting it can easily come up through a portion of the covering.

I once sadly lost a number of *Iris cycloglossa* that I raised from seed, and which had been doing quite well, to a similar situation as yours. In my case they were in a dishpan -- the same pan that I had planted the original seed in. That winter I hadn't packed leaves all around the pan. That made all the difference in the world. All the bulbs were mush. Sad, sad, sad!"

Penny later replied, "I wanted to let you know that the Junos I lost were in the ground. You got confused when I was stating that I lost a lot of pots by removing the cover early: the Junos were not in pots. Anyway it was a raised bed and after the mulch was removed. I suppose that enough freeze / thaw occurred to kill them. It was really 5 days of 5 below [-20°C] however, and then back to normal spring."

I wrote back, "Thanks for the clarification, but you've gone and messed things up (smile). The idea of loosing Junos in pots made sense. The idea of loosing them in the ground, even raised beds, doesn't (at least not in my experience). Of course this was the whole idea behind sending the bulbs to you -- to see if there would be any problems in your part of the country." I had hoped Penny might like to try them again, but she was in the process of moving, so has put off trying more until another year. I am fairly certain they will do well for her. The other thing I had been hoping to learn was how well they would increase.

I'm still surprised and very puzzled by what seems to have happened. I would love to know how much growth above ground there had been, and whether any foliage rotted (re: rot travelling into the bulbs via the foliage).

I once had problems with *Galanthus* (Snow Drops) coming into bloom too early, then being hit by very cold weather and having their leaves turn to mush. Rot would have developed and traveled to the bulbs, wiping them out. In hindsight I should have cut the damaged tissue away, then put some gypsum on to dry out the cut tissue. Perhaps this would have saved the bulbs; of course it might not have.

I have on very rare occasions seen rot develop in the axils of Juno leaves -- on plants in a south facing bed which are the first to come up (snow still covers other beds). A bit of gypsum stopped the resulting rot from spreading.

Only if a raised bed had very sharp sides (eg. sides of 1/2 inch wood), would I think there was a chance bulbs near the sides might be killed.

Certainly there is a temperature swing that will kill them since you can take a bulb at room temperature, freeze it in a standard refrigerator freezer, and it will turn to mush. Yet those same bulbs, when they are properly conditioned, can survive the ground being frozen solid: try digging the soil with a pick when it's really cold. It's amazing how it's almost as hard as rock.

Patrick Healey in Belmont Manitoba Canada (~near the U.S. border) wrote, "last winter was outstanding for prolonged cold. November through mid March was generally 5 to 10°C below average, but there were no extremely cold periods (below -35°C). Deep snow came in early November and persisted through the winter (50 to 60 cm deep). In spite of this, there were large losses of perennials, including some plants I have had for years. One of the losses was *Iris milesii* which you sent. *Iris orientalis*, the bearded Iris, [plus Retics and Junos] you sent [in 1995] continue fine." He didn't have time in the spring to record any bloom details. Information he sent in the fall showed good increase on the Retic hybrids, all of which were from 'Cantab' x *bakeriana* crosses

Patrick wrote, “there was no bloom on *aucheri* or *vicaria*. *Aucheri* had only one fan, while *vicaria* had 2, with leaves reaching 15 cm. I was very impressed with the floriferousness of *magnifica* and *willmottiana* hort. Both had 3 stems, about 30 cm tall. Bloom was in early May.”

This fall I went around to a lot of my Junos and cut off the two side shoots (shoot plus a portion of the basal plate and one or more roots). I happened to notice when I was starting to replant some of the Junos, that last year’s shoots didn’t increase and were now part of the old dead basal plate tissue: wasted potential increase!!! In some Junos, such as many forms of *vicaria*, the bulbs don’t increase in number. However you will always find two small shoots on either side of the bulb. These pieces can then be planted close to the soil surface so they will be able to easily get a leaf up. If this works well, as it should, it will help tremendously with species / clones that don’t increase, that increase only very slowly, or that are “rare” and need to be increased faster.

As always though, it’s a matter of having time to do this work. Certainly I’ve known of this in the past, but I’ve never made a concerted effort to do anything about it.

Understandably pieces with shoots should have a better chance of forming bulbs than just pieces of basal plate with roots. I did in some cases cut off pieces without shoots (ie. in situations where there was extra basal plate and roots available), but I didn’t keep any records (no time, especially for the large number of bulbs I was trying this on). I was wondering at the time whether allowing the wounds to dry would make a difference to the success rate. Generally I cut off the side shoots and then immediately planted all of the pieces. Only in cases with imported bulbs did I have a chance to trim off the side shoots several days before planting them. Similarly, I wondered whether doing this in mid summer verses the (normally) moist fall would make a difference.

Aside: this year October was quite dry! We didn’t have a good rain for almost three weeks, which was extremely unusual. (Nov. 4: we’ve now had a couple of days of rain on and off, but the ground may still be dry 10 or 15 cm down.)

Of course the main concern with slicing up your Junos, is whether disease might get into the cuts. There is always a risk of this, so it is prudent to leave a few bulbs untouched... just in case something goes wrong. This is especially true with your Juno rarities. I’m not at all concerned about any question of reduced bloom. I don’t believe lack of primary roots makes any real difference to whether a bulb will bloom. It’s the bulb’s size that matters most. So if a bulb doesn’t have many roots, and you still want to cut off both side shoots, then go ahead and leave it without any roots.

I’m not sure what the impact is of cutting off side shoots of varieties that do increase: ie. is it the side shoots that normally produce the main new bulbs? It may be that you don’t gain much in terms of the number of bulbs produced in relation to their size: the net effect being that the extra effort is a waste of time (something to look into further).

Often when you buy Junos you’ll find a few primary roots in the bag. These however don’t have any basal plate attached, and in many cases the top is withered. Sorry, these are of no use and are best just tossed in the garbage.

I had also sent Michio Cozuka some Junos in 1995. He wrote, “alas, all has gone! They seem not to like Japan climate. It is difficult to grow, I think same as to grow the *Oncos* and *Reglios*. It may be too hot in the summer time. I have to study much more to grow the Junos.

Climate of Naygoya: Naygoya is situated 35° north and is influenced by the Japan current (Pacific Ocean) that comes from the Southern Pacific and very warm, and not so cold in winter. January and the first half of February is the coldest period of the year. In this period we have freezing temperatures a few mornings to -2 or -3°C, and also small

Pests

This year a squirrel took a liking to eating Tulip bulbs! He also went after one Crocus clone. I have never seen him at work: only the damage. I found that filling in the holes he dug only caused him to redig there a day or two later. I ended up putting out more and more sections of old chain link fencing on the garden to stop further damage and as a preventative measure. In the past people had mentioned they had problems with squirrels digging up bulbs, but that always surprised me since I had never experienced it. Well now I have, and it’s very annoying!! Fortunately he didn’t get anything rare. If this problem turns serious it’ll be war: I’ll buy a humane trap, catch the little devil(s), and then set them loose miles away.

I am glad to report there were no problems with white grubs attacking Junos this year. I did find a fair number in the soil when I was replanting bulbs however.

Just after Halloween I got rid of a mouse who was trying to set up a winter nest under some stone work at the front of the house. He had dug a tunnel under a large plastic bag that had been sitting on the bed edged by the stone work. That’s

how I discovered his existence. The bag had a Halloween picture on it, and was filled with leaves. The mouse ate some bulbs I collected in Turkey over 10 years ago, but he didn't get anything important.

For the first time we had mice in our garage. I had seen evidence of mice in late fall (they had eaten some snail bait), but some surplus Tulip bulbs were untouched over quite a period of time. As a result I concluded the mice had left. In late December I put some pots of Junos in the garage. They were fine for several days, but one day to my horror I found many of the growing tips eaten! In one case the whole top half of the bulb was gone. I put out a trap and eventually got four of the little varmints. They must have been quite hungry to have gone after the Junos. Clearly the snail bait hadn't hurt them.

Potpourri

I took another look at digital cameras in early 1997, but didn't find the quality to be sufficient for flower close ups. The cameras that are currently available at a reasonable price have resolutions around 600 x 400 pixels. I tested one and found in some situations part of the fall washed out. More often the fall ridge colour washed out. My tests were all indoors, so I don't know if outdoor results would have been any better. For general pictures digital photography is good, particularly if the picture is being printed to a portion of an 8.5 x 11 inch page. If the picture is being used on a monitor at a high resolution (eg. 1024 x 768) then the picture's quality is poor due to the camera's low resolution. For now I'm still better off using traditional photography, and then scanning the slides into my computer.

The advantage of digital cameras is to go from camera to computer in one step. There is no delay in needing to get film processed, and the cost savings of not needing film can add up to be quite significant. Of course storing all of the digital images can be fairly expensive, in terms of needing to buy a CD-ROM burner. Currently each slide costs 38¢, which adds up to about \$200 per year. Ideally photos could be posted on a web site right after they were taken (I don't yet have a web connection at home, only one at work, but that's sufficient for my needs right now).

Digital cameras will of course continue to improve over time: resolution (at a reasonable price), colour accuracy, etc. The trick so-to-speak is to know when the right time is to jump in and get one. Now, in early 1998 a couple of 1152 x 864 or slightly higher resolution cameras are available for just under \$2,000 Canadian including taxes, so I should take a look again (my target price however is just under \$1500 including basic accessories). Now that resolution is reasonable I expect that colour accuracy will become my focus of attention. For example, I need accurate blues, not blues that are approaching violets (it's possible that this may vary depending on light level).

One additional problem to be aware of is that most digital cameras do not give you "What You See Is What You Get". There is often an optical view finder separate from the lens. This makes taking close-ups a bit of a guess (you see one thing, but what you get is shifted slightly). Even with attached LCD screens you can't see how well in focus the object is. It looks reasonably good on the small screen, but when you transfer it to your computer, and look at it in high resolution, the areas that are of most interest to you, are often a bit out of focus. There are also other things to be aware of as well, such as how much manual control the control the camera allows.

I like to take slides of my flowers. The colours, highlights, etc., all come out much better than with prints. I do have prints made to send to people since they are easier to view. I get quite disappointed when the flowers don't look like they do in the slides, which happens reasonably often.

Too bad flowers don't show up well on home video cameras (camcorders), which is something many of us already have. In particular the information stored on tape does not have enough detail. Also the colours don't get captured well on the tape. I have sent signals from my camcorder's video section directly into my computer and the colour is much better but there is still some colour shifting.

I still haven't bought a slide scanner. My highest priority still is to get my book text written. Unfortunately it is progressing very, very slowly -- I just don't have time to work on it.

In December I bought a used laptop computer (Mac of course - equivalent to a 386 25 MHz) for \$230 including tax. It's a great little machine. Now I wish I had bought one sooner (I almost had in 1996). I actually intended to get a used Pentium 120 MHz equivalent machine, but the few that had been available at \$1150 with a passive matrix screen, were all sold out (the used active matrix ones were being sold for twice that). Since I couldn't get what had hoped for, I decided to "go low", and get a "cheapy". As it turns out, it suits my needs quite well: I use it on my way to and from work primarily for letter writing when I'm not driving (there are two other drivers in our car pool). The only draw back of this, is it won't run the latest versions of certain software. This means slight hassles in going back and forth from my desktop system to the laptop.

A couple of years from now when prices come down, I'll get one of today's top-of-the-line colour laptops with CD etc., and be able to show people pictures of my Retics and Junos without having to carry around a very large photo album. If I

was retired, and thus had a lot more time, I would invest more money in these great toys right now, since I would be able to make good use with them. However, with having to go to work, etc., the investment wouldn't be worthwhile given the very fast rate the equipment depreciates at (eg. new Macs are 6 times faster than the 7100/80 MHz machine [Pentium 90 equivalent] I bought 2 years ago).

Seeing the new British Iris Society book 'Irises' was a real treat, and a surprise. I do remember several years back of talk of one, but since I hadn't heard any more, I figured the project was dead. I'm actually quite surprised nothing further made it into Species Group newsletters in recent years.

Overall it is quite a good book, it's just unfortunate that it is so expensive. One error I noticed in my quick look over the book: *bucharica* does not have nubbed seeds.

It's funny how a certain pattern of chores has developed over the years. For me, each year starts off with lots of work at the beginning of April when the Reticulatas bloom: covering them with cans and dish pans to keep the rain off, etc.; collecting pollen and hybridizing; plus making notes about the blooms and taking photos of them (though last year I didn't have all that much time for those two activities). As well, all of the straw and leaves used as winter mulch need to be removed from the beds. Juno Irises get going in earnest just as the Retics are finishing. All the while lots of Crocus, Scilla, Tulips, etc. are coming into bloom as well.

Some where in there I have to find time to spray for Iris bore. I haven't yet been successful in totally irradiating them. At the very least two sprayings are required, at least two weeks apart. I also include a fungicide to try to keep leaf spot down. This is more for Agriculture Canada's benefit (re: sending Iris overseas), though the leaves do look a lot nicer without brown spots on them.

June is seed collecting month. The Retics of course ripen first, but it's a case of constantly having to scour the garden to see whether anything needs to be picked including Junos, Crocus, etc. I take the seeds off a few things of before they even ripen such as *Tulipa turkistanica* and *tarda*, and toss them in the garbage. They are quite common. I do collect seeds for a number of societies, but I've come to realize I can't collect everything: I only end up creating more work for myself. Some things like *Iris lactea* take a fair amount of work to shell, so I only do a small amount and toss the rest.

Seed collecting continues until about mid July. Along the way we have strawberries at the end of June, and lots of raspberries by mid July. It's typically been the last week of July that we go on vacation (ever since we had children), for two or more weeks. Oh, I forgot to mention the all important weeding. That is of course a MUST! Getting one weed out before it goes to seed, saves having to pull at least 10 the following year. My gardens are fairly weed free, but every year there seem to be quite a few that have come from goodness knows where (last year I had problems with straw that wasn't clean -- I'm not buying any from that nursery again -- It caused quite a lot of extra work!). I usually end up doing two major passes about a month apart through the garden getting all the weeds. Even after we came back from last year's vacation out west there were a couple of large weeds in the garden that I would swear, weren't there when we left.

In early to mid August it's time to replant as many bearded Irises as possible, with some of those going to the Canadian Iris Society's table sale and auction (I missed doing this the past two years due to long vacations). A number of bearded Iris are kept aside for sending overseas. They are then put together with beardless Iris and / or Junos and Retics. I typically send out more than a dozen parcels, which takes up a lot of my spare time with scrubbing the roots (must be free of all soil), then packaging each order up (most are actually for exchange of plants), getting phytos (use to be free; now they are \$15 each), and finally writing up letters with descriptions of what's been sent. I'm glad when that job's done. It's a real load off my shoulders because I usually get behind where I'd like to be.

The next highest priority is to get an area clear for Retic and Juno seeds. Then it takes a number of days to get the seeds all planted. I often end up taking one or two days off work in order to try to get further ahead. Of course before the planting can happen the seeds which were originally put into cans and jars when they were collected, need to be counted, have info about them entered into my database, and have aluminum tags marked on them as to what the cross was. The original tag used when the cross was made is plastic. It doesn't last all that long. I can typically use a plastic tag for 6 crosses over the course of 6 years. By 3 years the top third of the tag is brittle (due to ultraviolet light) and it easily breaks off. As well, unsuccessful crosses need to be entered into the database, but of course the timing for doing that is not as critical. Processing the seeds is something that can be done after it's too dark to work outdoors.

Once the seeds are all planted, including any that I got the previous spring from alpine societies, then its time to replant as many bulbs as I can: in particular the Retic seedlings, but also Crocus, Trilliums, Tulips, Colchicum, etc., etc. This is a bit of a loosing battle since I just can't get to all of the spots. I of course try to get to the most important areas, but I have one bed that's gone more than 8 year's without being replanted. Two other areas are starting to similarly be neglected. As mentioned previously, the Retic & Juno seedling replanting work is growing in leaps and bounds -- good in some ways (all of the blooms), but bad in others (the time and effort it takes to do the replanting). With all the success I've been having, even just looking after the more important clones is a lot of work.

At the same time I need to get surplus seeds off to various societies and a few individuals. For the past couple of years some of the best seeds (mainly Junos), have been sent to Jim & Jenney Archibald for their extensive seedlist. This brings in some money to offset the reasonably high cost of this hobby.

In the fall there is also picking of hardy kiwi fruit, grapes and pears. We usually freeze some of the latter two. The kiwi crop is picking up, with the *arguta* species fruiting for the first time this year. The *kolomitka* species have been bearing fruit for at least three.

Then of course there's getting the beds ready for winter: putting leaves and straw on them in order to keep the ground frozen (or at least moderate the ground temperature if we have any long warm spells), as well as to prevent any Iris that were replanted, from heaving out of the ground. The mulch also dramatically reduces rot in bearded Iris.

On top of all of that, there's trying to get a bit of writing done. Usually I get at least something written about the year's bloom season (ie. this report). But I try to do that by mid summer if I can (well, I was able to do that in 1995). Before I know it Halloween has come, along with daylight savings time. In a way I'm glad because I'm ready for a break from all of the work; though what I'm up against in the winter months is getting caught up with letter writing, plus working on my Juno book. And I mustn't forget cataloging the slides I took that year (something I've only partially done for 1996 so far).

Of course, while all of this is going on I have a job to go to at Ontario Hydro (electrical utility), where I write computer software, and a family to spend time with (Jeffrey turned 9 and David turned 7 this fall). It's quite likely I need to spend more time with my boys: that's something I'll have to work on.

The trouble is, now-a-days I'm always behind where I would like to be. It seems there's too many "important" things I'd like to do in reasonably short order. I don't feel I'm taking time to "smell the roses". I'm always busy: type 'A' behaviour. It would be nice to have a period where I don't have much that I need to do. In one sense, what I need to do is retire from my job at Ontario Hydro. Of course I'm "only" 42, and my ~20 years of service wouldn't give me much of a pension (actually I have to work until I'm 56 before I qualify for one; even special retirement packages, which are few and far between, require at least 25 years of service).

I have cut out things like going to Canadian Iris Society (CIS) shows. Many years ago I dropped my involvement with the main CIS executive. I am still treasurer of the Toronto region group, and I help out with the auction and table sales in August. One of these years I hope to get back into going to the annual CIS luncheon. Unfortunately it seems to always work out that I am planting seeds at that time (and I am behind where I would like to be), plus the weather turns out to be beautiful, so I can't pass up working in the garden.

An ARGs (American Rock Garden Society) Eastern Study Weekend was held in Toronto at the end of January 1998. It was a treat to visit with Brian Mathew, as well as meet Eric Pasche for the first time. One especially interesting plant I saw was a slide of *Crocus mathewii*, named after Brian by Eric. It's a beautiful white with a reasonably large strong blue centre. The picture didn't show its outer petals, so I'm not sure what they're like. Eric said that as well as being beautiful, it's a good doer.

I had thoughts of having some of my Reticulata hybrids in bloom for the conference, but it wasn't to be. I only found out about the conference after all of the bulbs had been planted. I did go out and dig a few in spite of the cold and the fact it was tricky to find bloom-sized bulbs without disturbing smaller ones too much. One bloomed in early January. Another was set to bloom just before we went away on vacation. I needed to find a way to put the bulbs on hold until the conference. Clearly the answer was cold temperature. The only problem was providing this. I could have put the pots outdoors, but with fluctuating temperatures around freezing due to El Niño, and some possibility that outdoor temperatures could drop quite low, I ended up just sticking them in a chest freezer. I realized there was risk of zapping them due to large temperature swings and the fact their cell sap might have a higher freezing point as a result of the bulbs having been kept at about 60°F. Retics of course bloom when the ground is still frozen, and they can be subjected to reasonable swings from below freezing to over 15°C. Of course the swings to the bulbs themselves is less since they're buffered by the earth. What happened though is the bulbs did indeed get zapped. Disappointing! I had been wondered about putting the bulbs in the refrigerator, but was afraid they still would have bloomed in the 3 weeks before the Rendezvous. ...of course I don't think my wife would have been too happy if I had; though I could have put the pots in slightly larger plastic ice cream containers.

I received a number of delightful letters from Janis throughout the year. In December he included a summary paragraph which I would like to share with you: "We had very bad season - it was enormously cold and wet till end of June and a lot of bulbs seriously suffered. In general we harvested less than we planted, and although very few taxa were completely lost, bulbs were small, and looked poorly. Thick roots of Junos were seriously damaged by excessive moisture. But most pity was early spring, when in February we had very warm weather, a lot of bulbs started growing and flowering. Then frost returned for 2 weeks with -15°C and no snow cover. A lot of foliage was damaged, suffered even plants which never

before were damaged. It looked like an absolute catastrophe in spring. Soil was again frozen even 15 cm deep! Fortunately later many plants more or less recovered. Greatest surprise was with *Corydalis* - they lost completely first foliage and flowers, but then from underground scale leaf sent up new stem with new leaves and flowers. But seed crop was very poor - we had no seeds from most *Fritillaries*, *Iris*, *Crocus* and many others. *Alliums* suffered enormously - in many cases we harvested approx. 30% of planted quantity!" [somewhat edited for clarity]

Table 1 The Five Juno Iris Sections

<p><u>Section Acanthospora</u> - Rodionenko (Round seed)</p> <p>Series <i>Planifolia</i> - McMurtrie</p> <p>[<i>palaestina</i> <i>planifolia</i></p>	<p>Series <i>Caucasica</i> - McMurtrie</p> <p>[<i>caucasica</i> subsp <i>turcica</i> subsp <i>caucasica</i> <i>pseudocaucasica</i></p>
<p><u>Section Physocaulon</u> - Rodionenko (White edged seed)</p> <p>Series <i>Drepanophylla</i> - McMurtrie</p> <p>[<i>drepanophylla</i> subsp <i>drepanophylla</i> subsp <i>chlorotica</i> <i>kopetdagensis</i> <i>porphyrochrysa</i> <i>xanthochlora</i></p> <p>Series <i>Rosenbachiana</i> - McMurtrie</p> <p>[<i>baldschuanica</i> <i>cabulica</i> <i>doabensis</i> <i>nicolai</i> <i>popovii</i> <i>rosenbachiana</i> <i>tadschikorum</i>* <i>zaprzagajewii</i></p> <p>Series <i>Wendelboi</i> - McMurtrie</p> <p>[<i>carterorum</i> <i>wendelboi</i></p>	<p>Series <i>Fosteriana</i> - McMurtrie (~Cubical seed)</p> <p>[<i>fosteriana</i> <i>narbutii</i></p> <p>Series <i>Kuschakewiczii</i> - McMurtrie</p> <p>[<i>inconspicua</i> <i>leptorhiza</i> <i>kuschakewiczii</i> <i>maracandica</i> <i>odontostyla</i> <i>orchioides</i> species from Aktash valley⁹ species from Chimgan <i>subdecolorata</i> <i>willmottiana</i></p> <p>Series <i>Miscellanea</i> - McMurtrie</p> <p>[<i>aitchisonii</i> <i>microglossa</i> <i>stocksii</i> <i>tubergeniana</i> <i>vvedenskyi</i></p> <p>Series <i>Persica</i> - McMurtrie</p> <p>[<i>galactica</i> <i>hymenopatha</i> subsp <i>hymenopatha</i> subsp <i>leptoneura</i> <i>persica</i> <i>stenophylla</i> subsp <i>allisonii</i> subsp <i>stenophylla</i></p>
<p><u>Section Tylosperma</u> - McMurtrie (White/Grey nubbed seed)</p> <p>Series <i>Linifolia</i> - McMurtrie</p> <p>[<i>albomarginata</i> <i>capnoides</i>* <i>graeberiana</i> <i>hippolyti</i> <i>linifolia</i> <i>narynensis</i>* <i>platyptera</i>* <i>parvula</i> <i>zenaidae</i></p>	<p><u>Section Wendelboea</u> - Rodionenko (distinct by plant physiology)</p> <p>Series <i>Cycloglossa</i> - McMurtrie</p> <p><i>cycloglossa</i></p>
<p><u>Section Juno</u> - Rodionenko</p> <p>Series <i>Aucheri</i> - McMurtrie (~Round seed)</p> <p>[<i>aucheri</i> dwarf form "subsp <i>leylekii</i>" <i>edomensis</i>* <i>nusairiensis</i> <i>postii</i>* <i>regis-uzziae</i></p> <p>Series <i>Bucharica</i> - McMurtrie (~Cubical seed)</p> <p>[<i>bucharica</i> <i>magnifica</i> <i>vicaria</i> (~Round seed) <i>warleyensis</i></p>	<hr/> <p>Notes</p> <p>⁹ Although related to <i>orchioides</i>, this plant may be a new species -- need to study living material.</p> <p>* Tentative placement</p>

